SMALL FARMER PRODUCTION IN TANZANIA: CONSTRAINTS AND SUPPLY RESPONSE

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ABSTRACT:

This paper discusses the supply response of small farmer with respect to three factors: incentives, constraints and innovations. It describes a conceivable development process starting from a situation where capacity is underutilised because price incentives are not powerful enough to induce the farmer to produce more to a situation where the farmer reaches his capacity limit in terms of the crop that is given priority by the government through price changes. Finally, it traces production increases in response to technical innovations.

1.0 A THEORY OF THE OPTIMIZING SUBSISTENCE FARMERS:

To prosper, or even to survive, a farmer has to make substantial commitments of money, time, energy and experience in order to produce from his land a crop the value of which in the market will give him at least a reasonable return on his investment. In developing countries, and certainly in marginal conditions, a reasonable return will usually not mean much more than an income sufficient to provide for his family on a year-to-year basis. In the process he has to make a series of crucial decisions regarding his operations: take substantial risks in regard to circumstances (climate, pests, sickness) over which he has either very limited or no control and keep his family fed and clothed in the lengthy period between sowing and harvest, in the case of a seasonal crop farmer. It is a familiar enough situation, the problems and difficulties of which are aggravated for smaller and poorer farmers working in very marginal conditions of production and exposed to uncertain markets. Many, if not all, of the problems of trying to make a living from the land in developing countries in the last decades of the 20th century have been with us for a very long time. To find and apply solutions to the problems of the small farmer, which are relevant to the conditions and circumstances in which he is working, remains a crucial concern in the developing world. And particularly so where ability to produce and to market is a matter little short of the choice between bare sufficiency and hunger for the individual farmer; and where the small farmer's contribution to the national economy is vital to the stability and welfare of the country as a whole.

Assumption (v) can be summarized as:

	Maize (M)	Peanuts (PN)
Yield per hectare	1200 Kgs.	640 Kg
Working hours per hectare	750 hrs.	1600 hrs
Yield per hour	1.6 Kg	0.4 Kg

The household can expend 2800 hours at most on cultivation. Disregarding the land constraint, what is the maximum quantity of maize that the household can produce with the labour available and so is for peanuts?

Maize : 1.6Kg x 2800 hrs. = 4480Kg.
Peanuts : 0.4Kg x 2800 hrs. = 1120Kg.

Disregarding the labour constraint, the maximum quantity of maize and peanuts can be calculated respectively with respect to land:

Maize : 1200Kg x 2 hectare = 2400Kg.
Peanuts : 640Kg c 2 hectare = 1280Kg.

(vi) It is further assumed that all parts of the farm are equally well suited for both crops and that all hours worked are equally efficient whether one crop or the other crop is produced.

Under these assumptions there will be a linear relationship between the quantity of each crop with respect to the individual constraints if the basic issue is that of the optimal product mix, what does this mean exactly?

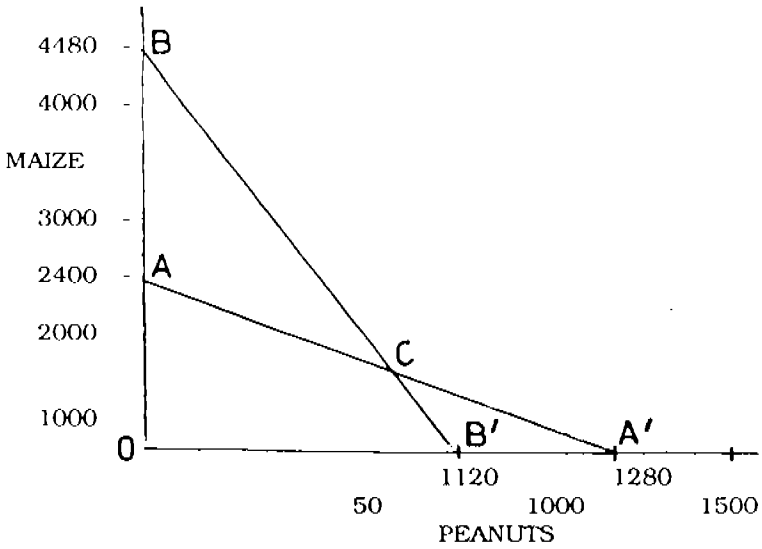
1.4 Labour Constraint:

If land would not put any limit on production the household could produce 4480Kg. of maize and 1120Kg. of peanuts or some combination of the two crops. What are the set of possible combinations?
Compute the opportunity cost of peanuts from the maximum alternative production figures i.e.

