This chapter deals with the concept of household income and with its measurement.

Section 2.1 discusses the concept of household income and the broad definitions of household income from the existing literature. Section 2.2 describes and evaluates two approaches to the measurement of household incomes: the national accounting approach and the household survey approach. Section 2.3 deals with the measurement of household incomes in India. The emphasis of this section is on household income surveys in India, though indirect methods of deriving household incomes from national income accounts are also briefly discussed. The final section describes in detail the definition and components of income used in the analysis in this thesis, and some issues in the measurement of household income.

2.1 **Defining Rural Household Income**

Fisher (1986) defines income thus: "a stock of wealth existing at a given instant of time is called capital; the flow of benefits from wealth through a period of time is called income."

From this definition it is clear that to define income it is necessary to specify the unit for which income is being defined, the period of time over which income accrues and the types of “flow of benefits from wealth” that are considered incomes, or to be more precise, the components of income.
2.1.1 Income Sharing Unit

This thesis is an attempt to understand rural households. Thus, for the purpose of the thesis, the household is taken as the income-sharing unit. A household is defined as “a group of persons who normally live together and take their meals from a common kitchen unless the exigencies of work prevent any of them from doing so”. This is the same definition used by the Census of India and the National Sample Survey Organisation (NSSO). We thus assume that the household income is the aggregate income of all its members. A household may comprise more than one production unit, and different members of the household may derive incomes from different types of economic activity. Similarly, two households may form a single production unit. It is not uncommon in rural India to find brothers jointly operating agricultural land even after their households have divided. In spite of such complexities in the process of income generation within a household, households serve as a better unit for studying incomes than individuals or families because the income is shared among the members of the household to provide a basis for economic and social life. Income is an important determinant of the well being of household members and its capacity for further income generation.1

The income required to sustain a member of a household differs also according to household size and composition. Hence, in the methodology of calculating household incomes, equivalence scales are often used to adjust for household size and composition of the household. “Equivalence scales usually represent the different relative costs of supporting different size families at minimally adequate levels” (Smeeding and Weinberg

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1 There are, of course, often differences in consumption levels and levels of wellbeing (defined by achievements in health, education and capabilities) within the members of the same household mediated by relations of gender and power.
In my analysis I have not used any equivalence scale and unadjusted total and per capita household incomes are used for inter-household comparisons.

2.1.2 Accounting Period

In this thesis we used the agricultural year as the unit of time for income measurement, since most rural households are dependent on agricultural incomes. The agricultural year in West Bengal generally begins in June with the sowing of monsoon paddy. The period of our analysis is June 2005 to May 2006, except in the case of farmers where the agricultural year began with the sowing of jute in May 2005. This applied to some farmers in Amarsinghi village in Malda district.

2.1.3 Components of Income

One of the major problems in accounting for household incomes is that there is no uniform definition of household incomes accepted by most countries of the world, as there is of National Income in National Accounts Statistics. Households derive income in various forms, some as direct monetary flows and some as indirect non-monetary benefits that raise the household standard of living. Cash earnings, rents, interests, transfers and capital gains are forms of direct monetary benefits, while food subsidies, housing assistance, subsidized or free electricity, water supply, sanitation are all forms of indirect non-monetary benefits. Concepts of household income vary depending on the categories that are included or excluded from its definition. Smeeding and Weinberg (2001) examined the data on components of income collected in various countries and formulated the definition of income summarised in Box 2.1. This definition, according to

---

2 Generally three crops were sown in the study villages: aman paddy was the main kharif crop sown in monsoon and harvested in autumn, potato, oilseeds and pulses were rabi crops cultivated between November and March and boro paddy was cultivated in summer between March and May.
the authors, "blends the 'top-down' national income based approaches with a 'bottom-up' microdata perspective" (ibid.)

Box 2.1 The components of household income from Smeeding and Weinberg (2001)

<table>
<thead>
<tr>
<th>Gross cash income = Cash earnings (wages, salaries, sick pay, vacation pay, farm and non-farm self employment income) + Other cash market income (net interest, dividends, rents, royalties, private pension) + Cash transfers (social securities and social transfers) + Other regularly received money income + Net realized capital gain and intermittent income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real disposable personal income = Gross Cash Income + Net inter-household transfer + Value of in-kind earnings from home production – Net work expenses including pay roll taxes – Net direct income taxes</td>
</tr>
<tr>
<td>Net total income = Real disposable personal income + In kind market income (fringe benefits, company cars) + In kind transfers (food vouchers, housing assistance) + Imputed rent for owner occupied dwellings</td>
</tr>
</tbody>
</table>

The Expert Group on Household Income Statistics (The Canberra Group), on the other hand, takes a micro-approach towards definition of the components of household income. They recommend that their definition be used internationally for income distribution analysis (The Canberra Group 2001). The definition provided by the Canberra Group is reproduced in Box 2.2.
### Box 2.2 Definition of household income by the Canberra Group

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1 Employee income</strong></td>
<td><strong>Cash or near cash</strong></td>
</tr>
<tr>
<td>1.1 Cash wages and salaries</td>
<td></td>
</tr>
<tr>
<td>1.2 Tips and bonuses</td>
<td></td>
</tr>
<tr>
<td>1.3 Profit sharing including stock options</td>
<td></td>
</tr>
<tr>
<td>1.4 Severance and termination pay</td>
<td></td>
</tr>
<tr>
<td>1.5 Allowances payable for working in remote locations etc, where part of conditions of employment</td>
<td></td>
</tr>
<tr>
<td><strong>Cash value of fringe benefits</strong></td>
<td>1.6 Employers’ social insurance contributions</td>
</tr>
<tr>
<td>1.7 Goods and services provided to employee as part of employment package</td>
<td></td>
</tr>
<tr>
<td><strong>2 Income from self-employment</strong></td>
<td><strong>Cash or near cash</strong></td>
</tr>
<tr>
<td>2.1 Profit/loss from unincorporated enterprise</td>
<td></td>
</tr>
<tr>
<td>2.2 Royalties</td>
<td></td>
</tr>
<tr>
<td><strong>In-kind, imputed</strong></td>
<td>2.3 Goods and services produced for barter, less cost of inputs</td>
</tr>
<tr>
<td>2.4 Goods produced for home consumption, less cost of inputs</td>
<td></td>
</tr>
<tr>
<td>2.5 Income less expenses from owner-occupied dwellings</td>
<td></td>
</tr>
<tr>
<td><strong>3 Rentals</strong></td>
<td>3.1 Income less expenses from rentals, except rent of land</td>
</tr>
<tr>
<td><strong>4 Property income</strong></td>
<td>4.1 Interest received less interest paid</td>
</tr>
<tr>
<td>4.2 Dividends</td>
<td></td>
</tr>
<tr>
<td>4.3 Rent from land</td>
<td></td>
</tr>
<tr>
<td><strong>5 Current transfers received</strong></td>
<td>5.1 Social insurance benefits from employers’ schemes</td>
</tr>
<tr>
<td>5.2 Social insurance benefits in cash from government schemes</td>
<td></td>
</tr>
<tr>
<td>5.3 Universal social assistance benefits in cash from government</td>
<td></td>
</tr>
<tr>
<td>5.4 Means-tested social assistance benefits in cash from government</td>
<td></td>
</tr>
<tr>
<td>5.5 Regular inter-household cash transfers received</td>
<td></td>
</tr>
<tr>
<td>5.6 Regular support received from non-profit making institutions such as charities</td>
<td></td>
</tr>
<tr>
<td><strong>6 Total income (sum of 1 to 5)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>7 Current transfers paid</strong></td>
<td>7.1 Employers’ social insurance contributions</td>
</tr>
<tr>
<td>7.2 Employees’ social insurance contributions</td>
<td></td>
</tr>
<tr>
<td>7.3 Taxes on income</td>
<td></td>
</tr>
<tr>
<td>7.4 Regular taxes on wealth</td>
<td></td>
</tr>
<tr>
<td>7.5 Regular inter-household cash transfers</td>
<td></td>
</tr>
<tr>
<td>7.6 Regular cash transfers to charities</td>
<td></td>
</tr>
<tr>
<td><strong>8 Disposable income (6 less 7)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>9 Social transfers in kind (STIK) received</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10 Adjusted disposable income (8 plus 9)</strong></td>
<td></td>
</tr>
</tbody>
</table>

*Source: The Canberra Group (2001)*
There are some differences in the two definitions presented above. The conceptual frameworks adopted by the two sources are different. While Smeeding and Weinberg (2001) roughly adhere to the National Accounts framework while defining the components of income, the Canberra Group takes a micro-approach and categorises incomes by different sources of earnings of households.

