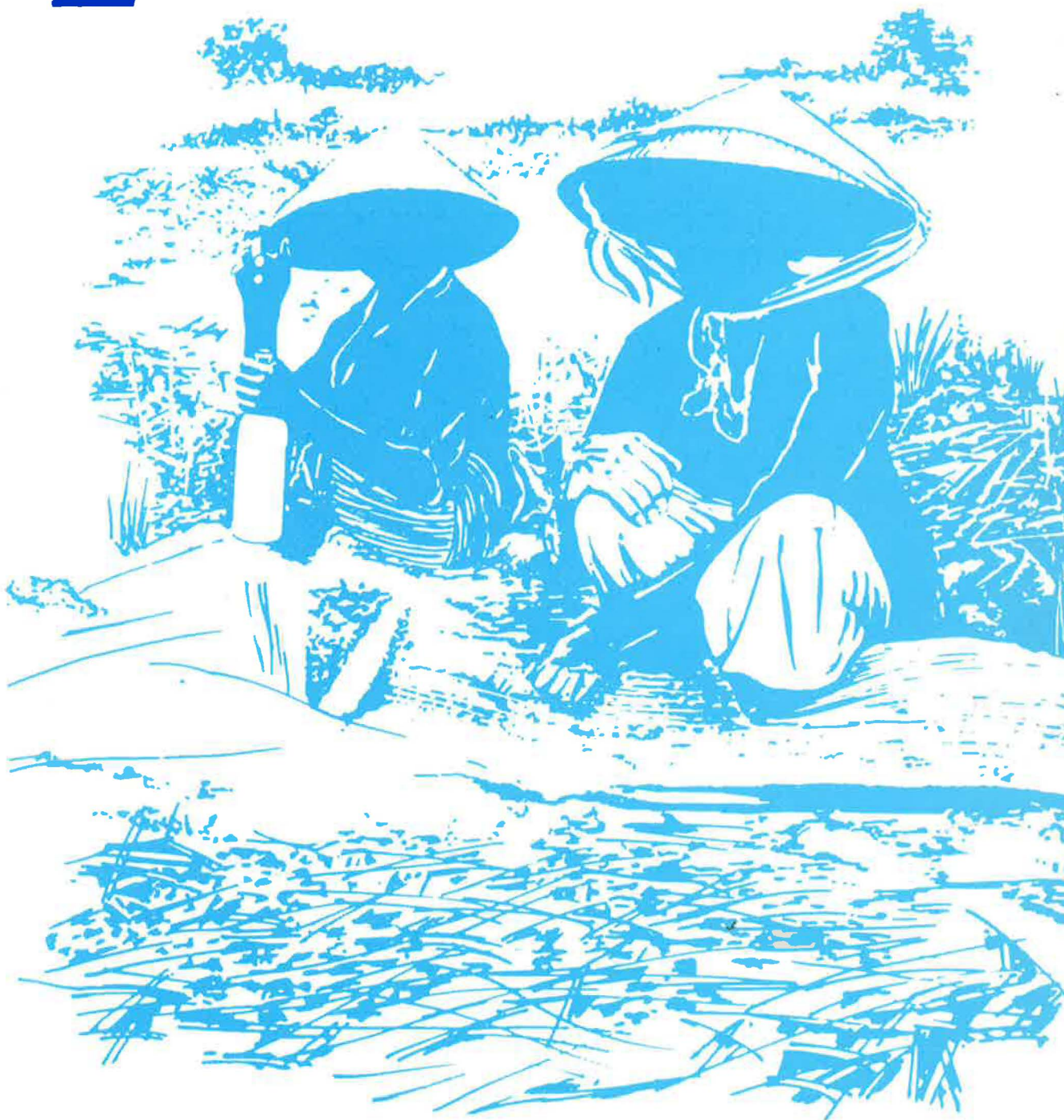


**Methodologies for Studying
Agricultural Markets in
Developing Countries**

2



Methodologies for Studying Agricultural Markets in Developing Countries

P. Magrath

Marketing Series Volume 2



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CONTENTS

LIST OF TERMS AND ABBREVIATIONS	iv
SUMMARY	1
INTRODUCTION	5
SECTION 1 REVIEW OF METHODOLOGIES	6
Objectives and Conceptual Frameworks	6
The Choice of Technique in Data Collection	10
The Contracting Out of Data Collection	20
SECTION 2 THE INDONESIA RICE MARKETING STUDY	22
The Objectives and Framework of the RMS	22
The RMS Sample Survey	24
Qualitative Research in the RMS	29
Price Analysis in the RMS	32
REFERENCES	32
APPENDIX AN RRA OF MARKET ORGANIZATION	35

List of Terms and Abbreviations

Terms

<i>gabah</i>	husk rice (unmilled)
<i>beras</i>	milled rice

Abbreviations

BULOG	Badan Urusan Logistik (Indonesian Food Logistics Agency)
DMR	Development Market Research
DOLOG	Depot Logistic (Regional office of BULOG)
NRI	Natural Resources Institute, UK
PRA	Participatory Rural Appraisal
RMS	Rice Marketing Study, NRI, Indonesia
RRA	Rapid Rural Appraisal
S-C-P	Structure, Conduct, Performance (school of thought)

SUMMARY

“If I use qualitative data, I believe it but no-one else does; if I use quantitative data, everyone believes it but I don’t.”¹

This report provides some guidelines on the selection of an appropriate methodology for studying the performance of agricultural markets in developing countries, from a public interest perspective. The paper draws on the experience of the Indonesian Rice Marketing Study (RMS), which was undertaken by NRI from 1989–91.

Methodology is defined to include the conceptual framework of the research as well as the data collection techniques, since these aspects are often interrelated. The main options for data collection that are explored in the paper are:

- (i) the implementation of a formal sample survey;
- (ii) the use of a number of informal surveying and interview techniques;
- (iii) the use of secondary data, particularly prices.

These options are not mutually exclusive, and it will often be advisable to use several approaches in a complementary fashion. The advantages and disadvantages of each approach, and their useful application are summarized. Although the discussion is set within the context of studies of agricultural markets in developing countries, many of the points made will be applicable more generally.

It is suggested that the main questions that need to be asked in selecting a methodology are:

- (i) What is the purpose and context of the study?
- (ii) What are the specific objectives of the study?
- (iii) What is the appropriate conceptual framework for the study?
- (iv) What are the time, budgetary and other constraints under which the study will operate?
- (v) Who will undertake the research?

Some of the key points that have arisen in the discussion are given below.

The Appropriate Data Collection Technique Depends on the Type of Information Required

The estimation of market supply requires a representative sample of producers; an understanding of trader decision-making is best obtained from in-depth individual interviews or participant observation; while the analysis of price movements requires systematically collected, precise and accurate data. The RMS experience in the use of different data collection techniques for different types of data is summarized.

In general, formal sample surveys are suitable for the collection of simple quantitative data, or to assess the incidence of particular phenomena. They will be necessary wherever estimates derived from the research are to be generalized to a wider population than that sampled. However, where the information sought is qualitative (understanding processes or relationships), sensitive (relating to individual profit margins), or complex (relating to local institutional arrangements) then intensive small-scale methods are necessary.

The Value of Using Several Approaches

This follows from the above point, since most studies will involve collecting different types of data, both quantitative and qualitative.

It also follows from the recognition of inherent weaknesses in each method. The quality of secondary data is difficult to assess while that of sample surveys is difficult to control. Small-scale studies may be accurate but how representative are they?

1. Comment by research assistant in an agro-economic survey in Indonesia, quoted in White (1984).

Thus, the use of different methodologies can be complementary. Key informant interviews improve the interpretation of sample surveys and secondary data. The sample survey can provide statistical validity for processes identified through small-scale qualitative studies. Analysis of secondary data can place the study in a broader geographical or historical perspective. Each of the three methodologies used for the RMS gave mutual confirmation of results from the other methods.

A third factor, in the context of marketing studies, lies in the elusive nature of performance criteria. Indicators of competition and efficiency tend to be ambiguous and difficult to interpret. Alternative criteria, such as the contribution of the market to economic growth, are even harder to measure. The best one can do is to collect evidence of several different indicators, using different research techniques. This is the approach recommended in Wye College (1991), and was that followed in the RMS.

The Importance of Planning the Sequence of Data Collection Activities

If several approaches are to be used, then what is the appropriate sequence of activities? One model that will be applicable in many contexts is as follows:

- (i) start with a review of the secondary data, in order to identify gaps in the current knowledge and to place the proposed study within the context of existing knowledge;
- (ii) then undertake informal field research to gain a general impression of the subject of study and the feasibility of the proposed research;
- (iii) finally, on the basis of the informal research, decide whether a formal survey is required or whether other approaches, such as in-depth case studies or informal surveys would be more appropriate. Given the high cost of implementing a formal sample survey the aim should be to restrict the scope of this component, by, for example, including only simple, quantitative variables for which estimates are to be generalized to a wider population.

This model will need to be adapted to the particular circumstances of each study. For example, if little is known about the area of research then greater emphasis should be placed on the early phase of informal research activities, since these allow for more flexibility during implementation, and can accommodate unexpected results. If little time is available then a carefully designed programme of informal surveys and case studies is likely to yield better results than a hastily designed formal survey.

If it is decided to embark upon a sample survey, it can be useful to continue the collection and analysis of secondary data during the period of survey data collection. This will provide an alternative source of information for cross-checking, covering the same period, and will be especially useful for data that varies seasonally and annually, such as agricultural production and price data. Informal research activities undertaken alongside a survey can serve the same purpose, and can be combined with field supervision of survey enumerators, as in the RMS.

Markets in Developing Countries Present a Number of Specific Problems for Sample Surveys

Obtaining a random sample can be problematic if, as is often the case, the data required for the sampling frame is incomplete or out of date or if it varies between locations. Even if a valid sample is obtained it is difficult to design an appropriate questionnaire that will generate meaningful data unless the researcher is already familiar with the area. Pre-designed questionnaires may be insufficiently flexible to handle the complexity and variation in local categories, and the unintended ambiguities that inevitably arise, even if pre-testing has been done.

An additional problem in the case of market studies is that much of the information sought may be of a sensitive nature. In situations where the success of traders in the market depends on their ability to conceal price information, it is hardly surprising that they will be reluctant to divulge such valuable secrets to a stranger with a questionnaire. In-depth interviews with traders already familiar with the researcher are a more appropriate forum.

While these problems may also apply to some extent in developed economies, they are likely to be more serious in developing countries, where official data collection is often haphazard, and where few traders keep regular records of transactions.

The main advantage of sample surveys which is that they can provide a basis for valid generalization to a wider population than that sampled—will be lost if the data is of such poor quality that meaningful results cannot be obtained.

This suggests that large-scale formal surveys should be embarked upon with caution, and again points to the advisability of running informal and qualitative studies prior to and alongside a planned sample survey.

Value of Starting with Farmers

The RMS was unusual in that the major component, the sample survey, was based on a random sample of farmers. Most studies of agricultural markets are focused on traders or on market places, or rely on the analysis of prices.

The decision to start with farmers was related to the objective of understanding interseasonal patterns of price formation, for which farmer market supply is crucial. However, studies with other objectives may find it useful to start with farmers for the following reasons.

