INCOME AND ASSETS
AS IMPACT INDICATORS

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EXECUTIVE SUMMARY

This paper addresses income and assets as impact categories in the assessment of microfinance programs. By analyzing these variables within the context of a household economic portfolio model, it argues that both categories are valid indicators for tracking changes in household and enterprise welfare. The paper emphasizes practical solutions--for measuring income- and asset-related variables--and pays particular attention to the level of resources required; the time required to engage in data collection, entry, analysis and write up; and the types of questions that one can expect from reasonably reliable data.

A practical definition of income highlights two aspects: the **use** of income and the **flows** of income from sales of products and services. This emphasis on the use of income highlights expenditure and investment activities of household members. Data on uses of income are less sensitive and more reliable to collect than actual incomes, and are more easily verified through observation, interviews, and discussions with shopkeepers and suppliers. Several key issues surrounding the use of income and/or assets as impact variables are discussed. These include: (1) income diversification; (2) intrahousehold income and asset control; (3) fungibility and problems of attribution; (4) seasonality; and (5) valuing assets and liabilities.

Multiple and complimentary approaches are emphasized. The best applied research designs allow for various "cross-check" measures on income and assets that can draw on rapid appraisals, qualitative case studies, and formal surveys. In the final section of the report, three approaches to data collection--'high', 'medium' and 'low'--are discussed in terms of: (1) time and costs of research; (2) precision of data; (3) number and quality of variables addressed; and (4) requirements for data analysis. Critical questions that should be asked before deciding on a particular approach for measuring impact is: (1) How is the information to be used and for what audience; (2) What are the objectives of the assessments; (3) What level of reliability is acceptable; and (4) Does "complexity" in data collection and precision of measurements equate with increased data validity. For many microenterprise program managers and donor agencies their concerns are: (1) is the program generally on track in terms of reaching a 'target population' and increasing household and enterprise welfare, or do modifications need to be made; (2) what additional information is needed to find out if intended impacts are occurring, or if program changes are required; and (3) is there sufficient information on impacts to warrant program extension into other areas?

The report recommends an approach to impact assessment that combines elements of the 'low' and 'middle' approaches. The recommended approach includes at least some interval measurements of welfare that permit greater precision over ordinal measurements in assessing the magnitude of impacts. This approach leaves open the possibility for some level of statistical analyses, and it includes three types of income variables ('household income', 'income diversification', and 'gross sales). However, interval (absolute) measurements are required for only two of the income variables. In the conclusion, the report shows that this 'middle approach' includes a reasonable amount of impact variables (10) to test hypotheses related to the impacts of microenterprise programs; focuses as much on expenditures (a reliable proxy measure of income) as it does on incomes and assets; and requires interviews with only one household member. By pursuing this option, the reliability of data is increased over a 'low' approach, and information of sufficient precision are collected without the costs of panel ('high') research.

I.   INTRODUCTION

This paper addresses income and assets as impact categories in the assessment of microenterprise programs. It analyzes them at the enterprise and household (and intra-household) levels within the context of a household economic portfolio model, and argues that both categories are valid indicators for tracking changes in household and enterprise welfare. The paper starts with a brief discussion of the definitions and differences in the concepts of income and assets or 'net worth', with particular attention to practical definitions that can be operationalized in applied research. This is followed with an assessment of the benefits and costs of using incomes and assets as impact indicators and then suggests techniques for alleviating some of the difficulties in using these measures. The conclusion to the paper presents three different approaches ("high", "medium", and "low") to measuring income and assets that differentiates them in terms of costs, precision and credibility of data, and uses of information.

The household portfolio model assumes that: (1) household members, either collectively or independently, pursue multiple income and investment strategies; (2) capital and income are fungible across household and enterprise activities and across sets of expenditure and investment activities; and (3) household members engage in internal negotiations and bargaining independent of the household "head" or of other members (see Chen and Dunn 1996; Guyer and Peters 1987). By invoking the portfolio model, the analyst accepts the economic and social realities of income diversification, high levels of fungibility among different types of activities, and a household concept based on internal differentiation rather than common interests.

Several key reports of the "Assessing the Impact of Microenterprise Services (AIMS) Program" (Barnes 1996 and 1997; Chen and Dunn 1996; Dunn 1996a and b; and Inserra 1996) have been used as background documents in writing this paper, and already reflect considerable review and analyses of income and assets as impact indicators and of different methodologies. These documents have been supplemented with additional literature investigations and references to some of the author's work on income and asset measurements (see Little 1992; Little 1993; Little and Dolan 1994; Little 1996; and Little et al 1989). This report, therefore, avoids obvious observations that can be found in existing literature and, instead, uses existing documentation to further explore some of the unresolved definitional and methodological challenges.   Their practical implications also are addressed. Practicality is determined, in this case, by the level of resources available and required; the time required to engage in data collection, entry, analysis and write up; and the types of questions that one can expect to use to collect reasonably reliable data.

It is emphasized that multiple and complimentary approaches are preferred to rigid 'either/or' choices that reduce something as complicated as income and assets to one type of quantitative technique; the best applied research designs allow for various "cross-check" measures on income and assets that can draw on rapid appraisals, qualitative case studies, and formal surveys. In a formal questionnaire, different questions can be asked that serve as "validity" checks on reported income and asset levels. Field research at the enterprise and household levels is an iterative process that is as much an "art" as a science, and that we do not need to think in dichotomous terms (qualitative versus quantitative), nor in narrowly defined ways of measuring income and assets.

II. DEFINITIONS AND DIFFERENCES: WHAT DO INCOMES AND ASSETS REPRESENT?

Income is most easily perceived as the total value of goods, services, and wages transacted within a specified time period. It often is calculated on a weekly, monthly, or annual basis, and its elements will vary depending on the activity or enterprise under consideration. Income can be estimated in terms of reported net or gross cash incomes, calculated net cash incomes (i.e., where the analyst gathers cost data and then subtracts this from reported enterprise incomes), and 'total gross or net income' (i.e., where imputed values are given to subsistence and other non-cash incomes). In the case of 'total income'--a variable that is rarely used in applied research--the summation of all values from multiple income sources, including remittances and in-kind transfers and wages, is required. This concept necessitates considerable calculation of imputed values (where monetary equivalencies are not readily available) and a lengthy, time-consuming survey form. All forms of income represent flow or continuous data and require temporal specification. Amounts of income can change drastically from one time period (e.g., week or month) to the next.

Assets, in turn, are stock or base wealth that reflect the accumulation and use of economic value and income over time. They are more stable sources of wealth (especially fixed assets) than income, and, unlike income, they are not subject to dramatic changes over short periods of time (This dimension does have implications for using assets as an impact indicator when the duration of observations spans only two or three years; see later discussion). It should be noted that assets can be acquired through inheritance and other transfers, but even in these cases asset levels generally reflect income levels; although asset accumulation will be higher--relative to income--among mature households and enterprises.[1]   Assets reflect the **uses** of income, a decision by a household or individual to use income for a financial asset (for example, a savings deposit account) or to purchase a productive (land, machinery, etc.) or other material asset. If assets can be perceived as uses of income, then actual expenditures will be a good indicator of income levels and income changes. This is especially the case for low-income households, where ownership of financial assets will be minimal. Like income, many types of expenditures also fluctuate over relatively short periods of time and represent 'flow' data. Hoddinot's study of household income and expenditure patterns in Western Kenya shows that variation in 'income shares' and 'expenditure shares' across different categories of households are almost identical. In his sample, the wealthiest 30 percent of households accounted for 66.5 and 66.3 percent of total income and total expenditures, respectively; while the poorest 30 percent, in turn, controlled 11.7 percent of income and 10.7 percent of expenditures (Hoddinot 1993:83). My own work among livestock traders and pastoral households in East Africa reveals similar patterns of expenditures relative to income (Little 1992; 1996).

