



**Participatory  
valuation of  
wild resources:**  
an overview of the  
*Hidden Harvest*  
methodology



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# Participatory valuation of wild resources

A vast savannah devoid of people and crops, a stretch of roadside gully, or a field border may seem of limited economic value. A forested area may seem to be valuable only in terms of its stand of commercially viable timber. But such landscapes can contain countless wild resources that make a significant contribution to local people's needs and national economics, and which supplement the more visible common crops and livestock. Many natural resource management policies which affect wild resources and their habitats often overlook these more hidden values, often because of a lack of appropriate methodologies for local level economic assessments. Ignoring these hidden harvests opens the door for land use changes that may appear more financially productive in the short term, but which may have grave consequences for local people's livelihood security and for the maintenance of genetic and biological diversity. This paper suggests some methodological alternatives for understanding the value of wild resources at a local level.<sup>1</sup>



Photo: J. Gujit

*There's more to forests than timber!*

This paper is an outcome of IED's *Hidden Harvest* research programme, which aimed to develop a more differentiated and inclusive approach to the valuation of wild plant and animal resources. The methodology involves seeking local level perspectives on economic questions about resource values and incentives, bringing together two traditions with unique features. The paper describes the methodological approach adopted and its conceptual background, as well as the debates and dilemmas encountered along the way. It is illustrated throughout by examples from case studies conducted in Zimbabwe, Botswana, Brazil, Nigeria and Papua New Guinea.

<sup>1</sup> This paper is a shorter version of a fuller methodological report from the *Hidden Harvest* project: "Valuing the Hidden Harvest: Methodological approaches for local-level economic analysis of wild resources". IED, 1997a.

# Why are local-level valuations important?

Wild resources are often critically important to rural peoples' livelihoods. This is particularly the case for marginalised social groups, notably the poor, women, and children. Wilderness areas and wild resources:

- enhance food security by providing an important buffer during certain seasons and/or major periods of stress;
- supply vital nutritional supplements to diets based largely on carbohydrate-rich staples;
- have significant economic value by preventing the need for cash expenditure, for example on construction material, fodder, and medicine;
- can provide ready sources of income to cash-poor households;
- have many cultural values, such as sacred sites or species used in ceremonies or for barter;
- hold the key for the future of agricultural production by providing essential genetic material;
- help to regulate climatic patterns and protect against natural disasters and degradation processes;
- represent as yet unknown medicinal values for future medical needs;
- provide essential indicators of environmental change.

Why are these important functions provided by wild resources so often overlooked? There are a number of reasons:

- they are highly site-specific and seasonal, and their importance differs from one social group to another;
- they are often collected opportunistically and sometimes illegally, making harvest assessments difficult;
- they are often marketed through informal networks or used as subsistence products and so do not have a formal market value;
- they often represent a value to local people which cannot be translated into financial terms.

## Further reading on the value of wild resources

- Anderson et al., 1985
- IED, 1995
- Jodha, 1986
- Melnyk, 1995
- Scoones, et al, 1992
- Campbell et al., 1997
- Emerton, 1996

These complexities (and others, see Box 1) make it extremely difficult for conventional valuations to capture fully the importance of wild resources and to communicate this effectively to policy makers. Yet local valuations can partly overcome these and other problems.

**Undertaking inventories and valuation studies with the resource users themselves will reveal more comprehensive and relevant, rather than assumed, economic values of local genetic resources and incentives for their management.**

This will help provide better information for policy makers and other stakeholders, thus increasing the likelihood of more appropriate policies and plans.

There are many situations when local valuation would be an appropriate approach (see Box 2).

**Box 1****Box 1. Defining wild, defining hidden**

What do we mean by 'a wild resource' and 'a hidden harvest'? This is not as straightforward as it might appear, with many interpretations of both terms. From whom is it hidden, how is it hidden, when is it wild or semi-wild, domesticated or semi-domesticated? In Brazil, for example, *malva* (*Urena lobata*) was introduced as a fibre crop in the last century. It has now infested natural shrubland to such an extent that it is considered a wild weed. However, as it provides an important commercial source of fibre, farmers actively manage shrubland to allow *malva* to continue its semi-wild existence.

Furthermore, the word 'wild' tends to imply the absence of human influence and management. However, many of the landscapes which are often viewed as pristine or 'wild' by outsiders, have been modified, managed and, in some instances, improved by people for centuries (Pimbert and Pretty, 1997; Gomez-Pompa and Kaus, 1992). Care needs to be taken when using the term, as it implies that the resource is not owned and that it can therefore be used by anyone, with implications for local and traditional use rights. Anyone undertaking a valuation study of wild resources should be aware of these potential pitfalls and confusions at the start.

'Hidden' also requires further clarification. The hidden harvest refers to those species or types of value that are not incorporated into formal economic calculations. In other words they are species and values which are perfectly visible to local people, but much less visible to policy makers and researchers.

**Box 2****Box 2. When can local-level valuation be used?**

Local level valuation studies can be used for several purposes:

- to address and challenge a particular natural resource, land use or market policy that may threaten wild resources and wilderness areas;
- to conduct an environmental impact assessment of a planned development, such as plans to convert a local wilderness area to agriculture, focusing on the potential loss of value;
- to understand the costs and benefits of different development options, such as cultivating wild plants as opposed to opportunistic gathering;
- to seek improvements in local institutions that manage resources, such as resource sharing or community management schemes;
- to identify better markets and resource management options for wild resources and their (by)products;
- to investigate people's livelihood strategies, and how these determine the constraints and options for making the use of wild resources sustainable.

Source: Guijt, I. 1997

# PRA and economics for local-level valuation

The methodology pursued in the *Hidden Harvest* studies has combined two traditions:

- Economic approaches for resource valuation; and
- Participatory research techniques, based largely on Participatory Rural Appraisal (PRA).

The process of methodological reconciliation has not been straightforward, as these two traditions have distinct, and sometimes contradictory, methodological approaches (IIED, 1997a). However, combining them has opened up a methodological middle ground between costly and lengthy resource assessments on the one hand, and making assumptions about or ignoring local resources, on the other. This section summarises the two traditions, describes how they can be combined, and reflects on some of the challenges encountered.

## What is the role of economics in valuing wild resources?

Economic assessments are important for several reasons, not least because they dominate policy analysis. Notably, economic analysis can help to explain the motivations of individuals. Looking at the costs and benefits as perceived by different socio-economic groups can shed light on how they will respond to certain policies and programmes. Weighing up the costs of certain interventions against their benefits can provide decision-makers with a relatively informed basis for investing in more environmentally sustainable options.

The format in which information is conveyed is crucial if policy-makers are to be influenced. If resource valuation studies are prepared for policy decisions, the different options are usually set out in a single, well-known numeraire, thus making a comparison of the relative merits of different land use options easier. Either quantitative or qualitative information can suffice, as long as it is relatively concise.

The aggregation and standardisation of most economic analyses provides ideal outputs for a policy planner or decision-maker.

### Key assumptions

Economics uses models to describe the relationships between costs, income, markets and people's behaviour in mathematical terms. As economics tries to make these complex interactions tractable, reality needs to be simplified by making some assumptions (Box 3). Therefore, highly simplified theoretical models of real life decision-making processes provide the general framework for economics.



Photo: J. Craig

Woman wearing man's ceremonial dress from local birds and holding a net used to hunt 'wild' fish, Mare, PNG.

**Box 3. Key assumptions of economics**

- The decisions made by individuals or groups such as households about their use of natural resources are based on their desire always to maximise welfare. In other words, the models assume that values reflect the fact that all actions taken by people are designed to increase their welfare.
- The economic value of a wild resource is ultimately determined through a market process in which no one person or group can exert greater power to influence the market outcome in their favour. In these undistorted conditions, the price obtained for the wild resource reflects its economic value.
- Where external factors such as subsidies, political pressure, etc., interfere with the functioning, or even existence, of markets, the resulting diversions from the model of perfect competition are viewed as market 'imperfections' or distortions.

