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Reaching the Poor through Rural Public Employment

A Survey of Theory
and Evidence

Martin Ravallion

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and Evidence

Martin Ravallion

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Martin Ravallion is a senior economist in the Agricultural Policies Division of the World Bank's Agriculture and Rural Development Department.

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Abstract: With the limited set of policy instruments typically available in the rural sectors of developing countries, imperfect coverage of the poor and leakage to the non-poor must be expected from even the most well-intentioned poverty alleviation scheme. One way to better reach the poor is to build incentives for self-selection into the scheme. Labor intensive rural public works projects have the potential to both screen and protect the poor, as well as to create and maintain rural infrastructure. The limited evidence for South Asia suggests that few non-poor persons want to participate, and that both direct and indirect transfer and insurance benefits to the poor can be sizable. However, details of project selection, design and financing, are crucial to success in poverty alleviation, both in the short and long run. Benefits to the poor can be rapidly dissipated by a badly conceived and executed project.

This is a background paper for the research project "Policy Analysis and Poverty - Stage 2: South Asia's Experience with Rural Public Works", based in the Agriculture and Rural Development Department and supported by the Bank's Research Committee. The project will be probing more deeply into many of the questions raised here. For their helpful comments on this paper, I am grateful to Harold Alderman, Jock Anderson, Steven Coate, Gaurav Datt, Jean Dreze, Monika Huppi, Ravi Kanbur, Kalanidhi Subbarao, Dominique van de Walle, and Tom Walker.

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1. Introduction

Under the right conditions, economic growth can be a powerful weapon against absolute poverty. However, the initial conditions for poverty alleviation through growth are often less than ideal, and further growth is often less than equitable. It may thus take a long time to bring the poorest up to adequate consumption levels. Governments will rightly be unhappy with this, and may want to intervene directly to increase the pace of poverty alleviation.

We must then confront a potential dilemma: direct interventions aimed at alleviating poverty in the short run may well involve significant costs against other policy objectives, including intertemporal trade-offs in alleviating poverty now, versus later. For example, direct intervention may deplete resources available for future poverty alleviation through growth. That may not always be so; for example, successful direct interventions to reduce current nutritional deprivation may have significant positive effects on the future productivity of the poor, and these could be strong enough to outweigh any adverse effects on growth associated with the method of financing those interventions. But with less successful interventions, and more costly methods of financing, we will often face an unfortunate, but real, trade-off between helping today's poor, versus tomorrow's poor (World Bank, 1990).

The terms of that trade-off will be influenced by the efficiency of direct policy interventions aimed at alleviating poverty. There will often be various policy options with different impacts on poverty for the same resource cost (or which achieve the same reduction in poverty at different costs). Careful research into the cost-effectiveness of policy alternatives can show

how to improve the trade-off between current and future poverty alleviation, by reducing the "growth cost" of current policy interventions.

This paper surveys theory and evidence relevant to assessing direct poverty alleviation schemes, focusing particularly on rural public works schemes, characterized by the direct provision of unskilled employment in rural areas, financed from public revenues. These schemes provide local employment on labor intensive rural development projects, generally creating and maintaining basic infrastructure (such as roads and water control structures), and typically employing workers at wage rates no higher than the going agricultural wage. Such schemes have been used or advocated for alleviating both chronic and transient poverty in South Asia for centuries; for example, the Indian famine relief codes of the nineteenth century recommended this form of relief, and it was often implemented. The central and local governments of a number of countries in the region now have rural public works schemes as part of their poverty alleviation and/or food security strategies. The Government of India, for example, has recently embarked on an ambitious nation-wide rural employment guarantee program. Similar schemes have recently been introduced or proposed in Sub-Saharan Africa and elsewhere, and are expected to be increasingly important in the future.

There is a large literature on these schemes, particularly for India. My aim here is not to survey that literature, but rather to survey the underlying analytical arguments involved. In doing so I hope to draw out some elementary but useful principles, which may help illuminate the South Asian experience with these schemes and the relevance of that experience to other countries. I draw on institutional details only when they illustrate the principles involved. While I rely largely on secondary sources, I will draw

on a number of casual, though often probing, discussions I had over two weeks in May 1990 with workers, officials, and others with interest in the "Employment Guarantee Scheme" run by the state of Maharashtra in India.

Thus the paper has three aims: i) to sketch a framework for thinking about employment schemes aimed directly at alleviating rural poverty, ii) to survey relevant knowledge about the performance of some of these schemes, and iii) to point out a number of issues which merit further research.

The following section discusses the objectives and constraints relevant to evaluating direct poverty alleviation schemes. Emphasis is given to the incentive and related information problems which routinely confound attempts to reach the poor directly. I then examine some empirical evidence with bearing on the performance of direct poverty alleviation schemes. The prospects for "indicator targeting" without work requirements are discussed. Evidence is then presented on the poverty alleviation benefits of Maharashtra's Employment Guarantee Scheme, and the Food for Work Program in Bangladesh. There are many other schemes of this sort in the subcontinent, but these are two of the largest, best established, and best documented. This is followed by a critical survey of a number of further arguments that can be made to support this type of intervention, and issues concerning the design and financing of such schemes. The final section offers some conclusions.

2. An Overview of the Policy Problem

Objectives

The desire to alter the distribution of living standards in a society is an important motive for policy intervention, and the attainment of minimal nutritional and other consumption needs by individuals is one of the criteria

by which we judge whether the distribution of living standards has improved or not. Our concern here is thus with a class of policies which have as their main aim raising living standards of the poor within a short time, and for which purpose a sacrifice against other social objectives is to be expected. Resources are available to alleviate poverty; how should they be allocated?

It will be assumed throughout this discussion that the motivation for such policies is to raise the consumption levels of the poor, by raising their incomes. This ignores the preferences of the poor concerning leisure or, more generally, time allocation. That is an important distinction. For example, a previously idle person who takes up employment on rural public works may be only slightly better off in terms of utility (allowing for the loss of leisure), but much better off in terms of income. Our concern here is solely with the narrow concept of "income poverty".

The trade-off between current and future poverty alleviation will crucially depend on the extent to which a poverty alleviation scheme generates future income growth for the poor, including those who do not actually participate in the scheme. A rural public works project may be viewed as an attempt to alleviate poverty in both the short-run (mainly by its direct employment effects), and the long-run (through the "second-round" effects on incomes of the poor arising from the assets created and effects on labor markets, or other income sources of the poor). Other policies also try to do this; for example, subsidized credit targeted to the poor may also alleviate future poverty. While both short-run and long-run effects are important, it is clear that the case for such policies rests heavily on the extent to which they are able to alleviate current poverty. I shall thus give a good deal of attention to the short-run effects.

In principle, any poverty alleviation scheme can be thought of as having both transfer benefits and stabilization benefits to the poor. The transfer benefits can be both direct and indirect; the former comprises the gross benefit to participants less any cost they incur in participating, while the latter includes the share of the poor in the extra incomes generated by scheme's outputs, and any other second-round effects on incomes from other sources. The stabilization benefits mainly arise from the scheme's effect on the risk facing the poor of a decrease in consumption. This may be particularly important in a poor agrarian setting; plainly, the benefits of any policy which allows those at the edge of survival to avoid down-side risks must be valued highly.

Some recent discussions of poverty alleviation schemes have tended to emphasize risk benefits, to the exclusion of transfer benefits. A not uncommon view is that policies should only aim to provide a "safety net"; for example, it is sometimes argued that relief should only be made available in lean seasons, or even just lean seasons of bad agricultural years, as part of famine relief policy. It has also been argued that such schemes should be confined to "unanticipated shocks" affecting the rural poor, which normal seasonality is not.

I shall take the view that, while the insurance benefits of policy intervention are extremely important in this context, they should be encompassed within the overall objective of poverty alleviation. Famine relief, for example, can be viewed as the alleviation of symptoms of extreme transient poverty (possibly associated with a prior history of chronic poverty), with both transfer and risk aspects (Ravallion, 1987, 1990). Quite a broad perspective on relevant insurance benefits is justifiable in this

setting. Here it is far from obvious that only unanticipated variability matters to the poor; facing imperfect (or non-existent) risk markets and institutions, and significant storage costs, the capacity of the poor to respond effectively to an anticipated future loss of real income may be severely constrained by their current poverty. As a moral judgement, it is also contentious that victims of foreseeable misfortune should not be helped, *ex post*. (That is not to deny the relevance of incentives in policy design, but they are more properly considered as constraints on policy options, rather than being imposed on the objectives at the outset). We may also face trade-offs between transfer and risk benefits when aiming to reduce poverty, which should not be ignored in policy design.

The reduction of unemployment (or "underemployment") amongst landless laborers has often been cited as an important criterion for the evaluation of rural public works schemes. I take the view that this criterion is only valid in the context of poverty alleviation objectives. Though some discussions in the literature seem rather confused on this point, I take it to be self-evident that we are only concerned about employment effects in so far as they further those objectives. Providing extra work - or, for that matter, raising wages for existing work - can be useful policy instruments for raising incomes of the poor, and reducing the risks they face of a cut in living standards. However, their status as policy objectives in their own right is questionable.

For many purposes we will need to be more precise about the meaning, and measurement, of poverty. It may often be the case that we only require a ranking of the distributions of income before and after a policy reform. Theoretical results on the use of "dominance conditions" may then be invoked. These may require only mild restrictions on the class of potential poverty

measures in order to decide whether a policy reform is desirable.¹ The subtleties of poverty measurement are then irrelevant.

