

Zeitschrift: Agrarwirtschaft und Agrarsoziologie = Économie et sociologie rurales [1980-2007]

Herausgeber: Schweizerische Gesellschaft für Agrarwirtschaft und Agrarsoziologie

Band: - (2000)

Heft: 2

Artikel: The role of agriculture in less-favored areas for a sustainable society

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DOI: <https://doi.org/10.5169/seals-966311>

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The Role of Agriculture in Less-Favored Areas for a Sustainable Society

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Recent developments in agricultural production, demography and the environment in developing countries indicate that the less-favored areas will have to play an increasing role in meeting domestic food requirements and general economic development in the coming years. Fulfilling these requirements, however, calls for a change in public policies towards these areas. This paper argues that policy measures that promote sustainable agricultural intensification in less-favored areas can help increase agricultural production, reduce resource degradation and improve the living conditions of the people in these areas. This requires a demonstration of political will and commitment to reforms at all levels of policymaking and program implementation.

Key words: Agricultural production, Less-Favored Areas, Sustainable Development.

1. Introduction

Over the last three decades many developing countries have recorded dramatic increases in agricultural production to meet increasing food demand, arising from population and income growth. Scherr and Hazell (1994) identify four main phenomena that accounted for this unprecedented growth: expansion of the agricultural frontier; declining use of fallow within settled agricultural systems; use of industrial farm inputs (chemical fertilizers, pesticides, tools and machinery), and improved plant seeds suitable for their use; and land-improving investments, particularly irrigation and drainage.

Agricultural development strategies have traditionally emphasized the significance of "high-potential" rainfed lands and the use of irrigation in increasing food production and stimulating economic growth (Abdulai

and Hazell, 1999). Policy makers were attracted to these high-potential areas because of their higher marginal returns to investments, their relatively well-endowed infrastructure that facilitated the flow of modern inputs and their capacity to supply food to growing urban areas. (Eicher and Staatz, 1984).

Although equity concerns prompted policy makers to invest in infrastructure, market development, and social services, and extension in the fragile lands, these investments were barely at levels that could generate sustainable growth in rural livelihoods (Scherr and Hazell, 1994). It has however become evident in recent times that the strategy of promoting only high potential areas is not sustainable. The environmental stress (including salinization and waterlogging of irrigated land, increasing pest resistance and resurgence, soil erosion, and fertilizer and pesticide contamination of water) together with the declining yield potential of these areas raises concern about the ability of the high potential areas to continue producing enough food to feed the growing populations. This suggests that the fragile lands will have to play an increasing role in meeting domestic food requirements.

Although the low agricultural potential in these areas is generally due to poor soils and low and uncertain rainfall, the neglect of these areas has left them with limited infrastructure and poor access to markets. Migration to cities has provided some relief to these areas, but population densities in many less-favored areas continue to increase, but crop productivity shows no signs of improvement. The consequence is worsening poverty, food insecurity, and widespread degradation of natural resources including mining of soil fertility, soil erosion, deforestation, and loss of biodiversity. Available evidence shows that about 500 million people presently live in less-favored areas, mostly in Asia and Sub-Saharan Africa, comprising of about a third of the rural population. The number is likely to reach 800 million by 2020, if the current trend persists.

The paper examines the role that increased investment in agriculture in less-favored areas can contribute to a sustainable society, focusing on incentives for producers and investment in the natural resource base. In line with the World Council on Environment and Development (1987), sustainable development requires meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life. A society in which poverty and inequity are endemic will always be prone to ecological and other crisis.

The paper is organized as follows. In the next section, a brief definition of less-favored areas is presented. This is followed by an overview of the significance of agriculture for less-favored areas. In the fourth section, the strategies for promoting agriculture in less-favored areas are discussed. The paper concludes with a discussion of some implications for increasing support to agriculture in less-favored area.