**Data needs**

The data needed for such models are specified in detail before data collection starts, and the models usually require large amounts of relatively aggregated and simplified data, although the actual data needs will depend on the model being used. Official government statistics are a common source of data. In their absence, or for more focused assessments, questionnaire surveys are commonly used. In either case, the aim is to obtain quantitative data sufficient for the analysis of the predetermined model.

The role of the economist in fieldwork is essentially one of analysing unprocessed data that have usually been collected by others. S/he may be involved in supervising the enumerators and may have pre-tested a questionnaire, but any input into fieldwork is limited in both time and intensity.

**A framework for wild resource valuation**

Environmental economics has provided a useful framework for classifying how wild resources provide value to local people (Table 1). The economic benefits of wild resources stem largely from the *direct use* that people make of them as a source of nutrition and a means of subsistence. However, because many wild resources do not enter into trade but are consumed directly by the people who collect them, techniques are needed which can calculate their value in these circumstances. Otherwise their true economic significance will be underestimated.

Besides their direct use value and like many other renewable natural resources (eg. forests, wetlands, biodiversity), certain wild resources have important *indirect* or *non-use values*. For example, some species of animals including bats, birds and bees play an important role in plant reproduction. This is an example of an indirect use value. Other plants and animals are prized for their rarity by conservationists, an illustration of a non-use value.

In rural subsistence situations, wild resources and natural habitat often have important cultural values, another example of a non-use value.

These other values are frequently neglected by those involved directly in the production and consumption of wild foods, or by government agencies charged with the management of wild food resources.

With different types of values and an array of valuation techniques, it is important to assess which will be the most useful prior to undertaking a study. The choice of a valuation technique will depend on the available data, on the nature of the resources being valued, and which of the types of values is being assessed.

Photo: J. Gujtt



Ceremonial dress made of wild species in Papua New Guinea



## Types of economic values and examples

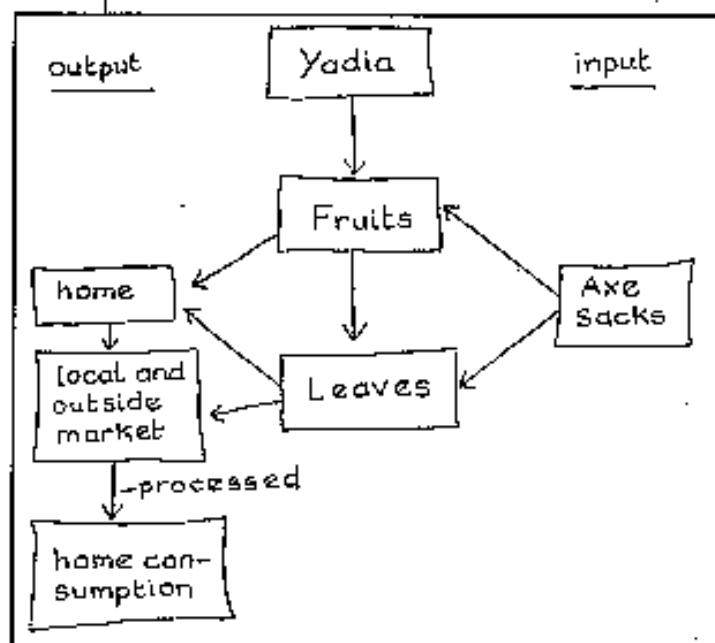
Use values		Non-use values
Direct	Indirect	Existence/cultural
<p>Wild plants and animals directly consumed or marketed</p> <p><i>Examples:</i> food medicine construction materials</p> <p>Non-consumptive direct benefits of resources</p> <p><i>Examples:</i> shade from trees use of forested area as burial ground use of wild species for improving domesticated varieties</p>	<p>Species or system which supports other economic activities</p> <p><i>Examples:</i> role of forested areas in protecting watersheds by regulating flooding nutrient cycling in agricultural lands promoted by forest or wild areas pollination of crops provided by wild species of birds or bees</p>	<p>Species or system which is valued for its own right without reference to an economic use</p> <p><i>Examples:</i> cultural appreciation and heritage beauty motivation to bequest resources to future generations (including a wide range of resources i.e. biological diversity)</p>

Source: adapted from Barbier, 1991

## Estimating values

To assign a value to the different types of uses of wild resources described in Table 1, economists try to calculate the *net economic value*. There are a number of ways of calculating net economic value, depending on whether the product is sold at market or simply consumed for subsistence, bartered and so on.

- **Marketed Products.** When a product is sold at local markets, its net economic value is



Processing of Yadia leaves (IIED/HNWCP, 1997)

the revenue obtained from selling it, minus harvesting, processing and transport costs, including non-financial costs such as own labour. For example, in the Hadejia-Nguru wetlands in Nigeria, *yadia* (*Leptadenia hastata*) leaves and fruit are harvested with an axe and are carried home in a sack. The axe might last five years, and may be used to cut several thousand fruits and leaves in this time. It will cost a certain amount to purchase/replace the blade. The sack might last only a month or two, but may cost next to nothing to replace. Both the leaves and the fruit can be sold at markets – transport to and from market will cost a certain amount, and market taxes may well be levied. All these costs need to be calculated and subtracted from the price which the *yadia* leaves and fruit obtained at market.

In many cases, most costs are in the form of labour spent by one or more individuals working for themselves. Economists tend to use local wage rates, eg. for agricultural work, to estimate the value of this time. These may be adjusted to reflect the varying effort of, for example, children versus adults, or the varying opportunity cost of labour depending on the season.

- **Non-marketed products.** Where prices are unavailable, the alternative is to look for marketed *substitutes* for the resource in question or for *barter* exchanges involving the resource or its processed product. For example, one wild pig might be traded for five medium size clay cooking pots. If the wild pig does not have a market value, but the pots do, then the value of the wild pig is easily estimated. Market values for these substitute goods or barter equivalents can be used to approximate the 'gross', as opposed to net, value of the wild resource. However, it should always be emphasised that these values are only approximate. Using substitute or barter goods to estimate market values are methods that are often included under the terms *surrogate market valuation* or *related goods approaches*.

Where reasonable data can be collected on the costs of harvesting, processing and transport, but there is no reliable information on market value for a resource or a substitute, the total costs incurred from harvest to sale can be used as an indication of the value of the resource. This approach is known as *opportunity cost valuation*. This will invariably lead to an undervaluing of the final product but produces a minimum indicative value.

#### Further reading on economic valuation of wild resources

- Barbier, 1991
- Gwaai Working Group, 1997
- IIED, 1997a
- Kramer et al., 1994
- Lampietti and Dixon, 1995
- Whittington, 1996

- **Indirect use and non-use values.** Indirect values can be assessed using the *production function*, or 'change in productivity' approach, which determines the physical or ecological relationship between certain resources or environmental functions and some economic activity. For example, where a natural forest regulates an adjacent field's hydrology, this indirect value could be assessed by the decline in agricultural production that would arise if the forest was to disappear causing increased flooding and crop damage. Of course, such relationships are very difficult to estimate empirically, and very simple assumptions are often made.

For non-use values, economics tends to use the *contingent valuation* method (CVM). This uses complicated questionnaires to ask individuals how much they would be willing to pay for the

maintenance of some benefits, such as a wildlife sanctuary nearby or continuing to receive drinking water from the clear mountain stream instead of the town treatment plant. While CVM can be applied to almost any type of value, its hypothetical nature has made it just about the only technique for environmental values, including non-use benefits of resources, such as cultural values. However, the extent to which communities can assess their cultural capital in monetary terms is highly questionable, particularly in less commoditised societies. Also, it is arguable whether or not the stated willingness to pay would be the actual amount paid if the benefit was ever marketed.