In many cases assets hold the capacity to produce value and assist households and enterprises to withstand economic 'shocks'. The accumulation of assets allows households and microenterprises to weather periods of low and unstable income; their disposal can "smooth" consumption and expenditure activities during crises (see Morduch 1995; Ruggles and Williams 1989). Assets can be financial, material--either productive (e.g., farm machinery) or consumptive (kitchen appliances)-- human, and/or social. Human and social assets reflect the fact that non-material resources (e.g., levels of knowledge and education) and networks--the social relations that individuals and households maintain for support--are important assets to entrepreneurs and other economic actors. These non-material assets pose special challenges to impact survey research, since they are difficult to identify

and quantify. At another level, assets can be distinguished between those that are fixed (e.g., buildings and land) and those that are variable or current (e.g., inventory of store supplies and cash) (see Barnes 1996: 5); the latter are subject to frequent change (see discussion above), while the former infrequently change and represent "stock" information. It is suggested that fixed assets are easier to address through survey methodologies than are 'current' business assets, and therefore, they can serve as a more cost-effective impact indicator of welfare (see Barnes 1996 and 1997).

A.   Indicators of Welfare

Both income and assets are indicators of welfare, but in most cases it is easier to gather data on asset ownership than on income earnings. This distinction relates to several factors that are discussed later in the paper, including issues of memory recall, sensitivity, and the nature of income data. In many instances assets also are a more reliable indicator of welfare than is income, because they can be more directly linked to expenditures (**uses of income**). The ownership of certain categories of assets (e.g., types of housing, savings accounts, and electronic goods) point immediately to certain levels of household and enterprise welfare. Net worth (assets less liabilities) allows even further insights by indicating the sustainability of certain patterns of expenditure and asset accumulation. It will be shown later in the paper, however, that the transaction costs (in terms of time and resources) of gathering data and calculating household and/or enterprise 'net worth' exceed the benefits of added precision and verification (also see Barnes 1997; Dunn 1996b).

Asset ownership is an important means of differentiating households and enterprises according to wealth measures. A simple ordinal "ranking system" of wealth/economic well-being based on a defined set of assets, education levels, and other criteria can be used to differentiate household into socioeconomic categories. These can then be used to gauge impacts on assets at different levels of socioeconomic welfare (e.g., the rich or poor), and to measure the general directions of household and enterprise wealth.

1.   Range and Extent of Income Diversification

Income sources and their relative importance are considerably easier to identify than absolute amounts of income (whether measured in gross or net term). Ordinal and nominal rather than interval measures of income diversification will suffice for most types of impact assessments (see discussion in Section IV). Obtaining accurate inventories of household income sources requires a carefully structured set of questions that includes mention of a wide range of local income-earning activities identified in an exploratory survey (Little et al. 1989). A household member(s) should be asked to rank/order sources of income from the most to least important, and to give relative percentages that each source contributes to household income.

Income diversity among low-income households reduces risk in an uncertain economic and physical environment, and can be a response to unstable and/or highly seasonal income flows. Diversity increases problems of income and capital fungibility and of attributing changes in income or asset levels to one or more independent variables. However, it is important to remember that income diversification does not always reflect a positive impact indicator of welfare nor of income levels. In many cases, diversification among poor households and microenterprises can be symptomatic of low labor productivity and employment. In my own work among small-scale trading

enterprises in Mozambique, I found income diversification to be a response to high levels of unemployment (partially as a result of structural adjustment programs) and imperfections in the labor market, rather than indicative of increased security and income--although under existing conditions of poverty it did reduce income "shocks" (Little and Lundin 1992). Paradoxically, the impact of structural adjustment programs in Zimbabwe seem to have resulted in greater specialization--rather than diversification--among microenterprises (see Barnes 1997).

2.   Operational Definitions for Impact Assessments

How are income and/or assets operationally defined as indicators in applied research? What are the advantages and/or disadvantages of using different operational definitions? A practical definition of income highlights two aspects: the **use** of income and **flows** of income from wages and sales of products and services. An emphasis on the use of income highlights expenditure and investment activities of household members. Data on uses of income are less sensitive and more reliable to collect than actual incomes, and are more easily verified through observation, interviews, and discussions with shopkeepers and suppliers. Investment data, especially those associated with financial assets, is more problematic, but since some assets (e.g., fixed business assets) also serve as forms of investment they can be partially captured through a focus on expenditures. Uses of income for purchases directly related to consumption (for example, the acquisition of different food types) also should be included as an indirect means of obtaining income information. Later in the paper, l will highlight the different types of expenditures that should be emphasized.

A focus on revenue or income **flows** is another cost-effective means to obtain income-related data. There are several different concepts of income--some of which were discussed earlier--that have varied implications for impact assessments. **Reported net incomes** asks the respondent to identify the amount of net cash s/he earned per enterprise or activity during a certain time period. It puts the burden on the respondent to estimate costs and income per enterprise, and raises several problems of credibility; for example, cases where enterprise expenses do not correspond to the period of reported income (i.e., when certain type of business expenses may only be made every three or four years and may not be recalled by respondent), or where a "lumpy" business expenditure creates short-term cash and net-income problems that should improve over time but may not be captured in an impact assessment spread only over two years (also see discussion in Section III A. on 'fungibility.'). Reported net income is likely to lay somewhere between a gross, on the hand, and a real net income figure, on the other; if enough other income- and asset-related data are gathered it can be a relatively reliable impact indicator.

As indicated earlier, calculated net incomes (per enterprise and/or household) are another measurement of income, which requires considerable collection of cost data. Time and survey resources for estimating a net income figure can be reduced by: (1) focusing only on the most important enterprise and/or income-earning activities (for example, the two most important per household); and (2) gathering data only on the three or four most important business expenditures. While a calculated net income figure can provide high levels of precision and increased reliability over other income measurements (although the latter is not always the case), its benefits need to be measured against the added costs of data collection and analysis (discussed further in Section II C.).

Gross incomes provide a general indication of income levels. In many cases this can be effectively approached by recording gross product and service sales for a specified time period (for example, biweekly or monthly). Data on gross sales are considerably easier to gather and they are good proxies of income levels within particular sub-sectors of microenterprises. The difficulty arises when gross sales are used to compare different types of enterprises, which may have inherently different sales levels and patterns. This may limit the comparability of the cross-sectional data. Yet, if at the same time one is gathering information on gross sales, market margins are recorded for a limited number of products (see Dunn 1996b:2), it is possible to relate sales to an estimation of gross income for a limited number of important products. Differences in scales of gross sales are normally similar for enterprises of different sizes within the same sub-sector. A measurement of changes in gross sales as a result of increased access to microenterprise services would be a key income-related indicator. The magnitude of that change would be as important in an impact assessment, as would the absolute levels of income and its change.

