

AGRICULTURE-INDUSTRY FORWARD LINKAGE: THE CASE OF TWO GRAIN MILLING PLANTS IN DEBRE ZEIT TOWN, ETHIOPIA

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INTRODUCTION

Producing sufficient food, exportable products, raw materials, and supplying labour for industries are the most important implications of the two-way linkage between agriculture and industry. The following is the highlights of the performance and issues of grain milling industry in Ethiopia on the basis of two case grain-milling plants in Debre Zeit town.

Agriculture-Industry Linkage and Sustainable Development

As farm input system expands, the backward linkage of agriculture with the rest of the economy, particularly industry, continues to grow. On the other hand, agricultural transformation, which is usually accompanied by commercialisation of farming, strengthens the backward and consumption linkage.

Expanding agricultural production, marketing and processing of agricultural products increase the forward linkage of agriculture with the rest of the economy. Industrial sector can not continue to expand for long without a balanced expansion in the output of the agricultural sector (Myint 1964). This clearly implies the importance of agriculture-industry linkage in sustaining economic development. Dejene (1997) has extensively reviewed the concepts and arguments involved in Agriculture-non-agriculture linkages.

Agriculture-Industry Linkage and Industrialisation

Agriculture-industry linkage can also be viewed from industrialisation perspective. In this respect, ADLI strategy emphasises the linkage effects of agriculture and industry as

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the key to the success of the strategy. Adelman and Vogel (1992) argue that successful implementation of ADLI presumes high inter-sectoral linkages, supply responsiveness in both agriculture and industry and the existence of agro-technologies appropriate for specific food crops, soils, topography and climate conditions. Successful ADLI presumes careful management of the agricultural terms of trade, so as to enable farm incomes and profits to increase with improvements in agricultural productivity.

The ADLI strategy would impart a strong impetus for industrialisation and income growth in African countries through creating better demand for manufactured goods. On the other hand, however, much of the induced demand for manufactured goods have to be satisfied initially by imports, as the domestic supply is not responding fast in terms of quantity and quality. This, in turn, implies that ADLI should be accompanied by import substitution efforts in industry and supported by a ample availability of foreign exchange for the import of manufacturing and non-competitive consumer goods.

Agro-processing Industry

Industrial processing of food and agricultural products offers important opportunity for agro-based industrialisation. On the other hand, agro-processing can be analysed from marketing point of view. In this context, processing of agricultural products (for utility) is one of the economic functions of marketing.

Nearly all food is processed in some way between the farm gate and the consumer. Consumers very often pay a higher price for additional processing done by industrial processing firms to increase food quality, product differentiation and to reduce home-processing costs and preparation time.

Agro-processing also offers opportunity to capture economies of scale through the use of processing technologies that reduce unit cost. It enhances market availability to agricultural producers, which in turn provide incentives to agricultural producers to increase agricultural productivity through purchases of improved inputs. It would also encourage specialisation and commercialisation of agriculture. Employment creation is another potential contribution of agro-industry. All these inter-linked induced changes do promote the structural transformation of agriculture and economy (Stevens and Jabara 1987).

THE CASE OF TWO GRAIN MILLING PLANTS IN DEBRE ZEIT TOWN

The Debre Zeit Food Industry

The Debre Zeit Food Industry (DZFI) is a privately owned grain-milling factory. The designed capacity for the mills was about 500 qt of wheat per 24 hours. Currently, however, the working capacity of the mills is 350 qt/24 hours due to depreciation and related factors .

The plant purchases wheat, the main raw material, from traders who assemble mostly from wheat farmers in Bale, Arsi, Hosanna and Arsi-Negelle areas. In some years, when wheat is in short supply, the factory buys from the Ethiopian Grain Trade Enterprise (EGTE), which usually imports wheat when its shortage is apparent in the country. For example, in 1997/98 and 1998/99, the factory bought about 25 % and 33 %, respectively, of the raw wheat used from EGTE .

As shown in table 1, the number of permanent workers has been decreasing over the last three years. A decreasing utilisation of capacity is notable. The decrease in the utilisation of the capacity is attributed to poor market and lack of or expensive whole wheat. Poor supply of wheat is claimed to be due to drought problem in many areas of the country.

Ada Flour and Pasta Factory

Ada Flour and Pasta Factory (AFPF) is a state (federal) owned plant. It has been in operation since 1967. It produces wheat flour, pasta, macaroni and related products. The factory had a designed capacity to mill 1700 qt. of wheat per 24 hours, but currently it operates at the rate of 700 - 800 qt/24 hours. This is mainly because of the outdated technology and old machinery system with very low efficiency. The two mills of the factory have worked for more than 25 years, more than twice the designed work life of the machinery. The grinding systems or the mills are of the technology of three decades back. Today, the available grinding systems in markets have a capacity of more than 500 ton/24 hours .

As can be noted in table 1, the factory has not as such improved its physical capital in terms of improving the machinery systems and other physical assets mainly because of

lack of financial capital. The number of workers employed in the factory has been decreasing over the last three years, reducing its role in offering employment opportunity. This could be related to decreasing rate of capacity utilisation and deterioration of the efficiency of the grinding systems over the years, leading to lower labour requirement .

