Occasional Paper No. 7

Conceptualizing Inclusive Development: With Applications to Rural Infrastructure and Development Assistance

Ravi Kanbur and Ganesh Rauniyar
December 2009

Ravi Kanbur, T.H. Lee Professor of World Affairs, Cornell University; and Ganesh Rauniyar, Senior Evaluation Specialist, Independent Evaluation Department, Asian Development Bank.

Independent Evaluation Department
Asian Development Bank
The views expressed in this paper are those of the authors and do not necessarily reflect the views or policies of the Asian Development Bank.

The ADB Evaluation Occasional Paper Series is an informal forum to present the reviews and findings of work in progress in evaluation or research relating to development effectiveness undertaken by ADB staff, consultants, and resource persons. The papers of the series are circulated to encourage discussion, elicit feedback, and advance knowledge. They are a rapidly disseminated, informal publication whose titles could subsequently be revised for publication as articles in professional journals or chapters in books. The series is maintained by the Independent Evaluation Department.
## CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>i</td>
</tr>
<tr>
<td>I. INTRODUCTION AND SUMMARY</td>
<td>1</td>
</tr>
<tr>
<td>II. WHAT IS INCLUSIVE DEVELOPMENT?</td>
<td>2</td>
</tr>
<tr>
<td>III. RURAL INFRASTRUCTURE AND INCLUSIVE DEVELOPMENT</td>
<td>6</td>
</tr>
<tr>
<td>IV. DEVELOPMENT ASSISTANCE TO RURAL INFRASTRUCTURE FOR INCLUSIVE DEVELOPMENT</td>
<td>10</td>
</tr>
<tr>
<td>V. CONCLUSION</td>
<td>14</td>
</tr>
<tr>
<td>REFERENCES</td>
<td>15</td>
</tr>
</tbody>
</table>
ABSTRACT

This paper undertakes three tasks. The first and major task is to define inclusive development, in particular distinguishing it from growth, pro-poor growth, and inclusive growth, and differentiating them from each other. The paper then applies this definition to specific issues focusing on rural infrastructure. The second task is to discuss the relationship between rural infrastructure and inclusive development. The third and final task is to draw out the implications of the recent literature on development assistance and its effectiveness, for aid agency support of rural infrastructure with the objective of inclusive development.
I. INTRODUCTION AND SUMMARY

1. This paper sets out a framework for discussing the role of development assistance for rural infrastructure to advance inclusive development. A number of issues are discussed and clarified.

2. The first task is to define inclusive development, in particular distinguishing it from growth, pro-poor growth, and inclusive growth; and differentiating them from each other (Section II). Starting with growth, which has a tight and well-accepted definition as an increase in real per capita income, pro-poor growth is identified as growth that also reduces income poverty. Inclusive growth is growth that is accompanied by lower income inequality, so that the increment of income accrues disproportionately to those with lower incomes. With these definitions, growth can be pro-poor without being inclusive, since (as has happened in many countries over the past 2 decades), growth can be accompanied by falling poverty but rising inequality. The concept of development differs from growth in expanding the focus from income alone to other dimensions of well-being, in particular education and health. Inclusive development, thus, refers to the improvement of the distribution of well-being along these dimensions at the same time that the average achievement improves. The Millennium Development Goals (MDGs) identify a number of these dimensions, and provide a good framework for measuring and identifying inclusive development.

3. The second task is to discuss the relationship between rural infrastructure and inclusive development. The literature shows some evidence, nuanced, on the causal connection between investment in infrastructure (for example, national road or electricity grids servicing the main production centers) and growth. This linkage also underpins the role of infrastructure in inclusive growth, since the literature not only identifies a rising spatial inequality accompanying growth in the past 2 decades, but also locates part of the causality in an uneven distribution of infrastructure, in particular across rural and urban areas. Infrastructure for inclusive growth must, therefore, address its adequacy in rural areas: for example, rural roads connecting villages to each other and to small market towns, and these small market towns to the district capital. Recent literature on education and health also has ample evidence of the role of rural roads in determining achievements along these dimensions. Thus, rural infrastructure is also a causal determinant of inclusive development, provided that attention is given to use of the infrastructure at the same time as its supply.

4. The third and final task is to draw out the implications of the recent literature on development assistance and its effectiveness, for aid agency support of rural infrastructure with the objective of inclusive development. The paper reviews this literature and identifies its macro and micro strands. The former discusses fungibility, budget support versus project support, conditionality, and aid allocation based on outcomes. Micro examination discusses rigorous project evaluation, especially in the framework of randomized, controlled trials. The implications for aid agencies involved in rural infrastructure include greater emphasis on support for sector-wide infrastructure programs with allocations conditioned on actual MDG outcomes, targeting support to projects in areas with the lowest MDG achievements, assessing whether the achievements are constrained by supply or by demand, and integrating rigorous evaluation with baselines and controls into the project design.
II. WHAT IS INCLUSIVE DEVELOPMENT?

5. In addressing the question of what is meant by inclusive development, two issues arise: first, the distinction between growth and development; and second, the import of the term inclusive. Development brings into play dimensions of well-being beyond simply income, while inclusive focuses attention on the distribution of well-being in society. Further intricacies arise, as will be seen, because the answers to these two questions are in fact interrelated.

