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Population, Poverty, and Policies

By C. PETER TIMMER*

Under the banner of "sustainable development," a new paradigm that links together population, poverty, and the environment has become widely accepted since the mid-1980's. At a theoretical level, Partha Dasgupta (1993a,b) modeled the household decision-making processes that lead to a cycle of poverty, low birth weight and stature, high fertility rates, and consequent degradation of common property resources that provide a significant share of income for the poor.

A divergence between private and social returns to additional children leads to a positive role for government interventions, one that extends beyond traditional family-planning programs to broader economic development policies that affect employment and poverty and environmental policies that protect the productivity and availability of common property resources such as firewood and water. In this paradigm, poverty, population, and the environment are closely linked, and common property resources are the central element explaining externalities within each component. By modeling this process as a dynamic path and specifically identifying market failures at each stage, Dasgupta has provided an elegant theoretical foundation for treating the "population problem" as a matter for economic analysis and policy intervention.

At a policy level, publications of the World Bank reflect current thinking on the nature of appropriate government interventions within the new paradigm. The *World*

Development Report, 1990 on poverty and the *World Development Report, 1992* on the environment emphasize the behavioral aspects of poverty-driven degradation of the environment (World Bank, 1990, 1992). Feedback mechanisms, through health and child mortality, influence fertility decisions in ways that drive a downward spiral of poverty, environmental degradation, population growth, and worsening poverty. Stephen Mink (1993), in a background paper for the *World Development Report, 1992*, examines the implications of this spiral for policy interventions that are consistent with the World Bank's overall mission and approach to development. In brief, the appropriate policy approaches are: promote poverty alleviation; reduce rural risks and tenure insecurity; redress maldistribution of income; strengthen education and public health programs; and expand family planning (Mink, 1993). These approaches are remarkably similar to those identified by Dasgupta (1993b), and this agreement indicates how widely accepted the population, poverty, and environment paradigm has become.

Still, economic growth provides the foundation for all approaches that seek to stop the destructive spiral identified in this paradigm. Lyn Squire (1993 p. 381) in summarizing the World Bank's experience, both operational and research-based, reached the following conclusions:

First, economic growth that fosters the productive use of labor, the main asset owned by the poor, can generate rapid reductions in poverty. Second, public spending has been an important factor driving improvements in the health status and educational attainment of the poor, but judging from rate-of-return estimates it still has a long way to go in most countries before it would generate trade-offs with economic growth. Third, of the total transfer to

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the poor, basic social services, rather than cash, have been the preferred delivery mechanism possibly for political reasons, but also because they achieve their intended objective of increasing the consumption of health and education services.

Dasgupta (1993a) notes, however, that the poor do not "own" their labor power—only its potential. If they fail to command other assets and resources that permit access to adequate food supplies, the poor will be unable to compete with better-endowed workers in terms of hourly or daily productivity, thus becoming excluded from the opportunities offered by wage labor. In this model, population pressures reduce access to (or the productivity of) common property resources that "endow" the poor with adequate nutrient intake. Larger families are a survival strategy of these poor households, partly because more children ensure continued supplies of firewood and water despite longer search and transit times.

What policy approaches can break into this cycle of declining productivity and worsening poverty? To move beyond the generalities offered above, one needs to have a far more robust empirical understanding of the dynamic behavior of poor households and the rural environments in which most of them live. But rigorous empirical testing of the functional relationships at the heart of this paradigm has only begun. Because of path-dependency and important dynamic feedback effects, cross-sectional evidence can offer only limited insights. Paul Schultz (1993 pp. 31–32) undertakes the most rigorous efforts to date to test these linkages at a macro level (i.e., using national aggregates over time and across countries). His conclusions summarize the current state of knowledge based on this empirical approach:

...the Bucharest World Population Conference in 1974 first asked whether fertility declines are promoted by development or by organized family planning activities. This question may be poorly framed, for both are certainly relevant. But the thrust of this analysis is that the level and sex com-

position of human capital, the decline of agricultural employment, and the basic nutrition of the population explain most of the variation in the levels of total fertility rates and their changes over time, whereas family planning explains relatively little of either cross sectional or time series variation in fertility. ... The education of women is the dominant empirical factor associated with the decline in fertility in the cross section and over time. ... Growth in income alone lowers child mortality but has little total (reduced-form) effect on fertility. Raising calorie availability at very low levels appears to be strongly related to lowering child mortality and thereby contributes to declining fertility at early stages in the development process.

As Schultz (1993) notes, income variables per se tend not to be directly significant in the models, although income plays a facilitative role in several independent variables that are significant. The role of income growth at the household level as an independent variable affecting mortality, life expectancy, and fertility, and hence aggregate population growth, also seems to be different from the role revealed from aggregate analysis.¹ This difference highlights two arenas for policy intervention which could break the vicious spiral linking poverty, population, and the environment: the distribution of aggregate income and the extent to which the poor, and especially women, participate in its growth; and the level of social spending by the public sector, especially on nutrition, health, and education, and the extent to which these public investments reach the poor.

