

ESS WORKING PAPER SERIES
AUGUST 2004

PAPER 02

**ANALYTICAL FOUNDATIONS OF MICRO-MESO-MACRO
LINKAGES IN POVERTY MONITORING:
A CASE FROM BANGLADESH**

Tanzir A. Chowdhury

*Department of Economics and Social Science
BRAC University*

Atiur Rahman

*Senior Research Fellow
Bangladesh Institute of Development Studies (BIDS), Dhaka*

ABSTRACT

Although there is a significant amount of research going on in the field of poverty monitoring in the entire South Asian region, there is still no uniform mechanism in poverty monitoring system that will track poverty both at micro and macro level, and establish linkages between these levels for successful policy implementation. This paper attempts to address issues related to linking poverty monitoring at different levels, and the theoretical foundations in establishing these linkages within the context of current poverty monitoring strategies in Bangladesh. In doing so, it discusses various poverty monitoring systems and tools currently used in Bangladesh to monitor poverty at various levels. It also outlines the empirical relevance for establishing links between micro and macro aspects of poverty monitoring as well as their impacts on successful policy designing and implementation. Various state and non-state actors at different levels with differing objectives undertake poverty monitoring in Bangladesh, making it difficult to establish linkages among them. These different systems need to be coordinated and a comprehensive poverty monitoring system needs to be developed by combining the best approaches of poverty analysis at various levels.

Key words: Poverty Monitoring, Micro Macro Linkages, Monitoring Systems

I. INTRODUCTION

Although poverty is being focused on as the most critical problem of development in the South Asian region, there is a mismatch between micro successes and macro failures in the arena of poverty reduction in most of the countries in the region. Consequently, many research institutions and development organizations along with different government bodies have now shifted their attention towards the field of poverty monitoring. Indeed, one of the major concerns of the on-going worldwide initiative of poverty reduction strategy is how to involve more people in understanding poverty and monitoring its trends. Even though this has led to the development of various approaches and methodologies of poverty monitoring at different levels, there has not yet been a uniform poverty monitoring system that can link micro-meso-macro levels and generate effective feedback for the planning and policy making needed to generate a faster pace of poverty reduction.

The need for linking micro-meso-macro aspects of poverty monitoring in Bangladesh has led to various studies on this issue. Most of them have focused on different aspects of poverty monitoring at an individual level. A number of studies have been conducted at macro level mainly using Computable General Equilibrium (CGE) models to analyze the impact of different macro policies and shocks on national poverty. A recent study by Hossain and Razzaque (2003) has incorporated time series analysis in CGE modeling and devised a more realistic macroeconomic model of Bangladesh for macro impact analysis. The model analyzes the impact on aggregate level of various macro shocks and policies, but does not show the impact at more disaggregated sub-national level, which is of great significance with regards to poverty analysis. This has been clearly demonstrated by Sen and Ali (2003) in another on-going study, which tracks spatial inequality in social progress in Bangladesh as evident from district-level data. On the other hand, at the meso level, another study by Siddiquee (2003) develops a regional poverty profile using GIS based analysis. Finally, at micro level, MIMAP (Micro Impact of Macroeconomic and Adjustment Policies)-Bangladesh has been working on a pilot project for devising a regular mechanism for collecting and analyzing poverty data at village level (Habibullah, Guha, Quader, Mamun and Pasha, 2003). These studies have not yet been fully able to devise a sound poverty monitoring system that will regularly collect and evaluate the data on poverty at different levels and effectively link them for further analysis at macro level.

Against this backdrop, this paper will address issues related to linking micro and macro aspects of poverty monitoring and discuss the theoretical foundations for effectively linking them. The paper begins by providing the overview of the problem of linking micro and macro aspects of poverty monitoring (Section 2) and the theoretical foundations behind establishing these links (Section 3). By using these theoretical insights it discusses various levels of poverty monitoring systems, as well as different tools and techniques developed and being used currently for this purpose (Section 4). The paper then discusses the various level of poverty monitoring done in Bangladesh and (Section 5). It then presents the empirical relevance of establishing the link between micro and macro aspects of poverty, and their impacts on successful policy designing and implementation in Bangladesh (Section 6). Finally, the concluding section presents some

recommendations for a sound poverty monitoring design for Bangladesh that will link micro-meso-macro aspects of poverty analysis resulting in more effective poverty reduction policies and subsequent monitoring of the same (Section 7).

II. ANALYTICAL BACKGROUND

As poverty is taken to be the foremost problem in many Asian countries, there have been an increasing number of strategies being followed at micro as well as macro levels for alleviating poverty in these countries. But there has not been a uniform poverty impact monitoring system that can link micro-meso- macro levels.

The poverty monitoring done at micro level by different agents such as local governments, national institutions, civil society institutions in general focus their attention on inputs and outputs of various poverty alleviating policies. Thus, the impact is only measured at that specific level. More attention deserves to be paid to the actual outcomes of these policies and their total impacts on various other levels.

At the decentralized or sectoral level various budgetary and regulatory policy decisions have direct as well as indirect impacts on the poverty situation. While measuring the impacts, the policy implementing agencies tend to monitor the direct sectoral impacts on poverty, overlooking the indirect impacts on other sectors as well as at different levels.

At the macro level, general economic and social policy decisions set the overall framework for poverty reduction in a country. Although poverty monitoring surveys in some of the Asian countries at national level have significantly been improved both in design and as well as coverage of indicators, the lack of existence of any institutional mechanism to generate and link poverty data at different levels still remains a significant constraint in designing an effective poverty reduction agenda.

Given the multidimensionality of poverty monitoring, it is not difficult to see the importance of linking micro, meso and macro levels of it. Such a multidimensional approach, moreover, highlights the need for the existence of a decentralized and participatory structure of local governance that can enhance the voice and influence of the poor, as well as ensure improved quality and accountability in the delivery of public services. This requires a comprehensive poverty monitoring system capable of providing the necessary information for use in local level planning and development which can be linked with development efforts 'from above'. In addition, this system can create a demand-driven receiving mechanism 'from below' to act as a pressure device to ensure the delivery of required services. Indeed, such a mechanism will enhance the social space for rights-based development.

III. THEORETICAL FOUNDATIONS

For an effective linking of micro-meso-macro aspects of poverty monitoring, first we need to understand how policy reform can impact stakeholders, as well as how impacts of a policy reform is channeled, and then how to establish a link between various levels of poverty analysis using these channels.

