

The trade-off between economic efficiency and food self-sufficiency in using Sudan's irrigated land resources

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Abstract

A shift in Sudan's food production strategy towards more reliance on the irrigated sector for food supply has been induced by the severe food shortages following the early 1980s drought and reduced availability of food aid. Coupled with the high yield potential of irrigated wheat under modern technology revealed by recent research results, this led to significant expansions in the areas of irrigated food crops, especially wheat after 1989. This paper used domestic resource cost analysis to examine whether the expansion in irrigated wheat production represents the most efficient option for using Sudan's irrigated land resources as compared to cotton, the country's most important cash crop competitor. At the 1993 prices, medium-staple cotton dominated various wheat technologies in terms of economic efficiency. An efficiency frontier was constructed to evaluate the sensitivity of competitiveness results to changes in productivity gains and price shifts. Wheat yields currently achieved by average farmers on the scheme need to increase by more than 50% for wheat to compete with cotton at the 1996 prices. In other words, currently one ha of exported cotton generates economic returns that are sufficient to import about 50% more wheat than can be domestically produced from the same ha under average farmers' practices in Gezira. In addition to its superiority over wheat in economic efficiency terms, cotton has larger employment benefits than wheat, being the more labour intensive enterprise. This means that expanding irrigated wheat production in Gezira for food self-sufficiency at the expense of cotton reduces employment opportunities in addition to compromising economic efficiency. Priority should therefore be given to increased investment in research on improving cotton production technology, marketing and

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lint quality. On the other hand, it is important to introduce more effective policy measures for faster adoption of improved wheat technologies to close the gap between potential and current yield levels. © 2000 Elsevier Science Ltd. All rights reserved.

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Introduction

Many developing countries during the 1970s resorted to state-led domestic production of agricultural import substitutes for achieving national self-sufficiency in food production. In Africa, this strategy constituted an important component of the Lagos Plan of Action in 1980 and formed a priority in the national plans of most African countries at that time (Thomson and Metz, 1997). Self-sufficiency has been pursued mostly through the expansion of food crops at the expense of the production of cash crops. However, the issue of favoring food crops production for self-sufficiency has been controversial and often considered to be at variance with the concept of food security, which implies physical and economic access to basic food needs at all times. Food self-sufficiency as a developmental objective is based on many perceptions. Those include the need for greater independence and control of own food supply (especially when food imports might be affected by political hostility); avoidance of exploitation on international markets; deteriorating terms of trade of export crops; non-tradability of some staple foods and the problems of dependence on one export crop as the case in many African countries (Thomson and Metz, 1997; Dorosh and Haggblade, 1993; Braun and Kennedy, 1994).

A generalised priori judgement for or against food or cash crops would be invalid as situations vary between countries and various crops under consideration depending on prevailing economic circumstances. For instance, India's effort to expand local cereals production from 90 million ton (mt) in 1970 to 130 mt in 1985 (translating into an annual saving of about \$10 billion of imports costs), has been considered a successful strategy to reduce food insecurity (Thomson and Metz, 1997). On the other hand, it has been argued that food availability in Egypt would decrease if land were switched from cotton production, for instance, to food crops. This is because one hectare of exported cotton generates sufficient revenue to support the import of a greater amount of cereals than would be domestically produced from the same hectare (Scobie, 1981).

More over, self-sufficiency may induce inefficient allocation of productive agricultural resources if expanding domestic food production does not conform to the country's comparative economic advantage. The debate on incentives for food or cash crops would be misplaced in the presence of policy and market distortions that favor some crops over others. In which case, correction of such distorted structure of economic incentives in the direction of comparative advantage becomes the precondition for any progress towards economic efficiency. While many import substitutes are produced at costs higher than their import parity prices, several policies are advocated as conducive to the improvement of the comparative advantage of food production

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