Unfortunately this is not always true; some of the more difficult issues of policy analysis in this setting have been found to rest heavily on the assumptions (including ethical value judgments) embodied in various measures of poverty. An important distinction here is between the concern about the prevalence of poverty, as measured by the number or proportion of poor, and the concern about the depth or severity of poverty, which also considers how living standards are distributed below the poverty line. We can readily imagine two societies with identical proportions of poor, but in one the poor are concentrated just below the poverty line, while in the other they are spread more evenly, and so poverty will be much more severe for some than others. The judgments made about these measurement issues can have bearing on certain policy choices. Examples are discussed below.

Constraints

Even when committed to alleviating poverty, we should not underrate either the political or economic constraints which confront attempts to design and implement policies for raising average consumption levels of the poor, and/or for reducing the consumption variability they face over time. Some of those constraints are obvious, though that does not mean they are easy to quantify properly. The budget constraint is a case in point. The resources employed in a rural public works scheme should be valued at their social opportunity cost. Market prices need not be a good guide in evaluating those costs; indeed the instigation of a rural public works scheme intended to alleviate poverty is often motivated by the existence of seemingly involuntary

underemployment of labor in lean seasons, presumably at wages above market clearing levels.

The constraints on policy instruments are no less important. Even a generous budget can have little impact on poverty if it is squandered on a scheme which is relatively ineffective in reaching the poor. The set of available policy instruments for poverty alleviation is often quite restricted in developing countries. This is particularly so in rural areas, where the highest concentrations of absolute poverty are generally found (World Bank, 1990).

Real world constraints on policy instruments have led many observers to be skeptical of the prospects for significantly alleviating rural poverty through piecemeal policy reforms and projects in many countries. By one means or another, the benefits of official development programs have (it is claimed) gone mainly to the larger farmers, helped by government officials whose own interests are also well served by that outcome.²

The essential problem here is how to effectively target benefits to the poor, and (as far as possible) only the poor. With perfect information on individual living standards, and a cooperative administrator, one can precisely identify the poor and target transfers perfectly. A means test can then be used to successfully screen the poor from the non-poor. There would be no place for a rural public works scheme as part of a poverty alleviation strategy; it would be more cost-effective to simply give money to the poor, rather than insist that they forgo other income to obtain relief. The impact on poverty is then only constrained by the available budget.

A successful means test is not generally feasible in most developing countries, particularly in rural areas. (I will discuss one attempt later).

More realistically, one can characterize the poverty alleviation problem facing a policy maker with imperfect information as follows: Each person supplies an information signal to a poverty alleviation agency employed by the policy maker. The signal does not, however, precisely identify each person's standard of living. Examples of such a signal include place of residence and landholding. There will be a distribution of living standards for each possible value of the signal. Properties of that distribution may be known (probably from a household survey), but one does not know who has which welfare level within that distribution. The policy maker has a set of policy instruments (such as contingent lump-sum transfers or pricing policies). The policy maker's problem can then be characterized as that of how to allocate policy instruments according to the information signals available, so as to minimize aggregate expected poverty. In doing so, the policy maker faces a number of constraints (such as budget constraints, and the constraints imposed by the behavioral responses of households, including equilibrium conditions in markets). Also, the administrative agent need not share the policy maker's objective, and its efforts at implementation need not be precisely observable; the agent's behavior may also constrain poverty alleviation possibilities.

Thus, the policy maker faces two sources of imperfect information: neither the true living standards of potential recipients, nor relevant aspects of the performance of intervening agents, can be known with certainty. In such circumstances, it is known that optimal redistributive policy interventions may entail that costs are imposed on would be participants - costs which would be deadweight losses in a "first-best world" of perfect information and unrestricted policy instruments.³ The following section reviews these arguments.

Incentives for Reducing Leakage

There are often actions which the policy maker can take to improve the information signal supplied by potential recipients and the performance of agents. The general idea is that the policy maker can impose a cost on recipients which varies implicitly as some increasing function of their (unobserved) income. I shall refer to this as the "cost-of-participation function". For example, a work requirement imposes the cost of forgone income on participants, and one would expect that cost to be lower for the poor; I shall discuss this in more detail later.⁴ The gross benefit level to participants, however, is generally independent of income (since the policy maker cannot know incomes). Thus, persons with incomes above some critical level (which may vary with other personal characteristics) will not want to participate. The cost imposed cannot, of course, be too high at low incomes, or the net gains to the poor will become so low that it would be more cost-effective to simply make untargeted transfers.

The case for self-targeting schemes will depend crucially on the cost-of-participation function. Figure 1 illustrates the point for two hypothetical self-targeting schemes. These are to be compared with untargeted provision, which is assumed to be possible by a uniform lump-sum transfer. The preferred scheme is taken to be the one which transfers the most income to the poor, for a given budgetary outlay. Cost of participation is assumed to be an increasing function of income. Two such functions are indicated, EF and E'F'. To allow a simple diagrammatic analysis, it is assumed that incomes are uniformly distributed between 0 and their maximum M. The distance along the horizontal axis can then also measure the number of participants in the scheme. By construction, this is given by OD for both self-targeting schemes,

while it is OM for universal (untargeted) provision. At a gross benefit level for the self-targeting schemes of B_s , each scheme costs AB_sOD to the government (non-wage costs and any assets created can be readily incorporated but are ignored). The net transfer to recipients is AB_sE or AB_sE' depending on the cost-of-participation function. To simplify the exposition, the poverty line is assumed to be OD so that in either case the scheme is perfectly self-targeting; all of the poor, and only the poor, want to participate. However, that does not mean that the scheme is more cost-effective than uniform provision, which will yield a benefit level of B_u (such that the area B_uGMO equals AB_sOD). The self-targeted scheme is more cost-effective than uniform provision if (and only if) its net transfer to the poor exceeds B_uCDO . As drawn in Figure 1, this may hold for the EF scheme, but it certainly does not hold for E'F'. This perfectly self-targeting scheme is less cost-effective than universal provision.

In practice, the feasible alternatives to a self-targeting scheme may be distributionally inferior to even uniform provision. Food subsidy schemes on normal goods, for example, typically entail higher per capita allocations to less needy households. Nonetheless, Figure 1 adequately illustrates a key point: once participation costs are considered, even a scheme which is very successful in screening the poor need not be more cost effective in alleviating poverty than poorly targeted alternatives. Whether it is or not is an empirical question.

The performance of the scheme may also depend on the influence that intervening agents have over participation. Discretion in the selection of beneficiaries by local administrators may either improve targeting performance (by exploiting further information on characteristics of desired

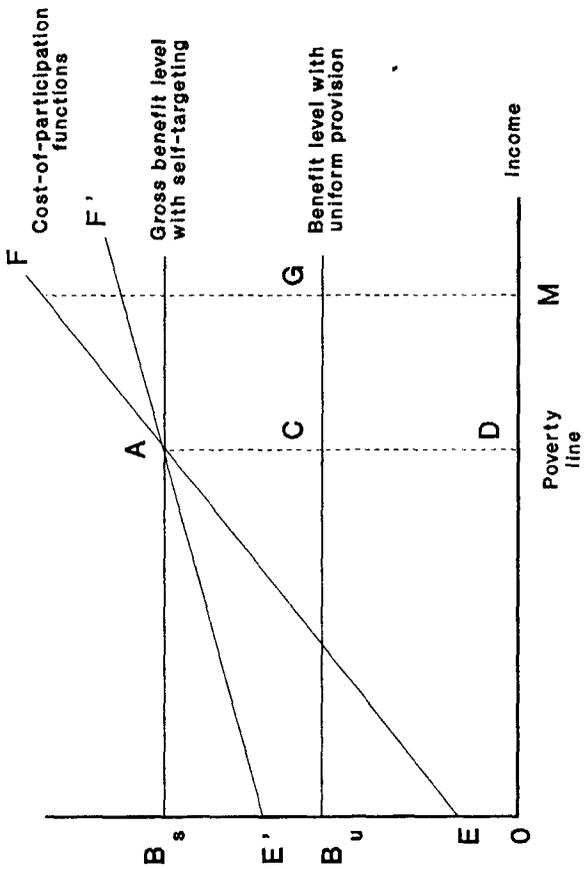
participants), or it may worsen it (by allowing agents to extract rents). The outcome is not obvious, as it will depend on the preferences and incentives facing the agent. Clearly, it should not be presumed that agents share the policy maker's desire to alleviate poverty. Opportunities for personal profit will probably be exploited.

We can thus identify two key variables influencing the scheme's performance: the cost imposed on recipients at any given income level, and the discretion given to agents in selecting recipients amongst those who are willing to incur that cost. Both of these variables can be influenced by policy design, as will be discussed later.

There are two main ways that incentives to avoid leakage can be built into a poverty alleviation scheme: i) the use of a penalty system, such that persons who misrepresent their indicator value so as to gain from the scheme are penalized (if not poor) or rewarded (if poor) with some probability,⁵ and ii) the use of work-requirements to discourage participation by the non-poor. Penalty systems can be administratively costly, and particularly so in most developing countries, for the same reasons that means testing is costly. I will thus concentrate more on the second class of policy instruments.

The potential for using work requirements to screen the poor has long been recognized.⁶ In terms of the arguments above, the information supplied by the recipient is simply their willingness to work at the wage rate offered. One is thus allocating relief on the basis of the worker's reservation wage rate; only those with a reservation wage less than the offered wage will volunteer. For such a scheme to be effective, a crucial issue is then the correlation between the reservation wage rate and the level of living of the

Figure 1



worker's household; if that correlation is too low then again it would be more cost-effective to simply make untargeted transfers.