Policy reforms at any level can be expected to have an impact on the various stakeholders through five main transmission channels outlined below: employment; prices (production, consumption, and wages); access to goods and services; assets; and transfers; and taxes. Each policy reform is expected to have impacts through more than one transmission channel. Further, different stakeholders are likely to be affected differently through these channels.

Employment is the principal source of income for most households. To the extent a policy change affects the structure of the labour market or the demand for the labour, particularly in sectors that employ the poor, the welfare of low-income households will be affected. The transmission through this channel can be direct as well as indirect. **Prices** determine real household income. How policies effect prices will have an important bearing on income and, directly and indirectly, on non-income measures of welfare. **Access** to goods and services will affect well-being, whether through access to markets and service outlets or through improvements in the quality and responsiveness of private and public services. Policy can affect access directly by enhancing service provision infrastructure or the service itself, or indirectly by removing constraints to access. **Asset** holdings or changes in asset value will affect income and non-income dimensions of household welfare. Policy changes can have direct as well as indirect impacts on these assets and their returns. Finally, **Transfers and Taxes** affect household welfare through private and public flows to and from households.

Having discussed the channels through which various policies affect poverty and welfare, we can now link the impacts from the various levels of poverty analysis using these channels. General economic and social policy decisions at the macro level that set the overall framework for poverty reduction in a country can be linked to analyze the impact on poverty at the meso or sectoral level through the transmissions channels for these macro policies. For example, a macro policy affecting poverty through employment generation can be linked to meso level poverty analysis through sectoral decompositions of the employment that are expected to increase, and thus affect the poverty for that sector. Also, the impact of these policies can be linked at the micro household level by linking the households to different sectors using these transmissions channels for the policy in question.

The transmission channels linking micro-sectoral-macro aspects of poverty monitoring are shown in figure 1. At the macro level of the economy, the policies affect the macro variables such as aggregate consumption, saving, production etc. The effects of these policies are captured by poverty analysis done at the macro level using macroeconomic models for the economy. The sectoral policies affect the variables in different markets such as product markets or factor markets. Their effect is captured in meso level analysis for different sectors as well as regions. Finally, the policies targeted toward micro-units (households, firms) of the economy affects various social well-being indicators for the individuals and households, which are captured by the micro level poverty analysis.

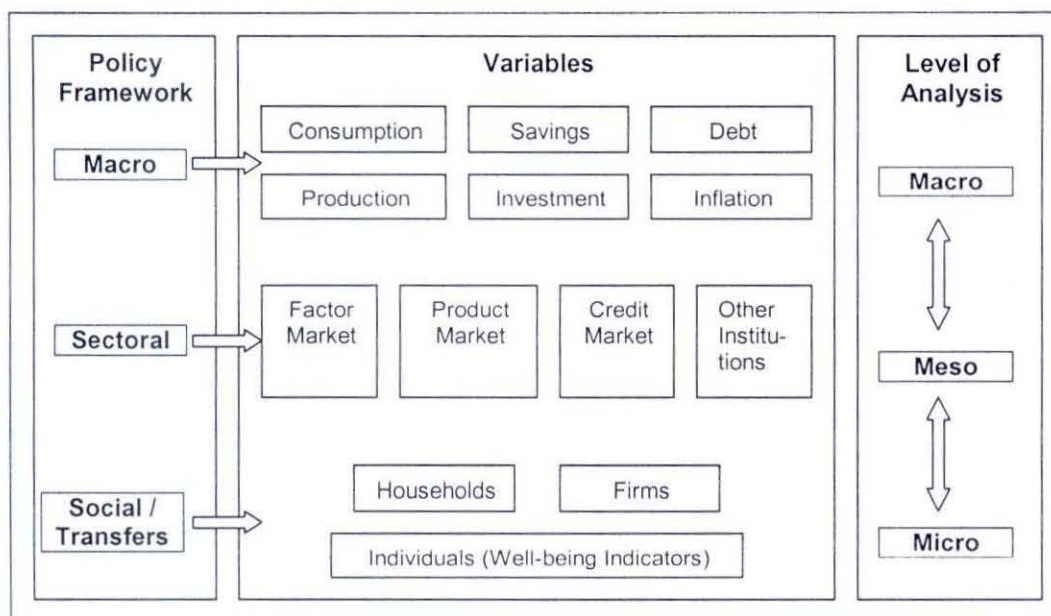


Figure 1: Linkages in various levels of poverty monitoring

IV. POVERTY MONITORING AT DIFFERENT LEVELS

Based on the theoretical foundations of linking micro-meso-macro aspects of poverty monitoring, this section discusses the poverty monitoring systems at different levels along with some of the commonly used tools and techniques used for this purpose. We also discuss tools that can establish linkages between these different levels.

The institutional mechanism relating to the poverty monitoring and evaluation of a country has a broad structure. The central statistical bureau of the country performs the main task of setting up poverty monitoring systems at different levels and conducting various surveys for the periodical collection of information. Based on the monitoring structure of the economy, these surveys are conducted centrally as well as locally to generate data on various aspects of poverty. Other than the central monitoring unit, there are different research bodies, NGOs and donor-funded organizations performing the task of poverty monitoring. But monitoring at these levels is more focused on specific organizational needs, rather than complete analysis of national or sub-national poverty. All these poverty-monitoring systems use various tools of poverty monitoring for collecting and analyzing the information.

At the micro level, the poverty monitoring systems involve micro-units such as households. The monitoring done at micro level can be classified into following approaches: Social Analysis, Direct Impact Analysis, and Behavioral Analysis. Social Analysis consists of several techniques that combine understanding of direct impacts with behavioral analysis. These tools analyze how people are likely to be affected by reform, how the impacts will differ among groups, how different people are likely to response to a reform, etc. Tools used in this approach include, Participatory Poverty Assessments, Beneficiary Assessments, Social Impact Assessment, etc. Direct Impact Analysis is a simple assessment of them who are directly affected by a policy change, and how much they are

affected. Behavioral Analysis, on the other hand, includes economic tolls that go beyond direct impact analysis to recognize some behavioral responses among households and economic agents. The tools for this kind of analysis include, Behavioral Incidence Analysis, Demand-Supply Analysis and Household Models of Production and Consumption.