Perhaps the simplest measure of assets highlights the absence or presence of individual assets or categories of assets, and then ranks asset ownership by some type of ordinal ranking. Values are given to certain housing characteristics, appliance ownership, vehicle ownership, etc. and categories are created to differentiate rich, poor, and other types of households. In most applied research efforts only a limited set of assets--usually the most valuable and important for economic activities--are addressed, with general estimates of their value presented. A more complex approach to the latter requires a determination of depreciation rates for certain assets, the value of sensitive assets (e.g., savings accounts), the market value of current assets, and other related factors. Estimations of asset holdings usually are calculated in gross value terms and not according to 'net worth' (value of assets less liabilities). Calculations of net worth entail considerable time and resources that require detailed valuations of all household and enterprise assets and liabilities. It often relies on assumptions and estimates that greatly diminish the reliability of the data, and that generally outweigh the benefits of calculating a net worth figure. Moreover, high levels of fungibility of income, assets, and other resources at the household and microenterprise levels make net worth estimations of a single or a set of microenterprises unreliable.

B. Intrahousehold Claims on Income and Assets

Incomes and assets within the household can be controlled individually or collectively. The former raises serious questions about the validity of data on assets and income activities from household members who may not be directly involved. It requires careful survey design in order to capture the variety of income and assets, as well as their relative importance. Certain common sets of questions about the income-earning activities of household members and about 'collective' assets shared by the household (appliances, housing, furniture etc.) can be asked of the household head (male or female).

The question of whether or not increased flows of income from certain types of enterprises enhance the control of income from certain household members is important. However, this is easiest addressed through case studies of individual entrepreneurs or enterprises and qualitative interviews, than through formal surveys. On a formal questionnaire, with 'medium-to-high-level' of complexity, one can ask questions about who makes particular decisions for major asset purchases or investments; who decides on the use of particular assets; who uses the income from its use; and who decides on

the use of the income from different activities? These will provide data of minimal precision but can be used to construct a general matrix of 'who makes decisions' and 'who has some control over certain assets and incomes' (for a similar example of this, see Schuller and Hashemi 1994). Contextual data, nonetheless, is required to verify any intrahousehold patterns, because unless two or more major income earners in the household are interviewed, answers to queries about resource control will be biased to the interviewee (in many cases, this will be a male household head).

C.   Gross versus Net Incomes

        As noted earlier, there are several feasible ways that different indicators of income can be measured and used. Since most microenterprises involve some type of sales, a simple measurement of biweekly or monthly gross sales can provide a basis for measuring changes in income over two or more observation points. While it has been shown that there are problems of data comparability in using gross sales figures, they nonetheless can serve as a variable for measuring the scale of change at two or more points in time. The appropriate unit of recall for recording gross sales or revenue flows will depend on the type of product/service involved. In many cases, the recording of gross sales on a biweekly basis will suffice for most agricultural products--although for high turnover items (vegetables and some foods) a smaller time unit may have to be used (2 to 3 days) as a basis for calculating a biweekly income. For transactions of larger items, such as electronic appliances or furniture, sales can be based on a monthly, quarterly, or even yearly basis. It is suggested that survey forms leave the time unit blank, so it can be completed by the enumerator during the interview. Forcing a merchant to calculate gross sales on a biweekly or monthly basis, when s/he conducts business in other units, will result in unreliable data.   The interviewer can always carry out calculations later on, if for comparative purposes a different time unit needs to be specified.

        In addition to wages, net cash income data from at least the two most important business activities in the household can provide a good indicator of whether or not a microenterprise program is achieving a favorable impact. It is advisable that quantitative data on cash transactions and costs only be emphasized, and that information about unpaid family labor costs and in-kind income (for example, produce that is consumed rather than sold) be gathered through informal interviews not formal surveys. While these data need not be calculated on a net income basis per enterprise, their frequency and relative importance can be recorded in a formal survey. Most microenterprises within a household portfolio rely heavily on unwaged family, which is one of their competitive advantages.

        There are three main techniques for attaining net cash incomes from business activities. The first, and least costly, is to simply ask for net incomes for different enterprises, within some specified time period. This will work for some activities, where expenditure and income patterns approximate similar time units. Perhaps the biggest problems with this approach are that: (1) respondent recall needs to be very good (for higher value, low volume enterprises recall should be less of a problem); and (2) business inputs and costs are usually fungible across several activities and, therefore, net incomes per enterprise may not be very accurate.

        A second means of dealing with net cash income from microenterprises is to record cash costs of significant business expenditures (hired labor, machinery, transport, etc.) and then subtract this from the enterprise's gross revenue. After business expenditures and marketing costs are subtracted, a net income figure can be calculated per week......month....or other time unit. A series of carefully

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constructed questions that tie cash expenditures and costs to a particular activity needs to constructed. The major difficulties with this second approach is that expenditures and costs may have vastly different time horizons than income flows, and the fungibility issue also is not addressed. A common problem here is that because of the fungibility of resources across activities business costs often show up as exceeding gross revenues, resulting in negative returns per enterprise (a similar result often occurs when data on household expenditure and consumption costs are compared with stated household incomes).

A third, 'middle-ground' approach is to estimate net enterprise incomes by arriving at one estimate of collective net enterprise income. This partially addresses problems of fungibility between different enterprises, but still does not confront the challenge of disaggregating resources used for household consumption from those utilized for enterprise expenses.

The net worth of different enterprises (individually or collectively) is an important indicator of household and enterprise performance and welfare. This approach requires a relatively 'high' level of data precision on incomes, the value of all business assets (fixed and current), and the value of all liabilities (including bank and other debts). Balancing income and assets against liabilities requires a 'high', complex approach to data collection that involves considerable time and resources.

III.   KEY ISSUES

As indicated earlier, **reliable data** on income is more difficult to gather than asset or expenditure information. Calculating the 'net worth' of an enterprise or household is even more problematic than either of the above indicators, because it requires a full accounting of income, assets, and liabilities (the latter is a particularly sensitive issue, see later discussion in Section III). Assets also confront methodological problems-- especially for financial assets--but the reliability of most types of asset data will be higher than income data, especially when the latter are based on absolute figures (either net, gross, or 'total'). Using 'net worth' figures requires an extremely laborious process of accounting that necessitates imputing figures for a range of assets (fixed and current) and transfers, and in the final instance will constitute a generally unreliable figure.

In this section of the report I cover many of these and other key issues related to measuring income and assets. Practical means for ameliorating some of these difficulties are raised for each topic.

A.   Fungibility

Fungibility problems of disaggregating resources at the household and microenterprise levels arise at several junctures. Income, asset, and other resources become indistinguishable once they enter the household, especially between: (1) different microenterprises within the household; (2) household income-earning strategies and enterprise income and investment activities; and (3) enterprise income and household consumption and expenditures.

Fungibility is not as severe a problem for all enterprises, as it is for others. For example, in certain enterprises business facilities or 'rooms' of a house, or particular types of machinery are mainly used for a specific enterprise(s). Probing questions can seek information on what proportion of an asset is used for a particular activity, rather than for general household purposes. Barnes, for example, cites Daniels' and Minot's survey efforts, where "they specifically asked about percent of home/building used for business versus household...In principle, this apportionment question could be incorporated for all physical/fixed assets and used to account for assets employed in more than one enterprise (Barnes 1996:22)." The types of questioning required to determine allocations between household and enterprise assets will greatly increase the time and resources required for data collection.

