

Evolution of Operational Processes in Rice Milling Industries of Burdwan City and Adjoining areas

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Abstract

Burdwan district is referred to as the granary of West Bengal, India, indicating its major role in paddy production. The economy of the eastern part of the district with the city of Burdwan as the centre, has been dominated by agro-based industries like rice mills and others. But this booming industry is currently facing huge problems related to modernization, marketing, labour and shrinkage of demand.

Introduction

Industrial activities are broadly defined into extractive and processing types. Of the latter type processing of the agricultural products form the most significant early step in industrial

development based on agriculture. In the path of modernising the economy, the first step is to establish the processing units of the agricultural activities. Therefore, such industries have closed links with the regional economics and reveal the inner strength and characteristics of the industrial growth. In Burdwan, the thriving regional agricultural economy has given rise to a large number of processing industries.

The Rice Milling Industry

The rice milling industry satisfies one of the basic needs of providing food. The basic raw material of the industry is paddy. Paddy as a raw material is boiled, then dried and poured into the machines, which crushes the paddy and extracts rice.

Operational Steps

The functioning of rice milling industry is a continuous process. The milling processes and the products at the end of each different process are described below; the four main parts of the rice kernel are the hull, germ and endosperm. The purpose of milling rice is to separate the outer portions from the inner endosperm with a minimum of breakage. The various steps followed in rice milling given in Encyclopaedia of Science and Technology, Volume-II (1985) is illustrated in the flow chart.

A lengthy processing is required before the paddy in the field is brought on to the kitchen for human consumption. Not only that, there are several technological levels in the processing of paddy. Starting from cottage *dhenkis* (wooden husking instrument) in rural areas there are large mechanized rice mill –cum –oil extraction

plants all coexisting together, sharing the same economic space, all parts of the informal economic sector.

Hand-Pounding Or Husking Pedal System

In village houses, hand pounding of rice is done by women workers apart from their other domestic duties with the help of *Dhenki*. Such a process allows the labourers to retain the bran and a portion of rice as their wage. Though this system of rice processing has lost much of its importance, it still exists in the rural areas of the district.

The hand-pound rice industry began to receive stiff competition from husking mills and rice mills from the early years of the present century.

The Husking Mill And The Rice Mill

The innovation of paddy processing machinery in England, Germany and other European countries gave a new dimension to the paddy processing industry of Burdwan during the late colonial period. In the very first decade of the last century husking mills and rice mills began to grow in Burdwan region along with other agriculturally rich districts of West Bengal like 24 Parganas and Hooghly.

The *modus operandi* of both the rice mills and husking mills are the same, that is, the fabrication of paddy into rice with the help of machines. The operational processes of the machinery used in both the types of mills are also the same.

The differences between a husking mill and rice mill are firstly, the rice mills, compared to the husking mills have more hullers

Secondly, rice mills have boiler plants to boil the paddy and drying yard for sun-drying because husking mills are to crush or fabricate the boiled and dried paddy of the consumers against certain commission which is better known as *Bani*.. But the rice mills perform all these functions at their own cost and trade with their products. Thirdly, the rice mills have a storehouse for storing both paddies as raw materials and rice as the finished product.

All the finished products and by-products in the husking mills are used to refund to the consumers. The husking mill owner is nothing but a miller doing the job of value addition and form utility creation. However, the system is so that it reminds one of pre-industrial revolution system, that is, non-capitalistic production system. In fact, similar production relations still exist in the handloom sector in some cases in India. It also shows the lesser specialization of production activity in rural areas.

Rice Processing In The Early Days of Mills

In the early days of the rice milling industry, the capacity of the mills was not as much as today's modern rice mills. At that time, in the absence of electricity, steam engines and boilers were in user and in steam engines and boilers, husk, coal and fire-wood were used as fuel. The only by-product obtained from the milling industry at that stage of development was bran. Though imported machinery was used, the rice milling industry at a class remains till date labour –intensive industry. The only exception is found is totally dryer based mill where labour requirement is small in comparison to mills with sun-drying yard.

To keep pace with changes in time and developments in technology, certain changes have been made in the operational processes of the rice milling industry. Previously the industry was a seasonal one and its operations would remain suspended during the rainy season. According to a senior miller, previously it was customary to suspend the milling operation on the day of *Rathayatra* and to re-open the same on the day of *Vijaya-Dashami* of every year.

The reasons ascribed by them for such suspension of work; first, due to rain, sun drying system through drying yard would not be possible; secondly, quality of rice produced during rainy season would fall whose serious impact on the price and profitability; finally in the rainy season the casual labourers engaged in rice mills would go to their cultivation work.