At the sectoral or meso level, the poverty analysis consists of mainly partial equilibrium analysis. Partial equilibrium analysis equates supply and demand in one or more markets so that prices clear at their equilibrium level. It is distinguished from general equilibrium analysis in that it doesn't include all markets and prices in the economy. Partial equilibrium analysis allows for indirect impacts that occur when changes in one market affect other markets. But it will capture these changes only to the extent that they include the relevant markets. For this reason partial equilibrium analysis is better suited for analyzing sectoral adjustments. Tools for partial equilibrium analysis are Multi-market Models and Reduced-form Estimation Models. Multi-market Models permit the combined estimation of systems of supply and demand relationships, so that it shows how policies in one sector can impact other related sectors. Reduced-form Estimations, on the other hand, can be used to simulate the impact of different policy variables on different sectors of the economy.

Finally, at macro level, the General Equilibrium Analysis is used for analyzing the poverty impacts of macroeconomic policies and shocks. The general equilibrium model goes beyond the partial equilibrium analysis and models all economic accounts in the economy and thus aims to present a comprehensive picture. The methods in this category have the complete specification of the economy in varying degrees of aggregation. While general equilibrium models can be used to capture the effect of all types of policy reforms, they are most relevant to reforms with multiple and significant indirect impacts on the economy through a number of transmission channels. Specific tools for general equilibrium analysis are Social Accounting Matrices (SAM), Input-Output Models and Computable General Equilibrium (CGE) models. While SAM and Input-output models are used for simple policy simulations, CGE models are completely specified models with varying degree of complexity.

The last class of tools and techniques we will consider links microeconomic behaviour and/or distribution with a consistent macroeconomic framework or a model. Distributional and poverty outcomes are estimated outside the macro-modeling exercise. In principle, the macroeconomic model is solved to derive the main equilibrium parameters for the economy, these parameters then determine the sectoral outcomes. These outcomes from different sectors are fed into the micro model to derive the impacts on poverty and distribution.

The underlying techniques for linking micro-meso-macro levels of poverty monitoring can be broadly classified into three categories in terms of the structure of the analysis. The first is, linking macro-framework to a reduced form estimation, which is the minimalist approach that simulates poverty impacts on the basis of various macro-variables. This approach simply examines how changes in certain macro-variables – particularly growth rates – affect poverty, based on a country specific distribution constructed using Household surveys. SimSIP (Simulation for Social Indicators and Poverty) and PovStat are tools of this type.

The second approach is to link macro-framework to behavioral analysis estimated for selected representative households. In this approach, the macro-consistency model is linked to a behavioral analysis of representative households. The technique can be used to simulate a wide range of policies, from labour and wage policies to taxation, prices, and the allocation and levels of government spending, and then examine their impact on poverty and distribution. Among the tools of this type, the 1-2-3 PRSP Model links the 1-country, 2-sectors, 3-commodities model to a behavioral analysis of representative households, and PAMS Model joins a labour-poverty module to a macro-consistency model. IIMPA Models also fall in this category.

A third technique is linking macro-framework to micro simulation, which is a more disaggregated method using representative households. In this approach the behaviour of the representative households is simulated at the individual level.

V. EMPIRICAL RELEVANCE: THE CASE OF BANGLADESH

In the case of Bangladesh, poverty monitoring surveys have shown significant improvements both in local as well as national level. Many of the development organizations have been working on designing a sound institutional mechanism to generate poverty data at the local level that can be linked to the national level indicators for evaluating the impacts of various poverty reduction policies that are implemented at different levels.

The central statistical organization, Bangladesh Bureau of Statistics (BBS), has set up the main poverty monitoring system. The major surveys it uses for the purpose are the periodical Census of Bangladesh and Household Income and Expenditure Survey (HIES). These are the most important sources of poverty-related information at the household level. They generate data on household income, expenditure, consumption, saving, household condition, health and sanitation, water and electricity supply, etc. in order to construct the national poverty profile. But these surveys are only restricted to micro level poverty monitoring. Moreover, there is always a long lag between the period of data collection and that of analysis and/or dissemination.

The need for a comprehensive monitoring system has led to the development of the National Data Bank. The conceptual framework of the National Data Bank was developed with the directives of Minister for Planning in 1992 with a view to develop a national repository of information necessary for macro, meso and micro level planning in a computer networking setup. Bangladesh has a centralized statistical system. BBS collects, processes, publishes and maintains official statistics for different socio-economic sectors. Different Ministries, departments, research organizations and NGOs also collect and publish statistics to meet their own requirements. It has been observed that statistics available in Bangladesh suffer from inconsistency, duplication, inadequacy, inaccuracy and lack of timeliness.

The National Data Bank is the Government's institutional arrangement that will function as an Open System Client/Server Model to mobilize resources in order to strengthen human resources capability for computerization and data storage of the Government's major undertakings under a computer networking environment. This will ensure development of storage and access to adequate and reliable data

as and when needed for effective planning and implementation of socio-economic programs. The rest of the section discusses some other major attempts in poverty monitoring at various levels in Bangladesh.

Micro Level Poverty Monitoring

One of the major attempts at poverty monitoring at various levels is carried in Micro Impacts of Macroeconomic and Adjustment Policies (MIMAP) in Bangladesh which includes activities to design and pilot test a local level poverty monitoring system (Habibullah, Guha, Quader, Mamun and Pasha, 2003) for use of local level planning and development, as well as facilitating the creation of macro-micro linkages in poverty reduction and the development agenda. Within the Poverty Monitoring System (PMS) component of MIMAP-Bangladesh, at the micro level the major activity relates to Local Level Poverty Monitoring System (LLPMS).

The main focus of LLPMS is on micro-credit, gender and environment variables at the village or *upazila* (sub-district) level for use in local level planning and development. One of the major outcomes of this activity will be to design a mechanism to collect and process poverty data at the local level in a participatory manner, along with specific indicators. In addition, the activity will also generate reports on methodology and application of poverty statistics in initiating local level plans, development programs and tested methodologies to create and sustain effective linkages with government agencies, NGOs, and community organizations.

LLPMS in Bangladesh has three major components: Participatory Poverty and Development Monitoring (PPDM), Resource Profile Monitoring (RPM) and Village Development Planning (VDP). The first two components generate the database of poverty related information and the third one utilizes the information in preparing local development plans and programs.

The PPDM monitors poverty and socio-economic changes with selected indicators. The indicators, chosen in a participatory manner, cover priority areas. The indicators have been specified to ensure that these are simple to collect, easy to interpret and preclude subjective interpretations. Specific indicators have been included to cover the chosen areas e.g. village/household characteristics; income/expenditure; nutrition and sanitation; employment, labour and wages; assets and credit; women and children; education and health; trade, commerce and non-farm activities; agriculture and environment; information and communication; and others. The information is collected at the village/household level using local informants. Technical and other assistance are provided through the project to develop local capacity to sustain data collection, processing and dissemination on a regular basis and to undertake periodic updating of the information. The local people are involved in all activities and the information is shared with them (e.g. through displaying on board at the *Union Parishad* office). Participatory techniques are employed to elicit the required information.