6. In principle, the distinction between growth and development should be clear at a general, abstract level. Growth refers to economic growth, in other words, increase in per capita income. This is a narrowly defined technical concept that is measurable and is, indeed, measured by statistical agencies the world over. Development, on the other hand, is not at all well-defined, at least not as precisely defined, as growth. At different times the term has been used to refer to (i) just economic growth, (ii) changes in economic structure of production (rising share of industry and then services from an agricultural base), (iii) spatial distribution of population (increasing urbanization), and (iv) improvements in social indicators of education and health, etc. The modernization debate in the social sciences has partly been about the normative significance of the trajectory of a country that might go through the above changes—is it a good thing and should countries aim to go through this trajectory?

7. Perhaps, the best known exemplar of the distinction between growth and development, certainly in terms of indicators that are on par quantitatively with economic growth as an indicator, is the human development index (HDI). As is well known, this index combines per capita income of a country with two other indicators to arrive at a single index of development. The two other indicators relate to education (measured by literacy rate), and health (measured by life expectancy). The objectives of those who formulated and developed the HDI included the explicit broadening of the evaluation of country performance from sole reliance on per capita income to considering other dimensions of human well-being.

8. We will return to the distinction between solely income-based versus more broadly constructed measures of well-being. Now, let us discuss what is meant by inclusive. Fairly clearly, it refers in some sense to the distribution of well-being, however measured. A given average for a population can be distributed in an infinite number of ways, ranging from perfect equality to extreme equality. And we can evaluate this distribution in a number of different ways, depending on what specific social welfare function is used in evaluating individual well-being, and then aggregating the evaluation to a social level.

9. One specific form of a social welfare function defined on the basis of income, for example, would lead to the well known Foster-Greer-Thorbecke class of poverty indices, which have now become the workhorse of empirical income poverty analysis among researchers and in international agencies. This class of indices includes the standard head count ratio measure (the fraction of population below the poverty line), the income gap measure (the shortfall of poor incomes from the poverty line normalized by the poverty line and total population), and the squared income gap measure (using the square of the shortfall, to emphasize the well-being of the poorest of the poor). Thus, this class of indices can capture judgments of values by varying the degree of poverty aversion. Another member of this family, as the poverty aversion

---

1 See Foster, Greer, and Thorbecke (1984); for an early use of this family of indices see Kanbur (1987); for an example of recent usage, see Ravallion and Chen (2007).

2 Although not the focus of this paper, the poverty line is a key ingredient of poverty measurement. For a review of the poverty lines literature, see Ravallion (1998).
becomes infinitely large, coincides with the Rawlsian maxi-min measure—evaluation is determined solely by the lowest level of well-being, in this case the lowest level of income.

10. Let us then pursue the notion of inclusiveness as being captured in some sense by poverty. For a given level of average income, inclusiveness can be measured simply by the degree of poverty. As for changes in average income, growth and its inclusiveness can, thus, be measured by the change in poverty. Specifically, we can calculate poverty change per unit of increase in per capita income, convert this into elasticity, and use the result as a measure of the inclusiveness of growth. Such exercises are now common and yield useful insights into the nature of growth. Clearly, a given increase in per capita income—a given growth rate—is consistent with a range of changes in poverty (including, even, an increase in poverty). This leads then to the idea of pro-poor growth, which at this level is indistinguishable from inclusive growth. Both could be measured by the growth elasticity of poverty reduction.³

11. But consider now the behavior of income distribution above the poverty line and, more generally, the inequality in the overall distribution, as growth takes place. For example, if inequality in the overall distribution falls with growth, this would have some claim to be labeled inclusive growth. If there is growth, and a fall in overall inequality, poverty will fall and so, in this case, growth will be pro-poor as well. But if there is growth and an increase in inequality, then we could have the case that poverty falls because the growth effect dominates the inequality effect. In this case, growth is pro-poor in the sense that poverty has fallen; but it is not inclusive in the sense that inequality has risen.⁴ These are not just definitional games. The recent experience of most fast-growing economies, in Asia and elsewhere, matches this stylized pattern.⁵

12. Using these definitions, we might say that inclusive growth is necessarily pro-poor, but non-inclusive growth (in the sense of inequality increasing with growth) is not necessarily anti-poor, provided it is not too non-inclusive (i.e., the inequality rising effect does not dominate the growth effect on poverty). However, making the same rate of growth more inclusive (inequality falling more or not raising so much) must make that growth more pro-poor. And, since there is a range of possibilities for distributional change associated with any given growth rate, inclusiveness itself can be more or less pro-poor—certain types of inequality decrease (for example, those that increase middle-level incomes) and reduce poverty by less than other types of inequality decrease (for example, those that increase the lowest incomes). To summarize on income, therefore, the focus of policy for poverty reduction must be growth with as much inclusiveness as possible, and with as much inclusiveness of the poorest as possible.

13. Clearly, the same framework that is now widely applied to income could, in principle, be applied to non-income dimensions of well-being.⁶ For example, if literacy were conceptualized