- (i) It is easier to obtain a representative sample of farmers than of traders. Data on farming occupations, often related to data on land tenure, is usually easier to obtain than that on trading. People often move in and out of trade, without registering their activities in the form of licences. Furthermore, variability in trader mode of operation creates problems for the categorization of traders. While the categorization and sampling of farmers is not without its problems, the sampling of traders probably requires a better prior knowledge of the market.
- (ii) Farmers are less likely to wish to conceal information. Although some farmers may be wary of enumerators and may fear taxation or other disadvantages, with traders there is the additional problem that their success in trading depends on their ability to conceal information on prices, supplies and margins.
- (iii) Farmers may be less articulate than other informants, and they may not have a broad perspective of the marketing system as a whole, but they are a good source of information on certain aspects of the market.
 - (a) *Market supply.* Together with the seasonal pattern of production, data on the percentage of production sold by farmers provides the basis for understanding interseasonal patterns of price formation. Farmer interviews are the most direct and probably the most accurate means of obtaining this information, provided that questionnaires are appropriately designed. Information on farmer sales could also be sought from traders, but they are unlikely to remember individual cases and it would be difficult to ensure the representativeness of the trader sample used.
 - (b) *Market structure.* Although farmers can often provide information only about the first link in a chain, this can give an impression of the choice of buyer, and range of trader types at this level of the market;
 - (c) *Competition.* Again farmers cannot give the whole picture, but “identifying the farmer’s range of choice at the initial point of sale is the first step in understanding how competitive price formation is likely to be.” (Timmer *et al.*, 1983). On the other hand it has been pointed out that it is possible for markets to be highly competitive at one level while uncompetitive elements occur at other levels. For example, a tendency toward oligopoly in wholesale markets has been noted even in cases where farm and retail levels of the market are competitive (Wye College, 1991);
- (iv) Finally, another good reason for starting with farmers is that many of the shortcomings of the marketing system, such as poor transport and communications, limited availability of processing facilities, or excessive trader profits, will be felt by them directly. Interviewing farmers can help decide the agenda for further investigation.

Value of Following Marketing Chains

Following marketing chains from sample farmers through to the wholesale or retail level was another distinctive feature of the RMS which proved successful. The method requires well-trained and committed enumerators and is time consuming, but it can provide a good picture of market structure including:

- (i) the number of links in marketing chains from farm to retail;
- (ii) the range of types of operators in the market;
- (iii) the predominance of different types of marketing chains;
- (iv) some indications of the relationships between traders;
- (v) locational and seasonal variation in the above variables.

In a situation where the sampling of traders is problematic, following marketing chains from a random sample of farmers can offer a partial solution. Such a sample could be analysed in its own right, as being based on a random sample of marketing chains, or could form the basis for subsequent sampling of traders, once the categories and their relative importance are known from the analysis of marketing chains.

In addition to following chains from the farmer to the retail level, chains can usefully be followed from traders either forwards (to buyers) or backwards (to sellers).

RRA for Markets

It is recognized that the major sample survey undertaken as part of the RMS requires more time and money than is generally available for studies of marketing systems. Some elements of the RMS approach could, however, be adapted for use under more stringent time and budgetary constraints. Both the emphasis on farmers and the following of marketing chains could be used within a Rapid Rural Appraisal (RRA) framework, using semi-structured interviews with either random or non-random samples.

An RRA approach would be particularly appropriate for studying the organization of the market, including ease of entry into the market, farmer and trader decision-making relating to stocks and sales, relationships between traders, and costs and margins earned by individual traders, none of which are easily amenable to a sample survey approach.

Such an approach could also generate indicators of levels of competition and efficiency through an assessment of the distribution of information in the market, access to credit, availability of transport, competition for supplies, and returns to trade. This would provide a good cross-check on price analysis, which is often used to assess market performance.

An RRA approach could also be used in the context of studies to identify technological or institutional constraints, and potential for interventions. Indeed the focus on constraints and opportunities is one of the hallmarks of the approach. The open-ended nature of the research and the commitment to learning the views of interviewees improve the likelihood of identifying relevant problems and current issues.

Introduction

NRI was recently involved in a Rice Marketing Study in Indonesia, which ran from September 1989 to April 1991, and included a major sample survey of market participants, supplementary informal qualitative research, and the analysis of officially collected prices. The methodology, results and policy implications of the study have been reported in Ellis *et al.*, (1991).

The methodology of the RMS included a number of unusual features. Whereas many studies of agricultural markets are based on samples of traders, or on specific market places, the RMS sample survey was based on a random sample of farmers, from which the trader sample was derived. A second unusual feature was the following of marketing chains from sample farmers as far as the wholesale or retail level. A third feature was the manner in which several data collection techniques were combined in the RMS. This meant that the study provided a number of different sources of evidence, which confirmed or challenged one another. This was considered to be particularly important in attempts to measure market performance, since indicators of performance are generally ambiguous and require confirmation from other sources.

The purpose of this paper is to record the RMS experience and to set it within a broader perspective, by reviewing the options for selecting methodologies for studying markets, and discussing the contexts in which each is appropriate.

The paper is divided into two parts. The first part gives a review of considerations and options in selecting a methodology, while the second part discusses the experience and lessons of the RMS.

Methodology will be broadly defined to include the conceptual framework and assumptions brought to bear on the research as well as the data collection technique, since these elements are generally closely interrelated (White, 1984).

There are a number of ways in which data collection techniques could be categorized. In this paper a distinction is made between:

- (i) formal sample surveys, where a statistically representative sample is used as a basis for generalization;
- (ii) informal techniques, including surveys and case studies; these will generally focus on qualitative information and generalizations should be made with care;
- (iii) the use of secondary data; in the case of marketing studies this often involves the analysis of available price data.

These different techniques are not mutually exclusive, and in many contexts it will be useful to combine two or more techniques. For example, informal surveys and in-depth interviews can be used in the design of formal surveys. This was the approach used by Crow in a study of the rice market in Bangladesh (1989).

Attention has been drawn to the tendency for marketing studies to place too much emphasis on the analysis of prices to assess market performance (Harriss, 1979; Reeves, 1989). Competition and efficiency are measured indirectly through estimates of marketing margins and of spatial and temporal market integration, because of the difficulty and expense of gathering good quality survey data from which to measure market performance more directly. The problems associated with price analysis are discussed on page 19. Given the past emphasis on price analysis and the extensive literature already available¹, this paper will focus on the use of primary data collection techniques in improving understanding of agricultural markets.

1. For example, the practical application of price analysis techniques is described in Goetz and Weber (1986) and in Holtzman (1986), and problems in the interpretation of results are discussed in Harriss (1979) and Magrath (1989).

Planning Research

If a marketing study is planned, there are a number of interrelated factors that will have a bearing on the selection of an appropriate methodology. First there is the purpose of the study. Who will use the study and what are its specific objectives? Secondly, there is the conceptual framework that will be used in the organization and analysis of data. A third set of considerations relate to the time and budgetary constraints under which the study will be run. Finally, it is important to consider who will undertake the study.

The conceptual framework should be selected in relation to the specific objectives of the study. A provisional plan of analysis can then be drawn up, and an appropriate data collection technique can be selected, within the restrictions set by time and budgetary allocations. Although all these decisions must be made at the start of the study, a degree of flexibility should be incorporated into the plan to allow for modifications during implementation, especially in the early stages. In this sense the planning of research can be seen as a continuing, iterative process with feedback from implementation leading to adjustments in the objectives, data collection activities and analysis.

The clear definition of objectives and the planning of analysis at the start will help restrict data collection to the bare minimum required, thus keeping costs down. On the other hand it is difficult to predict the quality or the content of data which will be collected, so that there may be a trade-off between collecting enough data to allow for poor quality in some areas and keeping the costs of the study to a minimum. This again calls for flexibility during implementation.

Informal qualitative studies are generally designed to allow for such flexibility. The focus of discussion, or the content of questionnaires can be modified from one interview to the next, in relation to information already obtained. Sample surveys are relatively inflexible in this respect, since the use of pre-designed questionnaires and hired enumerators do not easily allow for substantial changes in the data collected. Changes made to questionnaires will require retraining of enumerators, and data already collected at substantial cost will be wasted.

Given this requirement for flexibility in the face of ignorance, it is generally advisable to precede a sample survey with shorter informal data collection exercises, which can feed into the design of the large-scale survey and reduce the need for future alterations.

No time was allocated to informal research during the design phase of the RMS. Small-scale field studies at this stage might have reduced the need for changes to questionnaires during implementation, which would in turn have reduced supervision costs, as well as resulting in better quality of data collected.

Section 1

Review of Methodologies

OBJECTIVES AND CONCEPTUAL FRAMEWORKS

Any research project is confronted with the formidable task of selecting a tiny proportion from the mass of information available in the real world. This requires not only a set of clearly defined objectives for the study, but also a conceptual framework, selected in relation to the objectives. A good conceptual framework helps to organize the selection process and also makes it explicit. However, by guiding researchers along well-trodden paths, a conceptual framework can also blind them from alternatives and inhibit the development of new models. The danger can be reduced if the assumptions on which the framework is based are made explicit, and are constantly questioned.

Objectives and Purpose

The main considerations in the selection of the conceptual framework will be the objectives and purpose of the study. These vary widely, but a broad distinction can be made between studies which aim at a general understanding of the market and its role in the economy and those which attempt to measure how well the market is performing, in relation to some agreed performance criteria.

The former set of objectives is found in academic studies, such as Gregory's analysis of the economy of Papua New Guinea (Gregory, 1982), and Harriss's investigations of the role of markets in rural development in Tamil Nadu, India (1981).

The second set of objectives is familiar to governments and development agencies which undertake marketing studies to provide guidelines for decision-making in relation to specific policies and projects.

There are, of course, studies which combine elements of both categories. The objectives of the RMS were both to improve the general understanding of the working of the rice market and to measure the performance of the market against various criteria, with a view to drawing implications for government policy.

The decision to focus on the measurement of market performance has implications for the choice of conceptual framework (as well as the data collection technique). The criteria most often used are those of competition and efficiency, derived from the neo-classical model of perfect competition. Other models do not generate such clear sets of performance criteria, but there are two weaknesses in the use of competition and efficiency. The first is that indicators of these criteria are generally ambiguous, given the complexity of influences operating in the market, so that great care is needed in their interpretation. The second is that these criteria are too limited as measures of economic performance, since they exclude important non-efficiency and dynamic aspects, such as the impact of markets on income distribution, employment or economic growth (Wye College, 1991). An understanding of this broader role of the market will provide an important background for government policies and programmes.

However, the measurement of market competition, efficiency and integration will be important for a number of government policies, especially those involving market interventions. These might include: price intervention policies to stabilize interseasonal price spreads, support producer prices, protect consumers from high prices or generate government income; and policies to improve market efficiency by lowering marketing costs or reducing the potential for excessive profit making.

In practice, given the absence of alternatives, most studies undertaken in a policy context, as well as many of those undertaken in an academic context, include attempts to measure the level of competition and efficiency, and the degree of spatial and temporal integration in the market, and where other criteria are considered to be important they are inferred from these measures.

Conceptual Frameworks

The neo-classical model generates a widely used set of performance criteria, but it is not clear from this highly abstract model how these criteria should be measured in practice. A number of attempts have been made to adapt the model for application to real-world markets.

Structure, conduct, performance approach

The Structure, Conduct, Performance (S-C-P) framework was an early attempt at this, developed by the Industrial Organization school for application to markets in industrialized nations (Bain, 1959). It has been used in the study of markets in developing countries by Lele in India (1967), Jones in West Africa (1974) and Harriss in India (1977, 1979), among others.

One of the problems faced in attempts to apply the neo-classical model to the study of markets is that it does not specify the causal links between performance criteria (competition and efficiency) and the factors that are supposed to affect them. The factors involved (such as the number of operators in the market, the transmission of information, or the degree of product specification) are simply treated as 'conditions'.

The S-C-P model tries to tackle this problem by adopting a descriptive approach, and by suggesting directions of causality between different aspects of the market. According to the model, the performance of the market is determined by the conduct (behaviour) of market participants, which is in turn determined by the structure (organization) of the market.

While structure and conduct can be examined directly, performance is generally measured indirectly, through prices. There remains the problem of how to separate out the influence of structure and conduct from other factors affecting prices.

The approach has been criticized on the grounds that the relationships between structure, conduct and performance in the model are too deterministic, while the precise causal links between them are not explained. The approach does provide a useful conceptual framework for organizing material, but studies which infer market performance from an analysis of market structure should be treated with caution (Wye College, 1991).