It is not obvious a priori that such schemes will perform well in reaching the poor. Some may be unwilling (due to social stigma), or simply unable (due to physical incapacity), to do such work. Nor can we easily dismiss the possibility that some of the non-poor (with relatively high unearned incomes, say) will be willing to participate. Furthermore, the non-poor will probably benefit in other ways, such as through the extra incomes they derive from the assets created, or through underpayment of workers by corrupt managers. And, even if the poor are screened well, forgone incomes may be so large as to make alternative policies more cost effective. Relevant empirical evidence for Bangladesh and India is surveyed later.

Political Economy Considerations

There are two distinct aspects of the political economy of poverty alleviation schemes with direct bearing on policy constraints. Firstly, from casual observation it appears that the generosity of those financing the scheme is influenced by its design and performance. Altruistic donors who know that their money is actually reaching the poor will probably be more forthcoming. To the extent that work requirements make this more likely, they will generate larger budgets. It is also thought that generosity is sometimes stimulated by the knowledge that recipients will have to work for their money. This assumes that donors care more about the incomes of the poor than their utility. It may also reflect a concern that the recipients should not be made so much better off in utility terms that they are discouraged from taking actions which would help them escape poverty in the future.

A second argument that can be made does not assume that donors are altruistic. Their financial and political support, and the political support of any third parties who neither participate in nor finance the scheme, depends on the benefits they personally derive. For example, the benefits from the assets created by a public works project can be far more widely distributed than the wages of participants. This has been a factor in the political acceptance amongst the rural rich of Maharashtra's "Employment Guarantee Scheme" (Herring and Edwards, 1983). More generally, one can think of any poverty alleviation scheme as having various benefits to the non-poor, ranging from their direct participation in an imperfectly targeted scheme, to external benefits associated with the assets created or external effects.⁷

An implication of the last point is that better targeting may actually be a mixed blessing for the poor. Schemes which provide wider coverage often permit the formation of coalitions which allow greater political support than the poor alone can muster for a targeted program. Thus, another trade-off can be identified: targeting may be more cost-effective, but less sustainable politically.

In risky environments, the terms of any trade-off between cost-effectiveness and political feasibility are likely to be better for self-targeting schemes which build-in the right of universal coverage; anyone can participate, though many will not generally want to do so. Under certain conditions, the scheme can then allow the formation of a wider coalition of interests than schemes which ration benefits to identified target groups. For example, incomes can vary considerably over time in agriculture-based economies; and are rarely perfectly co-variate, at least over a wide enough area. The set of potential participants in a rural public works scheme may

then be far larger than that of actual participants at any one date. Many who rarely participate will still value the scheme's insurance benefits. A larger set of potential users will provide a wider base of political support for creating and maintaining the scheme. In this respect, the employment guarantee feature of the Maharashtra scheme does appear to have encouraged a degree of political solidarity amongst the state's rural poor, which has not gone un-noticed by the state polity (Echeverri-Gent, 1988). This will by no means guarantee political feasibility, but it will undoubtedly help.

3. Do These Schemes Reach the Poor?

Targeting Without Imposing Work Requirements

There is surprisingly little quantitative evidence on the gains from targeting, and the performance of incentive schemes for self-targeting. While there have been some recent attempts to quantify the poverty alleviation impact of rural public works schemes, these have been based on ad hoc assumptions about their performance in screening the poor.⁸ This section will survey some evidence which throws light on these issues. The available data cannot tell us whether rural works schemes are the most cost-effective means of alleviating poverty, even where they have been implemented. That would require a careful quantification of the aforementioned trade-offs. But the available evidence can at least suggest whether such trade-offs exist.

The discussion of the previous section suggests that rural public works will not be cost-effective for alleviating poverty if they do not reach the poor significantly better than transfers based on easily monitored indicators of poverty, or simply untargeted transfers, which do not impose costs on

participants. The case for work requirements rests, in part, on the potential of the available indicators of poverty, including direct means testing.

A common transfer instrument in South Asia has been subsidized credit, allocated through rural financial institutions. The largest scheme of this sort is India's "Integrated Rural Development Program" (IRDP), which has made grants and loans at below market rates of interest to about 30 million rural households over the past ten years or so. Poverty alleviation has been an explicit aim, and local officials are given instructions on the criteria for eligibility, based on average household income. IRDP is thus of special interest here as it is one of the few instances in a poor rural economy where a means test has been attempted.

There is now a large literature on IRDP.⁹ Governmental evaluations of the scheme have generally been encouraging, suggesting that a disproportionate number of beneficiaries have had incomes below the poverty line. For example, Pulley's (1989) results based on large surveys done for the government suggest that 95% of IRDP participants had incomes below a poverty line which about 50% of rural India's population as a whole would have failed to reach in 1984/85.

However the methodology of some of these evaluations has been seriously questioned. Assessments of performance have been plagued by the fact that the scheme's use of a means test encourages participants to understate their incomes. Naturally, this leads to overly optimistic assessments of targeting performance. Some evaluations have tried to avoid this problem by re-surveying participants, asking them to recall their incomes prior to receiving credit. With recall periods of two or more years and the likelihood that incentives to avoid exposing previous income understatements would persist, doubts can also be raised about this method. Failure to adjust benefit

streams for inflation has also lead some evaluations to over-state the returns to the poor from IRDP (Gaiha, 1990). In this respect, the more careful evaluation done by the Reserve Bank of India indicates a much more modest impact on poverty (Gaiha, 1990).

Independent village-level studies of IRDP have also been far less enthusiastic about its success in reaching the poor. Surveys in Maharashtra and Tamil Nadu during 1984 by the Institute of Financial Management Research also suggested rather poor targeting, with the average pre-selection incomes of IRDP beneficiaries exceeding those of non-beneficiaries in each of the five districts surveyed (Shah, 1987). Similarly, Dreze (1988) found that very few of the poorest households in the village of Palanpur in Uttar Pradesh took up IRDP loans during 1983/84. Of course, this is only one village, and significant regional variations in performance have been identified (see, for example, the results of Rao and Rangaswamy, 1988, for the same state). However, Dreze's findings have the advantage that they are unlikely to be contaminated by the aforementioned incentive effects on survey income responses, his IRDP survey having been done as part of a careful study of living standards in the village. Also, Dreze reports similar findings for a village in the state of Gujarat, though the scheme appears to have been far more effective in reaching the poorest in a surveyed village in West Bengal, where the rural poor have a stronger political representation at local level. Dreze identifies a number of factors which act to restrict access of the poorest to IRDP loans: the poorest have little influence over the local administrator, who has considerable discretion in selecting beneficiaries, and they are considered a bad risk by Bank managers. Some of the poorest are also

unwilling to participate, for fear of being cheated, or fearing the consequences of their own default.

While the assessments of IRDP's targeting performance vary, there is clearly widespread dissatisfaction amongst observers with the means test used for assessing eligibility; its inherent imprecision is compounded by the incentives it creates for leakage, both through recipient manipulation and local corruption. Reviews have recommended replacing the means test with targeting based on less manipulatable indicators (Pulley, 1989). I discuss possible indicators below. It has also been proposed that credit-worthiness criteria should be used, so that IRDP resources go to those amongst the poor who are likely to have higher rates of return to the loans and higher repayment rates. It is unlikely that these will often be the poorest of the poor, who would rarely have the skills or complementary endowments needed to be successful in self-employment. This need not be inconsistent with IRDP's poverty alleviation objective, which (even if one is concerned more about the severity of poverty than simply its prevalence), will depend on both its performance in reaching the poor and the rates of return received by the poor. But it does suggest that other policy instruments, such as rural public works schemes, will be needed to reach those missed out by IRDP.

One credit scheme in the subcontinent has had very favorable reviews of its targeting performance, namely the Grameen Bank in Bangladesh. Hossain (1988) estimates that the average pre-intervention income of borrowers was half the national mean, putting them in the poorest 40% of the population. The income gains to participants also appear to have been sizable, certainly greater than the rate of growth in the national economy. The scheme has also performed well by more narrow banking criteria, in terms of interest and

repayment rates. This success appears to be due to both the scheme's design (particularly its use of group-based lending) and the quality and individual motivation of its management. It remains to be seen whether that success can be maintained while the scheme expands, or in attempts at replication.

Constraints on its effective expansion as a poverty alleviation scheme can arise from limitations on local development planning capabilities and adverse general equilibrium effects on non-participating poor (Osmani, 1989). Like IRDP, it can be argued that this is not the ideal scheme for all of the poor.

Regional targeting has a number of seemingly obvious attractions when trying to reach the poor. Substantial regional disparities in living standards are common in developing countries, and backward areas can often be readily identified. Place of residence may thus be a useful indicator of poverty. Also, the existence of local governments suggests that an administrative apparatus is generally available, and has already been exploited by IRDP and other poverty alleviation schemes in the subcontinent. The allocation of central government disbursements across states in India has also been determined, in part, by regional disparities in poverty.

The poverty alleviation potential of regional targeting is an empirical question, and it is a difficult one to answer. Datt and Ravallion (1989) have looked at this question for India. They consider the effects on aggregate poverty of both additively and multiplicatively absorbed transfers across states of India, and between their urban and rural areas. Effects on pre-transfer incomes or relative prices are ignored. Depending on the assumptions made about how poverty is measured, they find that 75% and 90% of transfers in which the "donor" state or sector has a higher mean consumption level than the "recipient" would have reduced aggregate poverty in 1983. Thus, the

qualitative effect of reducing regional disparities in average living standards generally favors the poor.

