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## **AGRICULTURAL GROWTH AGAINST A LAND RESOURCE CONSTRAINT: THE PHILIPPINE EXPERIENCE: COMMENT**

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A distinct change in the pattern of agricultural growth occurred in the Philippines in the 1960s. Crisostomo and Barker (1972) document that extensive growth through the settlement of new lands was superseded by intensive growth marked by investment in irrigation of existing cultivated areas and adoption of yield-increasing inputs. In an article in the December 1976 issue of this *Journal*, Hayami, David, Flores and Kikuchi (HDFK) (1976) develop a hypothesis to explain this shift:

As population pressure pushes the cultivation frontier into marginal areas, we expect the marginal cost of production via expansion of the cultivated area to rise relative to the marginal cost of production via more intensive land use. Eventually the economy reaches a stage at which more intensified land use becomes a less costly means of increasing agricultural output than expansion of the cultivated area. (p. 148).

Furthermore, HDFK argue that escape from a Ricardian trap of mounting population pressure on a fixed supply of land in the Philippines depends on:

. . . intensified investment by the public sector in irrigation, and in research on the compelling need of the economy for internal land augmentation. (p. 155).

This conclusion is based on a comparative benefit-cost analysis of land settlement and irrigation projects. The results presented are that land settlement produces zero net benefit to society, while irrigation produces a substantial net benefit, particularly when combined with high-yielding seed varieties and large doses of fertiliser.

The HDFK analysis is based on overly restrictive assumptions. There may be considerable room for expansion of the area cultivated in the coming decade even though in the long run the land constraint is binding (see, e.g. ILO 1974; Myrdal 1968; NEDA 1978; and Simkins and Wernstedt 1971). Five criticisms of the HDFK article are offered:

1. Aggregative analysis of irrigation and land settlement costs as used by HDFK is misleading. 'Marginal cost' curves drawn to represent all projects cover up the fact that individual project costs vary greatly. For example, Huelgas and Torres (1976) found up to a fivefold varia-

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tion in the per hectare cost of seven irrigation systems. Moreover, costs of large-scale irrigation undertaken recently are substantially higher than assumed by HDFK. Barker (1977, p. 12) reports that, due to management problems, the construction costs of national irrigation systems may be double what is assumed prior to development. Some land settlement projects may now have a cost advantage over these irrigation projects.

2. The cost components of land settlement assumed by HDFK include items budgeted for only a small subset of settlers receiving substantial government assistance.<sup>1</sup> A recent study of resettlement projects by an interagency team (Interagency Resettlement Team 1974) found that only 28 per cent of settlers in government resettlement areas fell into this category. While government-directed schemes have often involved high costs, spontaneous settlement schemes involving low costs have been quite successful (see, e.g. Elder 1973; Lewis 1971; and Simkins and Wernstedt 1971) HDFK failed to consider the latter.

3. HDFK assume the benefit stream in land settlement derives solely from one upland rice crop using traditional seed, or alternatively, two corn crops a year. This assumption leads to gross understatement of benefits since cropping patterns in recently settled areas are quite diverse and are frequently intensified over time.

Lewis (1971) and Simkins and Wernstedt (1971) indicate that spontaneous land settlement with low initial levels of public expenditure resulted in dynamic regional growth. Substantial surpluses of rice, corn and cash crops were produced and marketed in the areas studied. Similarly, a study of an upland settlement in Palawan by Eder (1973) revealed that settlers responded to market opportunities and intensified their farming methods. They produced not only upland rice but also vegetables, copra and livestock. These settlers achieved high incomes at low investment cost, using mainly their own labour.

Cropping patterns in government schemes have also been developed beyond the subsistence crop assumed by HDFK. The Interagency study (1974) and the author's research reveal that, in Bukidnon, settlers supply the city of Cagayan de Oro with its corn requirements; in Davao, settlers market large surpluses of rice and export fruits to Japan; and in Palawan, settlers now produce surplus rice that is consumed in deficit areas.

*Ex post* project analysis of settlement schemes such as these would be a more reliable means to test the efficiency of land settlement than the *ex ante* HDFK approach, based as it is on high-cost types of settlement producing only a subsistence crop. Until such *ex post* studies are conducted, the conclusion that irrigation projects are, in general, more efficient than land settlement is of little use in making investment decisions.

<sup>1</sup> These settlers are typically provided with transportation to the resettlement area, housing, food rations for one year, medical services, farm implements, a water buffalo, seeds, chemicals, fertilisers, and production loans at a subsidised interest rate.

4. In the Philippines there are large differences between regions in the ratio of population to arable land, in rural wages, in farm incomes and in opportunities to gain access to land. Migration and settlement of relatively underdeveloped areas is efficient from the standpoint of reducing these regional disparities. Encouragement of productive rural-to-rural migration also reduces the troublesome influx of rural folk to crowded urban centres. Land settlement has desirable employment effects as the ILO (1974) demonstrates.<sup>2</sup>

5. The last reservation to the conclusion that land settlement is less viable than irrigation in the Philippines is the lack of knowledge of the availability of new land and of development costs. HDFK admit their analysis is 'highly conjectural' (p. 144) due to limited data on these questions.

NEDA (1978), in the new five-year plan, estimates that an area of almost 8 million ha of uncultivated land remains in the Philippines, one-fourth of which may be suitable for agricultural development under existing technology. The plan envisages a major resettlement effort to bring potentially productive land under cultivation.

The continued expansion of the area cultivated in some provinces indicates that the land frontier has not been reached. For example, if the HDFK hypothesis is accepted in relation to Palawan, the land constraint would have been reached in 1960. Yet since then the lowland rice area has been increased tenfold and still less than one-fourth of the area released for agriculture is occupied (PEDC 1977).<sup>3</sup> This rapid expansion in rice area occurred at the same time that the irrigated area was considerably increased, suggesting that a complimentary approach of area expansion and irrigation is feasible.

The purpose of this comment has not been to challenge the importance of promoting the adoption of intensive farming methods in the Philippines. Rather it has been to suggest that a more balanced view of the options open to policy makers be taken. This is of critical importance in the coming decade and until population growth is reduced, as appears to be recognised in the new five-year economic development plan.

<sup>2</sup> The ILO (1974, p. 466) estimated that irrigation projects on existing cultivated areas create 0.5 man-years of employment per hectare, land settlement of a non-irrigated area creates 1.0, and settlement of land requiring irrigation creates 1.5.

<sup>3</sup> According to the 1960 census (Bureau of Census and Statistics 1960, 1971), the lowland rice area was a little over 2000 ha. The PEDC (1977) reports the area of lowland rice in 1975 was over 21 000 ha and that, of almost 400 000 ha of agricultural land, less than 90 000 ha were occupied.

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