At a relatively low level of precision it is possible to attribute expenditures and other uses of income to: (1) particular income sources; (2) assets of particular activities; and (3) financial assets and debts related to particular enterprise activities. In the case of major expenditures--for example, costs of education for household members--they may relate only to one or two income-earning activities. For example, in women-owned trading enterprises in The Gambia and Ghana, traders claim that they diversified into additional enterprises solely to finance the education of their children; and that the revenues from the new activities are reserved mainly for education. In parts of Kenya, earnings from male wage earners within the household often are used to purchase land and housing assets; while agricultural incomes earned by women are used to purchase household consumption goods and finance children's education. In some cases household labor and other resources may be strongly constrained in their use for certain activities, where benefits are seen as solely controlled by

one member of the household (see Carney 1994). Survey questions directed at the most knowledgeable member of the household can point to certain uses of income sources or assets that may not be fungible across certain activities and enterprises.

The division of labor and activities within the household may be such that fungibility will not be as great a problem in certain cultures as it is in others; and that it may be preferable to focus on the individual rather than household level. Preliminary appraisals and interviews with key actors will provide insights into this. Gracia Clark's research among women trading enterprises in Ghana suggests that these enterprises are operated almost solely independent from household demands and that a household perspective would overstate the fungibility of resource flows between the household and enterprise (1989; 1994). In fact, virtually all inputs and assets for the trading enterprises are obtained by the entrepreneur independent of the household and are kept distinguishable from household income, assets, and liabilities.

Credit or capital flows raise a major challenge for distinguishing household from enterprise expenditures. Yet, even in this case certain types of credit are mainly reserved for certain purposes. Dunn (1996a), for example, cites a study conducted in Nepal by Yadav et al. (1992) that suggests "limited substitutability between formal and informal sources of debt" (1996:15).

> Based on a purposive sample of 190 farm households in western and central Nepal, the authors found that formal sector borrowing accounted for half of the transactions. These loans were secured by collateral, had higher transaction costs, and went overwhelmingly (91%) toward productive purposes (Dunn 1996a:15).

Other cases where fungibility may be not a severe problem include loans that are closely monitored and that have restrictive rules about how funds can be used, and where only certain types of business assets can be purchased; and where the entrepreneur may have to incur the expenditure and show proof of purchase(s) before the full amount of the loan is released. Even for informal sources of credit there tend to be general patterns that reduce substitutability. Small-scale traders in West Africa often belong to ROSCA-type savings groups based in the market, and use the funds from these arrangements almost strictly for trading-related expenses (e.g., security, transport, or bulk purchases); while the same traders may belong to another informal credit group in their villages where funds are used mainly for household and social expenses.

B.   Problems of Attribution

All types of impact assessments usually try to relate change in a set of variables (in this case, income and asset levels) to a set of program inputs. The objective is to determine or estimate if changes in a set of indicators or variables is caused by (or, more accurately, associated with) a set of program inputs (e.g., provision of credit). How do you then attribute raises in income from certain microenterprise activities to the use of a particular set of program inputs (including credit), or approximate cause-and-effect-relations between the use of key productive assets and subsequent increases in income? The standard means of doing this in impact assessments is to include a 'control sample' of households, and to utilize a series of 'control' variables (for example, gender, assets, education, etc.) to compare the 'control' sample with the sample of 'program participants (see Gaile and Foster 1996) and to reduce "self-selection bias in the sample" (Dunn 1996b:18). The goal is to

eliminate causal explanations that may derive more from the characteristics of the 'participant' sample (for example, unusually high initial asset levels relative to the general population) than to program inputs (a set of statistical techniques for carrying out these kinds of analyses are reviewed in Gaile and Foster 1996). The use of 'control samples' are particularly important for assessing the impacts of microfinance programs, because the 'participant' sample (i.e., those who choose to participate) is not truly random and, therefore, may reveal asset and other characteristics that are not representative of the general population. The control sample of households can be chosen from non-participants in an area where the microenterprise is operating; from a geographical area that is not covered by the program; or from other sets of criteria. The use of 'control' samples will be discussed further in Section IV.

C.   Seasonality

This is an issue that pertains especially to income ('flow') data and presents one of the main challenges to survey research, even in the context of detailed questionnaires. Can households recall income data from previous seasons? Is there a way to obtain seasonal income data from 'one-round' of data collection when recall is a problem? Contextual and case-study information can help point to general patterns of seasonality in sales/incomes of particular enterprises. In agriculture-related enterprises sales and income usually relate to changes in agricultural seasons; while a service or clothing enterprise oriented to the education market will have peak months that correspond with the annual school calendar. In most countries, peak business days for retail enterprises tend to be on Fridays, Saturdays, or Sundays. A wide range of other income sources are intermittent and/or highly seasonal, including handicrafts, fish sales, charcoal, casual labor, remittances, and tourism. When business is very slow during certain months the enterprise may only be open a few days/week, or for much shorter periods of time. At these times the household will shift into other income-earning activities. Holiday seasons are likely to be periods of high activity for certain types of retail enterprises.

By timing an initial survey to correspond with the main season of commercial activity, it may be possible to capture at least some dimension of seasonality. Another way is to ask questions on a month or seasonal basis about the number of days/week, weeks/month, or hours/day that the business operates. For many enterprises frequent sales will necessitate the recording of income and sales data on a daily and weekly basis. These figures, in turn, can provide an indication of income and sales levels during slow periods when enterprises do not operate full-time. In recording income-related data for a specific period (for example, two weeks), it is helpful to ask if the revenues for the previous period were higher or lower than the recorded data. In some cases it may be possible to extend the questioning back even further and to ask whether or not the recorded income levels are higher/lower than different months/seasons of the year. In research on agricultural trading enterprises it is possible to have traders indicate which months are best for sales and income and which are lowest. This can provide another indication of whether or not the collected data are representative of 'normal' income levels, or reflect seasonal differences. For enterprises without written records (which are the majority) one is limited to data about the relative importance of certain seasons and months for sales and income, rather than absolute amounts for each month/season. Estimates of weekly sales and income can come from data on the number of days/weeks and seasons which an enterprise is operating.

D.   Managing Risk and Economic 'Shocks'

Diversified income and asset sources generally are a means of dealing with risk. A relevant research hypothesis is: High levels of income and asset diversification enhance a household's capacity to confront economic 'shocks' without steep declines in income and assets. Enterprise owners may withdraw from a particular activity and/or market in cases of crisis, only to return after conditions improve. An excellent technique for measuring how households employ diverse income and asset strategies to confront risk is through a set of sequential ('step-wise') questions that trace how decisions about income and asset use are made during an economic crisis (see Gladwin 1989). Sequential queries about how assets and income strategies are employed during crises can show the importance of diversification; the key role that asset disposal can play in 'smoothing' income fluctuation; and the role that certain income activities assume during periods of hardship and uncertainty. A major 'shock' may relate to a natural encounter (e.g., drought) or an unnatural one (e.g., loss of employment, destruction of important business assets, or loss of a market). An initial question would ask the respondent to identify a major event during the past two to three years that negatively affected enterprise income and/or assets. It would then be followed up with queries about how the household and/or individuals responded to the event, particularly in terms of income-earning strategies and the disposal of assets. A relatively simple approach to studying how economic shocks relate to income activities and assets would only seek low levels of precision and a listing of key assets disposed of and/or new income-earning strategies (e.g., increased labor migration by certain household members). A more detailed investigation would attempt to look at the value of asset disposal and of other strategies, and the ways that the enterprise has responded to subsequent 'shocks'.