Commodity systems approach

A more recent approach, which builds on the S-C-P framework, is the Commodity Systems approach developed at Michigan State University (MSU) by Shaffer (1980), Riley and Staats (1981) and others. Examples of its application to the study of markets in developing countries can be seen in Harrison *et al.* (1974) and a description of its use with Rapid Reconnaissance techniques is given in Holtzman (1986).

According to this framework, a commodity system is set within a food system, comprising the agricultural and livestock sectors and related industries. Thus, in contrast to the single market approach of S-C-P, the commodity system is taken to include all activities from input supply, through transport and processing to retailing. Both horizontal and vertical links are explored and the interdependence of markets for related commodities is explicitly recognized.

Another important characteristic of the approach is its attempt to go beyond the static efficiency of S-C-P by focusing on the dynamics of the system, including an examination of underlying trends in supply and demand and their predicted impact on output and product use. Related to this is the emphasis on identifying constraints to improved market performance. The latter is broadly defined to include, for example, progressiveness (potential for innovation); equity of returns to market participants; employment; and the impact on nutrition and conservation of natural resources. It is this emphasis on the dynamic aspects of market performance which makes the approach attractive for application in the context of economic development.

The commodity systems approach again provides a useful framework for the formulation of study objectives and establishment of data requirements, but judgement is required in specifying the boundaries of the system to be studied (Wye College, 1991).

Spatial and inter-temporal models

Neither of these models explicitly addresses the locational or seasonal aspects of market performance. A number of models of the spatial organization of markets have been developed and used by Jones (1968) among others. Jones makes a distinction between:

- (i) segmented markets where no trade flows occur;
- (ii) markets which trade only sporadically, in times of scarcity;
- (iii) 'two level' systems in which destination markets are each connected to a number of supply centres, but are not connected directly with one another;

- (iv) redistributive systems, where products from dispersed local markets are collected in bulk at intermediate markets before entering destination markets for redistribution. This last model resembles the market hierarchy model of central place theory developed by Christaller (1966) and used by Skinner in a study of markets in China (1964–65), and by Dewey in Java (1962)².

The selection of an appropriate model of the spatial organization of markets is especially important in studies of spatial market integration. Certain techniques for measuring integration depend on rather restrictive assumptions concerning the spatial relationships between markets (Magrath, 1989; Ravallion, 1987).

Timmer has developed a number of descriptive models of the seasonal aspects of the market. He illustrates the importance of accounting for seasonal changes in the direction and magnitude of trade flows (1974), a point also made forcefully by Harriss (1979, 1981) who found cases of two way and multidirectional trade in markets in Tamil Nadu. Such seasonal variation will again have implications for the use and interpretation of prices in measurements of market performance, especially where prices are averaged over monthly or annual periods (Harriss, 1979), or where there is inter-annual variation in seasonal patterns (John Wyeth, personal communication).

'New institutional economics'

The analytical frameworks described above all work within the standard neo-classical framework of assumptions, although some practitioners are aware of its limitations (Harriss, 1979), and the 'systems' approach attempts to tackle some of the limitations explicitly.

The neo-classical model was developed to explain the economies of Western industrialized nations, but is intended to be universally applicable. Many have questioned its usefulness in the context of the economies of developing countries where few of the assumptions of the model are seen to hold (e.g. Seers, 1963; Gregory, 1982). In particular, the institutional context (including legal and political structures) may be very different, and standard performance criteria may be inappropriate.

It has been observed that, in the absence of formal credit or legal structures market traders adopt various strategies in the formation of contracts and for obtaining working capital and supplies. One example of this is the establishment of networks of personalized and multifaceted relationships, which can involve exchanges in grain, credit, and productive assets. These networks of exchange relationships involving several related markets can restrict market entry and can lead to wide variations in transaction costs for different traders.

The need to look beyond economic variables to the institutional structures affecting them is recognized by the 'new institutional economics' school (e.g. Bardhan 1980, 1984). They have focused on the implications of local institutional arrangements, such as informal contractual agreements between traders, for measures of competition and efficiency in the market. Thus, interest rates or marketing margins that diverge from an expected 'market' rate might be explained in a particular context, in terms of specific institutional structures operating, rather than simply being attributed to 'market imperfections'. While some argue that these institutional arrangements are inefficient, others deem them to be efficient alternatives, given other existing market imperfections.

Within this 'new institutional economics', Stiglitz, Newberry and others have developed what they call the 'imperfect information paradigm' (Stiglitz, 1986). They claim that many of the perceived differences between markets in developing countries and those in Western developed economies can be understood in terms of the distribution of information in the market. They have thus isolated market information and its distribution as key factors in determining market performance.

2. Its application to Java was questioned in a later study by Alexander (1986).

Other approaches

Others have preferred to reject the neo-classical model completely and to use approaches that tackle the variation in economic systems more directly. Some of these are derived from political economy approaches, such as the gift-commodity paradigm developed by Gregory from his study of Papua New Guinea (1982). Others belong to the 'substantivist' school in social anthropology, which holds that economies should be understood in relation to their specific social, political and historical context, rather than in terms of imported neo-classical models. Examples include the 'modes of production' approach used by Sahlins in his *Stone Age Economics* (1974), and the 'spheres of exchange' model suggested by Bohannon (1968) to explain the Tiv economy in West Africa.

These alternative approaches offer conceptual tools which can improve understanding of particular economies and can illuminate shortcomings in the neo-classical approach.

Conclusions

In many cases the neo-classical framework will provide a good starting point for the analysis of markets, and the structure, conduct, performance model will provide a useful means of organizing material.

Models of the spatial organization of markets (Jones, 1968) and of their seasonal dimensions (Timmer, 1974, Timmer *et al.*, 1983) will be important in studies of market integration, including estimates of integration from price analysis and the examination of trading profits from spatial arbitrage and from interseasonal storage.

However, in the context of economic development, models designed to measure static economic efficiency are often considered to be limited or inappropriate. The commodity systems approach attempts to incorporate a dynamic element in measures of economic performance, while the new institutional economics extends the applicability of the neo-classical model to the institutional environments which prevail in developing countries.

There will usually be alternative ways of looking at the phenomena under study, and the selection of conceptual tools ultimately depends on the kinds of explanation which the researcher, or the client, finds satisfying in the context of the study. It is important, then, to be aware of the alternatives and to question the assumptions of the models used.

THE CHOICE OF TECHNIQUE IN DATA COLLECTION

Whatever the subject of study there are at least three methods of data collection: the use of secondary data, primary data collection using a formal sample survey, and primary data collection using informal techniques. This section discusses the strengths and weaknesses of each and the potential role they can play, both generally and in the context of studies of agricultural market performance in developing countries.

In all studies there will be a role for secondary data analysis of some kind. This is likely to include a review of existing research, and the analysis of available official statistics. In the latter case it is important to know about the quality of the data – who collected it, using what methodology – and if possible to witness the data collection process. This was done in RMS, when an NRI team member joined price collection teams in all research locations (Ellis *et al.*, 1991).

In the context of marketing studies, secondary price data can be analysed to describe vertical, spatial and temporal aspects of the market and to identify indicators of market performance, but caution is required in their interpretation, and hypotheses should be tested against direct evidence from the market in question, such as data on market supply and market flows.

A formal sample survey is characterized by: random sampling techniques used to generate a representative sample from which generalizations can be made to a wider population than that sampled; the use of pre-designed questionnaires; the focus on quantitative data; and the use of teams of enumerators, required because of the large scale of such surveys.

Informal primary data collection techniques involve variations on one or more of these elements, and can include surveys using non-random samples, case studies, semi-structured or open-ended interviews or direct observation. The degree of informality varies, and small-scale qualitative studies can involve well-planned and carefully implemented sampling techniques and interview schedules. On the other hand, informal techniques can be used to collect quantitative as well as qualitative data. The key difference, which distinguishes 'informal' from 'formal' techniques, is that generalizations to a wider population cannot rely on statistical validation, and must therefore be made with care, if at all.

However, statistical validity does not constitute proof, and a sample survey is only as good as the quality of the data collected. This is notoriously difficult to control, and it may be that informal techniques, although not 'representative' in the statistical sense, generate more accurate, relevant or meaningful results than formal sample surveys. In addition to the problem of quality control, sample surveys are generally both expensive and time consuming compared to alternative methods. However, they will be appropriate in certain contexts, and especially where statistical representativeness is required.

Sample surveys are often used to generate a comprehensive national data base, as in the Farm Management surveys undertaken in India and elsewhere. The main danger in such large-scale surveys is that too much data will be collected, and that little of it will be used effectively (Chambers, 1980).

A carefully designed and focused survey can be appropriate as a base-line study, to be used in project planning, and to provide a basis for future project evaluation. KHARDEF, an Overseas Development Administration (ODA) rural development project in Nepal, used this approach. It can also provide the basis for regular monitoring of key variables. The RMS sample survey was intended to provide a basis for future monitoring of the rice market, to feed into Bulog operational activities.

A sample survey will also be appropriate where the intention is to test specific hypotheses or to assess the incidence of phenomena discovered in qualitative studies. However, sample surveys are generally better at assessing the levels of individual variables than at capturing the subtleties of relationships between variables.

Sample surveys are not well suited to the generation of new hypotheses, however. The use of closed questionnaires and of hired enumerators in a formal survey restricts opportunities for discovery. Where new discoveries are made they tend to disrupt the survey, if changes to questionnaires or planned analysis have to be made and data already collected is shown to be invalid. They are also unsuitable for the collection of qualitative information, which is generally too complex and variable to be captured within the fixed categories of formal questionnaires.

Small-scale, informal or in-depth studies, on the other hand, are well suited to identifying processes or relationships that would be missed in an extensive large-scale study. Their role is to allow for discovery and the formation of hypotheses and conceptual frameworks, rather than to generate strong conclusions (Alexander, 1986; Debus and Novelli, 1989). While they cannot be used to confirm existing hypotheses because of the small and non-random sample size, they can play a role in challenging existing theories or generalizations.

Informal surveys are particularly useful at the early stages of an investigation, when little is known about the phenomena under study, and they can provide a good foundation for a more extensive, formal follow-on study. In particular, if a sample survey is planned, qualitative studies can be used

to identify the key categories for the questionnaire design. In the case of a marketing study this might include identification of the main types of traders, farmer sales options, or the different ways of organizing harvests.

Informal surveys would also be appropriate in the context of studies aimed at identifying opportunities for technical interventions, in particular sectors of the market, for example in storage or processing, although follow-on formal surveys might be advisable in some contexts.

Small-scale qualitative studies are becoming increasingly popular, given the time and budgetary constraints under which many studies are undertaken, and the disappointing results of many large-scale surveys. When policy decisions have to be made, sample surveys are very often out of date or incompletely analysed and cannot be used. This is particularly so with agricultural surveys, because of the inter-annual variation in many relevant variables, especially where rapid technological change is taking place, as was the case in Indonesia in the 1970s and 1980s. In such situations it may be necessary to rely on secondary data (such as regular official statistics) and on rapid reconnaissance surveys.

If well done, informal and qualitative studies can provide an adequate basis for decision-making in many contexts, but extreme caution should be used in drawing conclusions or attempting generalizations from the results, not only because of the use of nonrepresentative samples but also because of the subjectivity of the data collection process.

The dangers can be reduced by using several different informal methods, which can provide cross-checks on each other, or, where possible, by relating the small-scale studies to an existing body of knowledge (Wood, 1981). Ideally, such studies are best undertaken in combination with extensive methods (Debus and Novelli, 1989). This was the approach used in the RMS, as described in Section 2.

The complementary roles of small-scale qualitative and formal survey techniques are summarized in Table 1 (adapted from Debus and Novelli, 1989).