Since recently, the grinding system is operating at the milling capacity of about 292, 000 qt of wheat per year. The trend is that the plant is operating below reduced capacity. For example, in 1998/99 the plant milled as low as 27 % of its capacity. Availability of raw wheat, frequency of downtime due to technical problems or power cut-off are some of the problems causing poor capacity utilisation. Lack of foreign currency to purchase the needed quantity of durum (pasta and macaroni) wheat from abroad is also one of the reasons for low capacity utilisation.

Table 1: Some Indicators of the Performance of Ada Flour and Pasta Factory and Debre Zeit Flour Industry, 1996/97 - 1998/99

Indicator	1996/97		1997/98		1998/99	
	*AFPF	**DZFI	AFPF	DZFI	AFPF	DZFI
Number of workers	522	168	503	159	476	138
Fixed net capital, (Birr)	3,204,118	5,892,285	3,510,954	5,438,876	2,765,542	7,161,699
Wheat purchased (qt.)						
Domestic	158,900	164000	116, 571	131250	79,788	80400
Import	-	-	-	43750	-	39600
Total	158,900	164000	116, 571	175000	79,788	120000
Gross flour Production (qt.)	116, 315	108256	43,672	98703	27, 374	83132
Gross value Flour (Birr)	6,579,940	25,917,295	9, 117,403	27,174,830	5,714,870	22,693,364
Capacity utilisation rate, %	54.4	84.7	40.0	77.3	27.3	65.1

Data source: The data is obtained from the management offices of the plants

* AFPF Ada Flour and Pasta Factory

** DZFI Debre Zeit Food Industry

PROBLEMS AND ISSUES OF GRAIN MILLING INDUSTRY

Market problem

Lack of stable market for the products is a considerable problem for both plants. The competition from the flour importers, who happen to sell flour of relatively good quality (white colour) for lower price worsen the opportunity of getting market. The important factor is, however, the low competitiveness of the local producers in terms of the efficiency, productivity, quality and price of the products.

Wheat supply problem

For both plants, the main source of wheat for milling is locally produced wheat (bread wheat and in some cases mixed with durum wheat). Shortage of wheat supply, particularly during bad production years, forces factories to process below capacity. Price of wheat grain has shown an increasing trend, becoming a bottleneck to processing performance.

A serious problem associated with wheat grain supply is the poor quality of wheat supplied from domestic sources. The attributes of wheat that reduce flour quality include broken seeds, impurities (mainly soil), germinating seeds (*bekolt*), high moisture content and low hectolitre (weight of a litter of seeds). The problem of seed quality is aggravated by the lack of standardising and grading systems for raw or processed agricultural products that ensure better price for better quality. Poor post-harvest handling of grains and lack of wheat varieties preferred for pasta/macaroni (durum wheat) and for bread wheat are constraints to quality flour manufacturing.

Technical and financial problems

Technical constraints like lack of power (cut off) and water shortage, machinery downtimes are also important problems. The low qualification of manpower to operate and maintain the machinery and technical systems aggravates the technical problems. Lack of capital to replace old machinery and their parts enforces the factory to continue with inefficient and old machinery system of backward technology. Lack of working capital is also a considerable bottleneck to run the plants smoothly and to maintain and repair the machinery systems in time.

Other problems

One of the reasons for low marketability of the products of the plants is the competition with the imported flour of relatively of good quality and cheaper price. This situation seems to create difficulties for the local grain milling plants characterised by relatively high cost of production, making them less competitive.

The role of advertisement and the bias created among most Ethiopians for imported goods has made the competition to be more stringent. The recently raised import tax on consumer goods and attempts to raise the public awareness on the importance of promoting domestic products are useful measures for the local processing plants.

CONCLUDING REMARKS AND RECOMMENDATIONS

Processing of agricultural products is done by cottage/handicraft, small-scale, medium and large-scale processing industries. Farmers and consumers do also process agricultural products as part of consumption activity.

The major problems of processing industries include:

- Supply of raw agricultural products of low quality or below standard for processing;
- Lack of capital to run the firms with required technological level;
- Risks of inadequate markets for the processed products;
- Lack of adequate and sustainable supply of raw materials from agricultural producers. This problem is linked with low agricultural production and growth, for which supply of improved technologies, farm inputs and extension services are essential. - Irregular rainfall pattern, poor crop husbandry practices and harvesting methods that aggravate.
- The problem of producing grains of required quality for processing.
- Lack of articulate rural industrialisation policy which support the expansion of agro-industry.

- and provide regulatory services to businesses involved in agro-processing industry.

Recommendations

- Enforcing standardised weights and measures: Purchasers should be made confident that the scales, weights, and containers used for measurement of agricultural products are accurate.
- Standardising grades: A way has to be found to describe accurately, with standardised grades, the nature of the various lots of agricultural products available. The grades have to be easily communicated in words through modern communication channels.
- Facilitating competition in marketing: Government should help to reduce the barriers to entry in processing and marketing channels by (a) facilitating access to credit, so that new firms have an opportunity to challenge the unit marketing or processing costs of established firms and (b) analysing any subsidies the established firms may be receiving, which provide them with unfair competitive advantages.
- Collecting and disseminating timely marketing information.

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