## Decision-making tools

As described above, the calculation of various resource uses in monetary terms helps us understand how important resources are to people. But they do not necessarily help to shape policies that can support sound management and discourage unsustainable wild resource use. The calculated resource values can be combined with another economic approach, *cost-benefit analysis* (CBA), to understand why people manage a given resource or its habitat. In this way, policies in support of sound management can be fine tuned. CBA can also be used for weighing up land-use options at a national level. In CBA, the expected costs and benefits of a project are estimated over the defined lifetime of a project, or some appropriate time scale. This stream of costs and benefits are added up over the time horizon and combined to yield one figure on which the project's merits can be assessed. This is clearly a powerful decision-making tool. However, there are obvious limitations involved in trying to reduce the benefits or drawbacks of a project or decision to just one criteria or number. CBA must therefore be used together with non-monetary and qualitative information.

# Limitations for local-level valuation

The relative simplicity of economic models partly explains their appeal for policy makers and decision makers. Economics presents its analysis and information in a concise form that allows for the comparability of very different situations. But there are several limitations to the approaches discussed above. These are often particularly apparent in a Southern, rural context, which involves different cultural situations and less commercialisation of economic activity than in the industrialised West where the models were developed:

1. The concepts, terms and units used in economic assessments are often imported from Western experience. Furthermore, different researchers, depending on their research tradition, define or interpret them in different ways. These definitions are critical, as they structure the way research is carried out, determine the questions that are asked in the field and in a survey and, necessarily, characterise the results that are reached. For example, the household is usually the most basic unit for economic assessments, such as analyses exploring production or consumption. However, this tends to overlook the important inter- and intra-household interactions which play a major role in the way that individuals within a household value the wild resources they use (Dasgupta, 1993; Jodha, 1986).
2. Conventional economics is dominated by a series of assumptions (Box 3). However, these are often a poor reflection of reality. For example, the assumption that households are driven largely by welfare maximisation does not always recognise sufficiently other, equally rational motives, such as maximising the likelihood of survival, or fulfilling social duties and rituals. With such a bias towards theory, the outcome of economic analyses must always be assessed carefully in the light of people's real livelihoods.
3. Simplified analyses can be especially misleading where wild resources are concerned.

Wild resource use is highly complex, with immense spatial and temporal variability. It is governed by myriad interactions of institutional factors and social relations. A differentiated analysis is essential to highlight the fluctuating value of resources according to season, or according to different household members.

FIREWOOD	BUILDING MATERIALS	MEDICINE	SING SING RITUALS	FOOD ANIMALS	INCOME	VEG
tulip talin watergum	kwila saksak labala r/wood b/palm walnut watergum bamboo	tulip ginger salat cinnamon mango ficus		pig cassowary bandikut fish w/fowl kina flying fox kakatu h/bill kapiak puklouw	kwila labala kapiak tulip kina shell boarchin	sa fer. ge ma to wa
(20)	(30)	(15)	(20)	(30)	(27)	( )

For instance, in drought periods the presence of wild foods may mean the difference between life and death, thus increasing their value enormously as compared with other periods, particularly for poor households. How can these values be incorporated into long-term planning?

4. Economics assumes that everything can be valued. However, many people feel strongly that some resources, or the functions performed by those resources, cannot be given a value. For example, certain species might play an essential role in ceremonies and will be irreplaceable. In other cases, if the value is too difficult or costly to estimate reliably, as with many ecological functions, then this important economic role may subsequently be lost, or underestimated, in the analysis.
5. Even if assumptions are relatively realistic, the way that data is collected can lead to biases and inaccuracies. Data for economic analyses are frequently derived from interview-based questionnaires. Much has been written on the biases and inaccuracies which can arise through this approach to data collection (see the next section). If data derived in this way is fed uncritically into an economic analysis, the results may be highly misleading.

In summary, answering the question "what's it worth?" is difficult, as total economic value has many components and limitations. Studies that attempt to translate all values into a monetary equivalent must be treated with caution. Such analysis must be understood by seeking more qualitative information about local perceptions and relative rankings of value.

By extending the question "what's it worth?", to "what's it worth, to whom, when and in what way?", and by seeking inputs from other, more participatory methodologies, a more balanced assessment of value can be achieved.

VALUES	SACRED AREAS	TOOLS	PETS	WATER	EROSION CONTROL	BOUNDARY RECOGNITION
	matmat puberan tafotzrop timatzra					
	10	15	5	30	30	30



Photo: J. Gujit

Local ranking of critical forest functions plus some key species, Mare (PNG). (Grieg-Gran, et al, forthcoming)

# Participatory rural appraisal and rapid rural appraisal

Rapid Rural Appraisal (RRA) developed in the late 1970s as a research and planning approach to help minimise existing methodological anti-poverty biases, avoid the limitations of questionnaire surveys, and provide sufficiently accurate and timely information for externally-driven planning. It grew from a growing awareness of the failures of conventional approaches to meet the needs of poor people. Participatory Rural Appraisal (PRA) evolved in the late 1980s, building on the methods and principles of RRA but seeking additional inspiration from methodologies that emphasised local empowerment. When used well, PRA can enable local people (rural or urban), to undertake not only their own appraisal but also to analyse it, act on it, and monitor and evaluate local changes.

RRA and PRA share some principles (Box 4). Methodologically, both emphasise visual forms of communication, such as diagramming, mapping and role playing. Interviewing techniques are semi-structured and flexible, rather than formalised and standard. Both approaches set out to compare rather than measure, with qualitative and quantitative insights being combined to build a picture of local realities which respondents themselves agree reflects their perspectives.

Despite the similarity of methods used, RRA and PRA differ considerably in their purpose and process. RRA began and continues to be a better way for *outsiders* to learn. RRA studies focus on collecting information, albeit in some cases using participatory methods. PRA emphasises local processes of analysis and sharing knowledge for *local-level planning*, and is therefore a much longer and open-ended process. The focus of a PRA process is on learning for action and forging partnerships between different individuals and groups. As the *Hidden Harvest* case studies have emphasised externally-analysed research, they are best described as RRA studies using participatory methods.

## Box 4

### Box 4. Basic principles of RRA and PRA

- offsetting biases: spatial, project, person-specific (gender, elite), seasonal, professional
- rapid progressive learning: flexible, exploratory, interactive, inventive
- reversal of roles: learning from, with and by local people; eliciting and using their criteria and categories; and finding, understanding and appreciating local people's knowledge.
- optimal ignorance and appropriate imprecision: not finding out more than is needed and not measuring when comparing is enough
- triangulation: cross-checking using different methods, information sources, disciplinary insights, and informants in a range of locations
- outsiders learn directly from and with local people
- seeking diversity and differences

PRA processes furthermore emphasise:

- facilitation skills which enable local people to do the investigation, mapping, modelling, diagramming, ranking, scoring, quantification, analysis, presentation, planning themselves
- sharing of information, of methods, of field experiences between and among NGOs, government and villagers
- behaviour and attitudes of external facilitators: critical self awareness; listening to villagers, and a relaxed and creative approach to the fieldwork.

Source: adapted from Chambers, 1992; Chambers and Gijlt, 1995

## Key assumptions

The assumptions which underpin participatory methodologies are different to those of economics. These are due to its diverse ancestry, based on methodologies from the natural and social sciences alike, and include:

1. Knowledge is culturally and socially constructed. Therefore, there are multiple views of a particular situation and no single version of reality;
2. Resources are valued by different people at different times for a variety of reasons. Economic value must be understood in the context of wider normative values about resource use;
3. Resource use decisions are continuously negotiated among many different people and groups. Such decisions must be analysed in the context of existing patterns of power and control;
4. Understanding local level resource use means interacting with local people, exploring their situation with them, and developing a joint understanding of different perspectives;
5. The principle of 'optimal ignorance', of accepting that one cannot know everything and still make a positive difference, allows not only a greater role for researchers who do not yet know the new research site, but also creates a greater role for local people who may find it difficult to express values in absolute terms. As the focus is on information that is 'good enough', relative representations of value become much more meaningful and, therefore, acceptable as research inputs (Shanley *et al.*, 1997).

## Data needs

In a RRA or PRA process, the process of generating information is as important as the information itself. After all, the main objective is to generate sufficient collective understanding of issues and interest to tackle a key development constraint. Therefore, the type of data to be gathered is not predetermined. General discussion topics are formulated and change to reflect which issues local people consider important. Information generation and analysis is a joint activity that takes place in the field.