Table 1 Complementary Role of Qualitative and Quantitative Data Collection Techniques*

Small-scale qualitative	Large-scale quantitative
Asks 'Why?'	Asks 'How many? How often?'
Provides depth of understanding e.g. motivations or relationships	Measures level of occurrence e.g. of types of institutions
Interprets	Describes
Allows discovery	Provides confirmation
Is exploratory	Consolidates
Allows identification of categories e.g. types of farmer or trader	Uses selected categories
Can address dynamics of processes	Addresses/static phenomena/events

*Adapted from Debus and Novelli (1989).

The following sections discuss the application of various data collection techniques to marketing studies, while Section 2 describes their use in the RMS. Table 2 provides some examples of marketing studies which have used the various techniques, and Table 4 provides a summary of the advantages and disadvantages of the main methods and the contexts in which they are applicable.

Sample Survey

One of the most important decisions that needs to be made in the planning of research is whether or not the study is going to attempt statistical representativeness, so that findings can be generalized, with some confidence, to a wider population than that sampled. A number of marketing studies have used formal sample surveys, for example, Crow (1989) and Islam *et al.* (1985) in Bangladesh, Harriss in India (1977, 1981), and the RMS in Indonesia.

However, the attraction of valid generalization must be weighed against a number of considerations. In the context of studies of markets in developing countries the following need to be considered.

- (i) The high cost of a large-scale sample survey.
- (ii) The problems of following the rules of sampling, in situations where data quality and availability is variable and often poor.
- (iii) The difficulties in designing an appropriate questionnaire, unless the researcher already has a good knowledge of the market in question, including, for example, the main types of traders and market flows. The questionnaire imposes a structure on data collected, and will lead to the exclusion of information that does not fit the predetermined categories (Lipton and Moore, 1972). A good knowledge of the subject under study will encourage the use of relevant and precise categories and questions and will facilitate the planning and execution of data entry and analysis.
- (iv) It has been mentioned above that sample survey methods are not well suited to the collection of qualitative information. In the context of marketing studies this would include decision-making processes related to stock holding and sales, description of bargaining practices and types of relationships established between traders. Unless measurable key indicators can be isolated, such subjects of study require open-ended questions not amenable to mass data processing and statistical analysis.
- (v) A specific problem for marketing studies is the tendency for traders to conceal information, especially that relating to profit margins (Harriss, 1981). A predesigned questionnaire administered by a hired enumerator is not the most favourable environment for encouraging the extraction of confidential information.

In deciding whether or not to use a formal sample survey it should be recognized that the advantages of a representative sampling frame will be lost if data is of such poor quality or limited relevance that generalizations are rendered invalid, and useful conclusions cannot be made.

These problems are explored in greater detail in the context of the RMS (page 20). Some of them can be tackled by running qualitative in-depth studies prior to, or alongside, the sample survey. If undertaken prior to the survey, qualitative studies can help to assess the viability of the sample survey, in terms of sampling methodology and questionnaire content, and the appropriateness of questions included in the survey. This was the approach used by Crow in his study of the rice market in Bangladesh (1989).

If run alongside a survey (as in the RMS) they can add qualitative information and provide cross-checks on the accuracy of information collected through the sample. This is especially important where data collection in the sample survey is difficult to control, for example, if it is contracted out.

Informal and Qualitative Research

The alternatives to a formal survey include a range of techniques and approaches that are difficult to classify, because of the degree of overlap between them. Under the general umbrella of 'informal and qualitative', techniques can be classified as follows.

- (i) *The sampling frame.* Informal sample surveys often aim at some kind of representative sample, even though strictly random samples are not used. Case studies choose a single unit for in-depth study. However, if the case study is a village or market, an informal survey or census could be undertaken within the case study.

- (ii) *Source of information.* The three main alternatives here are individual interviews, group interviews or discussions, and direct observation. In many cases a combination of all three will be used.
- (iii) *Interview format.* Interviews can be structured to a varying degree, ranging from the use of pre-designed questionnaires, through checklists, to open-ended discussions which can develop in unanticipated directions. A further alternative is for the researcher to abandon the interview format altogether, and to act as a facilitator of discussion among group members, as in 'focus group' discussions, or to encourage members of the study population to interview one another, as advocated in 'participatory rural appraisal' (PRA).
- (iv) *Type of information.* The main distinction usually made is between quantitative and qualitative information. Further divisions are possible. The categories of quantitative data suggested by Lipton and Moore are described in Section 2 (page 28). The objective here was to assess ease and reliability of recall. Further important distinctions from the point of view of assessing the quality of the data collected include the distinction between 'usual' events or behaviour and specific examples, and between recall of past or current events and estimates of future events. In some cases it can be hard to find actual examples of behaviour described as usual. In this case the 'information' serves to reflect local ideology rather than practice, which may be of interest in itself.

None of the above categories of data collection techniques are explicitly linked to particular sets of objectives or conceptual frameworks, although certain types of data requirements will favour certain approaches (see Table 3). There are a number of approaches that draw on the above and adapt them for application in particular contexts. Perhaps the most well-known of these is Rapid Rural Appraisal, developed in the late 1970s to provide, in the words of one of its founders, "relevant, timely, accurate and usable" information in the context of rural development (Chambers, 1980). A recent development of this approach is Participatory Rural Research, where an attempt is made to involve the 'interviewees' themselves in the research activity.

Another complementary approach which is gaining ground is the application and adaptation, for project planning and evaluation, of techniques developed by the Western commercial market research profession.

Qualitative and informal techniques provide an attractive alternative to a formal sample survey, especially under time and budgetary constraints. The obvious attractions should be weighed against a number of potential problems or dangers (adapted from Debus and Novelli, 1989)

- (i) There is a tendency for such techniques to be used inappropriately. For example, they may be analysed as if they were representative sample surveys, with strong conclusions drawn and generalizations made.
- (ii) The techniques often involve subjective interpretation of information and are open to a number of biases, particularly the 'hypothesis confirmation bias'³ where information which challenges preconceived models is ignored, or 'élite bias' where greater weight is given, perhaps unconsciously, to information provided by influential people (Haven, 1987).
- (iii) It is hard to assess the quality of data collected by others. In many cases the quality of the study is 'entirely dependent on the ability, the experience, and the ingenuity of the investigator...' (Casley and Lury (1986) in the context of 'case studies'), although some studies may be amenable to internal cross-checks, or testing against other information.
- (iv) There is a danger of being undisciplined in planning research and analysis.

For these reasons, informal methods are best used in conjunction with quantitative studies or with reliable secondary data.

3. This bias is possible in all data collection techniques. For example, in a formal sample survey it is likely to operate in the design of questionnaires.

Table 2 Source of Information

Individual interview		Group interview	Direct observation
Advantages	Build up trust	Interaction of individuals stimulates discussion	Objective measurement
	Easy to organize	Internal cross-check of individual responses	Open to verification by others
Types of information		Target group language	Cross-check interview
	Sensitive topics e.g. debt	Opinions and priorities	Physical processes e.g. rice milling
	Complex issues	General description of locality	Physical quantities/objects e.g. storage capacity, stock
	Detailed description of individual's situation e.g. trader annual net margins	Functioning of local institutions Local problem identification Identification of hypotheses	Interaction between people e.g. market transactions

The following sections describe the techniques in greater detail, and discuss their application to marketing studies. It is rare for published results of studies to include detailed descriptions of the methodologies used in data collection, but some examples of marketing studies using various techniques are given in the text and are summarized in Table 2. Informal and qualitative techniques used in the RMS are described in Section 2.

Informal sample survey

Informal surveys have been used by Hayami and Kawagoe in Indonesia (1991), by Anderson in Indonesia (1980), and by Crow in Bangladesh (1989). The objectives of Hayami's study were to explore peasant-market linkages for certain food crops, and to assess the efficiency of 'informal' market institutions. He took a purposive sample of three villages, and then a farmer sample in each village. It is not clear how farmers were selected but no claims of representativeness beyond sample locations are made. As in the RMS, marketing chains were then followed from sample farmers through to retail markets.

Anderson was interested in the function of the 'pasar' in the movement of commodities in West Java, and he used a 'Reconnaissance' survey of markets in three regencies.

Crow used informal surveys to provide a basis for a subsequent formal sample survey of the rice market in Bangladesh.

Case studies

Case studies can be distinguished by the focus on a single unit or individual as the subject of study. A small number of examples are studied in great detail in order to identify and understand relationships or processes in greater depth than would be possible from a more extensive study. Unlike some of the other alternatives to sample surveys, case studies are not necessarily 'quick'. Indeed the hallmark of anthropological studies is the long-term case study involving participant observation by the researcher for up to three years.

Case studies are especially vulnerable to the criticism of not being representative, but their value lies in generating hypotheses, which can then be tested elsewhere (Alexander, 1986). Another danger is that of failing to acknowledge links beyond the boundaries of the 'case' whether individual, village or market. For example, in a village study, all internal links might be investigated, but not the relationship of the village to local or central government (Hart, 1986). For these reasons, case studies are usually best used in combination with more extensive approaches.

Case studies have been used in a number of recent studies of markets. Crow (1989) and Clough (1985) use case studies of traders to examine the social relations of exchange in the market; Alexander (1986) uses a case study of a chilli depot to illuminate trader strategies for obtaining information and maximizing margins; earlier research using case studies includes Dewey's study of a market in West Java (1962), and Geertz's study of a bazaar in Morocco (1968).

In-depth individual interviews

In-depth interviews are well suited to obtaining information of a sensitive or complex nature. In the context of marketing studies this includes information relating to costs and margins, to trader strategies, and to relationships between traders. In-depth interviews were used in the case studies described above and in the RMS.

Key informant interviews can provide a quick overview of the subject of study but are particularly susceptible to 'élite bias' and should be cross-checked with other sources where possible (Lipton and Moore, 1972). Holtzman (1986) discusses the selection of key informants for marketing studies at some length.

Focus group interviews

The use of group interviews in rural development research is becoming increasingly popular.

The focus group interview is a formalized technique for carrying out group interviews, which originated in the field of clinical psychology but has been developed largely in the context of commercial market research. A manual has been produced on its application to project planning in development agencies (Haven, 1987), and similar techniques have been used in Rapid Rural Appraisal (see below).

In a focus group interview, the group participants are encouraged to discuss a specific subject with each other. The researcher acts as a moderator of group discussion rather than as an interviewer. In some contexts it is advised that the group should be comprised of homogeneous members, for example, those sharing the same socioeconomic status, age or sex, who are likely to have similar attitudes. It is believed that this will encourage the expression of opinions which an individual might be inhibited from expressing in a one to one interview. Heterogeneous groups can be appropriate for exploring differences in opinions or priorities, provided that underlying conflict between groups does not inhibit discussion or cause disruption.

Community interviews involving a larger group provide another alternative, appropriate for certain types of information.

Group interviews may be used for a variety of purposes, such as uncovering key components of a target-group's culture, to understand its language, to understand a behavioural pattern, or to develop new ideas and hypotheses (Epstein *et al.*, 1991). In the context of marketing policy studies they would be appropriate for finding out about local institutions, such as those relating to harvest labour or share-cropping, or local facilities such as transport or milling facilities. They might also provide an overview of marketing channels and flows for a particular location. Holtzman has suggested their use in eliciting views of subsector performance, constraints and opportunities for development, and government policies (Holtzman, 1986). However, since much of the information required from farmers and traders in marketing studies is either sensitive or quantitative or both, there remains an important role for individual interviews.

Direct observation

Direct observation is useful both for cross-checking information obtained from interviews, and for understanding processes which are difficult to grasp in an interview context. In marketing studies it is especially useful to observe market transactions, as well as processing, transport (for example by following sacks of rice) and storage (to estimate the size of stocks, storage conditions etc.).

Participant observation is an extreme form of direct observation, commonly associated with long-term anthropological studies, such as those of Alexander (1986) and Dewey (1962) mentioned above, where an attempt is made to empathize with the people studied. However, short-term participant observation, for example living with a trading family for a number of days, can make a useful contribution to short-term studies (see below in relation to RMS).