2. Less-favored Areas

Different reasons lead to lands in certain areas being described as less-favored. Some areas, particularly on hillsides, have good soils that are at risk for degradation but could produce good crops under certain conditions. Others have soils that are so poor that farmers cannot even consider growing crops there. There are also others that have productive soils but are inaccessible and need infrastructure like roads to make it worthwhile for farmers to increase production. Many of these less-favored areas are in mountainous regions, particularly in industrialized countries or tropical low-lands, with low and unstable rainfall. Other less-favored lands also suffer from environmental degradation because they are supporting a population beyond their carrying capacity and need to be rehabilitated. Estimates from IFPRI suggests that about 3,200 million hectares of land in developing countries are less favored, although land improvement could make some of this marginal land more productive, just as degradation could make it worse (Hazell and Garrett, 1996).

3. Significance of Agriculture for Less-favored Areas

The significance of agricultural growth in contributing to overall economic growth and poverty alleviation has been well documented in the literature. Timmer (1995) has recently argued that agricultural growth remains the key to poverty alleviation in low- and middle income countries. Less-favored areas in developing countries usually have severe problems of rural poverty and environmental degradation (Fan and Hazell, 1997). Given that marginality is an outcome of the interactions among population, natural resources, policies and available technologies, conditioned by the particular history of each region, the neglect of less-favored areas and

concentration of efforts in high potential areas have contributed to the higher poverty levels in the former areas (Scherr and Hazell, 1994). For example, Fan and Hazell (1997) argue that although the incidence of poverty in India has declined in both more-favored and less-favored areas between 1972 and 1987, the poverty gap between the two areas is still substantial. Irrigated areas that are more-favored and the less-favored areas in India grew larger between 1972 and 1987. As is evident in Table 1, the incidence of poverty in 1972 was 45 percent in irrigated areas, and 54 percent in the rainfed areas. Within the rainfed areas, the incidence was 51 percent in the high potential areas, and 57 percent in low potential areas. In 1987, the poverty incidence had declined to 41 percent in irrigated areas, and 47 percent in rainfed areas.

Table 1: Poverty Changes by Type of Region, India

		Irrigated areas (more-favored)	Rainfed areas (less-favored)		
			Total	High Potential	Low Potential
Percentage of poor in total population (percent)	1972	45	54	51	57
	1987	41	47	44	49

Source: Fan and Hazell (1997). The data are for 48 out of 65 agricultural climatic zones, and encompass only about two thirds of the total rural population of India. Irrigated agricultural zones have at least 40 percent of their crop land under irrigation.

Numerous economic conditions and policies can create disincentives for farmer investment in improving soil fertility, soil moisture management and reducing soil erosion. In general, perennial crops or tree crops provide more vegetative cover than annual crops. Under annual crop cultivation, the soil is also exposed to rainfall from harvest until new crops grow to provide some vegetative cover. Thus, the greater the area is devoted to the production of annual crops at the expense of tree crops or timber, the less likely the production system enhances the land quality. Similarly, increases in the frequency of annual cropping without any change in production methods or amounts of land enhancing inputs usually cause soil degradation (Templeton and Scherr, 1997).

In many Sub-Saharan Africa countries, the adoption of trade and macro-economic policies that favor the domestic terms of trade for agricultural cash crops encouraged increases in the production of perennial tree crops such as coffee, cotton, cocoa and tea, particularly in highland countries like Kenya, Uganda, Tanzania and Rwanda. Given that most of these crops are cultivated in hilly or mountainous areas which are susceptible to soil erosion, their increased cultivation contributes to more sustainable land management practices. The increased income generated from the cultivation of export crops may also reduce the motivation of resource poor farmers to extend cultivation into more fragile lands. This is in contrast to the situation in many countries during the early 1980s, in which the low prices for many important cash crops encouraged farmers to remove perennial tree crops and expose land to erosive pressures (Larson and Bromely, 1991). For example, low coffee prices induced Chagga farmers on Mt. Kilmanjaro to remove coffee bushes from their home gardens and to grow annual crops. The failure of the Sudanese government to devalue the local currency resulted in a fall in profitability and production of gum arabica, a crop that is important for protection against desertification and land degradation across the northern Sudan (Barbier, 1997).

Case studies from Eastern Nigeria (Pingali, 1989) and from Indonesia (Belsky, 1994) also indicate that cropping frequency and the evolution from shifting cultivation to sedentary cultivation and to multiple cropping per year is determined partly by increases in farmgate prices and better access to markets.