The PPDM information largely caters to need identification at the local level while RPM data provides resource and potential analysis. Using similar methodology as in PPDM, RPM indicators provide the inventory of available resources and indicates potential for development. The profile includes all village

resources e.g. availability and utilization of land, population, agriculture, livestock and fisheries resources, forests, water resources, infrastructure and marketing, non-farm and cottage industries, education and health services, transport and communication services, social activities and others.

For preparing VDP, the information from PPDM and RPM are combined with explicit need assessment and priority ranking by the communities through adopting participatory techniques. The programs are designed on a sectoral basis with specific targeting to underdeveloped areas and poor groups.

The general aim of the activities is to strengthen the capacity of the local government institution at the Union level (lowest tier of local government) to regularly collect, classify and incorporate poverty and socio-economic data in preparing and implementing local development plans and programs.

The indicators of the LLPMS have been selected to cover all major areas based on priorities expressed by concerned stakeholders at the local level. Some of the selected indicators are presented in the appendix.

For information collection, both household survey method and Participatory Rural appraisal (PRA) techniques are being used. The researchers from MIMAP and BARD are involved in providing guidance at the village level. Selected young people from the villages have been trained to collect and process the household level data. The members of the *Union Parishad* are actively involved in the process so that the process can continue in a sustained manner. Several participatory techniques are being combined as appropriate, to collect the relevant information on poverty and development/resource profile monitoring indicators. These include: village transect (geographical and physical characteristics), social mapping (village/household characteristics), resource mapping (social/natural resources identification), venn diagram (social sector program identification), wealth ranking (household wealth and poverty status), seasonality exercise (seasonal vulnerability and disease profile), problem ranking (priorities and prospects) and focused group discussion/household survey (individual household and related information).

The implementation of the system jointly with the *Union Parishad* will make the information available directly to the local representatives and the local officials of the line ministries for their use in planning and implementation of programs/projects. Similarly, these will be available to the NGOs, CBOs, and other agents who are involved in local-level development activities. The comprehensive Village Plan Book will contribute towards ensuring greater coordination among various agencies at the local level.

After the pilot-test and with subsequent successful validation of the results and outcomes of the system through refinement and necessary adjustments, the replication of the system over wider areas would be pursued with support from the government and interested agencies, and through devising appropriate strategies so that interested communities can make the system operational in a cost-effective manner. Moreover, advocacy efforts under the MIMAP will continue to highlight the potential benefit of the system to encourage the relevant government agencies to institutionalize the system as a means of poverty monitoring and initiating effective anti-poverty programs at the local level.

Sectoral Level Poverty Monitoring

Along with micro level poverty monitoring, poverty monitoring is also done at the meso or regional level, specifically looking into impacts of policies or programs related to one or more sectors of the economy on poverty.

Among some of the past and recent work on poverty monitoring at sectoral level, an important study under MIMAP-Bangladesh (Siddiquee, 2003) involves itself in developing a GIS based regional poverty profile and development indicators. The main objective of the above study is to prepare a poverty profile for Bangladesh and examine the level of development for different regions. The study uses the data from the 1999 Poverty Monitoring Survey of Bangladesh Bureau of Statistics with support from the MIMAP-Bangladesh, covering 16,000 households. The process of developing the indicators for the study was guided by four strategic considerations: i) Poverty and Deprivation, ii) Socio-economic, institutional and infrastructural development, iii) Women's empowerment, and iv) Physical resource endowment and management.

In case of poverty and deprivation, the study mainly collects data on socio-economic characteristics of households like income poverty, child deprivation, nutrition, etc. For the second group of indicators, the study focuses on economic performance, inequality and health indicators for socio-economic development; access to credit, market access, NGO coverage, etc. for institutional development; and roads and transportation facilities, financial services, health services, etc. for infrastructural development. For the women's empowerment data the study looks at economic empowerment, female literacy and female occupation indicators. Finally, in case of physical resource endowment and management indicators, the study collects data on land ownership and other resource endowment, scope of saving, population density, etc.

Basic indicators are aggregated using the 'Zero-to-one score' method in three stages. In first stage basic indicators are aggregated into 14 indexes by taking average values of component indicators. These aggregate indexes are then further aggregated into 4 indexes, namely, Poverty and Deprivation Index, Social and Economic Development Index, Women Empowerment Index, and Resource Potential Index. Finally, the Level of Development Index is created by averaging the above indexes in order to compare regional developments.

The data from the study can be used for designing specific policies targeted toward regions that are lagging behind and need immediate action for improvement in regards to the poverty situation. Also they can be used for estimating the short and long-term regional impact of various policies. This is done in another recent study (B. Sen and Z. Ali, 2003), which tracks spatial inequality in social progress in Bangladesh as evident from the district level data. The study uses a multivariate framework to explore the differential pace of social progress at the spatial level. The *Instructive* outliers and deviants are identified in terms of underachievers and overachievers as compared to the benchmark predicted by level of affluence. The study then tries to coalesce a contextual reasoning about for such unexpected deviations from the general pattern.

There exists a considerable regional and social variation in the extent of poverty of Bangladesh. Districts of overachievers and underachievers for various poverty and social indicators do not necessarily coincide with each other. Some of the

districts have achieved far more compared to others in some indicators while others have achieved more in other indicators. This is also true in the cases of underachievers, implying diversity in terms of achievement for various poverty and social indicators.

The results show that spatial inequality in social development has been reduced by a modest extent over the second half of the nineties. This is measured by the spatial trends in the Human Poverty Index and some other key social indicators like, total fertility rate, child mortality, severe child malnutrition, net enrollment rate at primary level, access to sanitation, etc. The study shows that the south-western and north-western districts, which were historically lagging behind, have done better during this period while the north-eastern and south-eastern could do more in accelerating the pace of social development compared to the predicted level. The study finds out that market integration facilitated by construction of Jamuna Bridge and intense political competition for public allocation for social and physical infrastructure may have contributed to declining spatial inequality.

There are, however, still many spatial pockets of severe distress that are not and cannot be revealed by the district level data. The results show the relevance of adopting a more spatially disaggregated sub-district level approach to poverty analysis.