Rapid Rural Appraisal (RRA)

The objective of RRA is to provide 'relevant, timely, accurate and usable data' in the context of rural development (Chambers, 1980). It has been developed in an attempt to find a middle way

between cumbersome and unusable sample surveys and superficial reconnaissance surveys, or 'development tourism'.

Table 3 Data Collection Techniques Used in Marketing Studies

Technique	Examples of use
Formal sample survey Random sample, claimed representative and used as basis for generalization	Ellis <i>et al.</i> , Indonesia (1991) Islam <i>et al.</i> , Bangladesh (1985) Crow, Bangladesh (1989) Harriss, India (1981)
Informal/reconnaissance sample survey Small or non-random sample to give overview of particular area. May be used for planning formal survey	Hayami <i>et al.</i> , Indonesia (1991) Anderson, Indonesia (1980) Crow, Bangladesh (1989) Lele, W. India (1967)
Case studies and intensive interviews May be used for planning formal survey	Ellis <i>et al.</i> , Indonesia (1991) Crow, Bangladesh (1989) Clough, Nigeria (1985) Alexander, Indonesia (1986) Hayami <i>et al.</i> , Indonesia (1991) Dewey, Indonesia (1962)
Participant observation	Ellis <i>et al.</i> , Indonesia (1991)* Alexander, Indonesia, (1986)
RRA Uses the last three categories above, with emphasis on identification of constraints and opportunities	Harrison <i>et al.</i> , MSU (1974) (Holtzman, MSU paper) [‡]

*Limited to up to 10 days.

‡Brackets indicate Manual rather than example of field use.

The approach involves using a combination of flexible research techniques, including semi-structured interviews with individuals or groups; the construction of social or geographical maps, or matrix ranking of preferences; and the use of key indicators for phenomena which cannot easily be measured directly. Both qualitative and quantitative data can be collected using these techniques, but the emphasis is generally on ascertaining broad directions of change rather than gathering precise statistics. Generalization to a wider population is not attempted, although a degree of randomness can be introduced, for example through the use of transect walks or 'random encounter' in sample selection. The focus is generally on identifying constraints and opportunities, but the approach can be adapted to a wide range of situations, including project planning, monitoring and evaluation.

It is probable that many of these techniques have been used in the past, for example by anthropologists engaged in long-term field work, trying to elucidate indigenous categories and world views (Hill, 1970). However, the systematization and recording of such techniques and their replication among development agencies and government bureaucracies appears to hold great potential for research and for project planning and evaluation.

Other characteristics common in RRA include:

- (i) a focus on the dynamic aspects of the system, and on local innovations and trends;
- (ii) its use within a 'systems' framework which recognizes interrelationships between, for example, economic, political and agro-ecological aspects;
- (iii) following from the above, the use of interdisciplinary teams;
- (iv) a particular focus on local people's opinions, attitudes and priorities in an attempt to assess their own conceptualization of the phenomena under study.

Recent developments within RRA have focused on this latter characteristic, and have gone one step further in encouraging the research population to undertake their own appraisals, and to

develop plans for action which they will themselves undertake. In this context, the use of visual aids, such as maps and diagrams, has proved to be a useful way of focusing a discussion, often generating interest and encouraging a more relaxed interchange of opinions and information than would be attained with purely verbal research techniques.

This 'Participatory Rural Appraisal' (PRA) has been particularly successful in the context of farming systems research where farmers are encouraged to join in the design of field trials as well as their implementation, and in rural development planning by private agencies, and increasingly by government bureaucracies (Pamesh, Aga Khan Rural Support Programme, India, personal communication). In general the approach is likely to work well where future benefits to the research population are dependent on their co-operation and participation in planned activities. As far as the author is aware, no examples of applications of PRA to research relating to agricultural markets are available.

However, a manual has been written on the application of 'Rapid Reconnaissance' techniques in the study of agricultural markets in developing countries (Holtzman, 1986) and a number of studies have used the approach (Harrison *et al.*, 1974). The manual includes 'rapid' versions of many standard techniques for analysing markets, such as those recommended for price analysis, but researchers are also encouraged to use interviews with market participants. Holtzman sets the RRA techniques within a 'food systems approach' which recognizes links between different commodity markets and between institutional and economic variables. It shares with other RRA manuals the focus on the identification of constraints and opportunities, the use of key indicators, informal interviewing of key informants, group interviews and direct observation.

Holtzman suggests a number of contexts in which RRA would be appropriate for market studies, including design, monitoring and evaluation of government or development agency agricultural marketing projects; assessment of the effectiveness or costs of government policies; assessment of the feasibility of particular types of investment by private firms; and as a diagnostic tool in the design of long-term research projects.

Contribution of commercial market research

A number of development practitioners have identified the potential for applying the resources and techniques developed for market and opinion research in industrialized countries for use in development projects. Both quantitative and qualitative techniques have been developed and systematized to a high degree, drawing on the behavioural sciences. It is considered that development projects could benefit either from adopting similar techniques themselves or from hiring the expertise of commercial research organizations.

Commercial market research agencies are spreading fast in Asia and are available in most Latin American and a few African countries (J. Coulter, personal communication). They offer services in data collection and analysis and can be contracted to carry out entire studies or specific elements within them. A significant proportion of their work is for government and other non-profit-making clients.

For example, NRI carries out a variety of marketing studies in developing countries, and these range from policy topics to research into the potential for new products or processes. Commercial agencies are sometimes used or recommended to other clients, for example in the case of a recent study of fish consumption in Madras, carried out by MARG Pvt. Ltd. According to NRI's experience, the standards of such companies are variable, but are often very good, with the ability to deliver highly professional work to exacting deadlines. In view of this, the capability of firms should be assessed on an individual basis in the context of the specific research requirements.

A leading contribution to this school of thought has been made by Epstein *et al.* (1991), supported by the International Development Research Centre (IDRC) and the BBC World Service. They call their approach 'Development Market Research' (DMR). As in much commercial market research, the objective is to identify people's preferences and opinions, although the emphasis is on their perceived needs or problems, rather than on their effective demand for specific marketed products. It is suggested that the fact that this is rarely done in development planning is one reason for the high failure rate of development projects.

The proponents of DMR recognize that the techniques of market research need to be specially adapted for application to cultures other than those in which they were originally developed. DMR therefore draws on anthropological approaches to identify key cultural variables and explore the implications of these for market research. These include consideration of the ways in which decisions are made, how status is achieved, and how prestige is acquired.

There is considerable overlap in the approach and techniques of RRA and market research, including the emphasis on the opinions and priorities of the research population, the creative use of different types of group interviews, and in some cases the participatory nature of the research. However, RRA is usually conducted by multidisciplinary teams of experts working 'in-house' for the commissioning organization, while commercial market research has been developed to obtain objective assessments by outside agencies working on a contractual basis and using professional interviewers. There may be opportunities for combining the two approaches; in-house RRA can be used to identify studies which can then be undertaken by an independent research organization.

Price Analysis

The importance of price analysis derives from the function of prices in transmitting information through the marketing system, providing the appropriate incentives for the balancing of supply and demand and the efficient allocation of resources in production and marketing. Since producers, traders and consumers are constantly adjusting their behaviour in response to price information (among other factors), and since these adjustment processes themselves affect price levels, prices can be seen as an indirect reflection of exchange processes at work in the market.

According to the neo-classical model, in a perfectly competitive and integrated market, price differences for the same commodity in different locations and over time can be fully accounted for in terms of transport and storage costs, allowing for a margin of 'normal profit' and a risk premium for the trader. Similarly, the prices of commodities at different stages of processing reflect only the cost of processing.

The analysis of prices can thus provide a range of indicators of market competition, integration and efficiency, which will have implications for government interventions in markets.

There are a number of standard techniques for measuring the behaviour or prices in any particular market. Goetz and Weber (1986) and Holtzman (1986) provide excellent guidelines for the practical application of such techniques in the analysis of markets in developing countries.

However, because of the many factors influencing prices, price movements tend to be ambiguous. If a competitive market generates prices which behave in a particular manner, the reverse does not necessarily hold. There are usually alternative explanations for price behaviour which cannot be verified without additional information about the market in question. A well-known example of this is the analysis of spatial market integration by correlating prices in different locations over time. In a well-integrated market, prices will move together, but they may also move together in a segmented market under certain conditions. For example, trend factors, such as inflation, operating in all markets may outweigh the more subtle effects of market integration (Harriss, 1979; Magrath, 1989).

Other problems commonly associated with price analysis include the poor quality of available price data in many cases (Harriss, 1979; Hill, 1986), and the reliance on average prices and costs, which mask significant variation. Profits for individual traders can be determined by local marketing conditions or by the social identity of the trader (Reeves, 1989), and average values mask the rapid fluctuations in prices and margins from which traders make a living (Harriss, 1979).

The problems of relying too heavily on price analysis in studies of markets is increasingly recognized, and a number of recent studies, both by anthropologists and economists, place greater emphasis on primary field data (for example Clough, 1985; Alexander, 1986; Crow, 1989; Reeves, 1989; Hayami and Kawagoe, 1991). The approach taken by the RMS was to combine the analysis

of prices with the analysis of primary field data relating directly to processes of production and exchange occurring in the market.

Table 4 Summary of Comparison of Different Data Collection Techniques

Data collection technique	Advantages	Disadvantages	Appropriate context
Formal sample survey	Basis for generalization Ability to test hypotheses Devolution of data collection and computerized analysis possible* Amenable to independent assessment and comparison with other studies	Expensive Time consuming Rigorous sampling procedure required (may be difficult to follow) Implementation inflexible Difficult to control data quality (if data collection contracted out) Not amenable to collection of qualitative data	Database e.g. Farm Management Surveys Baseline study e.g. RMS Test hypotheses arising from other studies or observation Test incidence of phenomena identified in specific cases Generate estimates of quantitative variables e.g. farm market supply
Informal surveys and case studies (including RRA, qualitative market research etc.)	Relatively cheap Relatively quick Flexible implementation (can develop objectives/framework)	Cannot generalize Susceptible to subjective bias Difficult to assess quality of results (of others work)	In-depth identification of processes Hypothesis formation Challenge existing theory Foundation for formal survey Cross-check or supplement for formal survey
Secondary data	If easily accessible: quicker than primary collection cheaper than primary collection	Difficult to assess quality of data	Substitute primary data if good quality* Add information to primary data Cross-check primary data Improve estimates from primary data

*Lipton and Moore (1972).

*After Casley and Lury (1986).

THE CONTRACTING OUT OF DATA COLLECTION

In theory, the contracting out of data collection to local research organizations⁴ has several attractions. It can be cheaper than hiring outsiders to do the job, and it can also add a training element to the project, if local researchers are given training specifically for the project. The experience gained by local staff would add an element of sustainability to project activities.

In practice, there are a number of contexts where the assistance of people with local research experience will increase the efficiency of the data collection exercise. Because of the large quantities of data involved, formal sample surveys will generally involve the hiring of enumerators, who should ideally be familiar with the research location and subject of study. Local commercial research organizations or universities may be able to provide such people. Small-scale, informal data gathering techniques can also benefit from the assistance of local researchers, working in collaboration with those carrying out the research, for example, in the organization of interviews, and in translation, where necessary.

4. Not to be confused with 'participatory research' where the 'respondents' are directly involved in the design and implementation of research (see page 18).

In some cases it may be decided to contract out the entire research project, including detailed formulation of specific objectives, data collection and analysis. The appropriate division of labour between client and contractor will depend on the context in which the research is undertaken and on the quality of services offered by local research agencies. It is therefore important that those sponsoring the research are fully aware of the choice of services available, since time invested in selecting an appropriate institution can save time and resources at later stages of the project.

In general, however, the experience of the RMS as well as of other sample surveys done in Indonesia (Frank Ellis, personal communication) suggests that organizations carrying out complex policy-related studies should be cautious about the contracting out of research studies to indigenous organizations, unless there is close supervision of data collection, entry and analysis.