There are also differences in the inclusion or exclusion of specific components of the income definitions proposed by the two sources. For example, the Canberra group includes incomes from insurance, rental incomes from owner-occupied dwellings, in-kind fringe benefits provided by employees, in-kind social transfers as part of the adjusted disposable incomes of households, while Smeeding and Weinberg (2001) include these components in total incomes but exclude them from disposable incomes.

However, it is clear that both the schemes presented above relate to an economy dominated by organised sector employment. Both emphasise components of income that are generated in the organised sector while the components of unorganised sector incomes are dealt with in less detail. Most of the components discussed in the above schemes are either not relevant to rural India where the unorganised sector dominates, or are of relatively small importance.

2.1.4 Income Definition Used in this Thesis

In my analysis I have categorised the components of income by source. The components of income are:

1. Income from crop production (gross value of output — cost of production)
2. Income from animal resources (gross value of output — cost of production)
3. Income from agricultural wages
4. Income from non-agricultural wages
5. Income from salaries
6. Income from non-farm self-employment
7. Income from forestry and fishing in common tanks
8. Income from rent (rent from agricultural land, machinery, non-agricultural land and buildings and other capital)
9. Interest from usury
10. Income from transfers (pensions, scholarships, disaster relief)
11. Remittances

Total household income is the sum of 1 to 11.

I have broadly adhered to the definition of real disposable personal income, as defined in Box 2.1. There are, however, some components of real disposable personal income that are not accounted for in my estimation of household income. Net realized capital gains and intermittent income (incomes from insurance proceeds, lotteries and gambling) and work expenses (travel costs) are not accounted for in the estimation of income in this thesis. For salaried households the reported income is income net of taxes. For households deriving incomes from sources other than salaries, data on income taxes were not collected. Rental incomes for owner occupied dwellings and in-kind social transfers are also not included in the calculation of incomes in this thesis. Collection of data on these components of income would be difficult, though, in my understanding, the importance of these components in household incomes is relatively small in rural West Bengal. Very few households would have financial assets in the villages given the low levels of incomes of majority of the households in the three villages. There are no taxes on agricultural incomes in India and incomes from agriculture form a substantial part of incomes in rural areas.
2.2 MEASUREMENT OF HOUSEHOLD INCOME

Household incomes can be measured in two ways: by using national accounts statistics or by means of household surveys. The first is called the "macro" method, or the derivation of estimates of incomes of individual households from income aggregates for the economy. The second method is to collect information directly from households (the "micro" method). In this section we describe and critically evaluate the two approaches.

2.2.1 Macro Approach

The income definition in National Accounts Statistics (NAS) that comes closest to describing household incomes is that of personal incomes (Anand, 1983). Personal income is a measure of actual current income receipt of persons from all sources (Government of India 2010). The definition of personal incomes or income from the household sector is shown in Box 2.3.

Box 2.3 Definition of personal income and personal disposable income in National Accounts Statistics

| Personal income/Income of the household sector = Private income - Savings of private corporate sector net of retained earnings of foreign companies - Corporate taxes |
| Personal Disposable Income = Personal Income - Direct taxes paid by households and miscellaneous receipts of government administrative departments |

(Where, Private income = Net Domestic Product at factor cost - Income from entrepreneurship and property accruing to government administrative departments - Savings of non-departmental enterprises + interest on public debt + Current transfers from government administrative departments + Other current transfers from rest of the world + Net factor income from abroad)

Source: Government of India (2010)

The NAS data on personal income can be obtained at various levels of regional and sectoral disaggregation. In India, disaggregated data from National Accounts Statistics are available at the level of States and by different sectors of the economy. It is not possible

3 The terms "micro" and "macro" approaches are used by the Canberra Group (2001).
to estimate income for the rural household sector separately, since the method of collection of National Accounts data does not allow for rural-urban disaggregation. Income from agriculture is often considered a proxy for rural incomes, though, given the increasing diversification of the rural economy, the expansion of the rural manufacturing and service sectors, rural household incomes go beyond agricultural incomes alone.

One of the major limitations of using macro aggregates is that while the levels of income can be estimated through these aggregates, it is not possible to analyse income distribution patterns and income inequalities in the economy. The analysis of the distribution of income and wealth assumes importance at all levels, globally, nationally and within the regions of a nation for the understanding of under-development and poverty and formulation and implementation of development policies all over the world.

In developed economies, another source of data on personal incomes is from income tax assessment records. These provide information on income levels, sources and distribution. In a developing economy like India, however, income-tax payers constitute only a small fraction of the total working population and direct tax records are not useful sources of data on household incomes. Bardhan (1974) points out that income tax records are not very useful sources of information as the structure of incomes even among the tax-paying population of India, for the following reasons:

i. Taxable income does not include agricultural incomes and are subject to various rebates and discounts.

ii. For every tax assessee in a household, there are many earning members who do not pay taxes.

iii. Income assessments in one year may include incomes that accrued in previous years
iv. The extent of tax evasion is high in India.

2.2.2. Micro Approach

Data on household incomes can be collected directly through household surveys. In many countries of the world, including developed countries like the United States and the United Kingdom, and less developed countries such as Sri Lanka, China, and Malaysia household income data is collected through household surveys. The merit of household survey data is that they allow for inter-personal comparisons of income and analysis of the sources and patterns of income generation. At the same time the estimation of income from household survey based data involves some well recognised problems.

2.2.2.1 Definitional Issues

There are wide variations in definitions of household income used in different countries in the world. Therefore, international comparisons of household incomes are difficult. There is no uniform definition of household income accepted and applied in all countries in the world. One of the reasons for the absence of definitional uniformity is that there is no consensus on the treatment of different kinds of monetary and non-monetary benefits received by households in the estimation of household incomes. Thus, a major problem of defining household incomes arises from the fact that households produce goods and services for sale in the market as well as for self-consumption. The monetised part of household incomes can be accounted for, but it is often difficult to value the non-monetised part of household incomes.

Smeeding and Weinberg (2001) provided a framework for estimating household incomes by creating a list of the different components of household income. Their analysis of
income survey data from 25 countries reveals that no single income survey collects information on all the components that come within their list (ibid).

Household incomes are difficult to measure with accuracy because income is a derived variable. Hence it is important to identify and measure each component of income accurately to derive reliable estimates of income.

In light of the definitional variations in household incomes, two major international efforts have been made to resolve the problem of dis-uniformity in definitions of household income used in income surveys in different countries of the world. The Luxembourg Income Study (LIS), that was initiated in 1983 under the joint sponsorship of the government of the Grand Duchy of Luxembourg and the Centre for Population, Poverty and Policy Studies (CEPS), tried to harmonise income survey data from OECD countries to enable cross-country comparisons (Atkinson 1990, Smeeding and Schmaus 1990, LIS 2008). At present the project covers more than 30 member countries (LIS 2008).

