Investing in Infrastructure: A Growth Strategy that Favors the Poor?

How large are gains from basic infrastructure investments, and to what extent are they beneficial to the poor? Researchers variously argue that such investments can reduce poverty. It may be that the poor have least access to infrastructure, and so will benefit most from new investments; alternatively the poor may be concentrated in sectors of the economy where rates of return to infrastructure investments are highest.

A recent World Bank study—drawing on the 1992-93 Viet Nam Living Standards Survey (VNLSS)—examines the extent to which empirical evidence from Viet Nam supports these arguments. The study is part of a wider effort in the World Bank's Development Research Group to understand how public spending policies affect well-being at the household level, particularly among the poor.

The 1992-93 VNLSS provides information from a nationally-representative sample of 4,800 households. The household survey collects data on access to infrastructural facilities (electricity, potable water, etc.). A community questionnaire—conducted only in rural areas—complements the household-level data with information on shared resources at the "commune" level, such as schools, health clinics, and irrigation services.

The study first describes the pattern of access to basic infrastructure in Viet Nam. It then focuses on one category of infrastructural investment—irrigation services—and assesses its potential impact on poverty. Two main policy conclusions emerge:

- Because basic infrastructure services are inadequate for all income groups in Viet Nam, generalized investment in public infrastructure projects will not automatically target the poor.

### Conditions of Basic Infrastructure in Viet Nam

Viet Nam's current physical infrastructure is inadequate. In rural areas, nearly a third of the population live in communes without a passable road. Nearly half do not have access to passenger transport, and more do not have electricity. Barely half of annual crop land is irrigated, and 95% of the rural population live in communes without access to piped water. In general, the poor tend to have worse access to infrastructure than the non-poor, but in rural areas access to many types of infrastructure is bad for both (see table at left).

Given population-wide deficits in access to infrastructure, there are no guarantees that public resources directed towards service expansion will be equitably distributed, much less well-targeted to the poor.

### Will Investing in Irrigation Services Benefit the Poor?

In which ways does this generalized lack of infrastructure affect the distribution of gains from future investments? Not surprisingly, the answer depends on how the marginal benefits from individual infrastructure investments are distributed. For
example, in the case of irrigation, if a household’s land is already fully irrigated, then clearly the marginal benefits to that household of expanding the total irrigated area are zero. If it were true that the rich had fully irrigated land while the poor did not, then clearly the greatest benefits of an expansion in irrigation services would go to the poor.

In Viet Nam, however, the VNLSS survey results indicate that the non-poor have more of both irrigated and non-irrigated land. At first glance it would seem, then, that an undifferentiated irrigation expansion would not be an important redistributive instrument; the poor would benefit, but probably less so than the non-poor.

However, a number of other important factors may influence the marginal benefits of irrigation. It is often argued, for example, that small farms are more productive; since the poor tend to have small farms, their marginal benefits may be higher. Education level, family size, and land quality may also determine productivity, and hence crop income.

Using a model of household crop incomes, the study simulates the impact of a 10 percent expansion in irrigated land area for four alternative targeting strategies. Simulation 1 simply extends irrigation to all farm households that have non-irrigated land. Simulation 2 limits the expansion to farms currently without access to any irrigated land. Simulation 3 targets irrigation on the basis of low total household land holdings. Simulation 4 distributes irrigation on the basis of low per capita land holdings.

The simulated results indicate that even an undifferentiated expansion of irrigation (simulation 1) would be redistributive—having higher proportionate gains to poorer households.

However, targeting the irrigation expansion to households with the smallest per capita land holdings (simulation 4) produces the most progressive incidence of gains, as well as the largest absolute benefits to the poor. Under this simulation, the poorest households receive a net annual gain of 4.5% of total household expenditures, while the gain to the wealthiest is only 0.1% of their total expenditures. And, the magnitude of the gain to the poorest households is larger than that for any other group of households.

All simulations show the highest total impact on net crop incomes would occur in Viet Nam’s two poorest regions (the Northern Uplands and the North Coast) where the outcomes also show the most pro-poor distribution.

The results also indicate that education contributes significantly to agricultural productivity in Viet Nam; interaction effects between education variables and land are generally positive, notably so for primary schooling.

**Summary**

Recent evidence from Viet Nam indicates that deficits in access to basic infrastructure are so widespread that new investments will not automatically be well targeted to the poor. In fact, in Viet Nam there is ample scope for the non-poor to capture the lion’s share of direct gains from such investments.

Determining how investment benefits will be distributed depends on controlling for factors that influence marginal returns. Simulated results for the specific case of irrigation indicate that even an across-the-board increase in irrigation services would produce income gains for the poor. But a program specifically targeted to households with low per capita landholdings would have the most progressive results. And, fine-tuning targeting to highly impoverished regions of the country would further increase the progressive distribution of benefits.

Finally, important complementarities exist between different infrastructural investments in terms of their capacity to reduce poverty. Given the positive interaction between education and agricultural productivity found in the case of Viet Nam, the marginal impact of irrigation projects is likely to be enhanced by simultaneous investments in education.