As the focus of analysis is the micro-level and diversity is sought, information will be detailed and site-specific. Extrapolation or generalisations are avoided. The emphasis on optimal ignorance means that precise and quantitative data is usually limited<sup>2</sup>. Instead the data sought is relative and explicitly subjective.

In participatory research, the researcher's role is not so much as an 'interviewer' and more as a facilitator, encouraging local analysis of information and data, guiding discussions and probing responses.

Rather than using a pre-determined list of questions, the flexibility of more informal discussions allow issues of importance to the particular respondent to emerge and be pursued (Box 5).

Data and perceptions are verified through triangulation, which consists of exploring and cross-checking a topic using different methods, information sources, disciplinary insights, and informants in a range of locations. In this way, each exploration builds a more comprehensive understanding of the issue. Similarly, by using a single method with several different groups (men, women, children, etc.), the different perspectives surrounding a particular issue can be revealed. Trustworthiness of data is strengthened by providing opportunities for the community to review, alter and verify the findings.

A further advantage of participatory methods when used in the context of research is that they can be more cost-effective in both time and money than most conventional long-term surveys.<sup>3</sup> Indeed, a growing number of cases from Africa and Asia that allow comparisons to be drawn indicate that participatory methods for local-level analysis and planning yields positive results that are largely verified by subsequent formal surveys (Gill, 1993; Chambers, 1992; Inglis, 1991; Rocheleau *et al.*, 1998). These comparisons showed that little new or conflicting information was collected in the formal surveys.

<sup>2</sup> The *Hidden Harvest* and other studies that seek to combine complementary methodologies are rapidly challenging this common situation by generating considerable amounts of quantitative data, albeit usually not as systematically and rigorously as if generated through a survey (cf IED, 1997b).

<sup>3</sup> Note that this may be true for participatory methods, but not for PRA in general, which is a long process of local discussion, planning, and action.

## Box 5. Querying questionnaires

For the past 60 years, the formal survey based on the use of a pre-set questionnaire has been the standard way of gathering socio-economic information. Yet there are many problems associated with the approach, many of which are non-sampling errors – data distortion that occurs as a result of problems with the application of the questionnaire and not from biases in the sample size and/or composition. Participatory research has evolved as a reaction to some of these.

- **Rigidity of design:** the question list is compiled before the fieldwork, and often before the researchers have a clear understanding of key local issues. From then on they cannot be altered. This means that any new topics that may be much more important to local people cannot be pursued.
- **Official nature of the survey:** the sense of formality generated by the presence of a clipboard and pen can be intimidating and does not promote good rapport between interviewer and interviewee. In these situations, it is not uncommon for people to give the answer they feel is expected



of them, rather than what they really know or feel.

- **Size and complexity:** When complex issues are under investigation, a great deal of information is required if the study is to be sufficiently comprehensive to be useful. The result is usually a long and cumbersome questionnaire, containing many sensitive questions that are difficult to answer. Even without the sensitivity issue, sheer length alone will cause respondent fatigue and a tailing off of interest.

- **Lack of transparency and feedback.** A stranger arrives in a village or neighbourhood, and asks if he or she can ask a few questions. The respondent, out of courtesy, agrees to be interviewed. Little effort is made

to develop rapport, or explain fully the purpose of the exercise or how the information will be used. There is no opportunity for the interviewer to double check the information given by the respondent, to ascertain whether questions have been understood correctly, or to understand the context within which they were asked.

Source: Gill, 1993; IIED, n.d.; Chambers, 1997

## Application for valuation studies

One of the key principles of participatory methodologies is to seek diversity, rather than to generalise about situations. The diversity of methods that are continually evolving reflect this principle. However, it is not only the methods themselves, but the combination and sequence in which they are used that make them invaluable for understanding the myriad values of natural resource use at a local level. For example:

### Further reading on participatory approaches and wild resource valuation

- Chambers, 1994, 1997
- Chambers and Guijt, 1995
- Emerton and Mogaka, 1996
- Gill, 1993
- IIED, 1997a
- Scoones and Thompson, 1994
- Scoones, forthcoming
- Shanley et al., 1997

- Social mapping and well-being ranking can identify diverse socio-economic groups within a community, enabling data collection to be targeted to them to understand how wealth and social aspects affect people's dependence on the hidden harvest;
- Seasonal calendars and timelines can be used to understand how the use and importance of wild resources varies over time;
- Maps, models and transects can be used to identify the location of wild resource harvesting areas. When created with elders, these can help understand historical changes in resource status;
- The values of wild resources can be elicited with a variety of matrix scoring and ranking techniques. These reveal not only how valuable different species are to different people, but also the ways in which they may be important, including non-financial values and their relative importance compared to other non-wild resources and activities;
- Product flow diagrams and tenure maps can be used to understand how wild resources and access to them are controlled, and to clarify who is and is not involved in their harvesting and management.

Using any or all of these methods with different groups: the poorest, the women, the children, the elders, will reveal the many different perspectives which surround wild resources and their uses.

## Limitations for local-level valuation

The tenets of participatory methodologies, particularly RRA and PRA, give rise to several limitations, especially when attempting to inform policy decisions.

1. The pursuit of micro-level details and diversity at the local level, the emphasis on local social processes, and the presentation in terms of specific narratives makes for information which is too detailed for policy makers and is not analysed in terms of policy implications. Other mechanisms and processes of information analysis and dissemination are needed to generate the types of generalised data that policy makers need. However, the use of PRA findings as 'case studies' to enrich policy analysis can be effective.

This type of qualitative analysis gives a human face to general statements and statistics. And it can demonstrate the diversity of local situations which policy should be able to take into account (Thompson *et al.*, 1996).

2. The context-specific nature of information derived from R/PRA makes quantification more difficult. The use of groups to discuss issues, and the emphasis on relative, rather than absolute, values contribute to this. This is not to say, however, that data derived through such methodologies are inaccurate or untrustworthy (see next point), but it often means that people will be less willing to accept it than that generated through more conventional approaches.
3. It is common for researchers using participatory approaches to be asked "But how does it compare with the real data?" (Gill, 1993). The assumption often is that participatory methods are a short-cut approach to research, leading to unrigorous and inaccurate findings. But as Robert Chambers has recently reiterated (Chambers, 1997), the purpose of rigour is simply to assure that data provides an accurate reflection of physical and social reality, and that personal judgement is minimised. Whilst rigour is traditionally linked with measurements, statistical tests and replicability, these can overly simplify reality, as in order to be counted, the real situation has to be broken into parts. This does not work well in the social sciences as the simplifications which result miss or misrepresent much of the complexity, diversity and dynamism of the system.  
As with all research methodologies, however, the 'rubbish-in, rubbish-out' theory holds true.

'Bad' participatory research can produce findings as misleading as 'bad' questionnaires.

4. One pitfall to avoid is excessive reliance on, and mechanical application of, the methods, and to remember the importance of open-ended and probing discussion. There is much that passes for participatory research or action-oriented learning that is simply poor research or incompetent community development work. Much of this is caused by inadequate facilitation. The strong focus of participatory methodologies on group-based interactions and semi-structured discussions means that the facilitation skills of the researcher or extension agent are put to the test much more than in the administration of a questionnaire survey. The dependence on good quality facilitation for trustworthy and representative findings means that, in the absence of good facilitators, the methodology is unlikely to be fruitful.

Nevertheless, participatory approaches clearly offer a powerful set of methods for understanding the complexities of wild resource use at a local level, for identifying changes over time and for understanding how values differ according to social status, gender, access conditions and so forth. The limitations of the approach, especially when trying to inform policy, highlight the importance of the search for complementarities with other disciplines.



# Complementarities and contrasts

## Building bridges between contrasting approaches

As we have seen, the contrasts between PRA and economics approaches are many. Economics explains complex processes using assumptions about reality. Participatory methods concentrate on examining just those complex social processes that economics tends to ignore. Economics usually analyses large quantities of numeric data, collected with written and/or interview-based questionnaires, and translates them into financial terms. Participatory research collects detailed narratives, through different diagramming and interviewing methods, and translates them into next steps for local action.