The International Expert (Canberra) Group of Household Income Statistics (also known as the Canberra group) is trying to move nations to adopt a more uniform and comparable definition of household income. The Australian Bureau of Statistics organised the first meeting of the Canberra group in 1996. The group consisted of experts in the field of household income statistics from national organisations of countries in Europe, North and South America, Asia, Australia and New Zealand, and international organisations such as the World Bank, International Labour Office (ILO), Organisational of Economic Cooperation and Development (OECD), Statistical Office of the European

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Communities (EUROSTAT), as well as the LIS. The main objective of the group was "to enhance national household income statistics by developing standards on conceptual and practical issues related to the production of income distribution statistics" (International Expert (Canberra) Group of Household Income Statistics 2001).

2.2.2.2 Differences in Household Survey Estimates and NAS

Secondly, in most countries, income estimates from household surveys are lower than estimates obtained from NAS. Further, it is difficult to statistically check the divergence in the two estimates because the margin of error varies across income groups and income components. It is generally understood that higher income groups tend to under-report incomes and that income from certain activities are more difficult to measure than others. In a comparison of household income estimates from household surveys and NAS in six developed countries, Sawyer (1976) found that the divergences between the two estimates varied between 15 and 30 per cent. The degree of under-reporting varied between income categories and was high for incomes from investments and self-employment (ibid). Anand (1983) compared estimates of personal income and average household income derived from the Post Enumeration Survey in Malaysia for 1970 and concluded that household income estimates derived from the Post Enumeration Survey were below the personal income estimates from NAS by 25 to 30 per cent. Atkinson, Rainwater, and Smeeding (1995) analysed income survey data from seven countries and compared the data with comparable fiscal measures and concluded that wages and salaries are fairly accurately reported in income survey data, but that on the whole, income surveys under-reported incomes. Even for developed economies such as the United States it was found that income estimated from farm and non-farm sources showed wide divergence between estimates derived from the Current Population Survey (household survey) and those

\[5\text{ Cited in Anand (1983)}\]
\[6\text{ Cited in Smeeding and Weinberg (2001)}\]
Deaton writes that it is difficult to obtain accurate estimates of income for self-employed households engaged in agriculture or family businesses because personal and business incomings and outgoings may be confused. However, according to Deaton, such problems can be minimised by using an accounting framework to estimate household incomes from self-employed sources (ibid).

2.2.2.3 Differences in Estimates of Incomes and Consumption

Thirdly, income estimates derived from surveys are often lower than estimates of consumption, even when national income estimates show high rates of household savings (Deaton 1997). According to Deaton (1997), “although there are often good reasons to doubt the absolute accuracy of national income figures, the fact that surveys repeatedly show large fractions of poor people dissaving, and apparently doing so consistently, strongly suggest that the surveys underestimate savings.” Anand and Harris (1994), by contrast, do not agree that chronic dissaving can be reason enough to regard household income estimates as implausible. Drawing on Fisher's Permanent Income Hypothesis, the authors point out that short-term incomes and consumption are not strictly comparable. Income may well fall below consumption as individuals save or borrow to bridge differences between income and consumption. The authors found from the Sri Lanka Consumer Finance Survey data that when individuals were ranked according to income, non-durable expenditure exceeded income for the bottom 90 per cent of the population. When individuals are ranked by durable expenditure, non-durable expenditure exceeded income for only the bottom 40 per cent of the population. Again, when individuals were ranked by food expenditure, only the bottom decile showed negative savings, that is, a higher non-durable expenditure than income. They conclude that, the fact household surveys in developing countries report chronic dissaving for a large proportion of the
population was because income is a noisy indicator of welfare. If a more stable welfare indicator, such as food expenditure, is used to rank individuals, the difference between income and non-durable expenditure is bridged.

2.3 MEASUREMENT OF HOUSEHOLD INCOME IN INDIA

2.3.1 Macro Approach

The need for official statistics on national incomes was felt in India after independence and an expert committee known as the “National Income Committee” was set up in 1949 under the chairmanship of Professor P. C. Mahalanobis (CSO 2007). In accordance with the recommendations of the expert committee, the first official estimates of national income were prepared by the Central Statistical Organisation (CSO) and published in 1956. Since then, national income accounting in India has undergone changes from time to time. These involve changes in coverage, and an expansion of parameters that are estimated as part of the system of national accounts. These include estimates of private consumption expenditure, saving, capital formation, transactions of the public sector. Changes have also been made in the base years for estimates at constant prices. The current series of national accounts aggregates use 1999-2000 as the base year (ibid).

Many States in India, including West Bengal, prepare estimates of State and district-level incomes based on the recommendations made by the System of Regional Accounting (SRA) Committee in 1976. These estimates are prepared by the State-level Directorates of Economics and Statistics (CSO 2007).
2.3.2 Micro Approach

Given the complexity of occupational patterns in the informal economies of the countryside in less developed countries, the conceptual issues involved in the analysis of household incomes are correspondingly complex. In India, these problems are further mediated by specific social conditions — including caste and gender relations and regional and agro-ecological factors — that obtain in the countryside. There are very few studies of household incomes in India primarily because of the dearth of data on incomes. The only nation-wide surveys that have directly collected data on income are the attempts by National Sample Survey Organisation (NSSO) in the 1960s and the recent Situation Assessment Survey of Farmers in 2002-03, and those of the National Council of Applied Economic Research (NCAER).

2.3.2.1 NSSO Surveys

Although the National Sample Survey Organisation conducts quinquennial surveys on consumption expenditure in India, it does not conduct regular surveys on household incomes. In the early years of its existence, the NSSO attempted to collect information on household incomes along with the consumption expenditure data at the 9th (1955) and 15th (1958-59) rounds (NSSO 1993). The NSSO reported that the two income surveys were conducted on “an experimental basis” and that “no proper methodology for systematic data collection on household income had yet been evolved” (ibid). The data that were collected on household incomes were not published in the NSSO reports on the 9th and 15th rounds.

In the 1960s, as part of its Integrated Household Surveys in the 19th (1964-65) and 24th (1968-69) rounds, the NSSO collected data on receipts and disbursements of households, that is, on their income flows. However, these efforts were not continued, as it was found
that the estimates of income that were made from survey data were lower than the
estimates of consumption and savings put together (Joshi 1996, NSSO 1993).

The two most important surveys on household incomes conducted by the NSSO were
the pilot survey of income, consumption and savings in 1983-84 and the Situation

2.3.2.2 Pilot Survey of Income, Consumption and Savings (1983-84).

In 1983-84 the NSSO attempted a pilot enquiry into household incomes in rural and
urban areas in five States (Haryana, Maharashtra, Tamil Nadu, Orissa and Uttar Pradesh)
and the metropolitan cities of Delhi and Calcutta. A hundred villages and 80 urban blocks
in the five States were covered under this pilot enquiry. The reference period of the
survey was January to December 1983. The objective of this enquiry was to “explore the
possibility of evolving an operationally feasible and technically sound methodology for
collection of data on household incomes through household interview” (Joshi 1996).

Sample households in each village and urban block were divided into three sets. For the
first set, only income data were collected, for the second set data on consumption and
savings were collected, and from the third set data on all three variables were collected.
The logic behind such a sample design was that data on incomes should be comparable
with data on consumption and savings. A total of 24 households were selected from each
village and urban block. Each household was interviewed twice in the year, in June and
December, and data on incomes and savings were collected for the periods January to
June and July to December. Data on consumption were collected for the 30 days
preceding the interview, it being assumed that consumption patterns are stable over the
six-month period (NSSO 1993).
The two main findings from the pilot survey were that, (a) household incomes were under-reported in rural areas, and (b) household incomes were lower than the aggregate of consumption and savings.

