MEANS OF INCREASING PRODUCTIVITY IN EXTENSIVE GRASSLAND FARMING IN ARID AREAS OF AFRICA

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Abstract: The agricultural and pastoral development of the huge dry areas of the world are subject of this paper. The author describes the possible stages of development of the pastoral industry in accordance with the general economic development of a country or region.

The development of the pastoral industry is much related to the availability of fodder during the year and over the years. Typical of the pastoral industry in the dry areas are the different ways of fodder compensation. The author points out that each development stage of a ranch has its typical way of fodder compensation in accordance with the general economic development stage of the region.

I. Characteristics of Extensive Grassland Farming

The world's acreage under permanent grassland is roughly twice as large as the world's acreage under arable cultivation. These grassland areas are mainly used for the purpose of extensive grassland farming. Under this type of management hardy grazing animals feed on the natural vegetation. The farmer does not actively promote the growth of plants to any degree worth mentioning nor does he protect his livestock in stables against the inclemencies of the weather or compensate in any large degree for feed shortages by growing forage or making feed purchases.

The following shall deal primarily with market-oriented, extensive grassland farming, and only slight reference shall be made to the other large category, pastoral nomadism, which has little reference to the market.

1. Geographic Distribution

Extensive grassland farming has developed under the most varying conditions of production. It is found in the marginal areas of the tropics where the annual mean temperature is 28°C and in the Kirgiz Steppe, where the monthly minimum ranges from minus 7°C to minus 26°C. It is practised by Arabs and Berbers living in climates with monthly temperature minima of seldom less than 5°C. It is found in the Sahara with its extremely arid climate and in New Zealand with its maritime climate. Agricultural countries such as the United Arab Republic or the Sudan, where the factor of industrialization is below 1, make use of extensive grassland farming, just as do countries with a medium factor of industrialization such as the South African Republic (factor of industrialization: 3.4). It is even practised in the highly industrialized United States of America, where the factor of industrialization is 9.2. However, extensive grassland farming is found most frequently in the semi-arid zones of the tropics, sub-tropics and moderate climates, i.e. in the dry savannahs and steppes, especially when these areas are situated in developing countries.

With reference to tropical Africa the following must be said:

- The more humid limits of grassland farming are identical with those limits dividing the tropical rain forest from the sub-humid savannah regions, since cattle and sheep husbandry are hardly possible when there is tsetse-fly...
infestation and when every pasture rapidly reverts to bush and forest;

- In the more humid areas of the savannah, livestock husbandry is more prevalent at places located near the climatic dry limit, although such locations are not optimal for livestock husbandry because of the prevailing high grasses and the danger of contagious diseases;

- Grassland agriculture prevails in the dry savannah—the region between the climatic and the agronomic dry limits;

- The thornbush steppe is almost exclusively exploited either by animal farms or by pastoralnomadism;

- In the semi-desert, even beyond the dry limits of animal husbandry up to the point of transition from semi-desert to desert, pastoral nomadism is sporadically met with.

2. Productivity

Market-oriented, extensive grassland farming, found the world over, has two predominant economic characteristics:

- It renders possible fairly good net labour productivity. In four different forms of grassland management practised in the United States, it ranged from DM 6.10 to DM 10.10 per man-hour, with an average of DM 8.60 per man-hour in the period from 1957/1959 to 1962/1964. This is surpassed by few other farm systems.

- It can be undertaken where the gross productivity of the soil is extremely low. An example is southwest Africa, where figures ranged mainly from DM 1.80 to DM 5.50 per hectare in the years 1962/1963. Figures are even lower in many developing countries. It is the farming system with the lowest demand on soil productivity.

The high net labour productivity of extensive grassland farming results from the fact that one worker is able to manage very large grassland areas with a minimum of material input (100 hectares of pasture are handled by approximately 0.03 to 0.3 workers). The enormous area of land that may be handled by one worker can be explained by the fact that in most instances this worker does not do any arable farming but simply tends the natural vegetal cover. There are no costs for planting, cultivation, etc., and even the costs of harvesting are very small, since harvesting is done by the livestock. Work is confined to the supervision and sanitation of the grazing animals. The crop yield per worker is based on very large area units so that labour productivity is very high even though the crop yield per hectare is very low.

The low productivity of the soil, of course, is a negative aspect of extensive grassland farming. But a positive aspect is that this farming system continues to function in spite of the low productivity of some soils, and makes it possible to utilize areas of low fertility. Another positive aspect is the extremely low minimum intensity of extensive grassland farming, which stands in causal relationship with the low productivity of the soil. This system is thus particularly suited for countries with extremely unfavourable economic conditions.

3. Locations of Production

The geographic distribution of extensive grassland farming is determined by the two economic characteristics mentioned, namely the possibility of high labour productivity and the toleration of extremely low soil productivity. There are two types of areas where extensive grassland farming proves its superiority over all other farming systems: those where the economic conditions and those where the natural conditions are very unfavourable.

Unfavourable economic conditions of production may result from unsatisfying market prices as well as from the fact that the farming enterprise is too far away from the market. In extensive grassland farming both conditions usually prevail.

A farming system of such a low soil productivity as extensive grassland farming is typical for thinly populated agricultural countries. These countries still have sufficient areas of land available so that the costs of land utilization are low. Workers are scarce and therefore more expensive than in overpopulated agricultural countries. Above all, market prices are very high for all capital goods produced by industrial enterprises. Market prices of agricultural products are relatively low. This price-cost situation is even worse if prices are charged free farmstead. Thinely populated agricultural countries have few market outlets. Railways and roads are lacking and transport rates are high. Since most of the farms are situated at some distance from the market, they are burdened with heavy transportation costs.

The farmer is in the dilemma of having to pay the transport of his produce to market as well as for the transport of agricultural means of production he has purchased at the market from there to his farm. In other words, he gets less than the market price for his products and pays transport costs in addition to the market price for his purchases. The exchange value of agricultural products for manufactured capital goods is therefore very unfavourable. The same is true for labour; it is cheaper near the market.

Typical, therefore, for farms at great distances to the market in thinly settled agricultural countries are low costs for land