Economic Assessment of Rice Production in Sindh, Pakistan

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Abstract: The aim of this paper is to analyze the production cost and revenue of rice crop in Sindh Pakistan. Primary data was collected from 60 growers of rice crop from Taluka Dokri District Larkana. The study focused on the determinants the cost of production, yield and revenue of rice crop. The result shows that overall cost rice was 60991Rs/Acre and yield was obtained from rice as 68.74 mounds per acre. Gross revenue was received by the rice growers as 68434 Rs/Acre. Study results further indicate that rice growers obtained gross margin as 28197.1 Rs/acre, but there were some problems facing by farmers in study area such as water shortage problem, high price of inputs, marketing problems, low price of output. Due hardworking of farmers and by proper Land management and timely use of quality inputs enhances the rice yield.

Keywords: Rice, Primary Data, Cost of Production, Yield, Revenue, Gross Revenue

1. Introduction

Rice is one of the important food crops in the world and ranks second in terms of area and production. It is the staple food for about 50 per cent of the population in Asia, where 90 per cent of the world's rice is grown and consumed. Asia's food security depends largely on the irrigated rice fields, which account for more than 75 per cent of the total rice production (Virk etal., 2004). Rice is the staple food for the world 2.7 billion populations mostly resides in Asia. Asia produces and consumes 90% of the world rice. (Said et al., 2000). It is the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the agricultural commodity with the third highest worldwide production, after sugarcane and maize, according to data of (FAOSTAT 2012).

Rice is a cereal grain; it is the most widely consumed staple food for a large part of the world's human population, especially in Asia. It is the grain with the second-highest worldwide production, after corn, according to data for 2010. Since a large portion of maize crops are grown for purposes other than human consumption, rice is the most important grain with regard to human nutrition and caloric intake, providing more than one fifth of the calories consumed worldwide by humans. Genetic evidence has shown that rice originates from a single domestication 8,200–13,500 years ago in the Pearl River valley region of China. Previously, archaeological evidence had suggested that rice was domesticated in the Yangtze River valley region in China. From East Asia, rice spread to Southeast and South Asia. Rice was introduced to Europe through Western Asia, and to the Americas through European colonization. Today, the majority of all rice produced comes from China, India, Indonesia, Bangladesh, Vietnam, Thailand, Myanmar, Pakistan, Philippines, and Japan. Asian farmers still account for 92% of the world's total rice production. There are many varieties of rice and culinary preferences tend to vary regionally. In some areas such as the Far East or Spain, there is a preference for softer and stickier varieties. Rice is normally grown as an annual plant, although in tropical areas it can survive as a perennial and can produce a ration crop for up to 30 years. The rice

plant can grow to 1–1.8 m (3.3–5.9 ft) tall, occasionally more depending on the variety and soil fertility. It has long, slender leaves 50–100 cm (20–39 in) long and 2–2.5 cm (0.79–0.98 in) broad. The small wind pollinated flowers are produced in a branched arching to pendulous inflorescence 30–50 cm (12–20 in) long. The edible seed is a grain (caryopsis) 5–12 mm (0.20–0.47 in) long and 2–3 mm (0.079–0.118 in) thick (Humayun, 2012). The rice is frequently grown on heavy clay soils that have an impervious, subsoil layer (hard pan) that limits drainage, because it requires a constant and plentiful supply of water. The rice production can be used to reclaim saline soils, because flooding leaches salts from the soils (Bhatti and Soomro, 1996). In Asia Rice is feeding more than 2 billion people (FAO 1995). 27% of dietary energy and 20% of dietary protein intake over all is provided by rice (Anonymous 2003). Rice is life for majority of people in the world and it is deeply rooted in cultural heritage of the societies. Two fold Increase in rice consumer is expected by the year 2020 as population of the world recorded six billion in 2006, will increase to 10 billion by 2025 (Khush and Toenni-essen 1991). It is an important food and cash crop and second staple food source of grain crop of Pakistan after wheat and major source of foreign exchange earnings after cotton. Rice accounts 3.1 percent of the value added in agriculture and 0.7 percent in GDP. During 2013-14 rice is cultivated on an area of 2789 thousand hectares, 20.8 percent higher than last year's area of 2309 thousand hectares. The production stood at 6798 thousand tones against the target of 6200 thousand shows a growth of 9.6 percent against the target (Economic Survey of Pakistan, 2013).