In all five States it was found that the average annual household income for rural areas was almost half of the corresponding urban incomes. This led the NSS to infer that rural incomes were seriously under-reported in the survey. Household incomes in metropolitan cities were much higher than incomes in other urban areas (NSSO 1993, Joshi 1996). There were also discrepancies in income estimates obtained from the three sub-samples in rural and urban areas. Though the discrepancies in the three income estimates were lower in rural areas than in urban areas, income estimates from Set III (income, consumption and savings) were significantly higher than estimates from Set I (income only) for rural areas (NSSO 1993, Joshi 1996).

Comparison of rural income data with rural consumption and savings data showed serious discrepancies. In rural areas, income estimates were found to be 30 to 40 per cent lower than the sum of consumption and savings. For urban areas as well, estimates for consumption and savings were marginally higher than estimates of incomes, but the differences were not statistically significant (NSSO 1993, Joshi 1996). In metropolitan areas the estimates were almost equal (see Table 2.1).
Table 2.1 Estimates of average income, consumption and savings per person, by place of residence, 1983-84

<table>
<thead>
<tr>
<th>Place of residence</th>
<th>Average income</th>
<th>Average consumption and savings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Set I</td>
<td>Set III</td>
</tr>
<tr>
<td>Rural</td>
<td>932</td>
<td>1004</td>
</tr>
<tr>
<td>Urban (excluding metropolitan cities)</td>
<td>1985</td>
<td>2020</td>
</tr>
<tr>
<td>Metropolitan cities</td>
<td>3111</td>
<td>3425</td>
</tr>
</tbody>
</table>

Note: Set I refers to the sub-sample in which only household income data was collected. Set II refers to the sub-sample that covered data on consumption and savings. Set III refers to the sub-sample that covered data on income, consumption and savings.

Source: Joshi (1996)

To summarise, the NSS pilot survey did not solve the twin problems of underestimating incomes and generating income estimates that are consistent with estimates of consumption and savings. All household surveys on incomes by the NSSO prior to the Situation Assessment Survey were experimental in nature, and these studies have not adequately been discussed and evaluated. I will focus on two issues in my review of the pilot survey. The first relates to the measurement of household incomes and income components and the second relates to discrepancies in income and consumption estimates.

Issues in measurement of household incomes. Most rural households in India are self-employed, and the difficulties of collecting income data on self-employed households are well known. It is important to use an accounting framework to estimate incomes of self-employed households with any degree of precision. Such a framework was not used in the questionnaire used for the pilot survey. The data collected on agricultural costs are not adequately disaggregated by crop or crop operation in order to facilitate recall by the respondent.
Discrepancy in income and consumption estimates. The NSSO has been critical of income estimates obtained from household surveys because estimated incomes are consistently lower than estimates of consumption expenditure and savings. The most important problem here is that the NSSO did not apply the same standards of accuracy to the collection of consumption data at the survey of household incomes that it does to its regular consumption expenditure surveys. In particular, the NSS pilot surveys are inaccurate in their measurement of household consumption because they did not take seasonal fluctuations in consumption into account, as the NSS surveys of consumer expenditure do.

The NSS Consumption Expenditure Surveys collect consumption expenditure data in four sub-rounds spread across the year in order to account for seasonal variations in consumption behaviour of households. The NSS pilot surveys, by contrast, were conducted in June and December. In most parts of India, these two months are months that closely follow the harvest, when food stocks and realised incomes from agriculture are high. In this respect, the method used at the pilot surveys is likely to overstate annual consumption.

Next, the NSS consumer expenditure surveys use a 30-day recall period for non-durable consumption items and 365-day recall period for durable consumption items, and medical and educational expenditures. The pilot surveys, however, used a uniform 30-day recall period for all items of consumer expenditure, thus replacing a more accurate method with a less accurate one.

There are further conceptual problems with regard to equating household incomes with consumption and savings. First, the accrual of incomes and their disbursal as...
consumption and savings are not synchronous processes. Consumption and savings in period $t$ are both functions of income in period $(t-n)$. Secondly, in situations where consumption is financed through borrowings, the sum of consumption and savings overestimates incomes, unless we consider "net savings", that is, savings net of borrowings.

2.3.2.3 Situation Assessment Survey of Farmer Households (2003)

The most comprehensive and large-scale attempt by the NSS to collect data on household incomes through direct enquiry was the Situation Assessment Survey of Farmer Households (SAS), conducted as part of the 59th round in 2003. This survey covered many issues related to farming households in India, including levels of income, consumption, farming practices, indebtedness, access to modern technology in farming, and ownership of productive assets and livestock. Surveys were conducted in 51,105 households in 6634 villages in all States and Union Territories of India (NSSO 2005).

The SAS was limited to farmer households. Farmer households do not represent all households dependent on agriculture. Agricultural labour households and households earning rental earnings from leased out land were not included in the sample. Nevertheless, the SAS is the single largest data source on rural household incomes in India at present.

The reference period for the SAS coincided with the agricultural year July 2002 to June 2003. The survey was conducted in two phases in 2003. Each household in the sample was visited twice. The first phase of the survey was January and August 2003, when information on the cultivation of kharif crops was collected. Second-round visits to
households were conducted between September and December 2003, when information on rabi crops were collected.

*Issues in definition and measurement of household incomes.* The SAS questionnaire was an improvement on the NSS pilot survey in that it used an accounting framework to derive incomes from self-employment activities such as cultivation, animal husbandry and non-farm business. However, certain features of survey method may have affected the quality of SAS data. First, costs of labour and other inputs are disaggregated by crop and not by crop operations or the type of input used, which may lead to recall errors by farmers. In most cases, farmers have a tendency to overstate costs, and inaccuracies can be checked to some extent by disaggregating the cost components.

Secondly, the SAS used different recall periods for different kinds of occupations. The recall period for farming was an agricultural season, the recall period for non-farm business was 30 days, and for wages and salaries it was seven days. The appropriateness of seven-day recall period (instead of 30 days) for wages and salaries can also be a source of inaccuracy in the data. Salaries are generally received on a monthly basis. Wage employment is highly seasonal and uncertain in character, and a 30-day recall is likely to provide more stable data on wages.

Rental incomes from agricultural land and machinery are considered non-farm business income in the SAS and income estimates from these components are based on a 30-day recall period. A 30-day recall period is likely to underestimate incomes from these sources, since rental incomes from agricultural land and machinery are received for an agricultural season or for specific operations in each season. Like agricultural incomes, the reference period for such rental incomes should also be the agricultural season.
Thirdly, the very definition of income used by the NSSO in SAS has two drawbacks. First, income from cultivation does not adhere to any of the commonly accepted definitions of farm business income specified by the Commission for Agricultural Costs and Prices (CACP). The costs of owned animal labour, and depreciation costs of agricultural machinery are not included in agricultural costs. Secondly, transfer earnings from remittances, pensions and scholarships and earnings from interest are not included in the questionnaire.

Differences in levels of income and consumption. The income data from SAS show discrepancies between income and consumption levels, even though data on incomes and consumption were collected in the same questionnaire. The average consumption expenditure per farmer household was significantly higher than income in all States other than Assam, Jammu and Kashmir and Jharkhand (Bhalla 2006, NSSO 2005). Bhalla (2006) has also shown that in 14 out of 18 States, the income of farmer households owning up to 2 hectares of land was insufficient to meet consumption needs.