---

³ For a recent overview and extension of the literature on growth-elasticity of poverty reduction, see Klasen and Mistlethorn (2007).
⁴ There is a large and, by now somewhat, confusing literature on these matters. Thus, Ravallion (2004) identifies two definitions in the literature of pro-poor growth: “One finds two quite different definitions of pro-poor growth in recent literature and policy-oriented discussions. By definition 1, pro-poor growth means that poverty falls more than it would have if all incomes had grown at the same rate (Baulch and McCulloch 2000, Kakwani and Perna 2000). By definition 2, pro-poor growth is growth that reduces poverty (Ravallion and Chen 2003).” It should be clear that the first definition comes closer to our notion of inclusive growth.
⁵ This pattern and its implications for the development discourse, are discussed further in Kanbur (2007).
⁶ For a recent application to India, see Sahn (2005).
as a continuous variable, then the literacy rate used in HDI would be seen as the analog of the head count ratio, where the poverty line is a minimum level of reading and writing ability. The same issues would arise along this dimension of inclusiveness. There could be an improvement in the average level of literacy, with little or no improvement in literacy below the minimum cutoff. On health, average life expectancy across all individuals could improve, but with little or no improvement below some acceptable minimum. Inequalities in health outcomes have become a matter of growing interest in developing and developed countries alike, and some conceptual energy has been devoted to measuring health inequality. Then if development, beyond growth, is to do with improvements in average levels of attainment along dimensions other than income, inclusive development has to do with the distribution of these improvements. Inclusive development occurs when average achievements improve and inequalities in these achievements fall. By analogy with the income case, we can define pro-poor development as occurring when improvements in average attainments are accompanied by improvements of achievements below a critical threshold. Thus, when development is inclusive it is also pro-poor. But development can be pro-poor even though it is not inclusive. Increased inequality in this non-income dimension is acceptable, provided that the increase is not large enough to offset the impact of the average improvement along this dimension on non-income poverty.

14. Thus, a move from just growth to inclusive development involves two steps—a move to evaluate the distribution as well as the average level of well-being along any dimension considered, and a move to include dimensions other than income in assessing performance. The move from growth to inclusive growth takes only the first step, staying focused on the income dimension. The move from growth to development takes only the second step, by bringing in non-income dimensions but staying focused on average achievements. Inclusive development as a concept invites and requires that both steps be taken.

15. Is HDI a Measure of Inclusive Development? HDI certainly satisfies the second requirement, because it brings in education and health alongside income in constructing an overall measure of well-being or performance for a country. However, it shows a concern for distribution only along one of these dimensions. This dimension is education because, as argued earlier, literacy, measured as the achievement of minimum levels of reading and writing, can be seen as being analogous to income poverty—it focuses attention on the lowest levels of educational achievement. But along the income dimension the HDI uses only per capita income, not its distribution and not income poverty measures. Similarly, along the health dimension the measure is average life expectancy, which can, in principle improve while its distribution worsens. Thus, HDI is not a measure of inclusive development. It should be noted, however, that there have been several attempts to modify the HDI to make it distributionally sensitive (e.g., by introducing income poverty rather than average income) or gender sensitive (by taking into account the distribution of education and health across the genders). But the core HDI, the headline HDI, does not have these features.

16. What of the MDGs? How Close Do They Come to Capturing Inclusive Development? The answer is that, in their totality they do represent a decisive shift away from the pure economic growth assessment of country performance, both because they bring in more dimensions than income and because they bring in distributional considerations along the dimensions. Thus, the two key indicators of the first goal (end poverty and hunger)—to halve between 1990 and 2015 the proportion of people whose income is less than $1 per day, and to

---

7 For a recent example, see Foster and Allison (2004).
8 For example, see Anand and Sen (1994); Hicks (1997); and Foster, Lopez-Calva, and Szekely (2005).
halve the proportion of people who suffer from hunger—focus on distribution, as well as going beyond just income (to bring in nutrition). The second goal, to achieve universal primary education, obviously goes beyond income but focuses attention on the lowest rung of educational achievement. The third, fourth, and fifth goals (on gender equality, child health, and maternal health) also emphasize distributional improvements of non-income dimensions.

17. The sixth goal, combating the Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), malaria and other diseases, has as a target, for example, the achievement of universal access to treatment for HIV/AIDS to all those who need it. This is certainly a non-income goal, but what of its distributional characteristic? If we conceptualize HIV/AIDS on a continuum from worst to less bad, then universal access to treatment is like equalizing the shortfall of good health from the critical minimum. In this sense, it can be viewed as analogous to an income poverty target. But suppose HIV/AIDS afflicts primarily those who have higher incomes. Then, in addressing distribution along one dimension, we might give additional resources to those who are better off along another dimension. This raises the question of aggregation along different dimensions, which we will take up presently.

18. The seventh MDG goal, environmental sustainability, has several components, some of which are distributionally sensitive, and others are not. Thus, the subgoal of halving the proportion of population without sustainable access to safe drinking water and basic sanitation is analogous to halving income poverty. But the distributional aspects of another subgoal, that of reducing biodiversity loss, are not self-evident since biodiversity cannot be ranked across individuals in the same way that income, or education, can. It is not clear who will benefit from reducing biodiversity loss at the national or global level. Once again, it leads us into following through the impact of acting on one dimension on the distributional characteristics of other dimensions—for example, will reducing biodiversity loss benefit the income poor or the income rich?

19. Growth is a unidimensional measure of performance. As discussed earlier, pro-poor growth or inclusive growth, while still focused on income, faces issues of aggregation across individuals—poverty indices are one way of effecting this aggregation, and more general social welfare functions are essentially methods of aggregating the myriad changes in income across individuals into a single national-level index for evaluation. The concept of development introduces dimensions of well-being beyond income, but this raises the question of aggregating across these dimensions to arrive at a single measure of performance. What if income rises but health or education worsens? Even if all dimensions move in the same direction, if changes are at different rates in different countries for different dimensions, the evaluation question remains. The HDI resolves this in a particular way—it takes an equal weighted average of the indicators along the three dimensions of income, education, and health. But it is not clear on what basis these weights, or indeed any other set of weights, can be chosen. The extensive debate on the question has not resolved the issue.9

20. Given the state of the literature, and accepting that growth by itself is not an adequate indicator of performance, we would argue that we should consider four things in assessment and evaluation: (i) economic growth; (ii) measures of income distribution, including income poverty; (iii) measures of average performance along dimensions other than income, in particular education and health; and (iv) measures of distribution along non-income

---

9 For an early critique of the weighting issues, see Kanbur (1990). Recent efforts to address the issue include Despotis (2005) and Foster, Lopez-Calva, and Szekely (2005).
dimensions of well-being, including distribution not only across individuals but across salient groups such as gender or ethnicity. In many ways, the MDG approach does this. There is an inevitable untidiness about the MDG approach since it has many dimensions and many indicators, but this is inevitable if we want to move from growth to inclusive development as the objective of policy.