Study area

The study area is extended between $23^{\circ} 11'$ to $23^{\circ} 21'$ north latitude and $87^{\circ} 46'$ to $87^{\circ} 57' 45''$ east longitude spreading over about 108 square kilometres in Burdwan city and its surrounding 6 *Gram Panchayats*. These are Belkash, Bagar II, Saraitikar, Rayan I, Baikunthapur I and Baikunthapur II. Burdwan acts as the main urban focus and the regional focus for this region (Figure I) where agro-processing industry has grown in a concentrated manner.

The areas lying just beyond the municipal boundary of Burdwan city have close physical and economic links with Burdwan and form our study region identified on the basis of diversities of rice mills and similarities in agricultural development. This region forms

a part of the agriculturally prosperous near-flat plain of the Ganges and its tributary Damodar, the *Banka nullah* (local name for a small stream) flows through the region from the west and forming a meander in the middle of the city. The Damodar River cuts through the south of the region and has proven to be a major physical barrier in the expansion of rice milling in the trans Damodar region.

Database and methodology

The present study is based on both primary as well as secondary data and various Government offices have provided maps. Data related to the number of rice mills in the district have been collected from the office of Burdwan Town Rice Mill Owners Association. Data related to the nature and actual size of the mill, the actual numbers of workers in the individual mill etc. all were collected from the *Shramik Bhavan* (Labour Union Office). The total number of rice mills in the Burdwan region was 52 at the time of survey out of which 35 percent rice mills were selected for study. The survey was conducted with the help of a structured questionnaire. The questionnaires were filled in by conversation with the rice mills owners. Authenticity of the information supplied by the mill owners were compared with the data made available from *Shramik Bhavan*.

Introduction of modern machinery

The innovation of improved machinery by Schulz Company of Germany made some dramatic changes in the operational process of the rice mills. In India, this modern machinery was introduced in some of the rice mills after the World War II. Some

rice mills of the Burdwan district started using these machineries from 1948-50. Consequently, the production capacity of the rice mills increased to a great extent from these years onwards. After the introduction of modern machinery, though the procedure for processing of paddy more or less remained unchanged, for the first time a separator-cum-polisher machine had been introduced to separate rice bran. This addition of the new improved processing system resulted in the reduction of broken rice to a considerable extent and thus helped for reducing the cost of production on the one hand and increasing the input-output ratio on the other.

Huller

The huller system of operation still continues and the production capacity of the mills would depend upon the number of hullers that it can afford to use. In huller the machinery consists of small sized huller, driven by electricity or diesel oil motor of 5 HP to 20HP.

There are usually a number of hullers in a rice mill. When paddy is converted into rice in a single huller, there is a greater percentage of broken rice. The huller type of mill generally employs ten persons. In this type of rice mills it is not easy to regulate the degree of removal of bran and the bran gets mixed up with powdered husk.

In 1968 the Government of India made some changes and modifications to the Rice Milling Industry (Regulation Act 1958) to replace the earlier system of operation by the modern system of

milling that is Sheller-cum-polisher-cum separator system.

By this Amending Act of 29 of 1968, the Government also directed the rice mills to extract rice bran from the rice as it has some industrial values.

The reasons for this replacement were as follows:

1. These hullers were scattered all over the country side far away from important market and in many cases, were run along with other power driven plants like flour, oil, dal mills or pumping sets etc. without securing requisite permits or license under the Act.
2. Most of the rice mills with hullers were antiquated and used outmoded technology. As a result the outturn of rice from outmoded hullers was much lower than that from sheller-cum-polisher type mills. As such, use of hullers decreased the availability of rice.

From the above reasons, rice mills both existing and new ones were equipped with modern machines and also began to use modern day technology. Moreover, the removal of bran, commonly known as 'polishing' of rice after its recovery from paddy, was also proposed to be covered by the term 'milling rice' which hitherto would be covered by the recovery of rice from paddy.

Sheller

In sheller type mills, grinding the paddy between two stone discs that resemble the stone chakki carries out dehusking. The automatic core polishers do polishing of the husked rice. The cleaning, dehusking, winnowing, polishing and sieving are

automatically performed in a continuous sequential process yielding different products like rice, husk and broken rice etc. A sheller type of mill with a single sheller generally employs about ten persons apart from casual labourers. Recovery of rice is about sixty nine to seventy percent.

Contrast to this, in the huller type of mills, dehusking and polishing are being combined in a single process. Polishing cannot be controlled to the same degree as in sheller type of mills operating with a core polisher (Sen, 1966).

The Role of The Government In Modernisation Of Rice Mills

1. In 1958, the Government of India enacted for the first time the Rice Milling Industry (Regulation) Act, 1958 for the country. In this Act, among many others, some provisions were also made for the development of organisational and operational aspects of the rice mills and the use of their by-products.
2. The Government of India changed the Rice Milling Industry (Regulation) Act, 1958 under the caption, Amending Act 29 of 1968 of the rice milling Industry (Regulation) Act, 1958. The Amended Act required the rice mills to replace the earlier huller system of operation by the modern system of milling that is sheller-cum-polisher-cum-separator system. The Government also directed the rice mills by this Amending Act 29 of 1968, to extract rice bran from the rice, as it has some industrial value.
3. The Government of India also agreed to pay subsidy to the existing or new mills, if they introduced modernised system of milling. This gave impetus to the millers and all existing rice mills

availed themselves with this opportunity to modernise mills.