However, the quantitative gains from even the complete elimination of regional disparities in average living standards in India are unlikely to be large. For example, Datt and Ravallion simulate the effects of the complete elimination of regional disparities across 20 states of India, with each state divided into urban and rural areas, while holding intra-regional relative inequalities constant. This would only yield a small reduction in the proportion of persons below the poverty line, from an initial value of 33% to 32% after the elimination of regional disparities. Regional targeting may thus be quite a blunt instrument for aggregate poverty alleviation in India. We should look for other indicators to enable finer targeting within regions.

The most promising single additional indicator is probably land-holding class, given the strong negative correlation observed between land-holding and poverty in rural areas of much of South Asia. Simulations of the effects on poverty confirm the need for targeting poverty alleviation schemes toward the landless or near landless in rural areas of Bangladesh (Ravallion, 1989a). However, the results also highlight the limitations of land-contingent targeting. One clearly cannot expect to eliminate poverty in this way, even with the most generous assumptions about what sort of income redistributions across land-holding classes are politically feasible. Indeed, even with complete control over the distribution of income across 10 landholding classes in Bangladesh, the maximum reduction in the aggregate severity of poverty which is attainable this way is no more than one could obtain by an untargeted lump-sum gain to all households equivalent to about one tenth of GDP (Ravallion, 1989a). Various factors may enhance the poverty alleviation

impact, such as any effects of the income or wealth gains on future productivity of the poor. Other factors will detract from their poverty alleviation impact. Plausible restrictions on the government's redistributive powers would further diminish the gains to the poor from such policies.

There may be potential for combining this type of policy with other targeting information. For example, the need to identify the poor amongst households with relatively large landholdings in Bangladesh is evident from the results of Ravallion (1989a). If these households can be identified with reasonable precision by other indicators, such as region of residence, then greater poverty alleviation would be informationally feasible in practice. Old age has proved a useful indicator in some transfer schemes. Since 1980, the Indian state of Kerala has provided a pension to agricultural workers over 60 who have low self-reported incomes (including that of unmarried adult children). An official local committee including representatives of minority groups is in charge of verification (Gulati, 1990).

Targeting Using Work Requirements

The empirical evidence surveyed above is not conclusive on the potential for reaching the poor through indicator targeting, without imposing work requirements on recipients. But it is clear that, even when direct targeting based on indicators of poverty is politically and administratively feasible, the informational and related incentive constraints have to be taken seriously. Rural public works schemes offer the hope of loosening those constraints.

Evidence will be surveyed on the targeting performance of two schemes. The first is Maharashtra's "Employment Guarantee Scheme" (EGS). This is the

single largest poverty alleviation scheme of any state in India. The scheme provides unskilled manual labor on small scale rural public works projects, such as roads, irrigation facilities, and re-forestation, at wage rates which are on a par with prevailing agricultural wages. EGS was introduced as a statutory program in the mid 1970s and expanded rapidly to reach average annual attendances of about 750,000 persons over the period 1977 to 1983. For 1984/85, gross employment amounted to nearly 180 million person days, representing 3% of total rural employment (Acharya and Panwalkar, 1988), though we do not know the figure net of displaced employment. The second scheme is Bangladesh's Food for Work Programme (FFWP). This was introduced soon after the 1974 famine, though a Rural Works Program (RWP) had existed since the 1960s. FFWP has grown considerably since then, providing about 100 million days of labor in 1987-88. The scheme organizes and pays (in kind) for construction and maintenance of irrigation, drainage and embankment projects.

There has been debate about the targeting performance of Maharashtra's EGS in reaching the rural landless. Dandekar and Sathe (1980) estimated that the scheme eliminated three-quarters of unemployment amongst landless or near landless households in 1977/78. However, there are reasons to suspect that this may be an over-estimate; under more conservative assumptions, Osmani (1988) argues that the scheme's impact could not exceed one-third of this group's unemployment. The Planning Commission's evaluation report on EGS was critical of the scheme's targeting performance, based on its observation that there was significant participation by small farmers, as well as the landless (PEO, 1980).

However, much of this debate seems to have missed the point. We are presumably only interested in reaching underemployed landless households in so

far as there is a high incidence and severity of poverty in this group. It is the poor who we are trying to reach, not the landless per se. And, though the correlation between poverty and landlessness is high, it is not perfect (as already discussed; also see Dandekar and Rath, 1971, Sharma, 1985). A similar comment applies to the relationship between poverty and unemployment (see, for example, Visaria, 1981). More direct evidence on targeting is needed.

This comment also applies to assessments which point to the scheme's success at reaching backward regions. For example, Echeverri-Gent (1988) finds that EGS had expanded most in a number of the state's underdeveloped dry-land areas. Again, that is an indicator of overall targeting performance in reaching the poor, but it is an imperfect indicator; a high participation from backward regions can be consistent with a modest impact on aggregate poverty.

A more direct test of the performance of a rural public works scheme in screening the poor is to compare the distribution of income amongst participants with that for the rural population as a whole. There are well-known difficulties in assessing incomes in this context. However, there have been four surveys of participants which have attempted to do so, and can throw further light on performance in reaching the poor. Three of these surveys are for EGS, while the other is for Bangladesh's FFWP.

Dandekar and Sathe (1980) report that 90% of workers in their 1978/79 survey of 1,500 EGS participants spread over 56 projects were living below the poverty line. (Note too that this calculation includes the EGS earnings of participants; the headcount index of poverty amongst participants must have been higher than this prior to EGS). There are problems of comparability, but this level of poverty is probably well above the average figure for rural

Maharashtra; the same poverty line applied to the 1977/78 NSS gives a headcount index of 49% for rural Maharashtra (Kakwani and Subbarao, 1990).

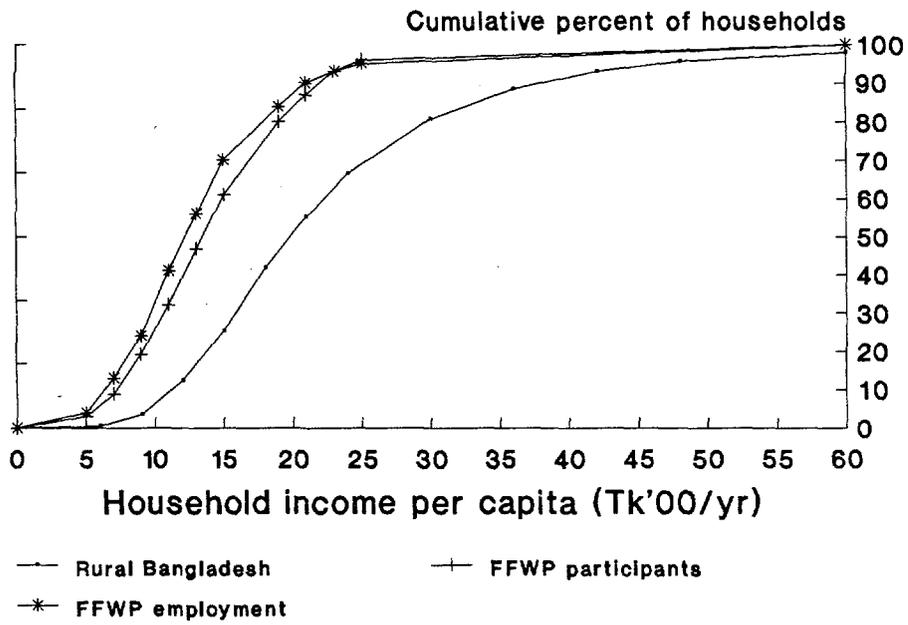
A similar conclusion is suggested by a much smaller but more recent survey of 100 participating households in the EGS during 1985/86, reported in Acharya and Panwalkar (1988). The mean income of participating households was found to be about 20% below the poverty line. From this evidence, EGS would appear to have performed well in reaching the poorest.¹⁰

Bhende and Walker (1990) have studied the targeting performance of EGS using household-level data over five years, 1979-1983, for two Maharashtra villages. Their results suggest that the scheme is well targeted; EGS participation is higher in the poorer of the two villages, and it is effective in screening the poor, particularly in the richer village, where the potential losses from leakage are larger.

The fourth source of data for making such a comparison is for Bangladesh's FFWP. A household survey was done in the neighborhood of various project sites in 1982 by the Bangladesh Institute of Development Studies (BIDS) and the International Food Policy Research Institute (IFPRI), as part of an evaluation of FFWP. The BIDS/IFPRI survey was comprehensive, covering 31 sites scattered over Bangladesh.

The screening performance of the scheme can be assessed by comparing the distribution of income among the BIDS/IFPRI sample of participants (prior to their participation) with the distribution for rural areas as a whole, which can be estimated from independent sample surveys done by the Bangladesh Bureau of Statistics.¹¹ Figure 2 gives the cumulative distributions of income from both surveys. We find that the scheme is quite effectively targeted toward the rural poor. For example, while 25% of rural households had an income per

Figure 2



capita per year less than Taka 1500 in 1981/82, this was true of 60% of the households with FFWP participants. Virtually all (96%) of FFWP participants in the BIDS/IFPRI sample had a household income per person below Taka 2500 per year, for which 70% of the rural population would be deemed poor. But, no matter where one draws the poverty line, FFWP participants came from poorer households than the rural population as a whole. Furthermore, it can be shown that this holds for a wide range of poverty measures, using theoretical results on dominance conditions for ordering income distributions in terms of poverty measures mentioned above. It can also be noted from Figure 2 that FFWP employment is even better targeted toward the poorest of the poor than participation; 70% of FFWP employment went to the 25% of rural households with an income per capita less than Taka 1500. (The participation of the landless is also high; 75% of participating households were landless, or had less than half an acre, while the proportion would have been about 45% for the whole rural population¹²).