Sudhir Anand and Martin Ravallion (1993 p. 147) address the issues of private incomes and public services directly:

The cross-country evidence assembled here suggests that, at least for basic

¹This difference is seen clearly in the micro-based work by Paul Gertler and John Molyneux (1993).

health, average affluence matters to the extent that it delivers lower [i.e., less] income poverty *and* better public services. Indeed, the commonly observed positive correlation across countries between life expectancy and affluence *vanishes* once one controls for incidence of poverty and public spending on health. (The same is true for other health indicators.) Though both these variables matter, it is notable that the quantitative significance of public health spending appears to be sizable. We attribute roughly two-thirds of the elasticity of life expectancy with respect to average income to the positive effect of income on public health spending; the rest is attributed to the decrease in income poverty that typically accompanies higher average incomes.

Economic development policies that foster investment in the public aspects of human capital—nutrition, health, and education—and a rapid reduction in “income poverty” can break into the poverty cycle. Historical experience of the earliest developing countries support this approach; indeed, more concrete strategies emerge for currently developing countries. Robert Fogel (1991), citing the factors that reduced hunger and mortality in Western Europe, provides strong evidence for the importance of increased caloric intake for reduced mortality and increased productivity of the working poor. Using a robust biomedical relationship that links height, body mass, and mortality rates, Fogel calculates that increases in food intake among the British population since the late 18th century contributed “about 30 percent of the British growth in per capita incomes over the past two centuries (p. 63).”

For very poor countries, an approach that raises food intake and improves nutritional status of the most impoverished is the surest route to breaking the cycle of poverty. Such countries must raise agricultural productivity and increase supplies of food. At one level, this approach is not controversial. Indeed, it would seem to fit naturally into the World Bank’s policy recommendations as

summarized by Mink (1993 p. 32):

The essence of these strategies is to make the best use of that resource which is most available to the poor—their own labor. Policies should therefore not discriminate against agriculture, which is the principal labor-intensive sector, and should provide strong support for agriculture development through the provision of rural infrastructure.

At another level, a more aggressive stance on the role of agriculture is needed to reverse urban bias and slow the poverty-population-environment spiral. To succeed, however, governments and farmers must invest in agriculture *beyond* the point indicated by commodity prices in world markets. These “border prices” undervalue the contribution of agriculture to the economic development of poor countries. In combination with political discrimination against the rural sector, often in the form of discriminatory pricing in relation to border prices, this undervaluation of agriculture contributes directly to the “population problem” modeled by Dasgupta (1993a,b). Less food is produced domestically and consumed than is optimal. Fortunately, these market failures are susceptible to intervention by appropriate government policies.

In existing strategies for coping with the poverty spiral, the role of agriculture has been limited, largely because of a failure to recognize the direct links between agricultural development, food availability, caloric intake by the poor, and reductions in poverty. The empirical evidence cited above from Schultz (1993) and Fogel (1991) illustrates the importance of raising caloric intake of the poor. But a more general case can be made.²

The case builds on three empirical regularities: the relationship between agricul-

²The following section is a highly abbreviated version of the 1993 Hibbard Lecture at the University of Wisconsin (Timmer, 1993), and work on the relationship between agricultural development and poverty alleviation in Indonesia (Timmer, 1992).

tural growth and poverty alleviation, between increased domestic food production and improved nutrient intake, and between growth in agricultural productivity and growth in productivity in the rest of the economy. The essential first step in breaking the cycle of poverty is to increase agricultural productivity. It has been long established that, for a given level of per capita income, a higher share of GDP originating in agriculture contributes to a more equal distribution of income (Simon Kuznets, 1955; Hollis Chenery and Moises Syrquin, 1975). An agriculture-driven growth strategy need not sacrifice aggregate growth in the early stage of development, and it will direct a greater share of income to the poor.

The second step in breaking the cycle of poverty is to raise domestic food production. Increases in domestically produced food supplies contribute directly to increases in average caloric intake per capita, after controlling for changes in per capita incomes, income distribution, and food prices (Timmer, 1992). Countries with rapidly increasing food production have much better records in alleviating poverty. This result might be due to changes in the local or intrahousehold economics of access to food, changes that are not captured by aggregate statistics on incomes and prices. Whatever the mechanisms, intensive campaigns to raise domestic food production, especially through rapid technical change, can be expected to have positive spillover effects on nutrient intake among the poor.³

The third step is to ensure that these sectoral gains are sustainable in both environmental and economic dimensions. Total factor productivity (TFP) must increase for the entire economy to sustain the growth process, and eventually, limited natural resources require that TFP growth must provide a substantial share of total growth in per capita incomes. Agriculture has a key

role to play at this stage as well. Endogenous-growth models have only begun to provide the theoretical foundations to explain the empirical spillovers observed from growth in agricultural productivity to growth in total factor productivity in the rest of the economy, but the empirical results are surprisingly robust even in the face of questionable specifications (Erh-Cheng Hwa, 1988; Timmer, 1993).

The policy approach suggested by these three empirical relationships adds agriculture as an important component of interventions designed to break into the cycle of poverty, population, and environmental degradation. For agriculture to play this positive role, governments cannot allow agricultural investments to remain entirely a matter of response to private incentives generated by world markets. The empirical relationships noted above, each of which links the agricultural sector to the cycle of poverty, raise the strong likelihood that prices in world markets undervalue the contribution of agriculture to breaking this cycle, as well as its role in sustaining rapid economic growth. Government policies must cope explicitly with these market failures in the design of agricultural investments and policies if the cycle of poverty is to be broken.

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³Controversy exists over the potential of cash crops to have this positive impact on nutritional status and poverty alleviation, but in Africa, where foodcrop technologies are still limited, expanded production of cash crops may be the best route available.

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