E.   Valuing Assets and Liabilities

There is a wide literature available on methods for addressing assets, from simple recording (absence/presence of key assets) to a full accounting of the market value of assets (see Casley and Kumar 1987; Grootaert 1986; Little et al 1989; and Barnes 1996); in the concluding section of the report some of these are addressed. Rather than repeat what is already well covered in the literature, this section will address three areas of asset measurement that usually are not adequately addressed. These are financial assets (and liabilities), human and social assets, and physical assets that do not have an identifiable market value.

1.   Financial Assets and Liabilities

The most difficult challenge is collecting data on financial assets (e.g., cash-on-hand and savings deposits and accounts) and liabilities. It is an extremely sensitive topic that requires discussions with the individual person that has the savings account or debt (Barnes 1996:23). Household heads and spouses are likely to know the absence/presence of any savings or other financial instrument held by household members. However, they are unlikely to know about all liabilities nor the levels either of savings or debts. Several approaches are offered to address the sensitivity of collecting data on financial assets. The first is merely to ask about the absence/presence of certain financial assets--savings accounts, pensions, and other assets[2]--and avoid estimations of actual values. Another method is to seek detailed information about collective and individual financial assets from the most knowledgeable household member. As several authors note, this type of

questioning should be done in private without other individuals nearby; however, in practice the latter is not always possible and can create a very awkward situation for the interviewee and interviewer. Participants in very restrictive credit programs may be unwilling to disclose how their debt was accumulated, nor the uses to which debts are applied. A practical interviewing technique is to emphasize that all data collected will be treated in full confidence, and to leave sensitive questions about finances and debts until the end of the interview, hopefully after some degree of confidence has been attained.

In my own work with retail shop owners in Kenya, I have found that they often are willing to list out on paper their financial assets and debts. This has worked for about 20 percent of shopkeepers, which I interviewed in the mid-1980s and is worth further exploration. It should be noted, however, that this method was only pursued after I had worked in the area for six months. Barnes (1996) also notes a case where a researcher successfully asked respondents to write out the value of their financial assets and liabilities. As she correctly points out, "the reliability of the data still relates to the interviewee actually knowing the information (1996:24)."

2.   Social Networks as Assets

Numerous anthropological and sociological studies have shown that extra-household networks also are valuable assets for households and enterprises. They can mobilize resources during crises; be a source of labor and credit during the year; recruit clients and customers for a business; convey important market information; and, at lower levels of income be the difference between survival and pauperization. How can social networks be treated as an asset in an impact study of incomes and assets? First, case studies of individual enterprises and entrepreneurs can elicit data on the types of social networks that households and enterprises utilize in business activities. A more formal network analysis is not needed but rather a series of directed questions about whether or not kinsmen (excluding those who reside in the same household), neighbors, church members, friends, business associates, and other members within an individual's social network assist in any enterprise activities (marketing, obtaining informal credit, or purchasing assets). From a questionnaire one can elicit low-precision data about assistance in different activities or in establishing new enterprises; the relationship of the person(s) to the household; how frequent is the assistance; and what are the terms of the assistance. Regarding the latter, it is not uncommon for market traders to reciprocate transport and other services during the year, even when they may be competitors in the same market. These questions would seek (yes/no) answers about which individuals outside the household provide assistance and for what types of activities. A simple ordinal scale could be constructed that measures the extent to which networks enhance household income and enterprise activities, and it would supplement what is learned from case studies. An important impact question might be: Do households that show increases in income and assets have well-developed networks which aid their business activities?

3.   Human Capital

Expenditures on education (human capital) is probably one of the best means of improving incomes in the medium and long-term and of enhancing a household's human assets. Increased expenditures on education by households is a positive proxy of income growth that should be included in any research approach on incomes and assets. Education expenditures are not particularly

difficult to collect, and recall ability by respondents on these costs is generally good. A good household-level hypothesis regarding participation in microenterprise activities would relate increased education expenditures to participation in microenterprise services (see Dunn 1996b:8; Chen and Dunn 1996:34).

In most low-income countries factor markets (land, labor, and capital) are "shallow" or imperfect, a process that makes the calculation of non-monetary assets important but very difficult. For example, commercial land markets can be absent or occur simultaneously with non-market forms of land allocation; and the same can be noted for waged and unwaged labor relations. Under imperfect, poorly-integrated factor markets the analyst has to impute monetary values of assets and income, which may not have readily identifiable market equivalencies. Calculations of land and housing asset values are important and should be pursued when using assets as an impact indicator; efforts to quantify other in-kind income and non-market assets are suggested in the conclusions.

IV.   RECOMMENDATIONS AND CONCLUSIONS

The previous discussion has pointed to key issues surrounding incomes and assets as impact indicators, and it has pointed to some of the practical techniques for alleviating problems of reliability and measurement. In this section methodological recommendations are made--in terms of 'low', 'middle', and 'high' approaches--for carrying out impact assessments. Critical questions that should be asked before deciding on a particular approach for measuring impact is: (1) How is the information to be used and for what audience; (2) What are the objectives of the assessments; (3) What level of reliability is acceptable; and (4) Does "complexity" in data collection and precision of measurements equate with increased data validity.   Often academic researchers mistakenly equate greater precision\detail in income and asset data with greater reliability and, thus, 'overload' survey instruments. For example, economists often require interval measurements and high levels of precision of variables in order to construct models and statistical tests, but may fail to ask the question: does this increase the reliability of the information, or of subsequent analyses? For many microenterprise program managers and donor agencies their concerns are: (1) is the program generally on track in terms of reaching a 'target population' and increasing household and enterprise welfare, or do modifications need to be made; (2) what additional information is needed to find out if intended impacts are occurring, or if program changes are required; and (3) is there sufficient information on impacts to warrant program extension into other areas? These are the kinds of questions that they are likely to ask of an impact assessment.

A.   Gathering Contextual and Qualitative Information

Relatively quick, cost-effective methods can be used to gather qualitative income and asset-related data without the use of a formal survey instrument. These techniques should be associated with all three approaches to data collection and will be especially helpful in: (1) the design of questionnaires and identification of important categories of questions; (2) providing context for the interpretation of survey data; and (3) eliciting group-based data. The 'high' and 'middle' approaches to data collection will spend considerable time on gathering contextual and qualitative information, and in designing and 'field-testing' income and asset-related questions.

1.   Rapid Appraisal Techniques

Before the design of a survey instrument, a reconnaissance should be undertaken that follows several of the suggestions of a rapid rural appraisal. These include: (1) interviews with key actors; (2) group interviews with community members about microenterprises and microenterprise programs; (3) group interviews to highlight general socioeconomic information about the area; (4) visit/observation of key markets; and (5) other qualitative information. In support of Inserra's position (1996a), it is not necessary to conduct a rapid wealth ranking of households, although one can ask groups to describe the general characteristics of a 'wealthy' household and of a 'poor' household. These data can be used to help construct a meaningful questionnaire(s) related to income, expenditures, and assets.