Macro Level Poverty Monitoring

Finally, in case of macro poverty monitoring in Bangladesh, CGE models are being used for quite some time to simulate the impacts of various macroeconomic policies and shocks on different levels of poverty. Among these one of the recent study conducted under the MIMAP-Bangladesh project (I. Hossain and A. Razzaque, 2003) that develops a macro-econometric model for Bangladesh is worth mentioning.

The model builds on a small open economy framework taking into account the unique features of the Bangladesh economy. It brings out a number of macro-micro linkages in the economy and provides an operational model that can be used for policy analysis and for tracing out the impacts of various exogenous changes on the economy.

There are several distinctive features of the model developed in the study. It uses the recently published revised national income accounting data of Bangladesh Bureau of Statistics (BBS), and thus the estimates of the sectoral equations are themselves important to know how various theoretical specifications fit with the new data. The supply side of the economy has been accounted for by specifying separate equations for value added in different sectors. Similarly on the demand side it incorporates separate demand function for private investment in different sectors, alongside the public investment demand function.

Another important feature of the model is that it incorporates time series properties of the data and uses co-integration technique for modeling long run relationship of non-stationary data. The short run dynamics of the model is captured by error correction modeling technique. Finally, the structural breaks that are present in the data, which could be due to macro and trade reform in the 1990s, are tested for and taken care of in the modeling exercise.

For estimation purpose the economy is divided into the following six blocks. These are: i) Production, ii) Investment, iii) Expenditure, iv) Trade, v) Government and vi) Money and Price.

The production block incorporates specific production functions for the different sectors (agriculture, manufacturing, and service) which are dependent on sector specific capital stocks. In the investment block, investment demand is divided into public and private investment, where public investment is a policy variable and private investment is classified by production sectors. The expenditure block consists of private consumption as a function of disposable income. Foreign trade block consists of export and import volume functions. Export is again subdivided into jute sector, readymade garments (RMG) sector and others including frozen food, tea, leather, etc., with export prices being exogenous. The Import function is divided into import of raw materials and intermediate goods, and import of other consumer goods. The Government block consists of revenue side and expenditure side. The revenue side is divided into trade related taxes, internal taxes and non-tax revenues. In the expenditure side there is government consumption and transfer payments. Finally, in the monetary and price block, the monetary system consists of Bangladesh Bank and the scheduled banks, where money supply is a function of government budget deficit financed by domestic borrowing, and total credit to private sector. On the price level side, rigidity in interest rates plays important role in setting prices, with the price level being determined by money supply and income level.

The model captures different micro and macro linkages that exist in the economy. Some of the main linkages are:

- (i) Production affects private consumption, imports and thus, balance of trade, government revenue and consumption. and finally price level.
- (ii) Banking sector credit to private sector affects sectoral investment, which in turn affects sectoral capital stock and thus production.
- (iii) Private sector credit and government deficit influences money supply, which in turn affects price level.
- (iv) Price level affects export incentive and import decisions.
- (v) Private investment is also affected by public investment.

Estimation of the model yields results that are theoretically consistent and plausible for the economy. The study demonstrates a significant effect of sectoral capital stocks on different sectors that characterizes the production side of Bangladesh's economy. The study also captures the presence of several structural breaks in the economy. Firstly, there is a structural break in private investment demand for the different sectors, i.e. public investment is complimentary to private investment in agriculture and service sectors but crowds out investment in manufacturing. Another massive structural break is in marginal propensity to consume between 1990s and 1980s. The structural break exhibited by Jute export elasticity may be due to increase in use of synthetics.

The RMG sector is found to be price inelastic which may be due to still highly regulated world market for RMG. Moreover, the study shows low price elasticity of import demand for raw materials and imported goods, which is due to very low

backward integration, where as there is a moderately elastic demand for consumer imports. Finally, revenue from internal taxes and non-tax sources are highly responsive to income where as government consumption elasticity is close to unity; and there is significance influence of government deficit and private sector credit on money supply, while money supply acts as a contributing factor to inflation.

The model was also used in simulation exercises to determine the sensitivity of endogenous variables to some exogenous shocks. These results show that, an increase in bank credit to private sector increases real GDP and the trade deficit, while decreasing budget deficit and price level. Also, an increase in public investment leads to a decrease in real GDP, but will prompt increases in budget deficit, trade deficit and price level. Moreover, a favorable import price shock results in increase in income and the domestic component of budget deficit, while lowering the price level and trade deficit. In the foreign exchange market, exchange rate devaluation (or depreciation) leads to a contraction of income, but an increase in the budget deficit and price level, while improving trade balance. Finally, a policy mix results in higher income, reduced budget deficit, expansion of trade deficit and decrease in price level.

These simulation exercises, along with the results from model estimations, can have a major impact in effective macroeconomic planning and policy design. There is a scope for further study, design and implementation of models linking micro and macro aspects of development and poverty.

PRSP Bangladesh

The Interim Poverty Reduction Strategy Paper (I-PRSP) (GOB, 2002) provides an overall perspective of the country's poverty trends in terms of income-poverty and human poverty. The PRSP perceives that the success of poverty reduction strategy would require a systematic approach to monitoring and evaluating the progress in implementing the strategy. To ensure the targets set by the strategy are achieved, PRSP proposes to establish a comprehensive poverty monitoring system to help the policy makers to monitor progress and subsequently adjust action to make policies more effective and efficient. This will also be used as a system of dissemination of poverty data to relevant stakeholders thus contributing to fuller participation of civil society in poverty reduction efforts.

For this purpose, a list of core indicators required for tracking the trends in poverty and the institutional framework for monitoring and evaluation of the strategy would be worked out. The framework will be further elaborated based on consultations to serve as the guiding mechanism for poverty monitoring in the country. Existing survey instruments such as Household Income and Expenditure Survey (HIES), Labour Force Survey (LFS), Child Nutrition Survey (CNS), Demographic and Health Survey (DIHS), Census of Manufacturing Industries (CMI), etc. would be further strengthened for the periodic generation of data, and appropriately re-designed to facilitate the monitoring of national targets under the poverty reduction strategy. One of the key outputs of the system will be an Annual Report on Poverty Reduction and Social Development, which will provide an overview of progress in achieving economic growth, human

development, poverty reduction, gender equality targets and analysis of factors behind the observed trends and their policy implications.

For ensuring effective development of the system, several information and data gaps would have to be filled in through appropriately designed baseline surveys, studies, assessments and evaluations. This would also require adoption of adequate benchmarking and selection of an internationally comparable data set of relevant indicators, particularly focusing on South Asia. Along with specifying the sources and streamlining the mechanisms to generate reliable data on all indicators of the monitoring system, poverty-focused surveys and assessments will be required on a regular basis for analyzing the impact of policies and programs and identifying the causal relationships. This would call for a sustained effort for capacity building both within and outside the government.