The main problem with contracting out is one of quality control. As the number of professional organizations increases, it may be harder to assess the quality of the data collected, and to be sure that enumerators have carried out the task properly. Where commercial research organizations are involved, it will often be possible for the client to accompany the researcher into the field. However, for complex policy studies of the kind described in this report, direct participation of the client in joint research activities would be preferable, if such arrangements can be agreed upon.

In the case of the RMS, data collection for the sample survey was contracted out to three local universities, but the training and supervision of enumerators was the responsibility of the NRI research officer. In the event, the research officer was heavily involved throughout the data collection exercise, running refresher training courses before each survey and visiting enumerators, in the field. The level of supervision required obviously depends on the experience, competence and commitment of the enumerators, which in the case of the RMS varied from good to poor.

A second, less obvious reason to exercise caution is that it is likely that a number of important decisions will have to be made concerning methodology during the implementation of the study. This is particularly the case in the early formative stages, during sample selection and questionnaire pre-testing, but can happen at any stage, if the study happens to come up with unexpected results.

In the case of the RMS, changes were made to sample selection procedures and questionnaire content when the study was already underway. The need for such changes depends on how well the researchers already know the area, and will be reduced if a survey is preceded by small-scale preparatory studies. However, even where these have been done, it will not have been possible to predict precisely the data availability in each research location when this can vary even from village to village, let alone from province to province. A sampling methodology which appears reasonable or essential on paper may prove to be impossible to implement, and compromises will have to be made. On the other hand, too many compromises made early on, perhaps to avoid being too demanding on local people whose co-operation is required, can destroy the foundation of the study. Thus, decisions made at the early stages of the study often require good judgement as well as a degree of authority so that sensible changes will be made and respected.

This is not to suggest that contracting out should not be considered, but rather, that there should be close collaboration between the contracted parties and those undertaking the research, at all stages in the data collection exercise. The experience of the RMS also suggests the value of incorporating a long planning and preparation period into the research programme, so that design problems can be resolved prior to the contracting out of any elements of the research.

In general, if it is decided to contract out part or all of the research project, then it will be necessary to ask whether the organization has:

- (i) an appreciation of the purpose of the research;
- (ii) a good knowledge of the requirements of sampling methodology;

- (iii) a strong commitment to obtaining an appropriate sample, even where difficulties arise in the field;
- (iv) good judgement in the event of compromises having to be made;
- (v) the respect of local people whose co-operation will be required.

Even where all these conditions are fulfilled, it is important to ask how the contracted party is likely to react to very unexpected results. Will there be a tendency to try to fit the data to existing hypotheses, or will discrepancies be recognized and fed back into the data collection exercise and into the analysis? It may be worth the extra cost of employing someone who has been directly involved in the survey design, and who has a genuine commitment to the research project at least in a supervisory role.

Section 2

The Indonesia Rice Marketing Study

THE OBJECTIVES AND FRAMEWORK OF THE RMS

The RMS was implemented under the umbrella of an on-going project between NRI and BULOG, (the Indonesian Food Logistic Agency) the NRI/BULOG Development Project. While the study was aimed at a general understanding of the rice market, it was specifically geared towards providing recommendations to BULOG in its price stabilization and buffer stock-holding operations. It was also designed as a base-line study to provide guidelines for future monitoring of the private market by BULOG.

Given the seasonal nature of rice production even a 'perfectly competitive' market has its problems. Prices will tend to drop at harvest, to the disadvantage of farmers anxious to dispose of their crop, and to rise in the pre-harvest period, due to the cost of storing rice from one season to the next. There is therefore a potential role for government intervention to stabilize prices for the benefit of producers and consumers.

BULOG achieves its price stabilization role through the implementation of a floor and ceiling price band. In an average year BULOG purchases no more than 5–10% of production, but, according to the findings of the RMS, Bulog carries out some 20% of interseasonal transfers of rice, the remaining 80% being shared by farmers and traders (Ellis *et al.*, 1991).

It was believed that if the private market was working well then BULOG might be able to cut down on its operations without reducing its effectiveness in stabilizing the market. In order to assess how well the market was working, and to understand the role that Bulog played, it was necessary to gain a better understanding of the processes of price formation in the private market. This was to be achieved by:

- (i) Estimation of the seasonal pattern of market supply from farmers;
- (ii) Investigation of decision-making by farmers and traders relating to stock-holding and sales behaviour across the seasons;
- (iii) Identification of marketing chains from farm to retail to explore the vertical relationships in the market and the spatial dimensions of price formation. This involved exploring the types of relationships established between different categories of traders;
- (iv) Analysis of the spatial and seasonal patterns of rice prices over a complete annual cycle (1990) and over the decade 1980–90.

The neo-classical model of the perfectly competitive market provided the main conceptual framework for the study. Attempts were made to measure the following indicators of competition and efficiency:

- (i) Sales choice of farmers and traders (from the sample survey);
- (ii) Ease of entry into the market (through in-depth trader interviews);
- (iii) Number and scale of operators, convergence of marketing chains and degree of competition for supplies at harvest (through the sample survey and direct observation);
- (iv) Transmission of information in the market (through in-depth trader interviews);
- (v) Marketing costs and profitability of trade. In an efficient market, marketing services are provided at the lowest cost and traders earn 'normal' margins so that both producers and consumers receive 'fair' prices. There is no generally agreed means of assessing what level of profit is 'normal' (Harriss, 1979) but the study worked with the general assumption that the more competitive the market, and the smaller the margins of traders, the better off the producers and consumers would be. The collection of accurate data on trader costs and margins is problematic, but attempts were made to estimate average values from the sample survey and to collect case study examples using in-depth interviews.
- (vi) Pricing efficiency. In a perfectly competitive market, prices in different locations vary only by the transport costs between those locations, and interseasonal price differences can be explained in terms of the cost of storage. Pricing efficiency was examined through price analysis, and some indicators were also obtained from the sample survey.

The study drew on a number of descriptive models of the seasonal aspects of market behaviour developed by Timmer (Timmer *et al.*, 1983; Timmer, 1974, 1986).

The 'structure, conduct, performance' model provided a useful framework for organizing ideas. As an initial description of the study it could be said that while the sample survey focused on market structure, the qualitative research concentrated on conduct and price analysis concentrated on performance, although there was considerable overlap (see Table 5).

The RMS used a range of data collection techniques, including a formal sample survey, informal surveys and case studies, and price analysis. The following sections describe how these methods were used, and discuss the problems encountered in the field. Table 5 summarizes the most useful data collected by each technique.

Table 5 Data Collection Experience in the RMS

Technique	Most useful types of data obtained
Formal sample survey	
Farmer	Farm market supply as percentage of production Timing of farmer sales in relation to harvest Harvest shares to harvesters and landlord Farm household consumption Farm level stocks at each survey season
All respondents	Type of buyer and sales choice Marketing chains from farm to wholesale/retail Convergence of chains
Informal surveys and case studies	Confirmation of marketing chains from formal survey Ends of chains not completed in survey Description of inter-island trade Example costs and margins earned by individual traders Networks of relationships between traders Other aspects of trader conduct
Direct observation	Active competition in obtaining supplies Market processes: harvest transport drying and milling exchange transactions Market flows
Price analysis	Trends in market prices Seasonal pattern of prices Locational relationships between prices

THE RMS SAMPLE SURVEY

Methodology

One of the unusual features of the RMS sample survey compared with other surveys of markets was that the sample frame was based on farmers, rather than on traders or on market places. This was based on the premise that the timing and magnitude of sales from farmers is a key determinant of price formation in the market.

A second unusual feature was the following of marketing chains from sample farmers to the wholesale or retail level. This proved to be a useful means of gaining an impression of market structure and of the vertical formation of margins through the system, incorporating the value added through processing, transport and storage.

The sample survey methodology has been written up in full in the RMS Report (Ellis *et al.*, 1991). The following are its key features:

- (i) Three *kabupaten* (regencies) were selected to represent:
 - (a) a rice surplus area supplying the capital city, Jakarta, which is the largest deficit market in Indonesia (Karawang, West Java);
 - (b) a rice surplus area with extensive land trading links (Ngawi, East Java);
 - (c) a rice surplus area with sea trading links (Sidrap, South Sulawesi);
- (ii) Ten villages were selected according to a linear random sample, to ensure good geographical spread across the sample *kabupaten*;
- (iii) A random sample of ten farmers was taken from each sample village giving a total of one hundred farmers per research *kabupaten*;
- (iv) Marketing chains were followed from each sample farmer. The farmer was asked to whom he or she had made the 'most recent sale' of rice. The named trader was interviewed, and was asked to whom they had made their 'most recent sale' and so on, as far as it was possible to follow the chains. This gave a sample of traders and millers which was not in itself random, but which was based on a random sample of farmers. The sample of marketing chains generated was considered to be representative of marketing channels for the research *kabupaten*;
- (v) A minimum number of traders and millers were specified for each *kabupaten* to ensure that sample sizes were large enough for statistical analysis. If sample marketing chains did not include enough traders, 'substitutes' were selected according to an informal non-random procedure;
- (vi) Sample farmers were interviewed three times, once at the main wet season harvest (when all sample farmers had harvested) and then at three monthly intervals thereafter. Most sample farmers harvested rice a second time and a few had three harvests over the year. An attempt was made to capture these harvests at the second or third surveys.

Organization of the Sample Survey

The data collection was undertaken by teams of enumerators from three Indonesian universities, each covering one of the research locations. The enumeration teams for Ngawi and Sidrap had ten enumerators, one for each village. The team for Karawang had five enumerators, each covering two villages. Data entry was done by BULOG staff, while the analysis was done by the NRI team leader and research officer.

The NRI research officer was responsible for supervision of data collection and data entry, and was involved in the project full-time.

The following paragraphs describe certain aspects of the implementation of the survey in the hope that future studies might benefit from the experience.

Village and Farmer Sample Selection

We developed the methodology for selection of sample villages and farmers in Sidrap, the research location in South Sulawesi. When we tried to replicate this methodology in the Java locations we found that:

- (i) Data availability and knowledge of local officials varied widely;
- (ii) The demographic situation was very different.

In Sidrap we obtained a district map showing the location of the 32 villages in the district, together with data on production and other village statistics. We knew little about the characteristics of the villages in terms of rice production and marketing, and the idea was to select a random sample with good geographical spread in the hope of covering the full range in types of marketing channels throughout the district. It was a straightforward procedure to list villages according to their location and then to take a linear random sample. In order to exclude villages with little rice production we took out villages producing less than 800 tons per year.

Things were not so simple in the other locations. Karawang turned out to have 301 villages and Ngawi 209, so the exercise took rather longer. Furthermore, we were unable to obtain production data by village in either case. In Karawang, data on area harvested was used as a proxy, but discrepancies arose in matching the village area list with the map. In Ngawi, data availability was particularly poor and we ended up using data on village area collected c. 1970!

Similar problems arose with the farmer selection. In Sidrap we had been assured that no one kept a complete list of farmers, but that since all farmers joined '*kelompok tani*' or farmers' groups, we could use *kelompok tani* (KT) lists as our sample frame. This may or may not have been the case in Sidrap, but when we visited the other research *kabupaten* it soon became clear that a sample based on listed KT members in villages in Karawang and Ngawi would have included a tiny proportion of all farmers. On the other hand it turned out to be relatively easy to come by complete village population lists, or lists of household heads at village offices. It was agreed to use these lists as the sample frame. A random selection was made, and villagers were asked to help exclude those who were not in fact rice farmers (we included both owner-cultivators and share-tenants but not agricultural labourers).

We were concerned to ensure that we had a truly random sample, since the usefulness of certain results would depend on their being representative of a wider population. The sampling exercise was very time consuming and required an awareness both of the requirements of sampling and of the quality of the data on offer. The realization that the KT lists would not provide a representative sample frame and the discovery of alternative lists led to the resampling of several villages in Karawang. In the absence of an NRI team member it is unlikely that either the realization or the resampling would have occurred. This also begs the question of whether more qualitative survey work should have been carried out in each region before embarking on a fully-structured exercise.