21. Finally, we want to clarify that the focus of discussion here has been on assessment and evaluation of the outcomes of policy and the development process. These outcomes are multidimensional, and assessment is correspondingly complex. But this does not say anything about how these outcomes arise, or how they can be improved. That is a separate question, and will be taken up in the next section, focusing in particular on infrastructure interventions. But it is as well to address a tendency in some parts of the literature, that one set of outcomes are essentially all that we need to focus on, because the other dimensions track these outcomes very closely, statistically, and causally. This argument is, indeed, made for income—traditionally for economic growth, but more recently for income poverty. Thus, it used to be argued, and is still argued, that education and health, for example, track income fairly closely, so we might as well focus policy on the income dimension. There are two problems with this argument. First, there is the straightforward statistical argument that education and health do not in fact track income perfectly. Even when there is a significant statistical relationship on average, there is considerable variation around the average, and countries at the same level of per capita income can have widely different achievements in non-income dimensions. This holds also for the relationship across individuals. Second, and more importantly, even the significant statistical relationship does not establish causality, at least not unidirectional causality from income to the other dimensions. There is significant evidence that education and health feed back positively on income. There is, thus, no substitute for careful analysis of each intervention and its impact on multidimensional outcomes, taking into account feedback effects from each dimension on to the others. And, as a practical matter, the MDGs provide a useful way of structuring the outcomes to focus on.

III. RURAL INFRASTRUCTURE AND INCLUSIVE DEVELOPMENT

22. Investing in infrastructure, rural infrastructure in particular, is a policy instrument available to governments to advance their objectives. What light does the objective of inclusive development, as characterized in the previous section, throw on the instrument, and what guidance does it provide for the deployment of the instrument? We focus on the differences with the objective of growth, which means paying attention to two issues—outcomes beyond income and distribution of those outcomes. As argued above, the MDGs provide a good way of addressing these concerns.

23. Infrastructure is a broad term. The standard usage is of course in terms of roads. But electricity, telephone connections, water supply, buildings to house markets, all fall into this category. In what follows we will use roads as the leading example, and will mostly have roads in mind when we use the term infrastructure, with qualifications noted as they arise.

24. The relationship between infrastructure and the levels and growth of income at the country level is much discussed in the literature. In principle, there could be excessive investment in infrastructure with the growth objective, in the sense that the economic rate of

---

10 We would argue that these propositions are widely accepted by now, and literature supporting them is voluminous. Here is a series of papers over the years that argues the case: Sen (1988); UNDP (1996); Ramirez, Ranis, and Stewart (1998); Sen (2001); Sahn (2005); Joshi (2007); Commission on Growth and Development (2008).
return from the investment is below the opportunity cost of funds; however, a significant body of
literature argues that the issue in most developing countries is too little infrastructure to support
rapid growth.11 The most obvious case is road connections between production centers
(whether manufacturing or natural resource extraction) and points of export. Thus, for example,
it is argued that one of the reasons why structural adjustment did not have as much success as
expected in Africa was because of the poor state of infrastructure. Getting the prices right to
serve as incentive for agricultural production for export was not of much use if the produce could
not get to the port on time and in good condition. But cuts in public expenditure, and especially
in public investment, worsened an already bad situation and negated the pricing reforms.
Coming right up to date, recent discussions on infrastructure constraints to India’s growth
prospects have led to an agreement on the need for massive investment if Indian growth is to
be sustained.12 However, while it is the assessment of the authors that infrastructure does play
a central role in economic growth, it should be made clear that the literature is not united in
ascribing causality from infrastructure to economic growth. At least, cross-country regression
analysis that tries to establish this link has been questioned by some authors.13 The relationship
between infrastructure and economic growth is perhaps best seen as being positive but
nuanced.

25. Equally, there is a lively debate on how exactly infrastructure can play this role, and
whether such a role should even be envisaged for it, or whether the government should simply
stick to deploying infrastructure in supporting a growth strategy. The issue is important because
different types of infrastructure investment have different outcomes, and real choices have to be
made.

26. Let us start then with roads and their role in inclusive growth. Spatial disparities in
income and income growth have long been discussed in developing countries. It is well-
documented that such disparities have been growing in the last two decades, accompanying
globalization and high national-level growth rates. Internal divergence between rural and urban
areas, between coastal and inland areas, and between subnational regions more generally,
which tracks unequal development of infrastructure across these divides, has become a
worrisome aspect of recent growth experience.14 What should be the policy response to this?
The consensus is that a reversal of the opening up of economies to global integration, which
has created opportunities but also inequalities, is not really an option. No country has attained
sustained growth without access to global markets, global investment, and global know-how.
Rather, the question is how the growing inequalities can be managed.