The SAS did not use a uniform 30-day recall period for expenditure on all consumption items. The survey was conducted in two phases all through the year, and thus consumption estimates were less affected by seasonal fluctuations than the data collected at the pilot study. In fact, the average monthly household consumption expenditure of farmer households as estimated from SAS data was found to be the same as the corresponding estimate for all rural households obtained from the NSS consumption expenditure survey that was conducted the same year (NSSO 2005). The SAS experience suggests that even when fluctuations in expenditure are taken partially into account and consumption data are collected together with income data, income estimates remain
lower than consumption. As in the previous section, this is a phenomenon observed in many income surveys in the world, and does not pose an insurmountable conceptual problem.\footnote{The estimated consumption expenditure in a large-scale survey conducted by the NCAER in 2004 was comparable with estimates of consumption expenditure from NSS 61st round (Desai, Dubey, Joshi, Sen, Shariff and Vanneman 2010). It was found, however, that rural consumption expenditure was higher than rural household income. Some households in the sample, usually those dependent on agriculture, earned negative incomes (ibid.).}

2.3.2.4 NCAER Surveys

The NCAER conducted an all-India consumption-expenditure survey in 1964-65 that also collected data on incomes (Bardhan 1974). The survey covered a sample of 3,331 households.

Between 1968 and 1971, the NCAER undertook another study to measure changes in income levels and income distribution and consequent changes in consumption patterns, and the investment and saving behaviour of rural households. Data on household incomes, consumption and savings were collected from 261 villages over three consecutive years between 1968-69 and 1970-71 for this study. A sample of 5,115 households was selected for the survey, though the actual number of households surveyed was much less, because many selected household did not respond to the questionnaire. The sample was a multi-stage stratified sample (NCAER 1987).

In 1981-82, the NCAER conducted a resurvey of households that were surveyed in 1970-71 in order to collect longitudinal information on the variables that were covered in 1970-71 (NCAER 1987). A total of 5263 households were covered in this survey, of which 3299 households belonged to the list of households surveyed in 1970-71. These 3299 households were taken up for the longitudinal study, which was to be a study of changes...
in income, inter-class mobility, the incidence of poverty, consumption levels and patterns of and changes in demographic behaviour.

In 1993-94, NCAER conducted another large-scale survey. It covered 35,130 households from 1765 villages in 16 States of India. The data was mainly used for the “Human Development Profile of India” (Shariff 2001). Unlike the previous NCAER surveys, information on consumption and savings were not collected in the 1993-94 survey. Information on income was collected.

In 2004-05 the NCAER conducted a survey titled “India Human Development Survey 2005”, in collaboration with the University of Maryland (Desai, Dubey, Joshi, Sen, Shariff and Vanneman 2010). Data on household incomes, consumption and other human development indicators were collected in this survey. The survey covered 26,734 rural and 14820 urban households in all the States and union territories in India, except Andaman, Nicobar and Lakshwadeep islands (ibid). Of the 26,734 rural households 13,593 households were households that were included in the human development survey of 1993-94.

2.3.2.5 A Critique of the NCAER Surveys

The major critique of the NCAER surveys of the 1960s and 1970s was that the estimates of income obtained from these surveys were lower than National Accounts Statistics (NAS) estimates of private income of the Central Statistical Organisation (CSO) (Bardhan 1974, Gaiha 1988).

According to Bardhan (1974), the under-estimation of household incomes in the NCAER 1964-65 survey could originate from four sources: a. response errors, b. exclusion of
unrealised interest incomes, c. exclusion of income from certain agricultural by-products and d. exclusion of households with annual incomes above Rs. 100,000. Bardhan, however, was cautious in his criticism of NCAER data, since the CSO estimates of private incomes were also inaccurate, especially for the unorganized sector, which constituted the bulk of the rural economy (ibid).

The method of data collection and estimation of incomes from the later surveys of the NCAER have not been widely discussed in contemporary literature. According to Lanjouw and Shariff (2004), "a fairly comprehensive measure of rural household incomes" could be constructed from the NCAER 1993-94 survey data. An examination of the questionnaire, however, showed that detailed data on various components of income were not collected in the survey. As a result, the estimates of household income from this survey are not reliable.8

First, calculation of income from crop production (which is the most important component of rural household income) was based on arbitrary imputation of production and costs. The only data that were collected on this component of income were crops grown and area under crops. Data on cost of production and costs of cultivation were not collected. Thus estimates of income from cultivation were based on imputed value of output and inputs. Rawal and Swaminathan (forthcoming) note that imputing crop incomes on the basis of land operated eliminates sources of variation in incomes across households other than from size of holding.

Secondly, estimates of income from wage labour were based on the number of days of employment and corresponding wage rates in few broad categories of employment.

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8 See, also, Swaminathan, Rawal and Dhar (2008).
Agricultural wage labour was disaggregated into three types of activities: sowing, harvesting and other operations. Non-agricultural wage labour was classified into five categories: domestic services, other services, skilled labour, construction labour and other unskilled labour. Such a broad classification of wage labour activities ignores the multiplicity of wage-labour contracts in similar activities, that is, the differences in wage rates in similar activities due to seasonal patterns of demand, employer-employee relationship, place of work, and many other factors. Hence, the corresponding estimates of wage incomes would be unreliable.

Thirdly, for all other sources of income (animal husbandry, trade, rent, salaries, artisan earnings) the household was asked to report the annual income from the source. This would lead to serious recall errors. To sum up, the accounting framework necessary to obtain an accurate estimate of incomes in the unorganised economy was not used in the NCAER 93-94 survey.

The design of questionnaire of the NCAER 2005 survey was better than the 1993-94 survey. However, some problems remain in respect of estimation of incomes.

Unlike earlier, the 2005 survey collected crop-wise information on production and sale of each crop. Data on the cost of cultivation of crops were also collected but, were not disaggregated by crop. Respondents were asked to report “annual expenditure” on the items of cost (such as hired labour, seeds, pesticides, fertilisers) or total value in case of home-produced inputs. Surveys such as these could follow the Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India, that have worked out a detailed crop-wise method for collection of data on input costs. Question on “annual
costs" is likely to give a less reliable estimate of costs (though it is not clear if this will lead to over or under estimation of costs).\(^9\)

For incomes from animal resources, information was collected for animal products that were sold by the household. Animal products that were consumed were excluded. Hence, income from animal resources would be under-estimated.

For wage income, information was collected on the number of days of employment and wages from each type of occupation. A major occupation, wage employment in agriculture, was considered a single occupation and was not disaggregated by season, crop, or crop operation. We have discussed earlier that such broad aggregation leads to recall errors and also ignores variations in wages in a single activity within a year. The major improvement in the questionnaire in 2004-05 was in respect of other non-agricultural incomes, such as business incomes and transfer earnings, where a more detailed module was used.

In short, although the NCAER 2004 survey design was an improvement over the 1993 survey, the information collected appears inadequate to generate reliable estimates of household income.

2.3.3 Combination of Micro and Macro Approach

As we have seen in previous sections, there are no satisfactory and regular sources of household-survey-based data on incomes in India. The absence of such data affects studies of income inequality and, consequently, of relative income-poverty and

\(^9\) See Surjit (2008) for discussion on the Comprehensive Scheme for Studying the Cost of Cultivation of Principal Crops in India.
deprivation in India. In the 1960s and 1970s, some scholars sought to bridge the data-gap by pooling data from various sources.

One of the earliest attempts was by Lydall (1960). In an attempt to compare income distribution in India and Britain, he merged consumption expenditure data for the bottom 75 per cent of the population (assuming that this part of the population does not save) and the income tax data for the top one per cent of the population, using a Pareto distribution function. The income estimate arrived at by Lydall for the year 1955-56 was quite close to the pre-tax income from National Income estimates in India.