Moreover, since part of the increased income from agriculture is spent on other locally produced goods and services for which there would not otherwise have been a market (e.g. some perishable agricultural products and local nonfarm services), additional demand and income are created within the region. Several empirical studies have documented the power of these farm-nonfarm growth linkages in rural areas of developing countries. For Sub-Saharan Africa, these studies show that increases in agricultural output can stimulate secondary rounds of growth in the rural economy that are 50 to 150 percent as large as the initial increases in agricultural income (Hazell and Hojjati, 1995; Delgado, 1992). The increased incomes from nonfarm activities can enable farmers to hire labor to build terraces. Non-farm income is thus significant to farm households in less favored areas as a means of risk management, as well as a source for cash for conservation investments (Reardon and Vosti, 1997).

4. Strategies for Promoting Agriculture in Less-favored Areas

Some attempts made in the past to develop less-favored lands, including integrated rural development projects, proved not very successful. To ensure success, higher levels of investments in less-favored areas need to be based on new or improved paradigms for sustainable development. Sustainable agricultural intensification will be a key component of the development strategy, but because of poor infrastructure, low-to-moderate yield potential, and high climate risk, the strategy would have to be different from that of the Green Revolution model (Reardon and Barrett, 2000).

Sustainable agricultural intensification requires adequate use of capital (broadly defined as use of organic and inorganic fertilizer, and land improvements including water control, and erosion prevention) to maintain soil fertility and conserve the land while meeting productivity goals. Sustainable agricultural intensification may be defined by economic and environmental criteria.

In the first case, the technology meets the farmer's production goals and is profitable. This requires non-decreasing total factor productivity, yields per unit cultivated area, and output per unit labor time. Hence, a conservation technology that reduces but does not stop degradation is not sustainable in so far as it cannot sustain non-decreasing productivity but merely limits the rate at which productivity declines. By contrast, organic and inorganic fertilizers used to replace macronutrients and an incomplete set of micronutrients, not including those inessential to non-decreasing productivity in crop or forage production, would qualify as sustainable agricultural intensification. Environmental criteria requires that the technology protects or enhances the natural resource base and thus maintains or improves land productivity.

In practice, meeting the sustainable agricultural intensification criteria requires capital-led intensification based on substantial use of non-labor variable inputs that enhance soil fertility (such as inorganic and organic fertilizer) and land improvements, such as land and water conservation infrastructure, that increase labor productivity (e.g., grass strips, anti-erosion ditches, hedgerows, and terraces). Of course, labor is employed by farmers to construct and maintain the latter. On the other hand, capital-deficient intensification occurs when farmers use insufficient capital inputs, mostly leading to soil mining and degradation (Reardon and Barrett, 2000).

The incentives and constraints facing farmers often determine their choices of agricultural technologies and factor proportions, and as such the choice of a sustainable expansion path. As indicated earlier, policy changes at the macro and sectoral levels, as well as structural changes (such as changes in global markets, urbanization, infrastructure due to public investment) induce changes in market conditions and prevailing prices, which in turn affect farmer choice, which then influences environmental outcomes. It is therefore important for policy makers to institute changes that make conditions conducive for farmers in less-favored areas to choose sustainable expansion paths.

These efforts outlined above, will have to be complemented by increased investments in rural infrastructure, health, and education, and by appropriate institutional strengthening, such as secure property rights to natural resources for the people who use them. A conducive policy environment that includes effective risk management options for offsetting severe climate risks and policies to help people on less-favored lands gain access to liberalized markets are also important.

Regarding areas that are fragile as a result of poor accessibility, improving road and transport facilities in these areas can improve farmers' access to markets and their ability to respond to changing economic environment. Linked with national trunk road systems, a widely dispersed network of rural feeder roads would ensure more efficient evacuation of farm produce and delivery of farm inputs. Food production has consistently been shown to be sensitive to distance from markets and other factors affecting access to production inputs and farm products. Recent research in Asia found that in villages with better access to roads, fertilizer costs were 14 % lower, wages were 12 % higher and crop output was 32 % higher (Spencer 1994). In Africa, rural road construction has been found to be associated with increases in agricultural production, expanded use of agricultural credit, increases in land values, proliferation of small shops and expansion of rural markets. The construction of roads and hydro-electric stations, and the resulting tourism, as well as government subsidies in some alpine regions of Switzerland, Italy and Austria has helped maintain full time farming alongside part-time farming activities in these less-favored areas.