---

11 There is a large literature on infrastructure and growth. Here is a selection: World Bank (1994), Canning (1998),
12 For a recent assessment see World Bank (2007).
13 In a recent paper, Estache and Fay (2008) take a particularly skeptical line: “There is still considerable
disagreement as to whether infrastructure accumulation can explain countries’ differing growth paths. Even if
infrastructure is necessary for modern economies to function, it may not be the case that more infrastructures
cause more growth at all stages of development or at any for that matter.” In similar vein, Straub, Vellutini, and
Waniters (2008) do not find a significant relationship between infrastructure and growth for East Asia. Part of the
problem in macrolevel assessments is that infrastructure variable may be too aggregated. Duflo and Pande (2007)
find that while large dam construction in India was marginally cost-effective, it contributed significantly to increased
poverty.
14 The most recent compilation of evidence comes from a major UNU-WIDER project. The overview, summarizing
evidence from 58 countries, for 26 of which there was information at two or more points in time on spatial
disparities over the past two decades, is presented in Kanbur and Venables (2007). A selection of papers on
spatial inequality in Asia is available in Kanbur, Wan, and Zhang (2007). The World Bank’s views and evidence on
spatial disparities are summarized in World Bank (2008).
27. Since the evidence and analysis demonstrate that, in the face of growth opportunities, some of the causes of regional divergence are due to divergence in the level and quality of infrastructure, the policy response is seen to lie in addressing infrastructure deficits in lagging regions.\(^{15}\) This applies both to infrastructure within these regions, as well as to infrastructure that links lagging regions to advancing regions and to the global economy.

28. Thus, the perspective of inclusive growth leads to a natural focus on rural roads. Rural areas contain the bulk of the national poor, globally in aggregate but particularly in Asia, and those are among the areas that have been lagging in terms of income growth. This is apparent both in direct comparison of income growth in rural and urban areas, but also in the observation that lagging regions are more rural in their composition than advancing regions in nearly all countries. Putting together the evidence on the causal connection between road connections and income growth, and the evidence on relatively low levels and growth of incomes in rural areas, it follows that policy should focus on (i) improving road connections within rural areas and (ii) improving road connections between rural and urban areas. Within the framework of a national road grid, between roads connecting villages and small market towns in rural areas, and roads connecting small towns and district capitals, which have larger markets and other facilities such as hospitals, the former have priority.

29. A question may be asked about higher level connections in the national road grid. Surely, it can be argued, without road connections between district capitals and state capitals and other industrial centers, including ports, lower level connections will be wasted? This is, however, a question of complementarity and priority. The higher level connections are important, but given those, the value to the poor in rural areas depends on the density of the lower level network. As the density of lower level connectivity increases, the marginal return to the poor will decrease and the argument for enhancing the higher level connectivity will strengthen. At some point the case for higher level connectivity dominates. But until then, the case for lower level rural roads remains strong. This is of course if the objective is inclusive growth—growth that brings along those at lower income levels. If the objective were just growth, then investment in higher level connectivity—from the industrial areas to ports, or even from natural resource-rich areas directly to the ports, would be the top priority. This is one of the ways in which an inclusiveness perspective changes the priorities of policy.

30. The discussion above and throughout the paper focuses primarily on the benefit side of infrastructure spending. But there is also the cost side to take into account, as is the case for any public intervention. The poor are more likely to be found in sparsely populated and/or remote areas, which means that the cost of providing a certain type of infrastructure (e.g., roads) is more expensive per beneficiary. The appropriate valuation measure is the social value of infrastructure in such areas relative to the social marginal cost of providing this infrastructure, the latter being a product of the marginal financial cost and the social marginal cost of public funds. It may well be the case, therefore, that the costs of providing infrastructure in some areas are so high that even with high social benefits, such provision is not socially optimal. These issues are discussed further in Kanbur and Venables (2007).

31. The objective of inclusive development, improving the well-being of the worst off along non-income dimensions such as education and health, strengthens the case for rural roads even more. As noted earlier, while income growth is one determinant of improvements in education and health, it is not the only one, and there is considerable variation in these

---

\(^{15}\) The evidence is overviewed in Kanbur and Venables (2007). Here are some examples of papers that argue along these lines: Ravallion (2005), Lall and Chakravorty (2005), and Christiaensen, Demery, and Paternostro (2005).
achievements at any level of income. Direct intervention along these dimensions so as to improve the lowest achievements is what we are led to if we accept the objective of inclusive development. And rural roads are central to improving these achievements.16

32. There is now considerable evidence that transportation is strongly complementary to health and education achievements. Take the case of maternal mortality, reduction of which is one of the MDGs. Clearly, having good antenatal care, good facilities for delivery, and good immediate postnatal care are central to lowering maternal mortality. But in many cases maternal mortality turns out to be a transportation problem. When complications set in during home delivery, there is a relatively short time window during which the woman needs to be taken to appropriate hospital facilities. There are then two issues—whether there is a facility nearby (say in the small market town nearest to the village, or in the district capital), and how quickly the woman can reach the facility. The quality of roads and of transportation facilities turns out to be critical. At the very least, therefore, when conducting cost-benefit analysis of rural roads, the potential beneficial impact on maternal (and child) mortality of the investment needs to be factored into the income growth benefits.17

33. A similar argument can be made for education. Distance to school is well-established as a determinant of school enrollment, particularly in underserved rural areas.18 Further, it can also affect enrollment and participation of girls in certain cultural settings. Clearly, building schools closer to villages and rural settlements is one strategy. Improving transportation to schools, especially by ensuring road connections in all seasons, is another. As with maternal mortality, the beneficial educational impact of rural roads would be added to more standard income-based cost-benefit analysis, when comparing them with other types of intervention that have more direct income benefits to the economy, but not necessarily to the poorest. When complemented in this way, the argument for rural roads is strengthened compared with standard assessments which, because they take a pure growth perspective, tend to favor higher level connectivity, say between industrial areas and ports.