The Questionnaires

It is a central dilemma of survey work that good design demands a very good prior knowledge of the location and subject of study. It can be argued that by the time you know enough to choose a good sample and ask useful questions there is little point in going ahead with the survey since it can add little to your knowledge. Indeed it has been suggested that sample surveys are unlikely to lead to new discoveries, but should be used only as a means of statistically verifying phenomena that have been encountered in qualitative or in-depth studies (Debus and Novelli, 1989).

In the case of the RMS we did not have sufficient time for in-depth studies prior to the implementation of the survey, although this was recognized as being desirable at the time. Had we done so, it is possible that we would have been able to use shorter questionnaires and to cut down on supervision costs during survey implementation. As it was, many of our discoveries were made along the way, through our mistakes. This process of 'learning by doing' demanded a greater involvement of the NRI research officer, in whose absence the appropriate decisions might not have been made.

Two pre-testings were done for the farmer questionnaire, with an NRI team member present in both cases. However, at the second pre-testing the research officer who was to be employed full-time on the project had only just arrived from the UK and was largely preoccupied with language problems.

As the data from the first main survey came in, areas of confusion among enumerators, sample farmers, or both, quickly surfaced. The area of greatest confusion was that relating to farmers' harvest. Enumerators had been trained to enter the total harvest, followed by a breakdown, including payments to harvest labourers, landlords, shopkeepers etc., as well as stocks held for future consumption. However, farmers were found to quote 'their' harvest net of payments in kind to harvest labourers and, in the case of share-croppers, to landlords. This suggests that farmers in Indonesia conceptualize the harvest in terms of the amount they are actually entitled to and can choose how to dispose of.

In this case, the confused data had revealed faults in the questionnaire design and at the same time had given us an insight into the behaviour of farmers. It is difficult to estimate how much further pre-testing would have revealed the potential confusion.

Another interesting problem arose in the discrepancies between stated standard harvest shares (for example those paid for harvest labour), and actual amounts paid from the respondent's harvest. There are a number of possible reasons why an individual might receive a non-standard share (for example where the harvester is closely related to the cultivator), but the problem is to distinguish between such special cases and respondent or enumerator errors.

Marketing Chains

The plan was to follow marketing chains from farmers to the wholesale or retail level by interviewing traders who had purchased the 'most recent sale' from the previous interviewee. In the most simplified model the farmer would sell to a trader of unmilled rice (*gabah* trader) and the chain would proceed to a miller and then a milled rice trader (*beras* trader). So we designed a *gabah* trader form, a miller form and a *beras* trader form. There was an implicit assumption in the questionnaires that *gabah* traders would be small-scale collectors, while *beras* traders would be large wholesalers, who would be the most reluctant to divulge information.

It quickly became apparent that traders did not fall conveniently into these categories and that most of our assumptions were more or less off the mark. People who bought *gabah* from farmers might be fellow farmers, millers, agents for large traders, or wholesalers in their own right. Some traders who bought from farmers rented mill facilities and sold milled rice, thus by-passing the miller as a separate link in the chain. Furthermore, farmers rarely knew enough about the traders to enable the enumerator to categorize them accurately. Indeed in many cases they knew so little about the person to whom they had sold their harvest that it was not possible to follow the chain.

It thus became clear that traders could only be categorized after they had been interviewed. We therefore decided on a single general form for all traders, and a supplementary miller form to be used if it became apparent during the interview that the trader owned milling facilities. Traders were then categorized at the analysis stage in terms of the transactions occurring at the time of interview. For example, someone who had been buying and selling unmilled rice was termed a *gabah-gabah* trader, while someone who was buying unmilled rice and selling milled rice was a *gabah-beras* trader. These categories did not account for the wide variation in scale and mode of operation within each functional type, but they proved adequate for the main elements of the analysis – the mapping out of rice marketing channels and the rough estimation of costs and margins along the chains in different locations.

We were warned at the start that it would be difficult to follow chains, since farmers would not always be able to give the name and address of the trader to whom they had sold. This was especially

so in Ngawi, the East Java location where farmers were said to sell to traders from outside the district. This proved true for villages located on the main road (three of the ten sample villages) but in general enumerators in all locations were able to follow chains to the second and often the third and fourth link in the chain. Few enumerators were sufficiently committed to follow chains beyond the *kabupaten*, or to enter the busy wholesale markets of urban capitals, and we could not obtain a complete picture of all chains to the retail level. However, the distribution and length of unfinished chains gave some indication of the variation in types of chains, and the distance covered by rice sold by sample farmers. As patterns emerged they could be followed up in the supplementary informal research activities (see below).

The commitment of the enumerators was clearly an important factor here. Close supervision by the research officer helped unravel genuine chain ends from premature ends where enumerators had failed to pursue them.

Three Seasons

The focus of the study was on understanding the seasonal pattern of price formation in the rice market. It was considered that a single interview at the time of the main harvest would not have been able to capture this adequately, and three main surveys were planned to coincide with the major wet season harvest and the second and third harvests where these occurred. In addition a monthly survey covering a subsample of 20 farmers per *kabupaten* was carried out starting in the same month as the first main survey. The objective of the monthly survey was to map out the flows of rice into and out of the household over the year.

The second and third surveys were useful for obtaining information on market supply from the second and third harvest, and for estimating farm household rice stocks in different seasons. They also provided cross-checks on variables such as household rice consumption (which did not vary significantly across the three surveys). Since marketing chains were followed from the same sample farmers at each survey, they also provided a good basis for examining seasonal variation in marketing channels, and revealed distinctive patterns in all research locations.

The advantages of seasonal coverage should, however, be weighed against the considerable increased costs, both in terms of data collection and analysis.

In spite of the problems in interpretation experienced at the first survey, the data collected from sample farmers was, in general, of higher quality and more useful than that of subsequent surveys. Enumerator and interviewee fatigue are likely to have played a part in this. But one of the great advantages of the first data set was that all sample farmers recorded a recent harvest. The timing and incidence of subsequent harvests was found to vary both within and between the three research locations. This meant that elaborate sorting of data was necessary before meaningful comparisons could be made across seasons.

In the case of the traders and millers, further problems of comparison arose from the fact that a different sample was interviewed at each survey depending on the 'most recent sale' of the previous interviewee. This was excellent from the point of view of mapping marketing chains, but, given the degree of variability within samples, it created problems for the analysis of seasonal variation in trader costs and margins.

The experience of the RMS should not discourage other studies from attempting to incorporate a seasonal element. Indeed one of the standard criticisms of 'quick and dirty' (or 'long and dirty') research methods has been the accusation that such studies tend to miss the 'difficult' seasons – the pre-harvest season when hunger arises or the rainy season when communications are difficult (Chambers, 1980, 1983).

In the case of the RMS, the seasonal element was crucial, given the objective of understanding seasonal aspects of price formation. With the benefit of hindsight, however, it might have been better to investigate the seasonal variation through subsamples and informal techniques (as was

done to some extent) rather than through repeating the large-scale survey. Another alternative would have been to run the sample survey with much shorter questionnaires, focusing on farmer sales and stocks, and on the mapping out of marketing chains.

Data Quality and Data Analysis

The sample survey included a number of different types of questions, including both quantitative and qualitative questions referring to the current situation or to events or decision-making in the past. The data sets which generated the most useful information are given in Table 5. The following paragraphs draw attention to some of those that were less fruitful.

Recall

A number of texts have drawn attention to the problem of relying on the recall of interviewees, especially in agricultural research where attempts are made to cover seasonal variation in a one-off interview, and where, during seasons of greatest activity, respondents have no time for questionnaires (Lipton and Moore, 1972; White, 1984). Lipton and Moore have suggested that errors will be lower where the information required is 'single point' rather than continuous, and 'registered' rather than 'non-registered'. 'Single point' events are those that occur infrequently and at specific times, such as a harvest or a sale. An activity is 'registered' if the respondent made a mental note of it at the time, or perhaps even a written record. Examples are the price received for a sale of rice, or the wages paid by a household for agricultural labour hired for a specific task.

The awareness of the problem of recall had a strong influence on the design of the RMS, including the incorporation of repeat surveys at three seasons, the encouragement of enumerators to interview farmers as soon after harvest as was possible, and the focus on the 'most recent' market transactions. As a result the maximum recall period required of interviewees was no more than two weeks in most cases, and most questions relating to the past were of the 'single point, registered' category. A substantial proportion of the questions related to the situation on the day of the interview. In the case of sales information, cross-checks were built into the study in that each member of a marketing chain was asked about transactions from the previous as well as the subsequent link in the chain.

In general, recall of interviewees was not considered to be as important a problem for data quality as certain other factors, such as confusion over the interpretation of questions, or the use of inappropriate categories or questions.

Confusions and complexities

The confusion relating to certain questions contained in the questionnaires has been described above. In general, the questions that worked well (in the sense that meaningful analysis was possible) were those relating to quantitative variables with which the respondent was familiar, such as the quantity of rice sold, household consumption, or the amount of rice currently in store.

Respondents were generally not confident about answering questions relating to the future, such as expected future prices, or estimation of when stocks will run out. This realization is in itself a result, although perhaps not the most cost-effective way of obtaining it!

The other main category of questions that did not work well was the category relating to decision-making of respondents, for example the reasons for the timing of sale or the choice of buyer. People generally have many reasons for such decisions, and the variation between respondents in the balance of priorities is too subtle to be captured in the fixed categories of a sample questionnaire. Reduction to a 'main reason' is somewhat arbitrary and the answer generally meaningless.

Most of the questions in the sample survey that did not yield useful information could have been investigated more successfully through informal qualitative techniques, such as in-depth individual or group interviews.

The experience of the RMS suggests that it is useful to categorize different types of questions according to their amenability to different techniques of data collection. The categorization used by Lipton and Moore (1972) in relation to periods of recall has been mentioned above. Further categorizations could usefully be developed for questions relating to the future and for qualitative questions of various types in the context of different research techniques.

Omissions and imprecisions

It must be common in sample surveys for the analyst to discover that some crucial item of data is missing, either because enumerators failed to ask or because respondents did not know. Not only can the analysis not be done, but large chunks of other data become useless. In the case of the RMS, an example of this was the assessment of the moisture content of rice. Every rice transaction recorded was supposed to include the moisture content. Without it, prices cannot be compared in a meaningful way, since the moisture content of rice is a key determinant of its market value. This is not only because it represents one aspect of the degree of processing (rice must be dried before it is milled) but also because the higher the moisture content the more rapid the deterioration of the rice.

In practice, the data sets relating to the moisture content of unmilled rice were patchy at best. This was partly because enumerators had not grasped its significance and partly because farmers are generally not familiar with the terms for different degrees of moisture content, so that further discussion and preferably direct observation are necessary.

The analysis was completed, with some elaborate cross-checking and sorting, but it is not possible to draw strong conclusions from the results relating to costs and margins along sample marketing chains. Given the importance of precision in the description of price data, a general sample survey was not an appropriate data collection technique. In the RMS, price analysis and intensive interviews in informal surveys provided alternative sources of information on costs and margins.

Conclusions

In general, the sample survey can be said to have fulfilled its objective of providing the basis for an improved understanding of the operation of the rice market in Indonesia (see Ellis *et al.*, 1991). With the benefit of the RMS experience, however, it is likely that future sample surveys could be undertaken in a more cost-effective manner if the following conditions are fulfilled.

- (i) Informal, qualitative studies are undertaken before the major sample survey. This will lead to a refinement of objectives, shorter and better designed questionnaires and possibly also lower supervision costs and less time required for analysis.
- (ii) Greater emphasis is given to pre-testing in order to improve questionnaire design and to anticipate possible future problems in the field.
- (iii) Consideration is given to the potential for running qualitative studies alongside the sample survey. If well designed, such studies can stand alone for independent analysis, as well as complementing the sample survey.
- (iv) Analysis is well planned before the implementation stage, and sufficient time is allowed for analysis including up to half the allocated time for assessing data quality through cross-checking and sorting.