The indicators of the system will serve multiple purposes providing information on changes in poverty and causes behind the outcomes in poverty. The Government will use the information for informed policy and decision-making, re-setting of priorities, and guiding the implementation of the strategy. This will ensure that the country is on track to achieve poverty reduction targets. This will help members of the civil society and as well as ordinary citizens in assessing how effective and accountable the Government is to the in reducing poverty.

Institutional Mechanisms

A *Poverty Focal Point* would be created in the General Economics Division (GED) of the Planning Commission for effective poverty-monitoring and tracking progress in implementing anti-poverty policies and programs envisaged under the national strategy for economic growth and poverty reduction. The focal point will be designed in such a manner that it can grow and function as an institutionally effective and technically competent Poverty Monitoring Unit with strong inter-Ministerial linkages and interactions with various types of stakeholders outside the Government. Participatory consultations will be an integral part of the work of the Focal Point both before and after the preparation of the final poverty reduction strategy. The Unit will also act as the key agency in the preparation of the strategy and periodic revision of the medium term agenda within the framework of the long-term vision set under a Perspective Plan. This would require measures to equip the Unit with adequate capacity and incentives to undertake its stipulated functions and carry out poverty reduction strategy related research and monitoring and evaluation activities.

A National Poverty Reduction Council (NPRC) chaired by the Prime Minister with participation of Ministers and the Secretaries of the relevant Ministries as well as representatives from the private sector like FBCCI, women's groups, academia and research institutes like BIDS, NGOs and the civil society will be formed. Since the implementation of the strategy is the central task, the key objective of the Council would be to comprehensively address the problems of implementation. The Council will also address the strategy and policy-related issues arising out of the monitoring and evaluation work of the Poverty Focal Point.

One of the key tasks of the Unit would be to monitor progress in the implementation of the national poverty reduction strategy and outcome

indicators. The poverty diagnostics, drawing on qualitative and quantitative information, would be used to set medium and long-term outcome-oriented targets for the country. These targets would be linked to macroeconomic, structural and social policies that together comprise a comprehensive strategy for achieving these outcomes. Setting clear targets in line with Millennium Development Goals (MDGs) would add transparency to the process of allocating resources and provide a benchmark against which to monitor the progress.

The Poverty Monitoring Unit would also engage in regular consultations with the civil society including the poor and women at suitable levels of social and regional disaggregation as part of Participatory Poverty Assessment (PPA) in tracking progress in the implementation of national poverty reduction strategy as well as for identifying new areas of anti-poverty interventions and/or corrective actions.

The poverty reduction monitoring initiative, however, will not be restricted to the efforts on the part of the Government only. Civic initiatives for monitoring poverty would be supported for getting an independent assessment of trends in poverty as well as effectiveness of poverty reduction policies. Such a group of concerned citizens will act not only for poverty-monitoring, but also function as an *advocacy group* for influencing policy. It is hoped that the activities of the group would help trigger collective action in respective sectors for reducing poverty and vulnerability. These activities will help broaden the space for regaining sovereignty over national policy-making process. As a result the national ownership over development policy agenda will be strengthened.

Monitoring Indicators

The matrix of proposed poverty reduction tracking and monitoring indicators has already been developed. A central aspect of poverty and social development monitoring would be to collect information on a wide variety of socially-differentiated, sex-disaggregated and regionally differenced poverty indicators. Evidently, the institutionalization of a comprehensive and efficient mechanism to ensure timely monitoring will require capacity building and coordination among the relevant agencies and departments. The details of the requirements will be worked out along with technical assistance requirements for meeting the needs. A sustainable poverty reduction strategy requires an effective system of managing the macro-economy.

Interim PRSP

The midterm assessment and evaluation of national strategy for economic growth and poverty reduction is often termed as the Interim Poverty Reduction Strategy Paper (I-PRSP). The income poverty, as indicated in I-PRSP, between 1991/92 and 2000 shows a modest reduction of one percent per year (from 58.8 to 49.8 percent). There exists noticeable urban and rural variation in poverty. The pace of poverty reduction in nineties could not drive the overall pace of poverty reduction of the country. In dealing with human poverty three dimensions were considered i.e. deprivation in health, deprivation of education and deprivation of nutrition. The human poverty is accompanied by gender inequality, child mortality and the female-male gap in malnutrition.

The government supported programmes such as old age pension schemes, vulnerable group development (VGD), food for education (FFE) and food for works (FFW) reveal favourable effects. But the grass-root consultation reveals several key concerns relating to law and order situation, extortion and economic violence, ineffective local government and decentralisation, poor quality of education, health and other social services, lack of infrastructure, lack of social capital at the community level resulting in low-level of collective action and lack of democratisation of political process.

The Millennium Development Goals (MDG) pinpoints the following targets: (i) reduce the number of people living below the poverty line by 50%; (ii) attain universal primary education for all girls and boys of primary school age; (iii) eliminate gender disparity in primary and secondary education; (iv) reduce infant and under five mortality rates by 65% and eliminate gender disparity in child mortality; (v) reduce the proportion of malnourished by 50% and eliminate gender disparity in child malnutrition; (vi) reduce maternal mortality rate by 75% and (vii) ensure availability of reproductive health services to all women.

I-PRSP proposes the five measures for long-term poverty reduction and social development. These are: (i) pro-poor economic growth for increasing income and employment of the poor; (ii) human development of the poor for raising their capability through education, health, nutrition and social interventions; (iii) woman's advancement and closing of gender gaps in development; (iv) social safety nets for the poor against anticipated and unanticipated income/consumption shocks through targeted and other efforts; and (v) participatory governance for enhancing voice of the poor and improving non-material dimensions of well-being including security, power and social inclusion by improving the performance of anti-poverty institutions and removing institutional hurdles to social mobility.

A medium-term macro-economic framework is set by the I-PRSP, which is supported by appropriate financing patterns and public resource provision to achieve the desired growth targets. The highlighted areas are macroeconomic framework, macro and trade reforms, governance and sectoral reforms. It also presents the national directions and priorities for achieving the poverty reduction goals. The policy matrix has outlined the operational monitoring and evaluation methods of the specific poverty alleviating programs and projects.