34. There is, however, a major caveat to drawing direct causal connections between rural roads and inclusive development. This relates to a broader issue of the balance between supply-side and demand-side interventions in achieving inclusive development. The argument can be illustrated for schools and education. As noted earlier, many families do not send their children to school simply because there is not a school sufficiently nearby to tilt the family cost-benefit in favor of school. And in such situations, if only one child can be sent to school because of transportation costs, it will be the girl child who misses out. In this scenario, the lack of an appropriate school/roads combination means that the family’s demand for education cannot be satisfied. The supply-side constraint is binding and school enrollments are low. In this situation, relieving the supply constraint will meet the policy objective of increasing school enrollments. However, as supply increases, the point will eventually come when the demand for education

---

16 There is a large and growing literature on the importance of rural roads for poverty in its many dimensions—income, education, health, etc. There is a useful website, http://www.ruralroads.org/, which gives a sense of the range of issues that arise. The following papers provide a flavor of the literature: Bryceson, Bradbury, and Bradbury (2008); Khandker, Bakht, and Koolwal (2006); Asian Development Bank (2006); van de Walle (2000); Fan and Chan-Kang (2005); Balisacan and Pernia (2002).


18 Some recent papers are: Chimombo (2005); Jacoby, Cuetto and Pollitt (2002); Holmes (1999); Khanam (2004)
becomes the binding constraint. Parents are not sending their children to school not because there isn’t a school nearby or well-connected by a rural road, but because they do not put sufficient value on education for their child. This may particularly be the case for girl children. In such a situation, building more schools, or more rural roads to improve transportation not schools, has no value for inclusive development. Or rather, in this situation, infrastructure investment has value only when complemented by other interventions to enhance utilization.\textsuperscript{19}

35. The general point concerns access to infrastructure (rural roads here) versus its use. It is often assumed that public policy to provide access will automatically lead to use. This is not self-evident, particularly with respect to disadvantaged groups—e.g., poor households, ethnic minorities, households with female head, disabled members in the households, and other similar groups. The simplest case is where the financial costs of use are simply too high.\textsuperscript{20} For example, there may be rural roads, but the costs of transportation are high because of a monopoly or oligopoly in private trucking and bussing. In addition, if there is discrimination against women, or disadvantaged minorities, that can also reduce their use.\textsuperscript{21} In such a situation, the demand for transportation is constrained despite the building of rural roads. Other policies are needed to complement the building of rural roads—for example a policy to improve competition and reduce imperfections in the market for private transport and trucking. Unusual as it may seem, in this setting competition policy is an essential feature of a package whose objective is to advance inclusive development by improving infrastructure.

36. To summarize the argument in this section: (i) there is consensus that investment in infrastructure is an essential ingredient for growth; (ii) if infrastructure is to contribute to inclusive growth, policy will have to focus on certain types of infrastructure, exemplified by rural roads; (iii) this argument is strengthened further if the objective is inclusive development; (iv) but the focus on investing in infrastructure targeted toward inclusive development will have to be complemented by policies that improve use of the infrastructure by disadvantaged groups. What is the role of development assistance in infrastructure investment for inclusive development? The next section takes up this question.

IV. DEVELOPMENT ASSISTANCE TO RURAL INFRASTRUCTURE FOR INCLUSIVE DEVELOPMENT

37. The literature and the debate on development assistance have several strands, many of which are unresolved. These strands encompass the macroeconomic aid regressions literature on the determinants of aid effectiveness, measured in terms of the impact of aid on growth and development, and the more microeconomic perspectives on the evaluation of project success, including the most recent discussion, and controversies on randomized controlled trials.

38. Among the most contentious issues surrounding development assistance are those concerning conditionality. The debate on conditionality intersects with another one, on budget (or program) assistance versus project assistance. Project assistance can be seen as the most highly conditional form of assistance, since, in principle, the aid agency can ask to approve any and all aspects of the project, its implementation, monitoring and evaluation. However, fungibility of public resources raises the question of the effectiveness of such conditionality—

\textsuperscript{19} This argument is developed for the social sectors in general, and illustrated by South Asian examples, in Devarajan and Kanbur (2007). A framework for assessing whether supply or demand constraints are binding is provided in Kanbur (2008).

\textsuperscript{20} There is significant literature on the costs of transport in rural areas and in developing countries generally. See for example, Carruthers, Dick, and Saurkar (2005); Raballand and Macchi (2008).

\textsuperscript{21} See for example, Merilainen and Helaakoski (2001), Riverson et al (2005).
with perfect fungibility the aid funds effectively finance the government’s marginal project, not the one that the funds are nominally designated for. Hence the argument is that development assistance might as well be budget assistance, and the conditionalities, if any, be such as to influence the overall pattern of the government budget, rather than this or that component. Hence, the emphasis is on macroeconomic policy conditions.