2.   Rapid Inventory of Retail stores

This can provide an assessment team with a quick appraisal of what households are buying in the area; general levels of disposable income; and seasonal patterns of expenditures. Retail shop owners can explain what people spend money on; how consumption/expenditure patterns have changed over time; and general impressions of the impact of microenterprise services. It is possible to categorize types of goods sold at retail stores and compare retail stores across different sites and regions. These qualitative data will be very helpful in designing questionnaire(s) and as 'cross-checks' to income and expenditure data.

3.   Case Studies of Individual Entrepreneurs

For the 'middle' and 'high' approaches case studies of individual entrepreneurs (10 for the 'middle', 20 for the 'high' approach) should be carried out in association with a formal survey. One can use semi-structured interviews (with an interview guideline) to obtain case history information on certain enterprises. It is suggested that an interview guideline be used to insure that certain areas of income, expenditure, and assets are covered in each interview. Each case study would take about ½ day to complete accurately, and it would be necessary to make at least two trips to each of the 10 enterprises.

Data to be collected include: sources for financing initial enterprise; changes in focus of enterprise(s) and markets; links between enterprise and activities of other household members; use of credit and other inputs; use of social networks and responses to economic crises; and the links between enterprise and other income activities. This methodology will supplement a formal survey and will allow the researcher to have a better understanding of how enterprises relate to household activities; how different sources of capital are used to finance enterprises; and the context of enterprise growth/decline. Case studies of both successful and less successful operations should be conducted.

B.   Low ('Simple') Approach to Data Collection

It should be noted that while a 'three-tier' approach ('low,' 'middle', and 'high') for impact assessments is presented, each approach is concerned with trying to determine causality (even at a crude level) between a set of independent variables (e.g., program inputs) and changes in a set of dependent variables (in this case, income, expenditure, and asset-related variables). Each approach also assumes that a set of basic socioeconomic data (on demographics, education, migration history, etc.) will be collected along with each survey, but that the detail of this information will be greater for the 'high' ('more complex') approach than for the other approaches. Each of the approaches also requires at least two observations ('rounds') in time and that in the second 'round' collection of demographic and other baseline data will only be briefly updated. The position taken in this report is that no respondent should be subjected to interviews that are longer than 1.5 hours (two hours at the outside limit). The general background data ('stock') on household demographics, education levels, household/enterprise assets, and other 'base' data can absorb almost one hour in interview time.

In terms of sampling, a 'control' sample of households is required for each of the assessment approaches to determine if self-selection biases are prevalent, and to reduce the possibility that

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changes are related to non-program variables. Even in the case of the 'low' approach where variable measurement mainly is in ordinal and nominal terms,[3] a 'control' sample is still required to validate the representativeness of the assessment sample. Of course, the number of 'control' variables used will be much greater for the 'high' than for the other approaches.

Recommendations for impact assessment variables related--either directly or indirectly--to incomes and/or assets for a 'low' approach are presented in Table 1. Seven variables are identified: three require ordinal measurements, three nominal measurements, and one an ordinal/interval scale. The level of precision for measurement in the 'low' approach is relatively minimal, and data would be gathered from interviews with only one household member; the survey would strongly depend on respondent recall. It should be noted that expenditures do figure strongly as indicator variables because: (1) they correspond closely with income levels; and (2) they are subject to more frequent changes than assets, which makes them important when short- and medium-term change (2 to 3 years) is being assessed.

A 'low' survey approach to measuring impact would require only two observations- -a 'before and after' scenario-- for measuring change and a survey instrument that could be completed in one hour or less. The length of time between the two observations should be at least two years and, therefore, at least two rounds of data collection would be required. The initial baseline data collection would require sufficient 'stock' and information that households and enterprises could be differentiated into general socio-economic categories: example, 'rich', 'middle', and 'poor' wealth strata. The 'low' approach would address the following variables listed in Table 1.

1.   Income-Related Variables

The emphasis in a 'low' approach toward measuring income and assets is on establishing general directions of income and asset change, and not on absolute amounts of these changes. Directed questions about the general direction ('improved,' 'declined,' or 'stayed the same') of income levels/gross sales are emphasized for variables #1 and #7 (see Table 1). Only in the case of variable #7 would any absolute figures be collected, and interval changes assessed over time. A 'low' or minimalist strategy for capturing income diversification would record the occupations and income-earning strategies of household members. It does not attempt to capture intrahousehold dynamics, nor does it collect detailed data on income and asset levels. Obvious disadvantages occur with this approach, especially where income diversity is high and earnings from one source are not overly dominant. These include: (1) failure to record all income activities and assets--even in cases where calculation of their gross or net values was not an objective; (2) bias toward the economic activities of the head; (3) underestimation of the importance of income and asset value levels, in cases where some approximation is attempted.

2.   Expenditure-related Variables

Only one expenditure variable (education) would be addressed in the 'low' approach, and this would mainly identify different types of education expenditures.

3. Asset-related Variables

A short list of housing characteristics and assets would be asked, but costs of household maintenance and running expenses would not be addressed. A check list of fixed business assets also would be made and an ordinal ranking system devised both for housing characteristics and assets and for business assets (using a scale of 1 to 5). The estimated values of these assets would not be asked.

Table 1
Summary of Recommended Approaches for Measuring Income and Assets: The 'Low' Method

Impact Variable	Measurement	Precision	Approach
1. Household Income	Ordinal	Low	Rank source of income in terms of importance and provide general indication of direction of income change for three main sources.
2. Income Diversification	Nominal	Low	List all main income sources and categorize by type of activity.
3. Education Expenditures	Nominal	Low	Record absence/presence of different education expenditures (school fees, books, uniforms, etc) during past year.
4. Housing Characteristics	Ordinal	Low	Use 5 key characteristics to categorize and rank household types; measure change in household types (by availability of in-house plumbing, concrete floors, roofing type, electricity, etc.).
5. Household Assets: Appliances and Vehicles	Nominal	Low	Record absence/presence of key domestic appliances.
6. Fixed Assets (Busin.)	Ordinal	Low	Record absence/presence (check list) for machines, equipment, etc.
7. Gross Sales	Interval/Ordin.	Low/Medium	Estimate gross sales for two main enterprises per month and year. Questions would be asked if sales higher, lower, or 'same' as previous month and year.

*Some of these impact variables are noted by Dunn (1996b) and Barnes (1997).

C. A 'Middle' Approach to Data Collection

A 'middle' approach permits a finer measurement of the magnitude of impacts on income and other variables and would include a larger number of variables than the 'low' approach. It is suggested that only two rounds of observations (data collection) be pursued, with approximately 2.5 years between the initial and follow-up rounds.

The 'middle' approach would require sufficient detail that more refined socioeconomic categories could be constructed to show impacts for key socioeconomic categories: (1) at least four different wealth strata (determined mainly by nominal and ordinal measurements of income and

assets); (2) for female-headed households, female-owned enterprises, and other important social categories; and (3) for certain types of enterprises. These categories would allow a more refined assessment of how program inputs have affected different categories of households and/or enterprises.