Following Lydall’s method, Ahmed and Bhattacharya (1974) integrated NSS consumption expenditure data and income-tax data using a Pareto distribution function and estimated the distribution of personal incomes in India for 1956-57, 1960-61, and 1963-64. The estimates of aggregate personal incomes thus derived were consistent with CSO estimates of private incomes for all years other than 1963-64. The results also showed a decrease in income inequality in India in the given period.

Ojha and Bhatt (1962, 1964, 1974) estimated the income distribution of India by pooling data from NSS consumption expenditure surveys, CSO data on national incomes, income tax data and data on savings. They estimated income inequalities in rural and urban areas separately. Their study indicated that, in the decade 1953-55 to 1963-65, there had been a reduction in rural income inequality, an increase in urban income inequality, and an insignificant increase in overall income inequality in the country.

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10 Pareto law assumes that the cumulative frequency distribution of incomes, when drawn on double logarithmic paper, follows a straight line for incomes above the mode (Lydall 1960).
In an interesting summary of the several studies on measurement of income inequalities in India, Bardhan (1974) pointed out that the attempts by various researchers to estimate income distribution in India in the 1960s and 1970s by pooling data from various sources was subjected to the criticism that the statistical method was based on subjective assumptions. In spite of such criticism, the summary measures of income distribution reached by the authors were remarkably close to each other.

2.4 MEASUREMENT OF HOUSEHOLD INCOME IN THE STUDY VILLAGES

This thesis uses data on household incomes collected from a primary survey of three villages in West Bengal. This section describes the components of household income and how each component was measured to obtain the final estimate of household income.

2.4.1 Components of Income

The income questionnaire that was canvassed in the villages had seven sections, each dealing with a separate component of income. The components were as follows.

1. Income from crop production. Income from crop production is defined as gross value of agricultural output net of paid-out costs.

2. Income from animal resources. Income from animal resources is the gross value of products from animals net of cost of maintaining animals.

3. Rental incomes from agricultural land. Rental incomes from agricultural land are rents received from agricultural land net of shares in cost of production, loan repayments and interest payments.

4. Agricultural wage income. It includes all wages in cash and kind earned from labouring out in agricultural activities during the year.
5. Non-agricultural wage incomes. Non-agricultural wage incomes of the household comprise wage earnings from non-agricultural wage-labour activities.

6. Income from salaries, business earnings, pensions, rents and remittances, scholarships and other incomes. These are more regular sources of household income. Salary incomes, pensions and scholarships were net of any taxes and deductions. Similarly, business earnings refer to the profit earned by households from non-agricultural self-employment. Rental incomes from agricultural machinery or other property (excluding agricultural land) are net of costs of maintenance of machines and property.

7. Income from forestry and fishing. This component was applicable only to Dalkati village in my survey. It includes incomes from sale of produce collected from the forest net of costs incurred (for example, cost of travel where the produce was sold outside the village). It also includes income from fishing in the common tanks in the village.

2.4.2 Measurement of Income Components

2.4.2.1 Income from Crop Production

Income from crop production is the gross value of output less the paid-out cost of production. Gross value of output includes the value of the main product as well as of by-products, such as paddy straw. The gross value of output was valued at market prices. The total produce was either sold in the market or consumed by the household. Where the product was sold, the actual price received by producers was used to value production. Where the produce was consumed or was not sold on the date of the survey, a standard price was used to value production. The standard price was the median of the market price of the crop reported by the households. However, during the survey, I
collected information on the market prices of crops from nearby markets to ascertain that
the reported price did not differ substantially from the market prices. In most cases,
reported prices were lower than market prices. There were two reasons for the difference
in market prices and reported prices. When products were sold to commission agents
within the village, as in most cases they were, prices tend to be low. Secondly, when
products were sold in regulated markets (as in the case of Amarsinghi), the actual price
received by farmers was less than the market price, because farmers have to pay a
commission to the market authorities. Sometimes, when farmers sold small quantities
they sold them outside the markets premises and received lower prices than the regulated
market price.

To estimate paid-out costs, the definition of A2 cost adopted by the Commission of
Agricultural Costs and Prices in India (CACP) is followed. Cost A2 includes the following
cost components (Sen and Bhatia, 2000)

a. Value of hired human labour
b. Value of hired bullock labour
c. Value of owned bullock labour
d. Value of owned machinery
e. Value of hired machinery
f. Value of seed, home produced and purchased
g. Value of insecticides and pesticides
h. Value of manure, home produced and purchased
i. Value of fertilisers
j. Irrigation charges
k. Land revenue
l. Miscellaneous expenses
m. Rent paid for leased in land
n. Interest on working capital
o. Depreciation of implements and machinery

With regard to hired human labour, hired bullock labour, hired machinery and irrigation charges, all cash and kind payments were included. In Amarsinghi and Bidyanidhi, a part of the wages for paddy cultivation was paid in kind, as paddy or rice. The component of wages paid in kind was valued at standard prices. In Dalkati, cooked food was a component of agricultural wage. Such food was valued at a standard price.

The cost of bullock labour includes rental payments made for hired bullocks for ploughing, carrying and other operations (such as threshing pulses). The cost of owned animal labour was valued at the average rent for hiring animals for similar operations in the village.

The cost of hired machinery includes the rental payments made for hired machineries such as tractors, power tillers and paddy threshers. Where the household owned the machine, the working costs of the machine, such as the costs of fuel, hired labour and maintenance of machinery, were included in this component.

Home-produced seed and manure were valued using the imputed costs of such inputs.

Where households leased land in for cultivation, the net rent paid to the land owners was included in paid-out costs. Rent was calculated net of the landowner’s share in the cost of cultivation. Rents in kind were valued at standard crop prices.
Cost components (a) to (m), excluding the cost of maintenance of own machinery, constitute the working capital of households. Interest on working capital was calculated at a rate of 12.5 per cent per annum, for half the total lock-in period, that is, the gestation period for each crop.

The depreciation of productive assets includes depreciation of tools and machinery used for production owned by the household. It does not include the depreciation of livestock used for agricultural production. The purchase prices of machines and tools owned by households were collected in the survey. Depreciation is calculated using the reported value of the machine at the time of purchase, the age of the machine, and the depreciation rates specified by CACP for various kinds of machines and tools.

I have included marketing and storage costs in my calculations of cost, though CACP does not include such post-harvest costs in the estimation of cost A2.\textsuperscript{11} Marketing costs, that is, the cost of transporting the product to the market and the cost of storing potato in the cold storage forms an important component of costs in Amarsinghi and Bidyanidhi.

Information on incomes and costs of crop production were collected separately for each crop. Information on labour use on each crop was further disaggregated by agricultural operations. Such disaggregation helps minimise recall errors.

\textit{2.4.2.2 Income from Animal Resources}

To estimate the gross value of output from animal resources, the total output, whether consumed or sold, was valued at market prices. The prices used were either reported

\textsuperscript{11} For a discussion of CACP methodology and its limitations, see Surjit (2008).
prices (for output that was sold) or the prevailing prices in the village (for output that was consumed at home).

Sometimes it was difficult for respondents to estimate the output of certain animal products. One such example was dung (used for fuel and manure) production by cattle. For such cases standard outputs were used for different types of cattle. The standards were based on a survey of few cattle owners in the village. For bullocks used for agricultural production, the imputed value of bullock labour (as calculated in cost component ‘e’ in income from cultivation) was included as an income from the animal.

The cost of maintenance of animals includes costs of feed, veterinary charges and medicines, maintenance of cattle sheds and cost of labour. The cost of feed includes purchased feed and home produced feed, such as paddy straw produced on land cultivated by the household. Home-produced feed was valued at half the market price. It was not possible to value every type of feed that households use for livestock, for example, items of feed such as paddy husk, leftover food, rice starch and food the animals obtain from grazing. Households were often unable to report the amount of feed used. In such cases standard quantities were used. The standards were based on a survey of livestock-owners in the village.