39. Analytical results claiming to have shown that the impact of aid on growth is greater the better the policy environment is, have been influential in the debate although these results were questioned no sooner than they had been disseminated. There are two issues. The first is whether it is indeed the case that a parsimonious set of policies can be causally associated with economic growth, let alone with inclusive growth, or inclusive development. It can be argued that the evidence is not as strong as originally presented. The growing consensus is that countries have followed a broad range of specific policy combinations to achieve outcomes ranging from growth to inclusive development. Secondly, however, it is not clear that conditionality associated with external aid can actually wag the tail of domestic political economy to get sustained changes in policy—even if from the outside we knew what these changes should be.22

40. In view of the above, there has been a growing movement in favor of outcomes-based conditionality. The argument here is that, from the outside, aid agencies cannot know the specific details of how good development outcomes can be achieved, and there are in fact many different, context-specific ways of arriving at the same outcomes. Thus, might it not be better to condition aid on outcomes themselves—ex post conditionality is a term that is sometimes used. Thus, rather than making aid conditional on certain prescribed changes to intermediate variables and interventions, this approach suggests tying aid to improvements in development outcomes—for example along the dimensions set out in the MDGs. This approach has been suggested at the macro level, for example, for making allocations of international development assistance across countries more oriented to outcomes, or to the provisions of the Millennium Challenge Account. It has also been suggested at the micro level, for example, in recent innovative experiments on payments for results.23

41. There are of course a number of objections to the outcomes-based approach. Does not the approach favor countries already doing better? Is it not liable to be influenced by short-term national or global shocks, in a positive or a negative direction? Since outcomes, particularly in the social sphere, appear after a time lag, is there not an incentive problem for a government that bears the costs of intervention but with the reward going to a possible future government? What of new governments, say, in postconflict situations, which will have no performance to show? Are not data on outcomes, particularly social outcomes, notoriously unreliable and of poor quality, making the basing of aid disbursements on measured outcomes problematic? These, and others, are all valid questions. But (i) rather than just the starting level of outcomes, the rate of improvement in outcomes can also be used in assessment; (ii) short-term fluctuations in outcomes can be smoothed out using time series smoothing techniques; (iii) outsiders cannot in any case influence policy and interventions sustainably: it has to be the domestic political economy that does so; (iv) start-up funds can be set aside for special circumstances, as is done now; and (v) there should be an immediate program for improving

22 We are summarizing a large literature here. Among the papers that give a flavor of the debate are Burnside and Dollar (2000); Guillaumont and Chauvet (2001); Easterly, Levine, and Roodman (2004), Kanbur (2006).
23 The outcomes-based approach has been argued for in a number of recent papers: Collier et al (1997), Kanbur (2005), Barder and Birdsall (2006).
information and data on the outcomes of development. Thus, the questions need to be addressed, but they do not undermine the fundamental argument in favor of outcomes-based approaches.24

42. The second major strand in the development assistance discourse has a more microeconomic perspective and relates directly to evaluating whether a project has had the impact claimed for it. Postevaluation of projects, with no baseline set of facts at the start of the project, has been criticized for the obvious reason that it cannot ascertain improvement in the outcomes of interest during the period of the project. Many projects now do in fact conduct such baseline surveys to establish the state of affairs before the project. However, the before and after comparison is itself open to the charge of unclear attribution—was the improvement because of the project, or would it have happened in any event? One answer to this is to compare before and after in another location where the project does not exist. But this is itself open to criticism if the project allocation between its current location and the control location was not random, but influenced by some factor (for example an enlightened and influential local government), which could itself have influenced the performance in the outcome of interest, over and above the project itself. Hence we come to what some have claimed is the gold standard for evaluation—randomized controlled trials (RCTs). RCTs are themselves controversial, and critics are agreed that too much is claimed for them, that the sort of power attributed to them in establishing causality cannot be fulfilled in practice. But there is no question that the RCT discourse has thrown into sharp relief standard methods of evaluation of development assistance projects, and these methods are being held to higher standards as a result.25

43. To summarize, while the literature on development assistance and its evaluation has not by any means resolved its many debates, some directions of emerging consensus can be discerned, relative to 20 years ago: (i) a greater willingness to entertain budget support, at the sector wide and the national level; (ii) a greater emphasis on measuring development outcomes and on making budget assistance, and the overall assistance envelope (budget plus project), conditional on actual performance on development outcomes; (iii) a greater emphasis on measuring development outcomes from projects and a greater focus on establishing causality from the project to those outcomes.

44. Let us turn now to a discussion of how this general debate on development assistance applies to assistance for rural infrastructure.

45. A first implication is quite independent of rural infrastructure and applies generally. There must be a greater effort in measuring development outcome nationally, but particularly in rural areas, which tend to be neglected in national statistical systems. Since the claim is that rural infrastructure supports inclusive development, and inclusive development is measured along a number of dimensions, including those identified in the MDGs, for the claim to be tested we must have reliable and timely information on development outcomes that go beyond average income but cover income poverty, nutrition, school enrollment (gender disaggregated), child and maternal mortality, prevalence of diseases such as HIV/AIDS and malaria, at a minimum. This information has improved considerably in developing countries over the past 20 years, but it is still sporadic and incomplete for most countries. Even where there are regular living standards and demographic and health surveys, sample sizes may not be large enough to focus

24 This argument is developed more fully in Kanbur (2005b).
25 Some of the key recent papers in the debate on RCTs are Deaton (2009); Duflo, Glennerster, and Kremer (2008); Banerjee and He (2008); and the papers in Kanbur (2005a).
on the achievements and patterns in particular rural areas. Recently developed econometric techniques can help in poverty mapping down to the local level, but they are only as good as the detail of the information underlying them.²⁶ Perhaps somewhat indirectly, therefore, those interested in effective assistance for rural infrastructure to advance inclusive development must also push for improvement in national statistical systems to better produce information and data on different dimensions of inclusive development. More directly, they need to support the collection of such information in their project area to better evaluate the impact of their rural infrastructure interventions.