Ten impact variables are included in the 'middle approach' (Table 2), of which four require interval measurements, three nominal measurements, one ordinal measurement, one nominal/interval measurement, and one ordinal/interval measurement. Three of the variables are income-related; three are expenditure-related; and four are asset-related. As with the 'low approach', a control sample of non-participants would be selected but more 'control' variables would be used to select the control sample. Only one member of the household (preferably the most knowledgeable) would be interviewed.

1.   Income-related Variables

The interviewer would record salaried wages and cash incomes for up to two different enterprises on a per month and per year basis. Questions about remittances, rental incomes, etc. that require considerable detail would be avoided. Identification of income diversification would be limited to the most important sources of income and an ordinal measurement; and questions about 'economic shocks' would not be asked.

The 'medium' approach requires more survey resources and time for collection of income-related data, than the 'low' approach. The level of detail--in terms of income and asset ownership and distribution within the household--will be considerably greater than for the low approach; no estimation will be made between levels of income and assets controlled by the household head and by the spouse.

Gross sales of products and services per month and year will be collected. As with expenditures, one will find the effective recall period will vary because of frequency of sales of certain items; frequent sale items should be distinguished from others.

Both 'middle' and 'high' approaches to measuring incomes and assets have numerous 'cross-check' questions. Multiple recall periods (monthly, and annual) for income and expenditures are used; expenditure data are compared with income data; and gross sales data are checked against stated income levels for different types of activities. In short, different questions are directed toward verifying reported incomes and asset levels, and the number and detail of these cross-check measures is greatest for the 'high' approach to income and asset measurement.

2.   Expenditure-Related Variables

Data on education expenses per year would be gathered, and food and non-food expenditures would be identified (from among a list) and used to rank households in terms of food expenditures. Important expenditure costs for household electricity, rent, and repairs also would be collected on an annual basis. Any major enterprise-related expenditures during the past 12 months would also be captured in the 'middle approach.'

3. Asset-Related Variables

Data on major domestic appliances and other household assets (vehicles) would be measured by nominal and ordinal means; their values would be estimated. The absence/presence (from a 'pre-tested' checklist) of major enterprise assets (e.g. physical structures and machinery) would be asked. A small number of directed questions about the ownership of financial assets or other sources of capital would be sought through the questionnaire. The 'middle' approach would simply ask for binary responses (Yes/No) about sources of credit, capital, and or assets that would be used for a number of purposes (these would be listed and would be based on observations from a 'test' round).

D. A 'High' ('More Complex') Approach to Data Collection

Similar to what Grootaert has suggested for the 'measuring and analyzing levels of living' surveys, the baseline survey (the first 'round') in the 'high' approach should be carried out in two parts: (1) a phase of basic socioeconomic and asset data collection and (2) a follow up interview about two-to-three weeks later to collect detailed data on incomes, sales, enterprise costs, financial assets, and expenditures. Important advantages to this are: avoid respondent fatigue; deal with the detailed, difficult economic data separately from general household data; provide a time period for respondent to refer to when providing income, expenditure, sales, and other 'flow' data; allow interviewer an opportunity to collect income, expenditure, sales data in a focused manner; and allow the interviewer to question more than one household member about income and expenditure activities. Less fatigue by respondents will allow for greater recall about seasonal changes in income, estimations of sales, and so on; and the time period for some questions can be stated : 'since the last visit what has been your income from . . .'

Table 2

Summary of Recommended Approaches for Measuring Income and Assets:
The 'Medium' Method

Impact Variable	Measurement	Precision	Approach
1. Household Income	Interval	Medium	Record cash income for household and for up to two main enterprises. Record data on a monthly and annual basis.
2. Income Diversification	Nominal	Low	List all main income sources and rank in income importance. Record changes in importance during past 12 months.
3. Education Expenditures	Interval	Medium/ High	Record education expenditures for household members on an annual basis.
4. Food Expenditures	Nominal	Low	Use 6 key food items; 2 of these should have relatively high income elasticity (for example, meat and dairy products). Absence/presence of purchases of each during past 1 month.

Impact Variable	Measurement	Precision	Approach
5. Housing Characteristics Running Costs	Nominal/ Interval	Low/ Medium	Use 6 key characteristics to categorize households. Record availability of in-house plumbing, concrete floors, roofing type, electricity, etc.); also record annual cash expenditures on rent, utilities, etc.
6. Household Assets: Appliances and Vehicles	Ordinal	Low	Record absence/presence of key domestic appliances, including types and brand names. Categorize and rank assets.
7. Fixed Assets (Busin.)	Ordinal/ Interval	Low/ Medium	Check list (absence/presence) of equipment, buildings, etc. for enterprise (exclude housing and vehicle if listed earlier). Record value of any major business expenditures during past year.
8. Waged Labor	Interval	Medium	Number of employees; amount of wages paid in past month.
9. Financial Assets	Nominal	Low	Absence/presence of savings account(s) (other financial instruments).
10. Gross Sales	Interval	Medium	Gross sales for two main enterprises, recorded on a bi-weekly, monthly and annual basis. Questions would be asked if sales higher, lower, 'same' as previous period, and to assess sales during other seasons.

*Some of these impact variables are noted by Dunn (1996b) and Barnes (1997).

Other important differences between a 'middle' and a 'more complex' approach to measuring changes in incomes and assets would be the latter's emphasis on multiple observations. This will not be appealing to donor agencies and microenterprise program mangers because of the added costs in time and resources. However, there is considerable scientific merit to measuring 'flow' data with more than one observation. It helps to address problems of recall; seasonality; and the effects of 'shocks' at the time of initial interview. The collecting of reliable flow data on expenditures and incomes suggests multiple rounds of data collection (approximately every 8 to 9 months) between the initial baseline observation and the final assessment round of about 2.5 years later. This approach will greatly increase the costs of the survey, but the use of local institutions and universities rather than US-based researchers should lower research costs. If resources can be saved by reducing sample size, for instance, from 500 to 300 households, this approach would opt for a decreased sample size in favor of 4 to 5 observations over a 2.5 year span.

Under the 'high' approach the first repeat 'round' of data collection (only on income and expenditure variables) would be conducted 8 to 9 months after initial data collection; many of the original demographic, asset, and other questions about 'base' information would not be gathered in follow-up rounds. For many of the important income-related activities, you could use the timing of the first round as a reference point when asking questions. By the time that the final 'round' is conducted, which will be used to measure impact, the analyst has access to interval observations to more accurately measure changes, and to assess the effects of seasonality, 'shocks', and other events.

The 'high' approach includes 14 variables, of which seven require interval measurement; four nominal measurement; two nominal/interval measurement; and one ordinal measurement. More than half of the impact variables call for medium or medium/high levels of measurement precision. Seven of the variables are income-related; four expenditure-related; and three are asset-related. In short, the 'high' approach includes greater numbers of variables and higher precision of measurement, than the other approaches.

1. Income-Related Variables

The "high" or complex approach would interview the two key income earners (e.g., husband and wife) within the household. Intrahousehold differences in income and asset ownership (variable #4) would be captured through questions about costs; cash values and purchases of major assets; and values for remittances and transfers. For income from sales and other activities, a small set of questions can be asked about whom within the household decides on purchase/sale; whom decides on a business investment/expenditure; and whom decides on use of income earned from sales. For hypotheses about the relationship between increased access to microenterprise services and greater control of household resources by clients (see Chen and Dunn 1996:34), data can be gathered for a matrix that ranges from 'high control' of income by client to 'little control' of household resources. The actual expenditures (including the type) will also provide some insight into testing this hypothesis.