Rice varieties with higher yield potential must be designed to enhance the total rice production of the world. Grain yield in rice is a quantitative/polygenic character and highly influenced by environment. Different rice varieties and germ plasma lines were selected on the basis of yield and yield contributing traits. Association of yield with corresponding yield components should be considered in determines the selection criteria of germ plasma on the basis of the variation (Habib et al. 2005). Rice, a monocot, is normally grown as an annual plant, although in tropical areas it can survive as a perennial and can produce a good crop for up to 30 years (IRRI).

Rice production in Pakistan holds an extremely important position in agriculture and the national economy. Pakistan is the world's 11th largest producer of rice, after China, India, Indonesia, Bangladesh, Vietnam, Thailand, Burma, Philippines, Brazil and Japan (fao.org 2007). In Pakistan's economy Rice is second food source after wheat and is an important foreign exchange earning commodity fetching about $950 million annually. It is one of the highest water requiring crops, depending on early and late maturing varieties. Coarse grain varieties are early maturing while fine grain varieties are late maturing. Sixty two percent of total rice area is under fine varieties, 27 percent under course grain varieties, and 11 percent under of others

varieties. Moreover, about 96 percent of fine varieties are grown in Punjab because there is suitable climate for maintaining the quality and aroma of these varieties. The yield of fine varieties is much lower than the course grain varieties but demand of fine rice is high in national and international markets. Most of the farmers prefer to grow fine varieties despite low yield high production cost and more water requirement. (Khushk et al. 2011). Rice is cultivated under diverse climatic conditions in Pakistan, where the rice cultivation areas can be divided into four ecological zones (Salim et al. 2003).

2. Objectives

1. To determine socioeconomic factors of rice growers in district Larkana, Sindh.

2. To analyses the cost of production and revenue of rice crop in study area.

3. To suggest the policy measures for enhancing rice production

3. Methodology

The study was conducted through primary data collection from growers of Rice from Taluka Dokri District Larkana. The study focused on the determinants the cost of production, affecting yield and revenue of rice crop.

3.1. Study Area

The research work was conducted in Taluka Dokri, Districts Larkana a rice cropping zone of Sindh. Sample random sampling techniques were used. Primary data was collected from sample of 60 rice growers.

3.2. Data Collection

Information about rice crop and other necessary aspects was collected by comprehensive and pre tested questionnaire. In order to enhance the response rate, data was collected through interview. Although questionnaire was prepared in English language while the interview with respondents was done in local language i.e. Sindhi. Different features were covered in the questionnaire.

3.3. Data Source

The data source of this study was primary data collection sources. The primary data were collected from the Rice growers through the well structured pre-tested questionnaire.

3.4. Data Collection Procedure

The data were collected by stratified random sampling techniques in the first step, major district of rice cropping zone were selected, and in the second step the location was identified. From each location about 4-5 growers were randomly selected and interviewed. A total of 60 Rice growers were determined as a sample. The interview with growers was carried out personally, which allowed very

detailed insights in crop growing in the target areas.

3.5. Data Analysis

After completion of the data collection procedure, the data were edited and interred on database file of statistical packages of social sciences (SPSS) as well on excel sheet to analyse the data. The variable names given on database file refer to the numbers of each question of the questionnaire the analytical techniques are as under.

3.6. Farm Costs Analysis

The farm cost analysis is based on rice production. The result of study provides the total costs and returns rice. Total costs consists fixed costs and variable costs etc.

3.7. Total Costs

Total Cost is the sum of the fixed cost and total variable cost for any given level of production.

Total Cost fixed cost + total variable cost=Total cost

3.8. Total Fixed Costs

Total fixed costs are the costs that do not change with the level of production. For example, water Charges, Govt. Land Taxes.

3.9. Total Variable Costs

Total variable costs are the costs that change in direct proportion to changes in volume. Variable costs can be avoided by not producing. For example: the cost of feed to feed animals is a variable cost. If the animal is not purchased, no feed costs are incurred, but the fixed costs of the livestock building are still incurred.

3.10. Total Revenue

Total revenue is the total money received from the sale of any given quantity of output. The total revenue is calculated by taking the price of the sale times the Physical productivity.

Total revenue=price x physical productivity

3.11. Gross Margin

A gross margin is calculated by taking variable costs away from the gross income earned from an enterprise. Gross margins are often reported on a per rupees basis for cropping enterprises.

Gross margin=returns–variable costs

4. Results

The main objective of study is to find out socio economic condition of farmers in study area and the cost of production and production analysis of rice crop. The socio economics conditions and Cost of production and production of rice are discussed here.