46. Given the state of information, the supporting development assistance for rural infrastructure must also support rigorous evaluation of rural infrastructure projects. To the extent possible, the gold standard of RCTs should be applied, it being understood that the standard itself may not be attainable in practice. Funds spent on rural infrastructure have real opportunity costs in terms of other uses to advance inclusive development, and it is appropriate that the question—what impact did these funds have on inclusive development?—be asked, and answered to the best of our abilities. Among other implications of this perspective is the importance of making sure that there are baseline surveys conducted to establish the state of development outcomes before the project (if the national statistical system does not already provide this), and that appropriate controls have been identified that will allow, to the extent possible, attribution of improvement in outcomes to the intervention in question.

47. Thus, while some general principles can be adduced, the main lesson from the literature on development assistance and on development in general is that context specificity matters, and the details can be very different from country to country and from location to location. Outsiders giving advice need to have humility about their recommendations, for sure. But taking this to its logical conclusion, if the aid agencies’ recommendations are not followed by the country, then what? Would aid not be given? More to the point, suppose the recommendations are not followed but the outcomes are as good or even better—then what? It would then seem to be somewhat nonsensical to have withheld aid because the agency’s model was not followed, even when it was shown, ex post, that an alternative model was better. The point, however, is that this model, which worked in one country, may not work in another.

48. This line of argument leads to a move away from a highly project-specific approach on the one hand, and a highly ex ante approach on the other. Taking a broader approach to the sector as a whole, and taking an outcomes-based approach, is the logical outcome. Thus, sector-wide budget support, its amount modulated by actual measured outcomes on inclusive development, is an approach that should be considered by those who support rural infrastructure for advancing inclusive development.

49. Of course, we recognize that the preceding makes sense only as recommendations for incremental adjustment, not as all-or-nothing upheavals to the current development assistance framework. In any event, there is sufficient debate on alternative approaches to development assistance for it to warrant a diversified strategy where alternative approaches work together. Let us turn, therefore, to the design of conventional rural infrastructure projects. What are the lessons for the design of such aid-supported projects?

²⁶ The best source for techniques and applications is the Poverty Mapping website: http://www.povertymap.net/. A useful overview is found in Henninger and Snel (2002).
50. Over and above building in rigorous evaluation into the fabric of project design, the discussion in the previous section suggests that aid-supported projects for rural infrastructure to advance inclusive development should have the following design features. First, they should target areas with weakest achievements along the MDG dimensions. Second, they should establish whether improvement in these achievements is constrained by supply or by demand as discussed earlier. If the latter, increasing rural infrastructure may not be the best project. Third, in such situations, projects to increase the use of existing infrastructure, such as lowering transportation costs by encouraging competition, or interventions to eliminate discrimination against minorities in transport, should move up the priority list. Fourth, if lack of achievement is indeed constrained by supply, then the project should identify the complementarities between different elements of supply—location of schools and roads to schools for education, or location of hospitals and roads to hospitals for different dimensions of health. Fifth and finally, the expenditure of the project, when it is building rural roads, for example, is itself a resource over the life of the project. The project design should, within a framework of cost-efficiency, prioritize the employment of the poorest of the poor and of disadvantaged minorities. Without implying a micro management that would go against the spirit of context-specific design, these five considerations can be turned into a checklist, or a list of questions, that can be used to frame the discussion, design, and evaluation of a project submitted for external funding.

V. CONCLUSION

51. The framework developed in this paper recognizes the somewhat untidy nature of the literature, and the importance of context specificity. Nevertheless, some conclusions can be, and are, drawn on rural infrastructure, development assistance, and inclusive development. Despite some powerful views to the contrary, growth has been supplemented by inclusive development as the objective of policy and of development assistance. Growth is precise as a concept. Inclusive development is not. But the MDGs provide a useful framework for specific discussions, with the added bonus that there is greater international consensus on them as objectives than on growth alone. Given that rural areas lag in their MDG achievements, and that infrastructure is causally linked to improvements in these achievements, investment in rural infrastructure emerges as a key intervention in support of inclusive development. But these interventions need to be targeted to poor areas, to pay attention to their use by the poor and the disadvantaged, and to build rigorous evaluation into their designs so that lessons can be drawn for future interventions.

---

27 A key issue highlighted in the literature on public works schemes as employment generating and poverty-reduction devices is the role of the wage. Too high a wage can lead to rationing of employment, with attendant discrimination on who is given jobs on the site. See Ravallion (1999).
REFERENCES


About the Paper

This paper undertakes three tasks. The first and major task is to define inclusive development, in particular distinguishing it from growth, pro-poor growth, and inclusive growth, and differentiating them from each other. The paper then applies this definition to specific issues focusing on rural infrastructure. The second task is to discuss the relationship between rural infrastructure and inclusive development. The third and final task is to draw out the implications of the recent literature on development assistance and its effectiveness, for aid agency support of rural infrastructure with the objective of inclusive development.

About the Independent Evaluation Department

The mission of the Independent Evaluation Department is to help the Asian Development Bank become a learning organization that continuously improves its development effectiveness and is accountable to its stakeholders. The Department conducts and disseminates strategic evaluations in consultation with its stakeholders, harmonizes performance indicators and evaluation methodologies, and develops capacity in evaluation and evaluative thinking.

About the Asian Development Bank

ADB’s vision is an Asia and Pacific region free of poverty. Its mission is to help its developing member countries substantially reduce poverty and improve the quality of life of their people. Despite the region’s many successes, it remains home to two thirds of the world’s poor: 1.8 billion people who live on less than $2 a day, with 903 million struggling on less than $1.25 a day. ADB is committed to reducing poverty through inclusive economic growth, environmentally sustainable growth, and regional integration.

Based in Manila, ADB is owned by 67 members, 48 of whom are from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.