A low-level variable to measure 'responses' to economic shocks (variable #3) would be included in the 'high' approach. Sequential queries about how assets and income strategies are employed during crises would be asked; and they would be measured in nominal terms. Emphasis would be given to asking about asset disposal and the role of certain income activities during periods of economic 'shock'. The initial question would ask the respondent to refer to a recent event ('crisis') during the past two years; and that the respondent would be provided several income-related options from which to choose (it is important that closed categories be used here--these could be identified in preliminary reconnaissances).

A variable to measure innovation (variable #14: New markets/enterprises) would be included in the 'high' approach. This would address any new market ventures, products, and/or business plans that have evolved in the past 12 months. It would highlight any changes in enterprise strategies, as well as growth into new markets and activities. This variable tries to measure at low levels of precision the transformation of households and microenterprises into new enterprise activities and markets. On the marketing side you should ask questions about market contracts, their duration, and value.

2. Expenditure-Related Variables

A 'high' approach would seek data on the proportion and costs of major inputs for different enterprises. Food expenditures would include questions only on the amount of cash spent on six important foods during the past month (or shorter time period if recall is a problem) (for additional details see Section C.2 above).

3. Asset-Related Variables

In addition to what is covered under this heading in Section 3 (above), a more complex ('high') approach would cover far more activities and sources of capital and credit; seek cash values for key assets; and ask these questions of two adult income earners in the household (rather than for only one individual).   Information about key assets and their value raise fewer problems and questions and, in some cases, can be directed to the household head. A 'high' approach would seek data on the value of major household and enterprise assets. Yet, even in the case of a 'complex,' resource-intensive approach to data collection, the fungibility of different resources within the household will make highly precise asset estimations per enterprise very difficult to ascertain. Calculations of expenditures and assets at the household level would be advocated over the enterprise level.

Table 3

**Summary of Recommended Approaches for Measuring Income and Assets:
The 'High' Method**

Impact Variable	Measurement	Precision	Approach
1. Household Income	Interval	Medium/ High	Record sources of income for up to three main activities; rank source of income in terms of importance and use some estimates. Record data on a monthly and annual basis.
2. Income Diversification	Nominal/ Interval	Medium	List all main income sources and categorize. Record income sources and levels for the past 12 months.
3. Responses to Economic	Nominal	Low	Focused series of questions on responses to economic Shocks' crisis/shock during past two years; identify role that income diversification and assets assumed during 'crisis'.
4. Intrahousehold control	Ordinal	Low	Ask questions per income source and major asset regarding who of income and assets makes decisions about their use; use case studies and qualitative interviews.
5. Education Expenditures	Interval	Medium/ High	Medium\High Record education expenditures for household members on a monthly, term and annual basis.
6. Food Expenditures	Interval	Medium	Use 6 key food items; 2 of these should have relatively high income elasticity (for example, meat and dairy products). Record expenditures for each during past month.
7. Housing Characteristics Running Costs	Nominal/ Interval	Medium	Use 6 key characteristics to categorize households and availability of in-house plumbing, concrete floors, roofing type, electricity, etc.); also record monthly/annual expenditures on rent, utilities, etc.

Impact Variable	Measurement	Precision	Approach
8. Household Assets:* Appliances and Vehicles	Nominal	Low	Record absence/presence of key domestic appliances, including types and brand names; and market values of existing appliances and any purchases during past 1 year.
9. Fixed Assets (Busin.)	Interval	Medium/ High	Estimated value of machines, equipment, etc. used for enterprise (exclude housing and vehicle if listed earlier). Major expenditures during past year
10. Waged Labor	Interval	Medium	Number of employees; amount of wages paid in past week/month
11. Financial Assets*	Nominal	Low	Absence/presence of savings account(s) (other financial instruments).
12. Gross Sales	Interval	Medium	Gross sales would be recorded on a bi-weekly, monthly, and annual basis. Questions would be asked if sales higher, lower, 'same' as previous period, and to assess sales during other seasons.
13. Gross Market	Interval	Medium	For up to 3 important products differences between Margins purchase/sale prices.
14. New markets/ enter.	Nominal	Low	Entry into new markets and enterprises during past 12 months; any new market/business contracts during past 12 months;

*Some of these impact variables are noted by Dunn (1996b) and Barnes (1997).

E.   Final Comments

In terms of measuring impacts, the main differences between the three approaches relate to: (1) the precision or magnitude by which impact is measured; (2) the number of impact variables selected; and (3) the number of observations that are required. Each of these differences, of course, have implications for cost and time commitments. In almost all cases, a 'high' approach to income and asset measurement will not be feasible given resource and other constraints, and the minimal benefits that accrue from the added precision of income and asset data. Including four rounds of observations over a 2.5 year period will increase research costs by 50 percent or more over a 'middle' approach, depending on whether or not the sample size is reduced. The costs and types of assumptions ('leaps of faith') one would have to make to quantify causal relationships, using econometric techniques, at the enterprise level would far outweigh the benefits of constructing a model. Moreover, there are questions about whether or not most audiences for impact assessments understand econometric analyses; and whether or not the increased precision in variable measurement actually increases the reliability of the data and analyses. In terms of their use as impact indicators, the precision needed to measure changes in income flows and asset ownership does not require the detail that accompanies a 'high' approach to measurement.

The reliability/validity of data is an issue that has come up several times in the report. The major issues of practicality here revolve around: (1) the ability of respondent's to recall income data; and (2) the problem of asking only one household member the income, asset, and expenditure

questions. Clearly, the reliability of these data are enhanced by having more than two observation points ('rounds') and by interviewing more than one household member. Both of these factors, however, greatly increase the amount of funds and time required for research and analysis (see discussion above).

Elements of a 'middle approach' to data collection would respond to most of the concerns of donor agencies and microenterprise program managers, especially regarding the question of 'whether or not a program generally is on track;' and also address some of the concerns for increased precision of measurement. It is recommended that at least some elements from the 'low' approach can be effectively used for measuring impacts that meet reliability criteria, and also some magnitude of change to be covered. These include variable #2 ('income diversification') which is identical in measurement/precision as the same variable in Table 2. It also is suggested that the recommended measurement and approach for variable #4 ('housing characteristics) in Table 1 be incorporated, while variable #5 in Table 2 not be included in a recommended approach. Estimating 'running costs' for housing will add little to an impact assessment, is likely to result in an unreliable measurement.

With these changes incorporated , the 'middle' approach includes at least some interval measurements that permit greater precision over ordinal measurements in assessing the magnitude of impacts. The recommended approach also leaves open the possibility for some detailed statistical analyses. This approach has three types of income flow variables ('household income', 'income diversification', and 'gross sales) but require interval measurements for only two of them. The interval measurements, in turn, depend only on 'reported' sales and income, and not on having to calculate net incomes. The report has tried to show that this 'middle approach' includes a reasonable amount of impact variables (10) to test hypotheses related to the impacts of microenterprise programs; focuses as much on expenditures (a reliable proxy measure of income) as it does on incomes and assets; and requires interviews with only one household member. By pursuing this option, the reliability of data is increased over a 'low' approach, and information of sufficient precision are collected without the high costs of panel ('high') research.

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