**In many ways, economics and PRA are philosophical and methodological opposites, resulting in fundamentally different perspectives on the nature of enquiry and how its validity is judged.**

To a certain extent, these differences will always be irreconcilable. This paper does not seek to compare the two disciplines, but instead to build bridges between them, in the search for better ways to value natural resources.

Based on our experience with the *Hidden Harvest* work to date, it would seem that there are four main ways in which the two methodological traditions can be combined:

- 1. Improving questionnaires:** participatory methods can be used to describe the research context, which is needed to help identify relevant economic research questions and to design more appropriate questionnaire surveys
- 2. Verifying questionnaires:** the economic values derived from questionnaire surveys can be verified, or ground-truthed using participatory research methods;
- 3. Replacing questionnaires and systematising participatory research:** economic models can outline the research questions and participatory research techniques can be used to find the information needed, instead of using questionnaires;
- 4. Looking beyond conventional value:** participatory methods can also help to challenge existing discipline-specific assumptions by seeking diverse local interpretations of value, notably indirect use values and non-use values;

The first three of these four strategies are essentially approaches to using participatory techniques to produce information for economic analysis. In the case of the first two, the use of questionnaire surveys is still pursued, while in the third, these are replaced by participatory techniques. In all three cases, the main contribution of participatory methods is to improve the empirical aspects of economics. The context for such approaches is clearly an extractive one in which researchers are looking for ways to gather information for their own purposes. Under the fourth strategy, the models and concepts of economics are refined using insights from participatory research, thus implying a higher degree of participation on the part of communities.

These strategies are not mutually exclusive and there can be elements of more than one in a given assessment. But they do represent different types and levels of contributions from PRA and economics respectively. The approaches of improving or verifying questionnaires should be the easiest for practitioners of either PRA or economics to tackle since these strategies concentrate primarily on empirical issues. On the other hand, the third and fourth strategies require a greater shift in thinking in order to incorporate some philosophical elements of PRA into economic analysis. It should be stressed that in these strategies, the use of PRA can be interpreted in one of two ways: (1) only as participatory

methods for data collection without use of the findings by local resource users; and (2) as a local participatory research process on the value of wild resources that leads to local identification and implementation of better resource management strategies.

In the section which follows we give some examples of how these complementary approaches were used in the *Hidden Harvest* case studies.

## Lessons from the *Hidden Harvest* case studies

As part of the *Hidden Harvest* project, case studies (see Appendix 1) were conducted in Botswana, Zimbabwe, Brazil, Nigeria and Papua New Guinea to explore the use of economic and participatory approaches for valuing wild resources at a local level. These diverse experiences show that there is no single, set research procedure. The choice and sequence of methods depends on the questions being answered, the economic model chosen, and the extent of local knowledge. The questions, in turn, depend on the local context, including resources, markets, and resource management structures and mechanisms.

Despite such local differences, there are a number of basic aspects of wild resource use which need to be understood in any valuation:

- How does the *location* of wild resources influence their value to the users?
- How do values of wild resources vary *seasonally*, and from *year to year*?
- How do differences in *wealth, power, gender*, etc. affect people's dependence on, and therefore valuation of, wild resources?
- How do wild resources fit into people's *overall livelihood strategies*?
- How do people rate their wild resources in terms of their *cultural and/or ecological importance*?
- How do *wild resource markets* function?
- What rules exist which *control access* to and use of wild resources?
- How *sustainable* is the current use of wild resources?

The two methodologies were combined in different ways to answer these questions, often with economics helping to structure the valuation question and the data needs for answering it, and participatory research helping answer it, and moving beyond a narrow sense of value.

### Understanding spatial aspects of wild resource use

The occurrence of wild plants and animals is site-specific. Understanding the spatial distribution of wild resources can help to assess people's value of certain sites and the management priority they might attach to them. Distance to wild resources influences the ease of access, levels of extraction, and costs incurred, which are essential elements in an economic analysis of costs and benefits. Resource maps and transects are participatory techniques which can help explore the spatial occurrence of wild resources, and which can generate related discussions, such as about the trade-offs involved in deciding where to go to collect wild resources and what sites are being managed in particular ways.



Discussing substitute products for existing wild resources with older men, Mave, PNG

Photo: J. Gujir

## Example A

In Muruteuzinho, Brazil, farmers identified eight different types of land, including four stages of shrub land and two types of forest. Each type of shrub land is characterised by differing levels of occurrence of key wild resources, and therefore, is perceived to have different values. Some plots are considered virtually worthless from a wild resource point of view. The lower the perceived value, the weaker the incentives to manage those lands.

Source: Guijt, 1994.

### Understanding dynamics of wild resource use over time

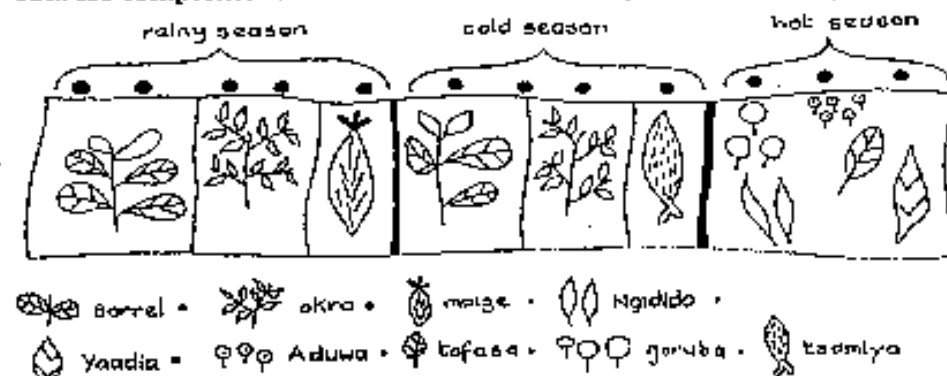
At certain times of the year, or during particularly difficult years, the value of and dependence on wild resources may increase dramatically. For example, when cash levels need replenishment in the village of Jacarequara, Brazil, villagers harvest the *malva* (*Urena lobata*) that they allow to grow wild on some of their lands and process it to extract its fibre. Although of very low market value, it is a dependable, year-round source of cash (Guijt, 1994).

A local level valuation methodology must be able to cope with the dynamic nature of wild resource use. When determining the net economic value of various wild resources, people's own labour is often the main input into harvesting and processing such products. What price to put on this labour has long been a thorny issue for economists with the usual practice being to assume some proportion of the agricultural wage rate. However, the relative value of someone's time and effort depends on the availability of alternative work possibilities which can vary considerably throughout the year. For example, in agricultural communities, the planting and harvesting seasons tend to be some of the busiest in the year.

Participatory methods such as seasonal calendars and time lines can provide information about the use and availability of natural resources, as well as the different demands on people's time throughout the year. Through such techniques, these relative changes could potentially be quantified and possibly 'anchored' with absolute values (such as agricultural wage rates). Other factors to take into consideration include the amount of effort involved, as opposed to simply time, and what social groups are involved (children, adults, elders, women, men, etc.).

## Example B

In Nigeria, a combination of semi-structured interviews and seasonal calendars was used with separate groups of men and women to investigate the seasonal use of wild tree products. The calendar below was drawn by a group of old women. It shows how they rely entirely on wild foods (*yaadia* - *Leptadenia hastata*; *aduwa* - *Balanites aegyptiaca*; *tafasa* - *Cassia tora*; *ngidido* - *Crateva adansonii*; and *goruba* - *Hypphaene thebaica*) during the hot season. Approaching the rains and the rainy season itself are the hardest times of year for men and women alike. Food stocks are low and farming has high labour demands. The calendar also shows how the seasonal availability of wild food sources complements that of cultivated foods (okra and maize).