All these surveys suggest that screening performance is good. The net income gains to participating households are more difficult to measure. Forgone income is the main cost involved (the monetary cost of transport to the site is probably negligible). This is likely to be highly seasonal, and also to vary from year to year and across households. Neither Dandekar and Sathe (1980) nor the further results in Dandekar (1983) throw much light on the extent of forgone incomes in their survey of EGS participants, though from their discussions it seems that they implicitly believed participation to have been fairly costless.

A better indication is probably found in the surveys by Acharya and Panwalkar (1988). They studied two samples of 100 households each, one of

which comprised households with EGS participants spread over 10 villages, while the other sample was drawn from the same classes of landless and marginal farmers as the EGS households, but from 10 villages where the scheme had not operated (though they give no explanation as to why the scheme was not active in the latter group of villages). From their reported results, one can calculate that the difference between the two samples in their mean incomes represented 53% of the mean (gross) income from EGS participation. This suggests that average forgone income accounts for about half of the average wages received.

For the Bangladesh scheme, the BIDS/IFPRI survey indicates that the cost to participants was primarily due to a shift from both farm and non-farm self-employment, rather than from wage labor. Still, the forgone income was far from negligible. By comparing the incomes of FFWP participants with those of a control group, and adjusting for differences in their pre-FFWP incomes, one can estimate from the results of the Bangladesh survey that the net income gain to participants was 57% of their gross earnings from the scheme.¹³ This is quite close to the above figure for Maharashtra's EGS.

In casual discussions with a number of groups of EGS workers in Pune district during a recent slack agricultural season (May 1990) I raised the question: "If you did not have this EGS work, could you have obtained any other work?". Many answered that little or no work was available, but on further probing it became clear that most would have searched and, in time, found something. For example, some work was known to be available in digging and trucking sand for private contractors. The women were more pessimistic about their prospects. Nonetheless, even in a slack season, it should not be assumed that forgone income is zero.

Cost-effectiveness in reaching the poor is also determined by the share of the wage bill in total costs. For EGS this is constrained to be at least 60% (though some exceptions are allowed). The wage bill for EGS has typically represented 70-80% of the government's total outlays on the scheme, though it appears that this has been declining somewhat over recent years to currently about 60% (GOM, 1990). Similarly, about 70% of the food aid used to finance Bangladesh's FFWP was disbursed to participating workers (Ahmed et al., 1985).

Combining these various calculations, the following crude assessment of the cost-effectiveness of a rural public works scheme in directly transferring income to the poor is broadly consistent with what we know about the South Asian schemes discussed. From the available evidence on screening performance it is not unreasonable to assume that virtually all participants are poor or near poor. The gross transfer to the poor is then the wage share of the scheme's cost, which I shall assume is in the range 60-70%. From the above calculation for EGS and the Bangladesh's FFWP, the direct gain to participants net of forgone earnings is about 50-60% of the wages received. Thus the direct income gain to the poor under these conditions is 30-40% of the government's disbursement on the scheme. This is only a rough indication, and there is probably a wide variation around this figure in practice. In slack agricultural seasons and bad years, when forgone income is smaller, it would not be unreasonable to assume that at least half of the government's disbursement went directly to the poor.

In addition to the direct transfer benefit, one must also consider any indirect benefits, arising through the assets created or effects on markets, and risk benefits to the poor. The next section discusses these.

4. Other Potential Benefits

Second-Round Income Effects

There have been conflicting assessments of how valuable the assets created by these schemes have been to the poor. It is widely thought that investment in basic rural infrastructure can have a high economic rate of return in developing economies, through increased agricultural output (Antle, 1983; Hazell et al., 1989; Binswanger et al., 1989; Binswanger, 1989). The key issues are the extent to which that return is realized by the infrastructure actually created by rural public works schemes which have aimed primarily to directly alleviate poverty, and the extent to which the poor have shared in those benefits.

Output effects arising from the assets created by both EGS and the Bangladesh FFWP appear to have been far from negligible. For example, there is supportive evidence from the BIDS/IFPRI study (Ahmed et al., 1985; Chowdhury and Asaduzzaman, 1983; also see Ahmed and Hossain, 1987). Sizable output gains have also been reported for the irrigation works created by EGS; see PEP (1980). However, other observers have been more pessimistic about the rate of return to food for work projects; see for example, Reutlinger (1984), World Bank (1986). It is clear that the second round income effects of these schemes arising from the assets created have varied greatly. The main problems identified for most projects appear to involve policy design issues, particularly restrictions on non-labor inputs, as will be discussed below.

From the point of view of poverty alleviation, our main interest is in the share of project outputs that has gone to the poor. A common criticism of the rural "public" works schemes in India is that the assets created have

often been "privatized", with benefits going to the rural non-poor without charge (Dandekar and Sathe, 1980; PEO, 1980; D'Silva, 1983).

The state of existing knowledge does not yet allow a rigorous assessment on this issue. But the above literature and my recent discussions with EGS officials and benefiting farmers suggest that, provided care is taken in project selection and design, it is feasible to generate economic benefits (by even distributionally neutral assessments) sufficient to cover short-run variable costs. What is far less clear is how much the poor will share in those benefits, either directly or through cost-recovery. An optimistic assessment would be that benefits are uniformly distributed so that the share going to the poor is simply the proportion of the population who are poor.

These assumptions imply substantial indirect transfer benefits; for example, if 40% of the population deriving benefits from the scheme are poor, then the indirect transfer benefit would be of the same magnitude as the previous section's rough estimate of the direct transfer benefit. However, this should probably be viewed as an upper bound to plausible estimates of the value to the poor of the scheme's outputs.

An important but relatively unexplored issue concerns the effects of rural public works schemes on agricultural labor markets and tenancy contracts.¹⁴ The transfer benefits from a rural public works project also include any effects on wage rates and other earnings from alternative activities. Time series evidence for India suggests that increases in the real agricultural wage rate will generally reduce poverty (van de Walle, 1985). Some simple simulations for plausible assumptions on relevant parameters suggest that multiplier effects on incomes of the poor arising through labor market responses could easily represent a doubling of the direct

transfer benefit (Ravallion, 1990). Indirect transfer benefits will tend to be higher at times and places of relatively wage inelastic labor demand.

Both of the major schemes in the subcontinent discussed above - Maharashtra's EGS and Bangladesh's FFWP - are believed to have put upward pressure on agricultural wage rates. Positive effects on the fall back position - or "threat point" - of the poor in bargaining relationships over wages and land rents may be particularly important in certain agrarian settings. The workers, farmers, and officials who I spoke to in Maharashtra generally believed that the EGS wage rate was an important determinant of the agricultural wage rate. The guarantee makes the EGS a credible threat point in bargaining over agricultural wages. There may also be possibilities for using rural public works projects as a vehicle for enhancing the skills of poor workers - with second-round effects on later earnings.

However, it is sometimes argued that such schemes should not be allowed to compete with existing employment opportunities, as this will diminish the net gains to the poor, and cause distortions elsewhere in the economy. The economics of this argument needs to be looked at carefully. It cannot be presumed that new distortions to existing labor markets should be avoided, unless one is convinced that those markets (and, indeed, all other markets) were functioning efficiently prior to the policy intervention. The existence of involuntary underemployment of labor in this setting (which is often part of the motivation for the very existence of these schemes) throws doubt on that presumption. A well functioning public works scheme can also make a positive contribution to reducing existing non-competitive features in rural labor markets. The existence of alternative income sources for the rural poor - such as public employment - can help break down exploitative labor relations

at the village level, arising from any monopsony power of large landowners, manifested as discriminatory wage rate differentials, such as between men and women, migrants and local workers, and across caste divisions (PEO, 1980; Dandekar, 1983; Binswanger et al., 1984; Hirway, 1988; Subbarao, 1989). Nor is the displacement of other employment sources necessarily a bad thing, since the transfer benefit to the poor depends on the gain in their earnings, not just their employment. The relevant economic comparison to make here is with the alternative forms of policy intervention, rather than the economy's first-best equilibrium. If labor market responses allow higher transfer benefits to the poor for the same social cost, then this is a more efficient policy. Again, the issue is cost-effectiveness in alleviating poverty, relative to the feasible alternatives. Further research is needed on these questions.

Risk and Stabilization Benefits

There has often been concern about the potential for displacing existing private and (non-governmental) social insurance arrangements by introducing public schemes serving a similar function. For example, the poor may find that community based village level support declines after the introduction of rural public works providing lean season employment. To the extent that the existing risk-sharing arrangements work well this would be worrying. But there are reasons to suspect that they do not. Casual observations suggest that savings by the poor are often quite insufficient to cope with even seemingly small deviations from normal seasonality, or more than one or two bad years in a row. The poor typically face quite restricted access to formal credit. Social insurance arrangements are thought to be important in the traditional rural societies of South Asia and elsewhere.¹⁵ These institutions

are plausible outcomes of repeated interaction in risky environments, but they can only be expected to cope well under certain circumstances (Coate and Ravallion, 1989). For example, if those involved discount future gains from reciprocity at sufficiently high rates then they will defect. Nor will there be much scope for sharing highly covariate risks.