Information on each component of income and cost was collected for each type of animal owned by the household.

2.4.2.3 Rental Incomes from Agricultural Land

There are broadly two kinds of tenancy agreements in agriculture, fixed-rent tenancies and share tenancies. Each kind of tenancy can either be annual or seasonal and may
require payment in kind or cash. In both types of contracts, landowners may share the
costs of production and may advance production loans to tenants. The landowner's share
in cost of production and interest payments on loans advanced to tenants was deducted
from gross rent received, while calculating rental incomes from agricultural land. Detailed
information was collected on every aspect of the tenancy contract, so that the net rent
received could be computed accurately.

2.4.2.4 Wage Incomes

Wage payments, specifically agricultural wages, in the three villages had a cash component
and a kind component. The kind component was usually a fixed amount of rice in
Amarsinghi and Bidyanidhi and cooked food in Dalkati. Paddy threshing in Amarsinghi
was a piece-rated operation calculated as a share of the total produce of paddy. Wages
paid in kind were valued at standard prices while estimating total wage incomes.

To minimize recall errors for reporting agricultural wage labour, information on number
of days of employment and wages received was disaggregated by crop and crop operation
for each agricultural worker in the household. Information on number of days of
employment and wages received for non-agricultural wage labour was disaggregated by
type of non-agricultural activity for each non-agricultural wage worker in the household.

2.4.2.5 Income from Salaries, Business Earnings, Pensions, Rents and Remittances, Scholarships and
Other Incomes

Information on incomes from salaries, pensions, scholarships, remittances and other
sources were reported for each month of the year. For business earnings, information on
the average returns in the previous six months and the cost of labour, material inputs,
maintenance and repair of machines and other relevant cost components were collected.
Rental income (other than rent on land) included rent received from agricultural machinery. This was net of cost of labour, fuel, maintenance and depreciation of the machinery. The information was collected for each agricultural season.

2.4.2.6 Income from Forestry and Fishing

Households in Dalkati collected sal leaves, herbs, mushrooms, cashew nuts, tubers and firewood from the forests and sold fish caught from common tanks.

Forest products such as sal leaves, cashew nuts, mushrooms and herbs were entirely sold in the local market and there was no household consumption of these products. Hence there was no problem in estimating incomes from these forest products. Certain forest products, such as specific medicinal herbs and snakes were sold in markets outside Jhargram. The transport cost for selling such products in markets was taken into account while estimating incomes.

In the case of products such as firewood, where there was no formal market, estimation of incomes is problematic. All households used firewood and each household collects firewood according to its need. Sometimes firewood was purchased from within the village. The price of purchased firewood often depended on bargaining and no precise prices emerge. The forest department also sold firewood and logs, which were priced by the cartload. These logs were used as fuel as well as for construction purposes and were priced higher than firewood bought in the village. Applying such prices to firewood collected for home consumption would lead to absurd levels of income from firewood collection. A number of methods and norms could be applied to calculate incomes from firewood. One way would be to apply a zero value or very low value to firewood, assuming it to be a free good abundant in supply. This sets the lower limit to the value of 75
the good. At the other extreme, firewood could be valued at the rates used by the Forest Department. This would be misleading, since the wood sold by the Department differed in quality from the twigs and dry firewood collected by villagers. The third method would be to apply a time-allocation criterion, valuing the firewood by the time each household spent in collection. This method could not be applied in our case as no such data were collected. I have not valued firewood for income estimation since any kind of valuation affects the income levels substantially, although it had no substantial impact on the economic status of the household.

Information on the average volume of sales of each item of non-timber forest produce and the prices received were collected for each household to compute total income from forest collection.

Some households in Dalkati received incomes from fishing in common tanks and selling the catch at local markets. The entire proceeds from the sale of fish was considered income, since there were no costs other than labour time that the income-earners had to bear. Monthly volume of sale and the prices received were collected to estimate incomes from fishing in Dalkati.

2.4.3 Some Issues in Valuation of Goods Not Transacted in the Market

One of the features of village economies in contemporary India is the prevalence of unmarketed production and hence one of the major problems of calculating rural household incomes is the valuation of goods not purchased or sold in markets. The problem may relate to the valuation of inputs used in the production process, valuation of unsold produce or valuation of common property resources used by households for consumption. Again, these non-traded goods may be classified in two categories. First,
there are goods for which a market exists, that is, goods that can be purchased and sold in
the market. Secondly there are goods for which no markets exist within the village. We
will discuss each of these cases separately.

2.4.3.1 Valuation of Inputs Not Purchased in the Market

In the process of agricultural production, farmers often use home-produced inputs.
Examples of such inputs are home-produced manure, home-grown seeds and the value of
labour of bullocks owned by the households. Inputs are generally valued using imputed
costs. The concept of imputed costs was propounded by Menger and Böhm-Bawerk and
is based on the relationship between the value of produced goods and factors used in the
production process. According to the imputed cost theorists, the values of factor of
production are determined by and are equal to the expected values of the consumer
goods to the consumer (Rothbard, 2008). Though this definition may conceptually be
acceptable, there remains the problem of valuing individual inputs when a product is
produced using more than one factor of production. To avoid such problems, imputed
cost is often determined by the value of the product lost if the factor of production is
reduced by one unit. In short, imputed cost is considered to be equivalent to the value of
marginal productivity of a factor of production.

There are difficulties in using this concept of imputed costs in the valuation of input
prices in the rural household economy for various reasons. First, imputed costs presume a
perfectly competitive product and input market, an assumption that does not hold true in
semi-subsistence rural economies in India. The second inconvenience in using imputed
costs of inputs by this definition is that it would require the estimation of production
functions.
Another way of looking at imputed costs would be to go one step back in the production process and value inputs by the expenses borne by the household to produce these inputs. The problem with this method arises from the fact that the household is a vertically and horizontally integrated unit of production. A household produces different outputs using similar inputs. At the same time, certain outputs are used as inputs in the production of other commodities. For example, in our computation of household incomes we needed to estimate the value of farmyard manure (FYM) and the value of bullock labour used in agricultural production. If we go one step back in the production chain, both of these are produced from bullocks (partially or totally). Thus the total maintenance cost of bullocks should add up to the value of these two inputs. It is very difficult to apportion the total maintenance costs between more than one input and the proportions that can be used would be, at best, arbitrary.

To avoid such complexities the method I have followed to value inputs is by using opportunity costs. Opportunity cost is the “evaluation placed on the most highly valued of the rejected alternatives. It is that value that is given up or sacrificed in order to secure the higher value that selection of the chosen object embodies” (Buchanan 2008). Thus the opportunity cost of a certain home-produced input is the value of the input if it was not used for own production, or simply put, the value the producer would obtain if he exchanged the input in the market. This can be done only when a market for such inputs exist.

With most home-produced agricultural inputs, the market prices set the upper limit for the opportunity cost of the input. Farmers, however, value seeds and manure that are

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12 Here again we are assuming that (a) FYM is obtained from bullocks only which is a very restrictive assumption since the household may own other cattle and (b) bullocks are used in agricultural production only, which again may not be the case since they may also be used to haul bullock carts.
produced at home at a much lower level than the inputs they buy in the market. I had collected data on the value that farmers attach to such inputs. In case of seeds, markets for home-produced seeds existed in all the villages. Farmers were able to report the price they would receive for the seed they used, had they sold it in the market. In Dalkati, a specific kind of exchange of paddy seeds took place. Households often borrowed seeds from other farmers at the time of sowing. After harvest, paddy amounting to double the quantity borrowed as seed was repaid. Hence, the value of seeds in such transactions was twice the prevailing market price of paddy.