QUALITATIVE RESEARCH IN THE RMS

Qualitative research, undertaken by the NRI full-time research officer, made a valuable contribution to the RMS, both in terms of improving the interpretation of data from the other components (sample survey and price analysis) and in terms of contributing new information. The objectives of the informal research activities were as follows.

- (i) To provide feedback into sample survey implementation, for example through identifying improvements to questionnaires, and offering advice to enumerators.
- (ii) To improve interpretation of sample survey data at the analysis stage.
- (iii) To add new information on subjects not amenable to the sample survey approach. This included the description of trader conduct, and relationships of exchange between traders which required a more open approach than that afforded by pre-designed questionnaires; and information on costs and margins which traders are sometimes reluctant to divulge in the impersonal context of a sample survey.
- (iv) To explore areas of the market missed by the sample survey, such as networks of inter-island trade, or wholesalers located far from the research locations.
- (v) To provide a further source of indicators of market performance, particularly in the structure and conduct of the market, including ease of entry, access to credit and information and evidence for active competition for supplies.

The initial concern with trader conduct in the RMS informal surveys was based on the idea that the way that trade is conducted – the individual strategies and exchange relationships between traders – is one important factor determining price formation and market performance. This is one of the tenets of the ‘structure, conduct, performance’ approach, and this framework provided a useful way of organizing material.

As the research progressed it became clear that phenomena, such as the exchange relationship between a miller and a trader or between traders and farmers, could be understood in a number of different ways, with reference both to economics and anthropological literature.

For example, the literature on transaction costs, interlinked markets and the imperfect information paradigm contributed to the interpretation of information on exchange relationships. The desire to reduce transaction costs and to obtain market information explains some of the observed trader strategies. The anthropological concept of ‘multiplex’ relationships and of patron – clientage were also useful in the context of understanding relationships between farmers and traders or traders and their agents. Another aspect that seemed crucial but was not covered directly in the S – C – P model was the importance of the distribution of ownership of resources in determining access to working capital, which in turn determines the role of a trader in the marketing system.

Methodology and Implementation

There is considerable overlap in the approaches and techniques of qualitative or informal research (see Section 1, page 6). The RMS used a combination of case studies involving participant observation, open-ended interviews and interview chains. The research was undertaken over a full calendar year, covering the same period as the sample survey and the two activities were always closely related, with research field trips fitting in around training and supervisory activities in survey implementation. Thus the sample survey both provided the umbrella under which the qualitative research was undertaken and placed constraints on its planning and implementation. The ways in which the qualitative research component could be adapted for freestanding studies is explored in Appendix 1.

Case studies and participant observation

One case study of a trader and two case studies of millers were undertaken, with the researcher living in the homes of the subjects for periods of up to ten days. In addition the researcher lived in the homes of farmers in two case study villages, for one week in each case.

The idea was to observe the daily patterns of activities, the division of labour, the timing of sales and purchases, and the manner in which transactions were conducted. The traders and millers were visited at different times of the year in order to capture seasonal changes in their mode of operation.

For example, the case study miller in South Sulawesi was selling a truck-load of rice to the DOLOG every other day in April, whereas by July he had stopped operating altogether. Records showed that the previous dry season (October to December) he had sold to traders in Ujung Pandang.

The miller in West Java operated a joint profit-sharing enterprise with a number of traders in the wet season. According to this system, the traders would buy *gabah* using working capital provided by the miller. They would then dry, mill, transport and sell the rice. The net profit would be divided equally after the miller had been paid for the capital loan, and for the use of drying, milling and transport facilities. In the dry season, however, the miller's relationship with the traders had changed and he merely used them as a source of *gabah* supply.

The long-term association with a small number of traders provided a good basis for discovering more about the costs and margins of the enterprises. All three case study respondents were happy to show their written accounts, once a good relationship had been established by the researcher. These accounts revealed the annual pattern of sales as well as the day-to-day variation in margins. While it was not possible to draw any conclusions directly from such a small sample, it did provide a valuable insight for interpretation of sample survey data.

For example, the frequent incidence of negative margins on the individual transactions of the miller in West Java placed the negative margins found in the sample survey data within the bounds of the possible, although it did not of course prove their accuracy. Traders could experience negative margins as a result of poor judgement of the quality of purchases, or because of changes in prices between purchase and sale dates.

Informal sampling and open-ended interviews

Some 50 farmer, trader and miller respondents were interviewed over the year, using open-ended questionnaires and checklists. A rough sampling procedure was followed whereby at least one central village and one peripheral village were covered in each of the three research *kabupaten* (these were not necessarily sample villages). Within the village, an attempt was made to cover the variation in scale and mode of operation of farmers and traders. For example, in one village interviews might cover a number of farmers, two or three traders who purchased from farmers in the village, one or two millers and a *beras* trader. Traders were also interviewed in urban areas that were sales destinations for rice from the sample *kabupaten*.

Where possible, marketing chains were followed, either starting with farmers or starting with traders and millers, at different levels in the chain.

Much of the material in the checklists used for these interviews covered the same ground as the sample survey questionnaires, with the objective of providing alternative estimates and/or cross-checks.

For example, traders and millers were asked in greater detail about variable costs and margins, sources of supply and sales destinations, and stock-holding practices, and an attempt was made to map out the key marketing channels in the different research locations. In general, data collected in this way fitted well with that obtained from the sample survey, providing confirmation of the validity of survey results.

In addition, traders were asked details of their mode of operation not covered in the survey, and the personalized relationships between trader respondents were explored using linked interviews with agents or regular customers.

A third aspect of the informal sampling was to cover areas of the market missed by the sample survey. For example, the seasonal pattern of inter-island trade was explored through interviews with wholesalers in Jakarta, Surabaya and Ujung Pandang at different times of the year.

PRICE ANALYSIS IN THE RMS

The analysis of rice prices made up the third component of the RMS. The objectives, methodology and results have been written up in full in previous documents (Ellis *et al.*, 1991; Ellis and Wyeth, 1990). In summary, the objectives were:

- (i) To provide a background against which to compare prices collected in the sample survey and qualitative research. This involved the analysis of officially collected prices in major cities over the full calendar year 1990;
- (ii) To add a historical perspective to the study through the analysis of time series price data over a ten-year period from 1980–90. This data again covered the major urban centres;
- (iii) To provide a further source of indicators of market performance.

There were three main components to the price analysis:

- (i) Trend and seasonal analysis of retail prices (various varieties) from 1980–90;
- (ii) Trend and seasonal analysis of producer–consumer margins over the same period. Both urban consumer and rural consumer price series were used in this analysis;
- (iii) The analysis of spatial market integration using price correlation coefficients between nine major provincial capital cities.

The first two components involved the deconstruction of price series into trend, cyclical, seasonal and random components, and the calculation of seasonal indices for each location and for Indonesia as a whole.

The results of this analysis confirmed many of the results of the sample survey and informal research. For example, results from the sample survey suggested that trader margins did not vary significantly between the three research locations, but that there was a degree of seasonal variation, with margins peaking at the main wet season harvest and declining thereafter. The price analysis also showed little variation in margins between provinces and a marked seasonal pattern with margins highest at peak harvest and lowest between September and December, depending on the province.

The price analysis also showed that interseasonal price spreads were low as compared to those of other crops in Indonesia, and this confirmed the statements from traders that it was not worth holding stocks from one season to the next for price reasons. However, traders do hold stock interseasonally for non-price reasons (see Ellis *et al.*, 1991).

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Appendix

An RRA of Market Organization

RRA is a flexible approach which must be adapted to each particular situation according to the judgement of the researcher (see Section 1, page 6).

The following are a set of suggestions based on the experience of the RMS. The focus is on understanding the organization of the market and the conduct of participants. The approach could be used in combination with secondary data, including price analysis, and could be set within the commodity systems framework suggested by Holtzman (1986).

Mapping – group interviews

RRA often begins with a mapping exercise in order to identify the distribution and location of potential participants in the research. In the context of a study of market organization this might involve interviewing⁵ administrators or traders at a market place to identify the key categories of traders and to map the location of different types of traders. In a village setting, a group of villagers could be interviewed to identify traders within the village, or to locate facilities such as mills, transport and market places.

The mapping of market flows for the research location would also be amenable to this approach. Focus group interviews with traders could be cross-checked with interviews with administrators involved in the market.

History – group interviews

A second role for focus group interviews would be to gain an overview of directions of change in marketing, including changes in types of marketing chains (for example, an increasing tendency for farmers to sell to wholesalers rather than to small village traders, or vice versa); processing technology; size of margins; credit availability; or government regulation. Such a discussion could then move on to the identification of problems or constraints in marketing and suggestions for improvements.

However, researchers should be aware of the tendency for this type of group interview to be dominated by 'élite' or influential individuals whose opinions are not necessarily representative.

Costs and margins – individual in-depth interviews

In-depth interviews with selected traders could be used to obtain information on costs and margins for individual private agents. An attempt should be made to cover the range of types of traders in the market and to obtain a good geographical spread to give an idea of variability in costs and margins.

5. 'Interview' is used loosely here to cover 'focus group' situations where the researcher acts as facilitator for group discussions or other activities, rather than directly interviewing participants.

Mode of operation – individual in-depth interviews

In-depth interviews could also be used to obtain information on mode of operation and on relationships between traders, including credit arrangements, renting of facilities, risk and profit sharing, distribution of information, institutional innovation and adaptability. Once particular institutions have been identified in this way, group interviews could be used to assess their level of incidence in the area.

Networks of relationships – interview chains

Interview chains can be used to explore networks of relationships between traders. For example, individual interviews could be taken of a miller, one or two agents of the miller, farmers who regularly sell to those agents, and, at the other end of the chain, customers who regularly buy from the miller. It would then be possible to map these networks and to consider their implications for entry into the market, the functioning of credit markets and the distribution of information in the market.

Marketing channels – interview chains

The researcher could follow a number of marketing chains to discover the main marketing channels. Chains can begin with farmers or traders at any level and can be followed forwards (to buyers) or backwards (to suppliers). This will give a rough impression of market structure and of the key destination markets for different locations. The problem here is to assess the representativeness of non-randomly selected chains. Chains are likely to vary both by location (depending on access to markets and production patterns) and season (depending on patterns of supply and demand in other locations).

Seasonal variation – sequential interviews

It will not always be possible to cover all seasons in a short-term study, and certain aspects of seasonal variation can be assessed from a single interview, especially if traders keep written records and are prepared to discuss them. In many cases, however, reliance on recall will give very inaccurate results and the use of sequential interviews will probably be worth the additional cost.

Sequential interviews with selected traders across crop seasons or across a full calendar year can be used to explore variation in trade flows, margins and in mode of operation by season.

Marketing functions – direct observation

Direct observation of sales transactions and of processing, transport and storage activities is advisable. As well as providing a cross-check on information gained in interviews, direct observation is especially useful for understanding complex processes involving a large number of interrelated decisions which are difficult to grasp in an interview context. An example is the harvest and disposal of a crop, beginning with the recruitment of harvest labourers, payment of labourers, weighing, transporting, sale and storage of the crop.

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Over the past decade there has been a proliferation of new ideas, approaches and techniques for carrying out research in developing countries. This has arisen from a dissatisfaction with conventional methods, such as formal sample surveys, and from an increasing appreciation of the value of informal and qualitative techniques. However, there are relatively few examples of the new thinking being applied to studies of agricultural markets.

Methodologies for Studying Agricultural Markets in Developing Countries reviews some of the available methodologies, and provide guidance on their application in studies which aim to appraise the performance of agricultural markets and recommend appropriate policy interventions. The paper draws on the experience of a study of the rice market in Indonesia, which used a number of different methodologies.

The book will be of interest to those involved in research and policy making in relation to agricultural markets, and to students, researchers, and organizations concerned with methodology in field research.