The insurance and income stabilization benefits of these schemes can be very important in risky agricultural settings.¹⁶ Rural public works have had a long history as an instrument of seasonal stabilization and famine relief in the subcontinent, with generally successful results.¹⁷ For example, though their sample sizes were small, Walker et al. (1986) estimate that landless agricultural households in two villages where the EGS operated had 50% less variable income streams (in terms of CV) than in a third village where no such scheme existed. EGS attendances peak each year in the dry summer period (February to May). And they fluctuate from year to year, depending in large part on the vagaries of the previous year's monsoon. Public employment generation was a key ingredient in the successful relief effort when much of central and western India, including Maharashtra, experienced a severe drought in 1987, following a sequence of poor monsoons (Government of India, 1989). In Bangladesh, it appears that the RWP and FFWP may have helped avoid famine in 1988, when conditions were not unlike those of the 1974 famine; both schemes experienced substantial increases in the number of workers employed over the previous year (roughly 90% and 20%, respectively). Employment on Bangladesh's rural public works programs has also been seasonal, with likely stabilization benefits, though some observers have argued that seasonal targeting of the FFWP could be improved (Hossain, 1985; Hossain, 1987).

The main second-round effects of these schemes arising through soil conservation and irrigation are also likely to have stabilization benefits to the poor, through employment expansion in the lean season of the main crop calendar. One farmer I spoke to in Maharashtra in the very dry month of May said he was employing 10 or so extra agricultural laborers at that time of the year as a result of a rise in the water table, allowing well irrigation of a number of acres of previously unirrigated land. The rise in the water table was attributed to the soil conservation project on his land recently completed under the EGS.

Targeting performance will probably be better in lean times. This is because unemployment amongst the poor is likely to increase at these times, probably enhancing the correlation between participation and poverty, and reducing the forgone income of participants. Substantial increases in involuntary unemployment amongst the rural poor during the severe droughts of 1986 and 1987 have been measured for a carefully studied village in a dry region of South India (Bidinger et al., 1990). No rural public works scheme was available to that village, and the targeting performance of food subsidies was poor.

A potentially important, but poorly researched topic, concerns the longer-term effects of the extra insurance provided by rural public works. The poor must often save in the form of cash, or other suitably liquid assets, to insure against down-side risk. The cropping decisions of marginal farmers are undoubtedly also influenced by uninsurable risks. It can be argued that productive capital formation is constrained by the opportunities for insurance (Eswaran and Kotwal, 1989). If the poor know that extra employment will be available in lean seasons, or if misfortune strikes, then they may be expected

to save in more productive ways from their peak period incomes; for example, by investing more in the education of their children.¹⁸ The long-run consequences of certain coping mechanisms, such as indebtedness and "distress sales" of land, are also of concern. Extra income at a crucial time may well save a household from a far more costly adjustment. Cain and Lieberman (1983) find that, while the volume of land sales is highly correlated with the incidence of famines in a Bangladesh village, no such correlation exists in the Indian villages they studied. Access to relief work (including EGS) appears to have allowed many of the poor in the Indian villages to avoid this costly form of adjustment.

5. Program Design and Financing

Design

The relevant budget constraint on such a scheme should relate to the long-term expenditure level, rather than current levels in any one year. Year-to-year fluctuations in outlays will reflect the scheme's important role in stabilizing income of the poor. Within the long-term budget constraint, a number of details of policy design will determine the scheme's cost-effectiveness.

The degree of discretion given to agents who manage the scheme, particularly in selecting projects and beneficiaries, is an important issue for policy design. Problems of corruption in the schemes discussed above have been noted often, and could well be a significant constraint on their performance.¹⁹ There are things that can be done to reduce leakage through corruption, such as by making workers better aware of their rights. It is

clearly important to consider carefully the incentives facing managers of such schemes, and the prospects for effective supervision.

Some of the issues discussed above are relevant here. As a rule, the more a poverty alleviation scheme relies on self-selection of participants, the less prone it will be to corruption by managers who do not share the poverty alleviation objective, and whose efforts cannot be monitored precisely. At one extreme, forms of targeting based on poverty indicators, such as land-holding class, will give an agent considerable discretion in the selection of beneficiaries. At the other extreme, that discretion will be most limited when all beneficiaries select themselves, are guaranteed employment, and are well informed about the scheme. The latter condition may be very important, yet it may not be easy to achieve. For example, an administratively convenient way to announce projects and wage rate schedules and working conditions for rural public works is to simply write them on a board, but this creates scope for exploiting the illiterate. The need to ensure that workers are well informed about conditions, and their rights, has been emphasized in a number of recent discussions of poverty alleviation schemes (Ahmed et al., 1985; Bandyopadhyay, 1988).

Discretion in selecting beneficiaries is not, of course, the only potential source of leakage associated with agency incentives. For example, although discretion in selecting beneficiaries is limited by the design of Maharashtra's EGS, local field officers have had considerable autonomy in day-to-day operations of that scheme, with implications for performance (Lieberman, 1985). Given the potential for leakage through strategic behavior by managers, there will still be a need for governmental guidance and monitoring, or other forms of (implicit or explicit) incentive contracts. My

discussions with EGS officials suggested that supervision may have improved over the past ten years.

The joint issue of the wage rate and coverage of a public employment scheme also arises in policy design. For a given long-term budget, the choice is between a scheme which aims for wide coverage at potentially low wage rates, and one which rations participation at a wage rate sufficient to allow more participants to escape poverty. Elsewhere I have examined this issue, and derived conditions for ranking stylized policy alternatives in terms of a broad class of poverty measures (Ravallion, 1989b). Empirical simulations of the policy alternatives for Bangladesh generally reinforce the case for wide coverage at low wage rates when the policy maker is concerned about severity of aggregate poverty.²⁰ This can hold even when the non-wage cost per worker is quite high (though if that cost is very high, limitations on coverage will become desirable). Arguments for rationed coverage at higher wage rates are more convincing when one is only concerned about the prevalence of poverty. The numbers of participants crossing the poverty line has often been used as a test of the performance of poverty alleviation schemes (see, for example, Dandekar and Sathe, 1980; Gaiha, 1990), though the relevance of that criterion has been questioned (Basu, 1981; Subbarao, 1985; Rao and Rangaswamy, 1988). Thus the policy choice may rest heavily on the value judgments made in defining and measuring poverty. There are persuasive arguments in favor of measures which embody a concern with the severity of poverty, rather than just its prevalence (particularly following Sen, 1981). These arguments lend support to wide coverage, albeit at potentially low wage rates.

This argument does assume that the policy maker can control the average wage rate on the scheme, so as to allow it to adjust to the long-term budget

constraint. However, in circumstances in which the wage rate is pre-determined (in keeping with statutory minimum wages, for example) employment cannot be guaranteed without losing control of the scheme's aggregate cost, and so potentially violating budget constraints. An unfavorable trade-off against poverty alleviation through economic growth may then be unavoidable.

The budgetary problem of providing an employment guarantee when the wage rate is pre-determined could be avoided if it is possible to delay payment of part of the wage (the difference between the statutory minimum wage and the wage rate which would clear the budget while providing employment to all who want it at that wage). For example, this might be held by the government in an indexed account which the worker can draw on at a later date if she or he becomes unable to work, through illness or old age. The insurance benefits of an employment guarantee may then be combined with other social security functions, while remaining consistent with the need for budgetary restraint. I do not know of any attempts to do this, but the idea merits investigation.

Another possible way to obtain some of the insurance benefits to the poor of an employment guarantee while respecting budgetary limits is to target the guarantee to specific regions where the vulnerability to down-side risk is thought to be greatest. Employment rationing will be required elsewhere.

Wage schedules can also be an important instrument in policy design. One of the most notable features of Maharashtra's EGS has been its success in attaining a high rate of female participation, roughly equal to that of men. This is attributable to non-discriminatory wage schedules - piece rates for any given job are fixed (though varying by district to reflect local wage rates). However, women do not appear to have had equal access to all jobs on the scheme. Female participants have complained of job segregation, with only

men being allowed to do the more physically demanding and better paid work, such as breaking up rocks for irrigation projects (Acharya and Panwalkar, 1988).

The choice between piece rates and time rates can also influence the scheme's cost-effectiveness. In this context, one should be cautious of the usual incentive arguments for piece rates - such as in the EGS. The case for using piece rates on rural public works will depend in part on the nature of labor contracts in alternative activities. If time rates prevail elsewhere (and they are not uncommon in many lean-season agricultural operations), then piece rates on rural public works will tend to attract the more productive workers out of the alternative activities, adding to the social opportunity cost of the scheme. There will then be a trade-off between on-site efficiency gains from piece rates and off-site effects on labor allocation.

Insurance benefits may also crucially depend on details of policy design. The insurance benefits to the poor from access to rural public works will clearly be diminished if employment is not guaranteed, or is only guaranteed in certain seasons. Depending on the design of the scheme, the insurance benefits will not be confined to the poor. Such benefit leakage to potential participants is costless from the point of view of the poverty alleviation objective as long as actual participation is well targeted to the poor. And it can also allow a wider base of political support, as discussed earlier.

The second-round effects discussed earlier have implications for policy design. Past schemes in South Asia have aimed to provide only unskilled manual work; opportunities for building training programs into the design of these schemes should be explored. The timing of work availability is also an important variable in policy design. The potential seasonal stabilization

benefits have already been noted. Here there is the possibility of a trade-off between the transfer and seasonal stabilization benefits of rural public works projects, associated with labor market responses. Peak period agricultural employment is likely to be more wage inelastic than for lean seasons, so the transfer benefits to the rural poor which arise through second-round effects on agricultural wage rates will be diminished if public employment is confined to only reducing the cost of seasonality to the poor (Ravallion, 1990).