4. The introduction of the modernised system under the encouragement of the State brought a radical change in the milling process and this system is still continued
5. The Government banned 'Kedar' boiler, an indigenous product that was much in use in the rice mills in the 1950's and 1960's, as the boilers had some technical snags.

Turnkey Project

A latest addition in the rice milling industry is the Turnkey Project. This project has been introduced in some states of India, such as Punjab and Andhra Pradesh. In this system, the raw paddy is poured in the milling process and 'Rotary Drying Process' does the boiling and par boiling automatically. Later, with proper drying, paddy is transferred to grinding machines by a conveyor belt, for grinding, followed by automated separation of husk, rice and bran.

This system has much advantage in its operational process. These are:

1. It does not require any drying yard
2. Less man power required for operation
3. Minimum time is required for the conversion of paddy to rice
4. Working of the mill is not hampered in adverse climatic conditions
5. Environmental pollution is very little
6. Safety and security are more ensured as it is an automatic process

7. Bulk production per unit time Substitute to the traditional parboiling (paddy to rice conversion takes 24 - 36 hrs.) this process requires 4 – 6 hrs yielding parboiled rice, free from any off flavour and its nutrient is infused into the kernel
8. It can be run by steam or electricity or diesel
9. Economically advantageous, due to substantial reduction in cost of production, requiring less labour and fuel.
10. Quality and quantity of products are improved at a time.
11. Increment in the output-input ratio, as a result of reduction in the broken rice yield.
12. Increment in the length of working period per annum of the mills.

Even in the rainy seasons, the rice milling process is not suspended from functioning. Naturally, the rice mills have been able to remove the seasonal character.

The Turn Key Project machinery that previously would be imported from Japan and the Philippines are now being produced in India by some manufacturing concerns, such as Oswal group of Industries.

Though Turn Key Project could make inroad into the rice milling industry of Punjab and Andhra, there has been very little progress in this regard in the rice milling industry not only in the district of Burdwan but also in the whole state of West Bengal. Various factors are responsible for the phenomenon.

First, It is not a fact that the rice millers in West Bengal are not aware of the system. The reverse is rather true Nevertheless; they

did not go far as it required some technical know-how, which were not readily available in the district.

Second, involvement of fixed capital requirement under the Turn Key Project is much more than the present sheller- cum-polisher –cum separator system and it is not possible for the millers in the district to provide such huge amount of capital at a time,

Thirdly, this project requires minimum number of workers for its operations, hence it is apprehended that any move to introduce Turn Key Project will not be favoured by the labour union.

Fourthly, the quality of rice produced under Turn Key Project is also not conducive to the consumers.

Lastly, Turn Key Projects being capital intensive by nature run counter to the philosophy of small-scale industrial units to which sector the rice milling industry as a whole belongs.

Recently, however, two Turn Key Projects have been undertaken in the district. In view of the various limitations of the system it remains to be seen how the rice milling industry in the district with surplus agricultural labour reacts to this new system

Conclusion

Tertiarization is a dominant characteristic of the third world urbanisation processes. The economy of Burdwan town also bears this characteristic with 72.15 per cent of its labour force in the tertiary sector. Most of the economic activities (both formal and informal) of the town are tertiary in nature. Trade and transport, employing 39.87 per cent of the total workers and 55.26 percent of

the tertiary sector workers is the main component of the tertiary sector of Burdwan. Counting the number of informal sector workers and measuring the value of their economic contributions is a formidable task both technically and because the definitions of informal economic activity are so flexible and shifting. Burdwan town evokes the image of a trade cum service centre to even lay people. Yet, Burdwan town has a significant industrial employment per cent of its total workers. Much of this employment is in the local agro-processing industries that are small in size, are sporadic in nature, and are low capital intensive where job security is minimal in spite of recent efforts by trade unions.

We have deviated from standard size-based definitions of industry in our study and prefer to call the agro-processing units “informal” industry. As we have elaborated before, the state definitions of small scale industry emphasizes the capital investment aspects or size of production, but neglect to incorporate debates on labour characteristics and the regional economy that is giving rise to such economic forms. In our study, we intentionally emphasize the social and economic aspects of agro-processing industries, and look into the technological processes that support such aspects. Completely under the control of private entrepreneurs, these units perform important roles in absorbing local surplus labour force and constitute an important link between the formal and informal sectors of the urban economy of Burdwan.

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