4.1. Socio Economic Condition of Farmers

4.1.1. Family Size of Farmers

In most societies family is the principal institution for the socialization of children. Anthropologists most classify family organization as matrilocal (a mother and her children); conjugal (a husband, his wife, and children; also called nuclear family).

Result shows that 23.33 percent of rice farmers had less then family members, 41.66 percent had 5-8 family members and 35.00 percent of farmers had more than 8 family members in study area.

4.1.2. Education Level

Education is always considered as an important factor of understanding and learning skills. It is education which changes the behavior of human beings. Education changes moral character, thinking pattern and make learn how to talk and behave with other people. It helps in making the decisions on right direction. Result of study reveals that 46.67 percent farmers were illiterate, 34.00 percent had primary to middle education, 16.67 percent were matriculate and only 4.66 percent of farmers were have Collage to University education in the study area.

4.1.3. Family Type

Joint family set-up, the workload is shared among the members, often unequally. The roles of women are often restricted to housewives and this usually involves cooking, cleaning, and organizing for the entire family. They are also responsible in teaching the younger children their mother tongue, manners, and etiquette. Extended family defines a family that extends beyond the nuclear family, consisting of grandparents, aunts, uncles, and cousins all living nearby or in the same household. An example is a married couple that lives with either the husband or the wife's parents. The family changes from nuclear household to extended household. A single-family detached home, also called a single-detached dwelling or separate house is a free-standing residential building. The result indicates that there were 48.16 percent of farmers were living in joint family system, 15.73 percent were living extended family type and 36.17 percent were living in single family type.

4.1.4. Farmer Status

A farmer is a person engaged in agriculture, raising living organisms for food or raw materials. A farmer might own the farmed land or might work as a laborer on land owned by others, but in advanced economies, a farmer is usually a farm owner, while employees of the farm are farm workers, farmhands, etc. A tenant farmer is one who resides on and farms land owned by a landlord. Tenant farming is an agricultural production system in which landowners contribute their land and often a measure of operating capital and management; while tenant farmers contribute their labor along with at times varying amounts of capital and management. The rights the tenant has over the land, the form, and measure of the payment varies across systems. The results reveal that 41.00 percent of farmers were tenant, 32.66 percent were

tenant and 26.34 percent were owner cum tenant.

4.2. Cost of Production and Revenue

4.2.1. Total Fixed Costs
Total fixed costs are the costs that do not change with the

level of production. For example, the cost of owning a building is incurred regardless of whether the building is empty, half full, or overflowing.
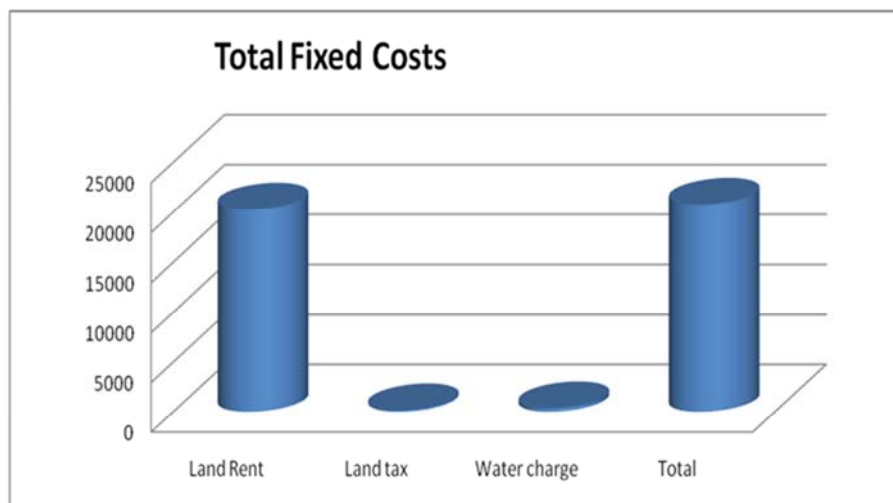

Figure 1. Total Fixed Costs of Rice crop.

Figure 1 show's that the total fixed cost was 20745Rs/Acre of rice crop. Total fixed cost includes Land Rent, Land tax, and water charges.