Source: REDH/WVCP, 1997

## Understanding differentiation within communities

There is no such thing as an homogenous community. Great diversity in wealth, ability, need, age, and power exists in every rural population. As an individual's social position influences the degree to which they value and depend on wild resources and areas, it is essential to understand such differences within communities. The value for one person or group cannot be extrapolated for the entire community. Whilst economic analysis can help identify who is benefiting from certain resources, and the incentives facing different groups, it is not very helpful for identifying the relevant groups within communities. When economists do include these issues in their empirical analysis, they typically look at the household as the basic decision-making unit, emphasising inter-household differences and ignoring strong intra-household differences, such as those caused by gender or age. This bias partly reflects the dominance of surveys designed to elicit information at household level.

Well-being ranking is a participatory method that uses local criteria to highlight socio-economic diversity. This can then inform subsequent sampling to ensure more focused discussions or surveys to understand individual use.

### Example C

In the Zimbabwe case study, well-being ranking was used to select a stratified sample of households, so that the degree to which income affected wild resource use could be explored in a household survey. Before starting, the name of each household was written on a small card. The list was then verified by a group of villagers. They were then asked to sort the cards into groups representing the different levels of well-being in the village. They were also asked to describe the criteria they would use to describe each grouping. Sample households for the household survey were then selected randomly from each group, the numbers chosen from each group reflecting the relative size of that group:

Wealth rank	Population	Sample	Criteria
1	23	7	Reliant on steady flow of remittances from relatives with good jobs in town
2	27	5	Remittances important, but more intermittent and sent in smaller amounts than in rank 1
3	42	7	Reliant on farming, brick-making, local trades
4	9	5	Widows and elderly people who are reliant on the assistance of others

Source: Hot Springs Working Group, 1995

Gender is another key axis of social difference that greatly determines individuals' dependence on wild resources and, therefore, incentives for their management. Research must focus on women and men as distinct groups of resource users, otherwise policies may be identified that will have adverse effects for those who have been ignored by the study.

## Understanding the relative role of wild resources

The degree to which wild resources are important for local people's livelihoods will affect the appropriateness of policies on incentives and on resource management. Comparing wild resources with other livelihood options or substitute products can help assess people's willingness to sustain the hidden harvest as a livelihood strategy. While there is no single economic approach that deals with this question, some participatory methods can provide valuable insights. For example, identifying and ranking substitute products alongside the wild product can help reveal if the substitute is preferred to the wild harvest and therefore if local users are likely to be interested in managing the wild product sustainably (Grieg-

Gran *et al.*, forthcoming). Furthermore, in vulnerable households a low, yet secure, income may be more highly valued than more sporadic but higher returns. Both economics and PRA can help to evaluate these trade-offs, and the role played by wild resources.

## Example D

A seasonal calendar was developed with a group of women in Danega village, Botswana. Four seasons dividing the year were identified along with a range of livelihood activities. Beans were used as counters to mark the relative importance of different activities in different seasons. When the calendar was completed, women were asked to rank the range of activities they had identified in order of importance. This revealed that whilst other activities are more seasonal, making baskets from the leaves of the *mokola* palm (*Hyphaene petersiana*) provides income throughout the year. Basket making was ranked second in importance after agricultural tasks.

ACTIVITY	SELIMO (Hot season)	LETABULA (Rainy season)	HAREGA (harvest, cold season)	DEKAKOLOGO (Begins to be hot)	IMPORTANCE RANKING
BASKET MAKING	•••••	••	•••••	••	2
PALM COLLECTION	••	••	••	••	✓
AGRICULTURE	Prepare fields, ploughing	weeding, green harvest	harvest, thresh, pound, storage, sales	prepare tools, fencing	1
CROP SALES	Maize, 2 surplus	Green melons, water melon, Sweet reed, <i>masaka</i>	Maize, beans, pumpkins	Surplus maize	✓
DEWIGHT JOBS	•		•	•	3
BUILDING	Temporary shelters in fields		Wings building & thatching	•	4
BEER	•		•	•	5
PALM FRUIT COLLECTION					6

Source: Bishop and Scoones, 1994

## Understanding non-financial values

Indirect and non-use benefits, such as spiritual, cultural and existence values, remain a methodological challenge. There is no consensus on how to deal with this set of values and how policy-makers can be convinced of their importance for local livelihoods. However, a range of participatory methods can complement some of the economic techniques developed. Participatory methods such as role plays and flow diagrams can be used to elicit the whole range of benefits provided by natural resources and the environment, rather than only those that can be captured in monetary terms. Ranking and scoring techniques can give an idea in relative terms of the likely size or importance of indirect values in relation to more direct consumption and income generating benefits. These more qualitative techniques could be used alongside economic approaches in this type of valuation in order to cross-check the reliability of the two methodologies.

**Example E**

In Mare village, Papua New Guinea, four separate maps were made with different groups to elicit a long list of forest functions and products. The research team compiled the information into 13 different functions. For each function, where relevant, the different products that had been mentioned by the villagers were listed, eg. under 'animal foods': pigs, fish, prawns, etc. In a second series of discussions, mixed groups were asked to rank each function on a scale of 1 to 30, using stones. This step revealed that complex functions, notably environmental protection, water, and land boundaries, were most valued. As these could not be computed, other than through this type of relative ranking, the remaining fieldwork focused on the three top functions for which direct use values could be calculated: construction materials, firewood, and animal foods. However, as the ecological and social functions were ranked highest, the value of the wild areas can be assumed to be considerably more than the combined monetary values of the top three direct use values that were calculated.



*Residents of Mare prioritising forest functions.*

Source: Grieg-Grain et al., forthcoming

## Understanding market relations

To calculate the financial returns to people from any wild product sales, information is needed on all the stages and costs per stage in the harvesting, processing and marketing of that resource. However, marketing and the use of wild resources is often a highly complex activity, influenced by personal relationships, gender, ethnicity, and political power. Conventional economic market analysis tends to gloss over these 'imperfections' by making a number of assumptions about social relations. However, it still provides the key questions, while participatory methods can help obtain the data and explore local complexities (Scoones, forthcoming).

Venn diagrams can identify various groups of actors in the market. Discussions based on these diagrams, or flow diagrams such as product marketing chains, can reveal the extent to which these groups might dominate transactions. The market share controlled by such groups could be estimated using techniques such as pie diagrams. Flow diagrams of producers, traders and consumers along a marketing chain can analyse issues such as trading margins, information flows and market segmentation. By looking at these issues from a variety of perspectives, an understanding of market characteristics and dynamics can be developed, including an assessment of the extent to which the market is competitive.

Seeking a variety of perspectives leads to a more comprehensive understanding of how the market operates. Historical changes in market activities can be explored through biographies and case histories. This will allow the range of market imperfections to be identified and a realistic assessment of the applicability of conventional assumptions about market behaviour to be made. For instance, policies which assume an open, free market setting may be rejected if the market is found to be highly differentiated.

**Example F**

In Zimbabwe, a number of local artisans and crafts-people were identified in the village using social maps constructed early on in the fieldwork. Some of these people were interviewed to explore product collection, processing and marketing with the aim of identifying the costs and returns at each stage of the process. Assessments of market demand, market competition and pricing strategies were also attempted. In each case interviews were informal and structured around a checklist of questions developed by the research group beforehand.