The selection of projects and production inputs has generally aimed to maximize the employment of unskilled labor, often driving the quantities of other inputs (tools, raw materials etc.,) down to levels at which substitution possibilities with labor would appear to be negligible. To help assure high levels of labor intensity, policy makers have often imposed quantity constraints on non-labor inputs. For example, the EGS has operated under a constraint that labor costs should account for at least 60% of variable input costs, and it appears that this constraint is often binding in project selection. Similar constraints have been applied to Bangladesh's FFWP, in the form of restrictions on the monetization of food aid.

Are such restrictions consistent with the poverty alleviation objective of these schemes? As already noted, it is the income gain to the poor, rather than the gain in participants' employment, which directly determines the scheme's impact on poverty. Ignoring risk benefits, the poverty alleviation objective is served by maximizing the transfer benefit to the poor, subject to the budget constraint; the transfer benefit comprises the increment to wage earnings of the poor plus the value of any benefits that the poor derive from the project's output, while the budget constraint equates net outlays on

wages, materials, tools, and administration to the scheme's revenue plus the share of benefits from the output accruing to third parties which can be recouped by the government (through, for example, user charges).

Only under special conditions would the optimal input combination for this problem coincide with a conventional cost-minimizing allocation. The distribution of benefits from the scheme would not matter to the latter, and so (under competitive conditions) inputs will simply equate marginal value products with input prices. Nonetheless, the optimal labor intensity from the point of view of poverty alleviation will generally exceed the level which equates the marginal value product of labor with the wage rate.

However, the argument for driving labor input up to its technologically feasible maximum is weak. Optimal labor intensity will depend crucially on the ability of the scheme to attract only the poor, the benefits the poor can obtain from the scheme's output, and on the extent to which income gains to the non-poor from the project can be recouped. The case for simply maximizing the scheme's employment, subject only to the technological constraint that at least something can be produced, rests heavily on an assumption that all benefits from the scheme's outputs accrue to the non-poor, with the poor gaining nothing beyond the wages from the scheme, and the government being unable to capture any of the output gains. A good deal of the direct wage benefit of these schemes does appear to go to the poor, while much of the non-wage benefit goes to the non-poor. Data are scarce, but it is hard to believe that this fully characterizes the distributional outcomes, or that efforts cannot be made to increase non-wage benefits to the poor. For example, the rural poor in Bangladesh will certainly share in the benefits from a sealed road (relative to an unsealed one which is washed away in the next flood), yet

this may entail a sacrifice against the amount of immediate employment made available by the scheme. Restrictions on the labor intensity of the projects can also add to the difficulties sometimes encountered in finding suitable projects. Outlays on non-labor inputs will also be needed to exploit the opportunities for on-site training.

Returns to the assets created can also be enhanced by assuring that projects are well integrated into existing rural development plans. There are obvious complementarities amongst rural public works projects, not all of which need come under such a scheme. There is often scope for coordinating projects designed largely for immediate poverty alleviation with local and regional development plans. An example is Maharashtra's new scheme, "Rural Development Through Labour Force" (RDLF), an off-shoot of the EGS. RDLF encourages local, village-level participation in formulating labor intensive development plans, including specific EGS projects. Constraints on the use of non-labor inputs are thereby relaxed somewhat, being applied in the aggregate, rather than to individual projects.

Financing

Financing is required since much of the benefit to the non-poor from rural public works typically takes a form which is difficult to recoup (such as increased crop yields due to irrigation projects, or insurance benefits). In any case it is unreasonable to expect, or demand, a poverty alleviation scheme to cover its costs.

It should not be presumed that the extra revenue (above financial returns less costs) is obtained entirely from the non-poor (including, let us assume, aid donors). The same problems which make other forms of direct targeting a

fairly blunt poverty alleviation instrument, will also make it hard to avoid some of the poor bearing the cost of financing. Plainly, any cost of financing borne by the poor will reduce the poverty alleviation impact. Adverse effects on poverty of the method of financing can arise in two ways: i) the poor may bear some of the direct cost of financing via, for example, a tax increase, or ii) the poor may suffer in the longer term through effects of the method of financing on growth. As for any public expenditure program, rural public works can be financed either through changes in current taxes/expenditures or by borrowing.

Cuts in other expenditure programs from which the poor benefit, or increases in relevant taxes, will obviously mitigate the poverty alleviation gains. Nonetheless, the scheme can still be effective; for example, a public employment scheme successfully targeted at the poor can still help alleviate poverty even if financed heavily by the poor (such as by cutting other, less effective poverty alleviation programs), once general equilibrium effects on labor markets are considered (Ravallion, 1990).

Long-run effects on the poor of financing through borrowing are rightly of concern; there is ample indication of adverse effects of excessive debt on current growth, and (probably) poverty alleviation, in a number of developing countries (though past fiscal restraint has allowed the countries of South Asia to largely avoid such problems). Asset creation by these schemes will, to at least some extent, mitigate any adverse effects of the method of financing on growth. Plainly, if the scheme can create assets with a similar rate of return to that obtainable elsewhere in the economy then the growth cost will be small (Parikh and Srinivasan, 1989).

Though there is no hard evidence, there does not appear to be cause for great concern about the methods used in the past for financing the main rural public works schemes in South Asia, discussed above. Maharashtra's EGS has been financed largely by special taxes (income taxes on urban professionals, sales taxes, and a surcharge on irrigated land) and partly by general revenues. The immediate incidence of the cost of financing has probably been heaviest on the urban non-poor (Abraham, 1980; Herring and Edwards, 1983). Bangladesh's FFWP has been financed largely from food aid; some of the cost of financing has almost certainly been borne by the poor, though it is not as much as one might expect given that the main alternative channels for disbursing food aid in Bangladesh - under various food rationing schemes - appear to have largely benefited urban areas, and not even gone proportionately to the urban poor (Abdulla and Murshid, 1986; World Bank, 1989b). Diverting food aid resources out of the existing food subsidy schemes into the FFWP is very likely to have reduced poverty in Bangladesh.

6. Conclusions

The difficulty of designing cost-effective poverty alleviation schemes when information is highly imperfect may well be as daunting as the political constraints on implementation. Means tested transfers are rarely feasible in rural areas of developing countries. Past experiences with direct intervention suggest that corruption and other forms of leakage to the non-poor can add greatly to the cost of a given impact on poverty now, which is also likely to diminish the scope for future poverty alleviation through growth. Some of the poor will simply not be reached, and benefit leakage to the non-poor is unavoidable.

There is some scope for targeting on the basis of indicators of poverty which are relatively hard to manipulate, such as region and/or sector of location, and landholding class. Sample surveys have confirmed casual observations that there are large regional/sectoral disparities in poverty incidence, and poverty in rural areas is positively correlated with landlessness in South Asia. However, these correlations are far from perfect, and simulations have suggested that the quantitative potential for poverty alleviation using readily available indicators alone is probably quite modest.

One way to enhance the impact on poverty is to build incentives into the scheme which encourage participation by the poor, and discourage that of the non-poor. With the right incentives, the poor are then "self-selected", and this can augment, or entirely replace, indicator targeting. Work requirements are an example. If the wage rate that a worker will accept is positively correlated with income then a work requirement will screen the poor. Provided that forgone income, or other costs of participation, are not too high for the poor, self-selecting schemes based on such work requirements will be more cost-effective than alternatives. That is an empirical question.

Though there have been a number of empirical studies of these schemes, they have not yet permitted a convincing assessment of their cost-effectiveness relative to alternatives. But the available evidence is clearly encouraging enough to warrant further investigation.

Evidence on the targeting performance of rural public works can be obtained from some of the surveys that have been done of participants. Unfortunately, past surveys have often focused on imperfect correlates of targeting performance, such as the proportion of direct benefits going to the rural landless. A better approach is to ask whether participants are poorer

than the population as a whole. The past surveys which allow us to focus on this question suggest that a substantially greater proportion of participating workers in both the Maharashtra scheme and Bangladesh's Food for Work Program came from low income households than one would expect in a random drawing from the rural population as a whole. For example, by combining independent but broadly comparable household survey results, I estimate that 60% of participants in the Bangladesh scheme come from the poorest quarter of rural households. Virtually all participants would be considered "poor" by conventional local norms.

There is surprisingly little evidence from the existing literature which allows us to properly measure the forgone incomes of participants. My estimates from past income surveys of both participating and non-participating villages for the Bangladesh and Maharashtra schemes suggest that the immediate net income gain may be little more than half of the gross wage payment. There is likely to be substantial variation around this figure, such as by agricultural season and gender of participant. Further research is needed to assess to what extent the seemingly excellent "screening performance" of such schemes is mitigated by the participation costs facing the poor.

One must also consider the indirect benefits. These are hard to quantify, but even ignoring any benefits that the poor may derive from the assets created, it is plausible that the direct transfer benefit is substantially less than the total benefit to the poor, once second-round effects on agricultural labor markets and (possibly) tenancy contracts are considered. Some displacement of alternative employment is probably unavoidable, and, indeed, it can be a positive factor, as part of the economic adjustments generating indirect transfer benefits to the poor.