With respect to farmyard manure, the value that farmers attached to it varied substantially across households, mainly because of the varying qualities of manure as well as the standardised measures for manures. It is not possible to ascertain the exact price and quality of the manure used by each household. At the same time, the use of market prices may overestimate the cost of the input. I valued home-produced manure at half the market price, a valuation that is, admittedly, arbitrary.

In each village there was an active market for hired bullock labour for tasks such as ploughing and carting. I used market rates to value bullock labour. However, using market rates may not always be a satisfactory alternative because of the prevalence of piece-rates. Hiring charges for bullocks are based on the area of land to be ploughed or the number of trips to be made by a bullock cart. Households that use owned bullocks may plough longer hours on a unit of land than households that hire bullocks, ploughs and carts. Market rates underestimate the actual opportunity cost of bullock labour. At the same time, bullocks are never hired on their own. The hiring charges of bullocks include the hiring costs of ploughs or carts and the wages of the worker who drives the

13 Manure is measured in weight or in volumetric measures, such as cartloads and trolley-loads. The volumetric measures for manures are generally not very precise.
animal. In this sense, market rates overestimate the opportunity cost of bullock labour. Such features of the use of bullock-power can be acknowledged conceptually but are difficult to accommodate in actual estimation. I have used market rates to value bullock labour, while noting the special problems that this poses for income estimates.

2.4.3.2 Valuation of Non-marketed Products

A large share of the agricultural goods produced by farmers in India is consumption goods, mainly food crops that are partly or wholly consumed by the farmer household. Such agricultural goods were valued using the opportunity cost method. Here I will discuss the methods by which some specific crops and by-products were costed. The method differed according to the nature of markets for the goods and the use of the goods.

For food grains like paddy, oilseeds and pulses, the market price was considered the opportunity cost of the product. When a household had sold part of the grain, the remaining grain was valued at the price the household received for the sold grain. Where the entire stock was unsold, the grain was valued at the median market price in the village. I faced a problem in Dalkati while valuing sesame and wheat produced in the village. Paddy is sold to commission agents at market prices immediately after harvest, the transaction often being linked to an interest free production loan taken at the beginning of the season on the condition that repayment has to be made immediately after the harvest, when prices are low. With regard to sesame and wheat even such a market did not exist, since the entire production was home-consumed. Only a few households in the village produced such crops. The minimum support prices (MSP) for these crops were used to compute the value of production. This would of course be an overestimation since prices actually received by farmers in all villages tended to be lower than the MSP.
The valuation of agricultural by-products such as paddy straw, jute sticks, and the plant remains of other crops was more complex because of the absence of markets for some of these by-products and the different uses of the products. Paddy straw has a well-developed market in Bengal as a fodder for cattle. However, there are two problems in pricing straw. First, there are no standard units of measurement. Straw is measured in volumetric measures, such as the number of bundles. The price of a bundle varies according to the length of the straw and the size of the bundle. Where a household did not own cattle and sold paddy straw, the straw was valued at market prices. Where a household owned animals, the straw was valued at half the market price. The discounting is arbitrary but essential because a part of the value is recovered through the animal.

By-products of jute and other crop residues were difficult to value in the absence of markets for such products. These products are used widely as fodder, fuel and thatch. But they are generally “free goods”, with substantial use value but exchanged free of cost in the village. No monetary value was attached to these by-products in our estimates of incomes.

2.4.4 Limitations of the Method of Income Estimation

While I believe that the data used in the analysis is of reasonably good quality and that the income estimates are accurate, there are certain further limitations of the income estimation, which mainly arise from practical difficulties of data collection and valuation.

The first limitation is that incomes from interests and dividends from financial investments are not included in income estimation. Similarly, income taxes are not deducted uniformly. These components are excluded because of the practical difficulties.
involved in collecting the data. At the same time, given the type of economy that I am studying, the contribution of such incomes and costs are not likely to be significant.

The second and more serious limitation is the problem of valuation of agricultural by-products. I did not value crop by-products, such as jute sticks and plant residues of mustard, sesame, and pulses, since there were no markets for these products within the villages. The CACP, in their calculation of cost of cultivation, values the by-products of jute and mustard.

2.5 Concluding Remarks

There are two ways of estimating household income, from personal income data from national accounts statistics and from household surveys. All nations have a system of national accounts but not the second. Nevertheless, there is a complementarity between the two. The importance of national accounts estimates is self-evident. Household survey estimates of household incomes are also essential for information on the sources and distribution of incomes.

Income surveys serve a purpose of their own in the understanding of important issues of income generation, income diversification and poverty. Aggregate data on personal incomes from the NAS or household survey data on consumption are not adequate to understand these issues since such data are collected with the only objective of quantification of levels of incomes and poverty. Thus, according to me, collection of household level data on incomes is of utmost importance and useful in the understanding of the dynamics of the household sector and income-poverty linkages, in spite of problems of estimation and consistency.
The number and range of studies on rural incomes in India are limited by the number and range of sources of data on household incomes in rural India. Most of the literature on rural incomes and income diversification is based on micro-level village studies. There are no serial large-scale household surveys on incomes in India. Some efforts by government and non-government agencies to collect large-scale data on incomes through household surveys have failed to generate consistent and reliable estimates of household income.

There are two large scale surveys on rural household incomes in India, the NCAER surveys and the NSSO surveys. These surveys were criticised on the account that they underestimated household incomes. The estimates of household incomes obtained from the NCAER surveys in 1964-65 and 1968-71 were lower than estimates of personal incomes in National Accounts Statistics (Bardhan 1974, Gaiha 1988). The income estimates from the NSSO pilot survey were lower than the estimates of aggregate household consumption and savings, specifically for rural areas (Joshi 1996). Thus it was concluded that income estimates from household surveys under-estimate rural incomes. In the two NSSO surveys of household income (the pilot study and the SAS), and the recent NCAER survey in 2004-05, estimated incomes were lower than consumption expenditure.

The response to these criticisms of household survey estimates of income are as follows. The problem of under-estimation of household incomes through household surveys is not specific to India, it is a reality observed in most countries of the world including developed countries. Response errors and underestimation of household incomes can be minimised through meticulous design of questionnaire. Income is a derived variable. If all components and sources of income are identified accurately and an accounting framework is applied to estimate incomes from each source, fairly accurate estimates of
income can be made. The accounting framework should disaggregate the items of costs and receipts in a way so as to facilitate recall and minimise chances of under-reporting.

Discrepancies in income and consumption estimates from survey data should also not be taken as a reason to reject income surveys. The common assumption that large sections of the population cannot dis-save when the macro-economic indicators show positive savings rate for the economy as a whole may not hold true because there are definitional, conceptual and temporal differences in the variables.

In recent years, two surveys by the NCAER (in 1993-94 and 2004-05) are being used to discuss estimates of household incomes in rural India. As discussed in this chapter, the questionnaires used these surveys does not follow a standard accounting framework for all components of income. Further, the questionnaires were not adequately disaggregated (especially for crop incomes) and recall errors are likely to make the data unreliable.

The main challenge for survey method in household income surveys is to overcome the problems of seasonality and a large unorganised sector. To acquire reliable data on household incomes, a very detailed questionnaire and multiple visits to survey households are required. For a large and predominantly unorganised economy like India this poses huge problems. To collect such detailed information from a representative sample size may be a very difficult task. There may be further difficulties due to the fact that there are differences in the agricultural seasons in different parts of the country. Calculation of household incomes from the collected data is another difficult and laborious task. When a large part of the transactions are non-monetised there are problems of valuation of products and imputation of costs. Such accounting problems may be difficult to deal with for a very large data set.