Source: Hot Springs Working Group, 1995



Women returning from market in Southern Malawi

## Understanding institutional context of resource use

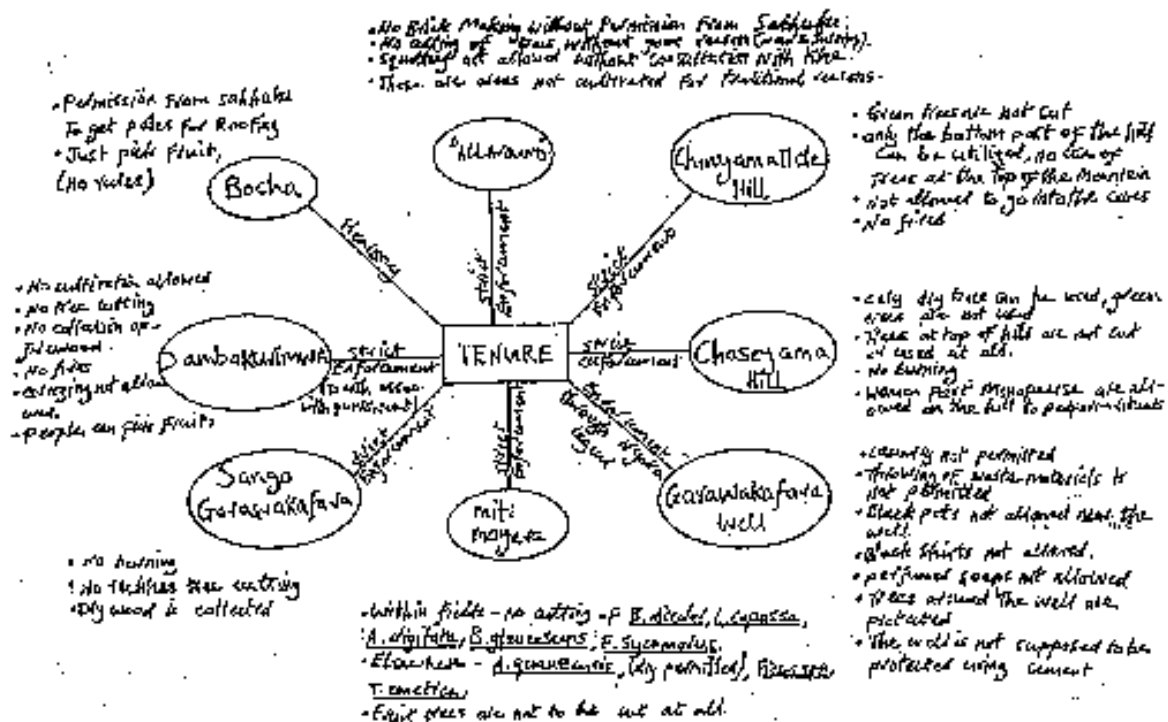
The use of wild resources and wild areas is often determined by traditional or government rules and regulations which define access and harvest rates. Understanding this can help to assess the potential success of resource management options. For example, insecurity about access encourages reluctance to participate seriously in long term resource management plans and can stimulate opportunistic harvesting to prevent possible future loss of access to the resources in question. Furthermore, understanding traditional tenure agreements can help to ensure that policies which stimulate an increase in resource use do not exceed sustainable extraction rates. For example, where local people take responsibility for the protection and management of wild resource sites, they may receive access to forest products with clear limits on harvest rates.

Resource economics uses a simple typology of resource management regimes which includes open access, common property and private property, and seeks to analyse the incentives facing users or managers under each system and the likely outcomes. This approach produces powerful insights into resource management and is most applicable to relatively simple resource systems. For example, the theory predicts that a renewable resource under open access will be exploited beyond sustainable limits and may even become locally extinct. However, rural situations involving wild resources may involve tenure systems that incorporate features of each of the three systems – thus an analysis richer in local detail is usually required.

A number of participatory techniques can be used to understand resource tenure and how it is changing. For example, maps can be used to identify resources and their associated rules and restrictions governing use (Example G). Venn diagrams are used to define the various stakeholders in a community and the relationships between them.

# Example G

In Zimbabwe, a village resource map was followed by discussions about tenure and the development of a tenure map. From the resource map, the villagers made a list of the local wild resource collecting sites. These were written on pieces of paper and organised on the ground according to geographic location. For each of these 'resource units', villagers listed the specific tenurial conditions, restrictions and taboos associated with each site. Different social groups were taken through the exercise separately to add to and verify the information shown. The degree of enforcement of each of these rules in each of the areas was also marked on the diagram. The resulting tenure diagram shows the wealth of information that this approach elicited, not only in relation to traditional rules but also about hitherto hidden values of certain wild species. For example, it revealed that villagers are forbidden from cutting some tree species because of the role they play in raising the water table.



Drawn by Jing'a  
 Villagers 26/1/1993

TENURE DIAGRAM - JING'A VILLAGE

Source: Hot Springs Working Group, 1993

## Investigating sustainability

Policies for encouraging the sustainable management of wild resource areas with present or future values will need information on whether the availability of a particular resource is declining, stable or increasing. Policies that are based on an assumption of declining availability will be fundamentally different from those which assume increasing availability, ranging from extraction bans to clearance subsidies. PRA techniques such as trend analysis, historical mapping, transects and interviews with community elders can assist in assessing sustainability by exploring what communities know about the changing state of their natural resources. Ideally a thorough assessment of sustainability will be based on a combination of these and ecological assessment techniques such as photo analysis, vegetation quadrats and transects, and production/consumption analysis.



# Some challenges

Finally, the case studies also raised a number of challenges, which have been highlighted here.

## The cost of participation

No research or text on development today is complete without referring to 'participation', and the *Hidden Harvest* studies are no exception. It is common for researchers and development practitioners to assume that full participation of all people all of the time must necessarily be a good thing. However, this is not always the case. As participatory methods (even when used for research) imply certain obligations, researchers must be aware of the following effects and anticipate responses:

- Active involvement of people in research and analysis means that all participants should have knowledge and ownership of the results. This implies effective and timely feedback, the sharing of any reports, and the recognition of all contributions.
- Participatory research methods often cause excitement and raise expectations that local changes are imminent. Thus plans must be made for follow-up. Rooting research work within local organisations, creating alliances with locally active development agencies and pursuing the findings all require prior planning and a commitment that stretches both before and beyond the research study.
- Open and frank discussions about resource use can open up latent conflicts which will need to be addressed. It is often highly questionable whether researchers have the skills, time, and 'authority' to deal with some of these conflicts.
- Finally, becoming actively involved in participatory research has costs for local people in terms of time out of busy lives, the accommodation and food often provided, as well as the potential costs of political and social disputes generated by the intervention of outsiders. Researchers must recognise these costs and compensate in locally appropriate ways.

It is thus essential to identify what form of participation is both desirable and feasible. This will depend largely on the objectives of the research. These objectives, in turn, will have many implications for the research design. If it is to be a data gathering exercise, then rapidity will probably win over pursuit of local analytical processes. If it is to be an exercise leading to local action, then building local analysis and competence in resource valuation will need to be prioritised over quick research outcomes.

## Confidentiality

Careful consideration of the confidentiality of information is of particular importance in the context of wild resources. As the gathering and consumption of many wild resources is illegal, exposing these activities poses a potential risk for resource users. Furthermore, biodiversity prospecting and the trend towards patenting intellectual property rights over genetic resources mean that rural communities will be suspicious of outsiders expressing an interest in their wild assets. Publishing reports which outline the potential value or usefulness of wild products may encourage biodiversity prospectors to exploit the resource. A financial analysis of how resources contribute to local people's income can also encourage taxation of these once 'hidden' assets.

Considering this range of ethical concerns raises questions about the role that external researchers play in the study process. Careful thought must be given to how final research results are to be used and disseminated, emphasising transparency about research objectives throughout the study. Local people should always be consulted about what they do or do not want to publicise about their hidden harvests.

## **Building capacity**

As there are very few researchers who have both participatory research and economic expertise, all the *Hidden Harvest* case studies were conducted following, and as part of, a training workshop. The training was important for building the capacity of professionals working in the case study areas in the use of participatory valuation techniques. However, there are inevitably trade-offs when research is combined with training.

For example, as the trainees are learning while pursuing the research, making mistakes is an essential part of the process. The research objective, however, requires a balance between the benefits of learning from mistakes and the need to undertake the highest quality investigation possible within the time constraints of the studies. In addition, in the initial stages when trainees are building their confidence in village-based fieldwork, communications between the team and the community requires extra attention. The time this requires should be incorporated into workshop planning.

## **The value of a *Hidden Harvest* assessment**

It is clear that participatory research techniques can help to develop an understanding of local economic activity, providing a wealth of information that both fits into and challenges an economic world view. Quantitative and qualitative information alike can be generated. Without participatory techniques, more time would be wasted on appraisal, more researcher biases would creep into the work, and local perspectives would receive less attention. By the same token, without the strength of the economic body of theory, the findings would have carried little weight for policymakers, may be less rigorous, and however locally relevant the research, key policies would remain unchallenged.