Risk benefits can also be substantial in lessdeveloped agrarian settings; there is ample evidence from South Asia that relief work can save the rural poor from the potentially disastrous effects of a sudden contraction in real incomes from other sources. This can not only save lives, but can prevent more costly forms of adjustment, such as the sale of assets. The extra insurance provided may also encourage more productive investment.

Rural public employment will not be equally effective in alleviating poverty in all circumstances. Certain sub-groups of the poor may be unwilling to participate, though an advantage of these schemes is that such sub-groups can often be readily identified by relatively non-manipulatable indicators, such as old age or physical disability, and so may be reached by supplementary indicator targeting (Dreze and Sen, 1990). In the (albeit unlikely) event that the labor-time of the poor is already fairly productively employed, and labor demand is fairly wage elastic, forgone earnings may be so large, and indirect transfer benefits so low, as to make rural public employment a good deal less cost-effective than even untargeted transfers, allowing for second-round effects on labor markets. Transport costs (including time) also reduce the gain to participants. Cost-effectiveness in poverty alleviation will tend to be lower in areas of lower population density, and hence higher transport costs, *ceteris paribus*. This may make other policies more attractive. Screening performance will also be better in some circumstances than others. Random variability in reservation wage rates (associated with, for example, the dispersion in transport costs facing potential participants in regions of uneven density) will diminish a scheme's performance in screening the poor, by reducing the correlation between the reservation wage rate and living standards. The productivity of the assets created will undoubtedly also vary,

with implications for the scheme's impact on both current and future poverty. Rural public works are likely to dominate certain policy options for poverty alleviation in certain circumstances, but they should not be viewed as a panacea for poverty in all places or all times.

Nor should such a scheme be allowed to expand indefinitely. It is plausible that rural public works will yield decreasing marginal benefits in terms of current poverty alleviation; it will tend to be the least poor who are the last to participate. One can also expect that marginal costs in terms of other policy objectives will tend to increase. It is thus likely that an optimal size will exist, and one should not rule out the possibility that this will occur well before poverty is even approximately eliminated by this means.

We should be wary of some of the rules-of-thumb that have been suggested to guide the design of these schemes. For example, once the full range of potential benefits is considered, the most cost-effective scheme is unlikely to be the one which simply minimizes the forgone income of participants, such as by only employing the unemployed. Nor is it likely to be the scheme with the best targeting performance, narrowly defined as the proportion of direct participants who are poor. Maximizing employment of unskilled labor is also likely to provide a misleading guide to the selection of projects and their implementation, in that it will not generally be consistent with the maximum impact on poverty for a given resource cost.

One simple principle for policy design does seem to have a lot going for it, namely the employment guarantee embodied in the Maharashtra scheme. To target initial benefits to the poorest, exploit the insurance benefits to all of the poor, and to undercut some of the possibilities for their exploitation both on the project site and in labor markets, there should be as few

restrictions on the guarantee as feasible, and wage schedules and the rights of participants should be well defined, well known, and non-discriminatory.

The budgetary allocation and the feasibility of an employment guarantee must be looked at carefully. In general, there will be a critical minimum budget, below which the guarantee is infeasible, in that it will not be consistent with a wage rate sufficient to attract participation, which is rarely costless. Beyond this, the optimal budgetary allocation to the scheme (and, hence, the wage rate) should be determined by properly weighing the marginal benefits of current poverty alleviation against marginal costs in terms of other objectives of public policy, including the alleviation of expected future poverty.

Notes

1. For example, if the cumulative distribution function of post-reform incomes lies nowhere above that for pre-reform incomes then, for a broad class of possible poverty measures and all possible poverty lines, the reform will not have increased poverty; see Atkinson (1987). Also see Foster and Shorrocks (1988).

2. For example, Hartmann and Boyce (1983) describe how an aid financed deep tube well intended for 25-50 farmers in Bangladesh came to be effectively "privatized" by a single rich farmer. Also see Chowdhury (1983a), Hirway (1986), and Hossain (1987). The problem is not unique to Bangladesh by any means; see for example Dreze's (1988) interesting discussion of how ineffective public policies have been in reaching the poorest in a north Indian village.

3. See, for example, Nichols and Zeckhauser (1982), Roberts (1984), Blackorby and Donaldson (1988), and Besley and Coate (1988).

4. There are many other examples. A similar screening function can be served by in-kind transfers of goods which the poor consume intensively but cannot be re-sold by the non-poor (Nichols and Zeckhauser, 1982). Queuing time is also used in allocating rationed food, and this cost is also likely to be lower for the poor, though see Alderman (1987). The cost imposed can take many forms; e.g., in trying to target health services to the poor, NGO's in India and elsewhere have deliberately provided lower levels of comfort (Murthy et al., 1989).

5. It may be sensible to subsidize misrepresentation by the poor. For example, poor households with relatively large landholdings (and they do exist in rural South Asia; see Ravallion, 1989a) might be encouraged to understate the size of their holdings when benefits are targeted to the landless.

6. The nineteenth century Poor Law in England used this device, as did the famine relief codes in British India. Performance in reaching the poor has been a prominent issue in recent debates on poverty alleviation policies in India; see, for example, Rath (1985), Dantwala (1985), Dreze and Sen (1990). For an interesting theoretical analysis of such schemes see Besley and Coate (1988).

7. For example, such schemes ameliorated concerns about theft in British India (Herring and Edwards, 1983).

8. See, for example, Narayana et al., (1988) and Parikh and Srinivasan (1989).

9. See, for example, Rath (1985), Subbarao (1985), Kurian (1987), Bagchee (1987), Shah (1987), Rao and Rangaswamy (1988), Hirway (1988), Osmani (1988, 1989), Bandyopadhyay (1988), Pulley (1989), World Bank (1989a), Gaiha (1990).

10. Though (as Dandekar and Sathe point out), the same evidence does not suggest that EGS was very successful in getting participants over the poverty line, though this may have altered with the subsequent increases in the real wage rate during the early 1980s. I shall comment further on this issue later.

11. See Osmani and Chowdhury (1983) and BBS (1986). The income definitions used in the two surveys are discussed in Quasem and Hossain (1985) and BBS (1986). They appear to be similarly comprehensive and both use an annual reference period for most income sources. However, since the BIDS/IFPRI survey used multiple interviews (at the end of each of the three main cropping seasons) it is probably more accurate. It is unclear how the greater measurement error in the BBS distribution will affect the comparison. The more important difference between the two data sources is probably that the BIDS/IFPRI distributions reported in Osmani and Chowdhury (1983) are for income per male adult equivalent, while the BBS results are for income per capita. It is not possible to correct for this difference without access to the unit record data. However, it can be argued that the difference is more likely to lead me to underestimate the extent to which the FFWP is effectively targeted to the poor. To elaborate, let c denote the relative child cost, so that the number of equivalent adults (ignoring any difference between males and females) is simply the number of adults, denoted a , plus c times the number of children. The ratio of income per equivalent adult to income per capita is then given by $(1+k)/(1+c.k) > 1$, where k denotes the proportion of children to adults. Also let F denote the cumulative distribution function of household income per capita. Then the proportion of households with an income per equivalent adult below any number z is simply given by $F[z(1+c.k)/(1+k)] < F(z)$. Thus, the "equivalent adult distribution" will lie nowhere above that based solely on the number of persons. In terms of Figure 2, the unknown distribution of income per equivalent adult for the rural population as a whole would be lower than that indicated.

12. BBS (1984) give a figure of 43% for rural Bangladesh in 1978/79. Note that targeting toward the landless appears to have been even more effective; those with no land accounted for 55% of participants, while they represented 7% of the rural population in 1978/79.

13. The BIDS/IFPRI survey included a control group of similar villages without access to the FFWP. However, prior to the season, the wage income of FFWP participants was 29% higher than that of the control group. The actual earnings of the control group during the FFWP season (of 42 days) were Taka 352, so (allowing for this 29% discrepancy) one can estimate the earnings of the FFWP participants would have been Taka 455 in the absence of the scheme. Their actual earnings in the FFWP season were Taka 649, of which Taka 342 was their gross receipts from the program. Thus, their estimated net income gain (Taka 194) represented 57% of their gross earnings from the scheme.

14. There have been studies of the general equilibrium effects of direct poverty alleviation schemes in this setting, though the models used have not included a labor market and so have not been able to address these specific issues; see Narayana et al., (1988) and Parikh and Srinivasan (1989).

15. For a recent survey see Platteau (1988).

16. A narrow focus on the "headcount index" of poverty may miss this point. Recent evidence on poverty over time for villages in India's semi-arid tropics suggests that stabilizing incomes can be an effective means of reducing the expected levels of distributionally sensitive measures of poverty, but the same study also suggests that expected gains in terms of the headcount index of poverty are negligible; see Ravallion (1988).

17. See, for example, Jodha (1978), Lieberman (1985), Walker et al. (1986), Dreze (1990), Dreze and Sen (1990).

18. There are a number of factors that would need to be considered before one could properly evaluate this argument. For example, one would have to consider the effect of such employment on the availability of labor to the activities which use the newly invested savings; if labor and capital are cooperant inputs to those activities (meaning that an increase in labor input will increase the marginal product of capital) then public employment may well discourage such investments.

19. See, for example, Dandekar's (1983) discussion of corruption problems on EGS. Also see Lieberman (1985) and Echeverri-Gent (1988). There have been reports of corruption by managers and local government officials on Bangladesh's FFWP and casual observers believe this to be an increasing problem.

20. To capture the "severity" of poverty one uses measures which are sensitive to the degree of inequality amongst the poor, following Sen (1981).

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