Given that less-favored areas are highly diverse, and that climatic, biological, or geographical constraints sometimes hinder agricultural production, agricultural development may not be an economically viable venture in some areas. In such places, alternatives may need to be found through the development of the nonfarm sector or increased migration.

Promoting growth in the rural nonfarm sector will not only provide rural employment and cash for conservation investments, but will also increase the demand for agricultural products through consumption linkages, and reduce the pressure on land by offering farmers alternative sources of income. However, because agricultural growth is the prime driving force behind the rural non-farm economy, inter-regional migration and remittances are likely to provide the most important sources of non-farm income for many less-favored areas, at least during the initial stages of regional economic development (Hazell and Hojjati, 1995).

5. Conclusions and Policy Implications

This paper has argued that policy measures can promote sustainable agricultural intensification in less-favored areas, reduce resource degradation and improve the living conditions of people in less-favored areas. However, political will and commitment to reforms must be demonstrated at all levels of policymaking and program implementation. In addition to economic policies, institutional changes in the direction of secured property rights will help ensure sustainable farm practices.

There is also the urgent need to increase support for agricultural research to emphasize the development of technologies for sustainable farming and natural resource management. This, however, must be accompanied by efficiency gains from careful identification of key priorities and appropriate research strategies.

A major challenge that faces many governments of developing countries, is to find ways to reduce transaction costs in rural areas. The high transfer costs that exist in many developing regions, particularly in Sub-Saharan Africa are acting as a constraint to increased food production. Even the adoption of improved technologies that depend on the use of purchased inputs, such as improved seed and fertilizer, is strongly influenced by the policy environment with respect to market infrastructure, both physical and institutional. A reduction in the unit costs of distribution can be as valuable to competitiveness as a reduction in the unit costs of production when the two are equal components of c.i.f. prices. Important long-term strategies to increase food production and conservation investments should therefore include investment in rural markets, transportation and communications infrastructure to facilitate integration of the rural economy.

In general, investments in land conservation and soil fertility are greater in cases where economic reforms lead to higher producer prices, and complementary inputs such as fertilizer is available to farmers. Farmers often require a sufficient net profit, in most case relative to other earning sources, to invest in conservation measures. Policies that increase only the average returns without reducing the institutional or price risk sufficiently, may not induce conservation investments.

Finally, there is the need to create a more enabling economic environment for nonfarm enterprises. This requires among other things, streamlining the acquisition of credit by resource poor farmers in fragile areas. However, allocating public expenditure to large farmers who are politically vocal does not help the rural poor gain access to credit. It rather undermines their ability to operate as family farmers, therefore increasing inequality, and also reduces efficiency and long-run growth. Promoting growth in the rural nonfarm sector will not only provide rural employment and cash for conservation investments, but will also increase the demand for agricultural products through consumption linkages, and reduce the pressure on land by offering farmers alternative sources of income.

Zusammenfassung

Die Entwicklung der Bevölkerung, der landwirtschaftlichen Produktion aber auch der Umweltverhältnisse in den Entwicklungsländer deuten darauf hin, dass die benachteiligten Regionen eine zunehmend wichtigere Rolle spielen. Dieser Artikel zeigt auf, dass Politikmassnahmen, die die nachhaltige Intensivierung der Landwirtschaft in diesen Regionen fördern, gleichzeitig den Verlust von Ressourcen reduzieren und den Lebensstandard der ländlichen Bevölkerung erhöhen. Mit einem entschieden politischen Vorgehen auf allen Ebenen kann sowohl die Versorgung mit Nahrungsmitteln als auch die gesamte wirtschaftliche Entwicklung in den nächsten Jahren verbessert werden.

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