It is to be hoped that whilst clearly an important way forward for assessing local resource use, these studies may inspire further attempts at exploring methodological complementarities between other disciplines and in other contexts.

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## Forthcoming reports

Grieg-Gran, M., Grijt, I. and Pentalo, B. *Local level assessment of the economic importance of wild resources in Papua New Guinea*. IIED, London.

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Detailed examples from the *Hidden Harvest* case studies

## 1. Local-level economic valuation of savanna woodland resources in Zimbabwe

This *Hidden Harvest* case study was conducted in two villages in eastern Zimbabwe. A variety of methods (participatory mapping, farm transects, historical time lines, seasonal calendars, role plays and ranking and scoring) were combined with the economic valuation technique of derived demand to assess the total value of savanna woodland to local people.

The derived demand approach uses prices of goods produced from natural resources to derive the value of unprocessed forest resources. For example, if a pole sells for \$2 and the costs of production are \$0.50, then the value of the pole as part of a tree standing in the forest may be derived by subtracting the costs of production from the end product price, thereby yielding a value of \$1.50. Using this approach, firewood was valued at Zim\$17,000-25,000 per year for each village. However, this represented only part of the total value of the woodland resource. Other participatory methods were able to complement this by eliciting the values for which there is no financial equivalent. For example, role plays and scoring exercises revealed a total of 19 values, many of which have no market value such as water retention, aesthetics, and camouflage. In the ranking of these values, non-market values received a higher score than firewood, which suggests that the total economic value of the resource is many times higher than the monetary figure obtained through the derived demand approach.

The undervaluation of the woodland resource has been a recurrent issue in land use policy in Zimbabwe. Such studies highlight the importance of policy measures that ensure that woodland values are taken into account more fully during planning exercises, such as for resettlement schemes. The study also highlighted the potential value of currently under-utilised resources such as woodland fruits. In the Zimbabwe exercise, a simple analysis of trends of some key indicators showed that current extraction rates were unlikely to be sustainable in the long term. These insights pointed to key policy areas which would increase the value of woodland for people's livelihoods on a sustainable basis. For example, marketing opportunities remain a major bottleneck for the sale of non-timber forest products, particularly fruit and crafts. Strategic support for small-scale enterprise development to add value to collected or manufactured products, which could encourage less harvesting, was identified as a major priority. The study also concluded that, for woodland value to be fully realised and managed sustainably, more attention needs to be paid to common property resource management institutions at the village level.

## 2. Beer and baskets in Ngamiland, Botswana

This study investigated the returns to different livelihood options open to women in two villages, to understand the economic basis for palm-based basket weaving in the area. A sequence of resource mapping, preference ranking and social mapping was used to describe the livelihood system. Market surveys and key informant interviews combined to develop a picture of the production costs and returns from basket making and beer brewing using wild fruits from *Grewia bicolor*. Sensitivity analysis of discounted benefit/cost flows showed the impact of different development options.

The analysis showed how the current marketing system, where fixed prices for graded basket products are offered through a relatively centralised, and in some cases subsidised, marketing system, encourages year-round production of baskets. This is especially the case in the dry season when basketry does not compete with agricultural labour needs. However, this pricing system tends to encourage resource over-exploitation, as it continues to be economical for women to travel to wild palm sites in the Okavango delta. Concerns about the sustainability of wild palm harvesting have prompted interest in on-farm cultivation of the palms. However, according to the analysis, such options are not financially viable under current conditions and may only be attractive to those who are physically unable to travel to the wild harvesting sites. Increasing the effectiveness of wild palm management through support to local institutional structures was seen to be key.

The study also highlighted market-based interventions. It was speculated that increasing the differential between low and high quality baskets prices might encourage greater investment in quality baskets, resulting in reduced resource consumption whilst still maintaining current income levels.

Detailed examples from the *Hidden Harvest* case studies

### 3. Palms and potash in a Nigerian wetland

The Hadejia-Nguru wetlands is an extensive floodplain area in north-eastern Nigeria. The annual natural flooding helps the wetlands perform several economic and ecological functions which are of critical national significance. Recently, climatic vagaries and the construction and inefficient operation of large dams and other irrigation schemes upstream have greatly reduced the extent of annual flooding in the wetlands. Current research is therefore focusing on the financial and economic values of current production systems within the wetlands so that planners can understand better the consequences of each development option. The valuation of wild resources, whose economic values planners seldom perceive, is of particular importance.

This case study focused on the wild resources which the villagers perceived to be of greatest importance, particularly doum palm (*Hyphaene thebaica*) and potash, which is used as a food supplement and medicine. Wealth ranking and seasonal calendars contributed to an understanding of the differentiated values associated with these two, and other, resources in two villages. Product flow charts and market surveys provided details of the costs and returns involved with the harvesting, processing and marketing of the products. This information was then used for economic assessments of the returns to labour involved with the collection and sale of wild resources.

The study showed that the economic importance of these wild resources varies greatly amongst different people. For example, potash is an important source of income for older and poorer women. Wild foods were found to be critically important for a number of disadvantaged groups with fewer economic opportunities. And economic benefits of doum palm are changing the ecology, with people cultivating it on their farms, thus transforming a wild product into a domesticated species.

The wealth of wild resources found in the wetlands depends directly on maintaining the annual floods. In one of the case study villages, people explained how their general economic prosperity has declined due to recent reduction in annual flooding. The value of the hidden harvest to local people demonstrates that this value is greater than that which would be derived from existing and planned water developments along the river system which divert water away from the wetlands.



## 4. Papua New Guinea

Many villages in the forested areas of Papua New Guinea are having to deal with offers from logging companies to fell large tracts of valuable forests. To date, few studies exist which offer insights for local people into the consequences of signing logging contracts. Two *Hidden Harvest* case studies were carried out to determine how local people use the forest and what the market value of that use represents. As a total valuation was impossible in the time available, the most important direct use values were investigated.

In Marc village, maps helped identify an extensive list of forest functions and specific products and species. A series of ranking exercises were held to determine which functions were most valued out of the 13 listed: income, construction materials, animal foods, plant foods, firewood, water, medicine, for rituals and costumes, land boundaries, tools, pets, sacred sites, and environmental protection. As these included several non-use values, like land demarcation, sacred sites, and complex indirect use values, like environmental protection, the study focused on the top direct use functions and the main species used in each. These were construction materials, firewood, and animal food. A sequence of flow diagrams, pie diagrams, seasonal calendars, and a social map elicited the numeric data required: time spent travelling, collecting, and hunting; quantity and cost of inputs; frequency of trips; amount consumed, etc. As these products are marketed by only one or two individuals, substitute assessments were carried out to enable approximate market values of the wild products. Historical discussions and Venn diagrams provided insights into local tenure and resource regulations.

The community of about 1300 individuals is facing rapid change, not least of which is commoditization. The growing need for money is generating new income generation activities, of which betel nut sales is the largest income earner. Nevertheless, all households depend totally on women's collection of firewood and almost entirely on local materials for construction of houses. Wild pig and other wild animal hunting and fishing represent a steady source of nutrients and income, and provide materials for the costumes used in local rituals. For example over K10,000<sup>5</sup> worth of bandicoots are hunted and almost K110,000 worth of wild pigs (net value).

As in the Zimbabwe study, the forest value for all the 13 functions, some of them irreplaceable such as sacred sites, is considerably higher than the simple calculations of firewood, wild animals, and construction material show. The community has nine clans, of which three recently sold off part of their forest cover to logging companies. This is creating new economic imbalances and social divisions in the community. Furthermore, the implications of destruction of the forest area for the other clan members, in terms of soil erosion, reduced hunting, degradation of water quality and quantity, etc have not been discussed as yet but are issues simmering below the surface. Creating awareness in the community of the potential loss that the forest represents, and the cost of replacing these functions with bought products, is being pursued by some of the participants of the case study.

<sup>5</sup> One Kina = US\$1.25

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