$\frac{4480}{1120}$ = 4Kg. of maize for 1Kg of peanuts on the average.

Figure 1 shows the combined effects of the two constraints.

FIGURE 1:



RELATIONS:

Line AA' represents the land constraint and line BB' the labour constraint. If the farmer wants to produce maize only and had plenty of land at his disposal he could produce 4480Kg of maize. But his land holding of 2ha puts a lower limit on his production. His output of maize cannot exceed 2400kg. In technical language, in specializing in maize his land constraint is binding while his labour constraint is not Consequently, the farmer and his family will end up with a lot of spare time if they only produce maize and no peanuts.

On the other hand, if all the family's efforts are concentrated on peanuts, the binding labour constraint will put a limit on production and the maximum attainable output will be 1120Kg. Thus, specialization in peanut production will leave some land unutilised.

At this point, three conclusions can be made:-

when prices are so low in absolute terms that the farmer does not find it worthwhile to expend any extra effort on producing either maize or peanuts;

if the government raises one or both commodity prices there is a possibility for increase in marketed production. Due to underutilised capacity the supply elasticity of either commodity could be very high.

(b) Suppose the output mix is initially at C. What happens if government raises the price of maize?

the farmer will shift out of peanuts and into maize:

any such shift is caused by a change in relative prices.

within certain range of relative prices, if may not be profitable to the farmer to change his output mix.

(c) Assume that the farmer is on his PPF. If the government policy changes and/or market conditions change, the farmer may try to push his PPF to the right. The question is: what can the farmer do himself and what could, and should, the government do to facilitate this growth process?

0 POSSIBLE RESPONSE OF THE FARMER TO CHANGES IN PRICES:

Net Price = the price the farmer receives less the costs of inputs other than the cost of land and of labour.

The farmer's cash income will be:

$$P_M Q_M + P_{PN} \cdot Q_{PN} \quad \text{----------} \quad (4)$$

where Ps are prices and Qs are quantities. We can now illustrate a hypothetical development process by drawing up a number of scenarios.

SCENARIO 1: This is an initial setting. Assume that P_M = 0.25shs. and P_{PN} = 0.5shs. Then, the three non-zero production corner solutions would give the farmer the following

With these prices solution C is the most profitable alternative for the farmer.

SCENARIO 4: Encouraged by the response of the small farmers but not yet satisfied with total production, the government once again double the producer price of maize to shs.1.00. At the same time, peanut buyers raise their price to shs.1.75. This time the government has managed to outbid the traders because farmers will increasingly specialize in maize. The model farmer will now stop producing peanuts altogether because solution A gives him the highest income:

A : shs. 2400

B : shs. 1960

C : shs. 2278

3. THE NATURE OF THE CONSTRAINTS:

So far we highlighted two issues:

(i) that farmers do respond to economic stimuli even if other considerations may weigh heavily in their decision making.

(ii) that the environment may impose limitations on their production which would not be binding in the purely technical sense.

The six "Ins", all of which, in one way or another, may influence the production decisions of the farmers are always identified by most agricultural economists:

(i) Incentives - in addition to prices there are a variety of circumstances encouraging/discouraging the farmer to increase production, these include security to the land, availability of consumer goods, etc.

(ii) Innovations - once the farmer has reached his PPF overall production cannot increase using old technologies. In the model above the farmer cannot respond positively to any further increases in the price of maize because he already uses his entire production capacity to produce that crop. To push the PPF to the right, new technologies are needed, e.g. new seed varieties.

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