VI. IMPACT OF MICRO-MACRO LINKAGES ON EFFECTIVE PLANNING AND POLICY MAKING

Successful implementation of policies for poverty reduction at any level requires a comprehensive monitoring system. Although the general economic and social policy decisions at macro level set the overall framework for poverty reduction in a country, it is equally – and sometimes more – important to have various area and target group specific policies implemented at local level. Thus, linking various micro-macro aspects of poverty monitoring is not only required for designing local, regional and national level policies for poverty alleviation, but at the same time it is necessary to ensure the effective implementation of policy at every level. We will now discuss the impact of micro and macro linkages in designing effective macroeconomic policies in case of Bangladesh from a recent study. (Osmani *et al*, 2003)

The economy of Bangladesh experienced moderately accelerated growth in the 1990s compared to previous decades. Faster growth in the 1990s was associated with faster rate of poverty reduction compared to the 1980s. Since overall income inequality increased during this period – in both rural and urban areas – faster growth must have played a causal role in reducing poverty.

In the context of the effect of macroeconomic reforms on economic growth, it is interesting to note that the outward-looking macroeconomic policy pursued by Bangladesh in the recent past succeeded in stimulating some parts of the economy (e.g. readymade garments, and fisheries). From the point of view of macroeconomic policy, the relative roles of tradable and non-tradable sectors in the process of growth acceleration have been extremely crucial. It was found that at least two-thirds to three-quarters of the incremental growth in the 1990s originated from the non-tradable sectors – mainly services, construction and small-scale industry.

Since non-tradable activities, especially those outside agriculture, played the leading role in bringing about accelerated growth in the 1990s, closer attention must be paid at the rural non-farm (RNF) sector, as most of the poor live in rural areas. The 1980s were characterized by a rapid shift of labour force into the RNF sector, the predominant nature of the shift being absorption into self-employment at the lower end of the productivity scale. By contrast, the 1990s have witnessed a less rapid shift of labour force into the RNF sector, but one that has been characterized by faster growth of relatively larger-scale enterprises that are more productive and employ more wage labour. The poor rural workers have thus found an increasing opportunity to secure wage employment in the RNF sector. This transformation in the dynamics of rural labour force has important implications for the dynamics of poverty in rural Bangladesh.

The relationship between growth and poverty in the 1990s can now be summarized as follows. Boosted by enhanced demand the non-tradable non-farm sector experienced accelerated growth in the 1990s. Faster growth enabled the non-farm enterprises to increase their scale of operation, thus changing the structure of RNF sector more towards the relatively larger enterprises. This structural change in turn brought about a change in the nature of labour absorption in this sector, as salaried wage employment became more plentiful with the emergence of larger enterprises. In the 1980s, most of the surplus labour that got absorbed in the non-farm sector found their way into low-productivity self-employment, whereas, in the 1990s the absorption occurred more into salaried employment in the relatively larger and more productive enterprises. Since salaried employment in larger scale enterprises was far more rewarding for the poor than the shift into self-employment that occurred in the 1980s, the structural change engendered by the growth process of the 1990s was especially conducive to poverty reduction.

The preceding analysis of the linking macroeconomic growth and poverty in the recent decades suggest a policy package that ought to include the following elements:

First, since the growth-poverty relationship was the demand-driven growth of the non-tradable sector, macroeconomic policy must do everything possible to sustain the momentum of demand expansion.

Second, the incentive structure promoted by macroeconomic policies should be such as to accelerate the growth of non-tradable non-farm activities, at least over the medium term.

Third, conditions should be created that would enable the poor to find more remunerative employment in scaled-up enterprises in the non-farm sector. This would in turn require the policy regime to aim at softening of at least three types of constraint: (i) education and skill of workers, (ii) physical infrastructure, and (iii) access to credit.

VII. CONCLUSION AND RECOMMENDATIONS

As mentioned earlier, persistent poverty has become the most important development challenge for most of today's developing countries. Also the problem faced by developing countries these days is not a simple one of achieving high rate of per capita growth, rather a complex multidimensional one having different aspects of poverty reduction. For this reason, the first step towards the success of any poverty reduction strategy requires a comprehensive poverty monitoring system that will link micro or local; meso or sectoral; and macro or national aspects of poverty analysis.

Bangladesh economy has experienced a moderate growth in the 1990s with a relatively high rate of poverty reduction, as compared to 1980s. For sustaining this pro-poor growth in the coming decades, with reduction in inequality, it requires a sound and effective macroeconomic policy design, which would foster growth in the sectors and areas more crucial for poverty alleviation. This calls for the development of effective poverty-monitoring tools that can link the micro and sectoral poverty to macroeconomic policies, as well as that can estimate the overall direct and indirect impacts of a micro poverty reduction strategy on sectoral, regional and national levels of poverty.

The preceding analysis linking macroeconomic growth to micro and regional level poverty suggests the following recommendations:

Firstly, there should be a sound macroeconomic model at the planning level which would be used for designing various pro-poor macro and development policies. This model should be updated on a regular basis to incorporate the most recent data and other steady changes in economic structure of the economy. Also the model should be able to incorporate sectoral variations in output, employment, etc and link them to poverty and development impacts for sector-specific planning for developments.

Secondly, at the regional level, there should be regular monitoring and updating of poverty profiles that will include comparison of different regions of the economy in terms of poverty, socio-economic development, infrastructural development, etc. This regional poverty profile must also be linked to the macro model for effective planning for developments of the backward regions.

Thirdly, at micro level there should be regular collection, estimation, and updating of various household level poverty and socio-economic data. Baseline studies and impact evaluation studies should be conducted for wide range of households and link them to regional poverty profiles as well as the macroeconomic model so that target group planning and policy design can be gainfully made.

Finally, poverty monitoring done by different governmental and non-governmental organizations need to be congruent. There are wide deviations in terms of data as well as analytical results from different monitoring systems. These different systems need to be coordinated and a comprehensive poverty monitoring system needs to be developed by combining the best approaches of poverty analysis at various levels. The emerging challenges demand a new outlook and indeed, a fresh approach towards coalition building at the level of actors such as central statistical bureau, different government bodies, local government, NGOs, private sector, etc. This area needs to be explored further for devising a complete and comprehensive poverty monitoring system.

REFERENCES

Agénor, P., A. Izquierdo, and H. Fofack 2003, *IMMPA: A Quantitative Macroeconomic Framework for the Analysis of Poverty Reduction Strategies*, World Bank, Mimeo, March 2001.

Arulpragasam, J. and P. Conway. 2003, 'Partial Equilibrium Multi-Market Analysis' in Bourguignon, F. and L.A. Pereira da Silva (ed.), *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*, World Bank.

Bourguignon, F. 2001, 'The Distributional Effects of Growth: Micro vs. Macro Approaches', paper presented at the Prebisch centennial conference, CEPAL, Santiago, July 2001.

Datt, G., K. Ramadas, D. van der Mensbrugge, T. Walker, and Q. Wodon. 2003, 'Predicting the effect of aggregate growth on poverty', in F. Bourguignon and L.A. Pereira da Silva, eds., *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*, World Bank.

Datt, G. and T. Walker. 2002. *PovStat 2.12, A Poverty Projection Toolkit, User's Manual*, World Bank.

Devarajan, S. and Delfin S. Go, 2003, 'The 123-PRSP Model', in F. Bourguignon and L.A. Pereira da Silva, eds., *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*, World Bank.

Economic Relations Division (2002): *Bangladesh: A National Strategy for Economic Growth, Poverty Reduction and Social Development (I-PRSP, Second Draft)*, Ministry of Finance, Government of Bangladesh, Dhaka, December 2002.

Fernandes, R. 2002, *Linking the IIMPA Macro Component with a Household Survey for Poverty and Income Distribution Analysis*, Paper presented in the Conference on Micro-Macro Simulation Methods for Poverty Analysis: An Introduction in IIMPA, Sao Paulo, Brazil.

Habibullah, Md., R.K. Guha, M.A. Quader, A.A. Mamun and M.A. Pasha, 2003, *An Analysis of Poverty and Development at the Local Level: Result from Four Villages*, MIMAP Working Paper, Bangladesh Institute of Development Studies, Dhaka.

Hossain, I. and A. Razzaque, 2002, *A Macro-econometric Model of Bangladesh: Some Simulation Results*, MIMAP Working Paper, Bangladesh Institute of Development Studies, Dhaka.

Hossain, M. and B. Sen, 1992, 'Rural Poverty in Bangladesh: Trends and Determinants', *Asian Development Review*, 10.

Lofgren, H., S. Robinson and M. El-Said, 2003, 'Poverty and Inequality Analysis in a General Equilibrium Framework: The Representative Household Approach', in Bourguignon, F. and L.A. Pereira da Silva (ed.), *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*, World Bank.

MOF 2003, *A National Strategy for Economic Growth, Poverty Reduction and Social Development*, Economic Relation Division, Ministry of Finance, Government of the People's Republic of Bangladesh, Dhaka.

Mujeri, M.K. 2002, *Local Level Poverty Monitoring System: Conceptual Issues and Indicators*, MIMAP Working Paper, Bangladesh Institute of Development Studies, Dhaka.

Mujeri, M.K., Q. Shahabuddin and S. Ahmed, 1993, 'Macroeconomic Performance. Structural Adjustments and Equity: A Framework for Analysis of Macro-Micro Transmission Mechanisms in Bangladesh', in *Monitoring Adjustment and Poverty in Bangladesh: Report on the Framework Project*, Centre on Integrated Rural Development for Asia and the Pacific, Dhaka.

Osmani, S.R., W. Mahmud, B. Sen, H. Dagdeviren and A. Seth, 2003. *Macroeconomics of Poverty Reduction: The Case of Bangladesh*, Paper prepared for the UNDP Regional Project on The Macroeconomics of Poverty Reduction.

Pereira da Silva, L.A., B. Essama-Nssah and I. Samake. 2003, 'Linking Aggregate Macro-Consistency Models to Household Surveys: A Poverty Analysis Macroeconomic Simulator (PAMS)', in Bourguignon, F. and L.A. Pereira da Silva (ed.), *Evaluating the Poverty and Distributional Impact of Economic Policies (Techniques and Tools)*, World Bank.

Ravallion M. 2001, *Tools for monitoring progress and evaluating impact*, Paper Presented at The World Bank-IMF Workshop, July 2001

Sen, B. and Z. Ali 2003, *Spatial Inequality in Social Progress in Bangladesh*, PRCPB Working Paper, Bangladesh Institute of Development Studies, Dhaka.

Siddiquee, N.I., 2003, *Bangladesh: Regional Poverty Profile and Development Indicators – A GIS Based Analysis*, MIMAP Working Paper, Centre for Hi-Tech Info Processing and Bangladesh Institute of Development Studies, Dhaka.

Annex

A1. Indicators of Local Level Poverty Monitoring System (LLPMS)

A. PPDM Indicators:

Village and Household Characteristics: Number of households/population; Religious status; Number of female headed households; Households by numbers of members; No. of widows, working children; In and out migration; Population by age group; Households characteristics and access to electricity; Distance from nearest pucca road; Distance from nearest (i) Primary school; (ii) Secondary school; (iii) College; etc.

Education: No. of illiterate adults; No. of children not going to schools; No. of schools and school enrolment; No. of persons attained literacy through adult literacy program; etc.

Health and Sanitation: Access to safe of drinking water; Arsenic contamination; Sanitation facilities; etc.

Mortality and Morbidity: No. of deaths; maternal mortality; Incidence of major diseases; Treatment facilities; etc.

Participation in local level institutions: No. of members in Union Parishad, NGOs and other different committees; etc.

Agriculture and Environment: Land ownership pattern and utilization; etc.

Labour and Wages: No. of wage labourers; Major occupation; Wage rates; Non-farm activities; etc.

Access to Credit: No. of borrowers by sources;

Food Security: No. of households with adequate access to food

Access to Market: Commodities transacted by types of markets and buyers;

Crisis and Crisis Coping Capacity: Type of crisis faced by households and mitigating measures adopted

Perception of Poverty: Self classification of poverty status and socio-economic characteristics;

B. RPM Indicators

Geographical Characteristics: Physical conditions; Land characteristics;

Land and Population: Land utilization and holding; Activity status and employment characteristics of population;

Livestock, Forests and Water Resources Livestock population and productivity; Animal feed and vaccination and mortality; Forest resources and afforestation programs; Sources of water and water use for different purposes;

Non-agricultural Activities: Small/cottage industries; Sources of raw materials; Resource base and its utilization

Education, Health and Social Sector Development: Literacy rate; Enrolment and drop out rates at different levels; Health services and access; No. of trained doctors; Special social development programs

Infrastructure and Communications: Availability of post, telephone and other facilities; Transportation facilities; No. of households with television and radio

Marketing Linkages Market centres and vertical linkages; Nature of commodity flows and marketing intermediaries; Storage facilities; Cooperatives; Prices of major commodities

Development Priorities and Prospects: Agriculture; Livestock; Forestry; Infrastructure; Education; Health; Income Generation; Women and Social Development; Information and Communication; etc.