4.2.2. Total Variable Costs
Total variable costs are the costs that change in direct

proportion to changes in volume. Variable costs can be avoided by not producing. Total variable cost consists of costs that are zero when output is zero and vary as output increases (decreases). These costs relate to the cost incurred for the use of variable inputs.
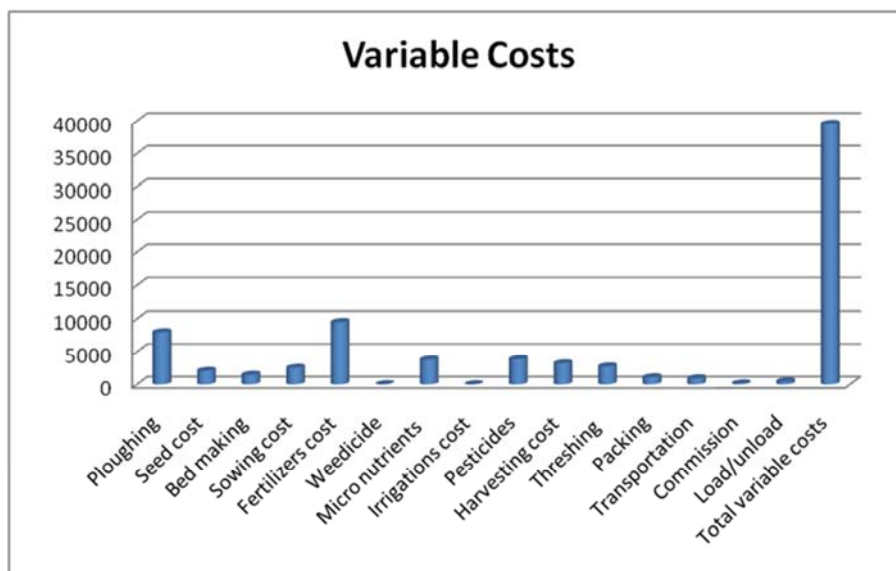

Figure 2. Variable Costs of Rice Crop.

Figure 2 shows that the total variable costs for rice were 39515.15Rs/Acre. Total variable cost of rice crop was Land preparation cost; seed cost, sowing and transplanting cost, fertilizers, weedicide and pesticides used costs, irrigation costs harvesting and threshing costs, and packing, loading unloading costs.
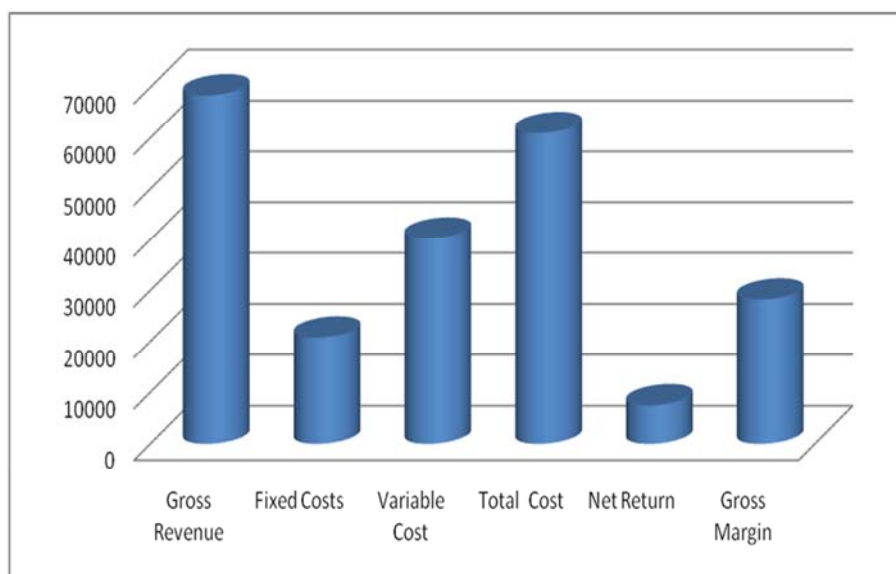
Total revenue is the total money received from the sale of

any given quantity of output. The total revenue is calculated by taking the price of the sale times the quantity sold. (Total revenue=price x quantity) (Biz 2002). Overall high yield was obtained 68.74mds/Acre from rice, as for prices concerned; the rice growers received 995.55 Rs/mounds. Total revenue of rice production was calculated as 68434 Rs/acre.

4.2.3. Gross Margin and Net Return

The analysis of gross margin is derived from the difference between total revenue and total variable costs. Total variable costs are calculated from the summation of total labor costs and total factor cost. Net Return is the value that remains after all costs; it is calculated by Gross Revenue subtracted by total costs. (Net Return=Gross Revenue-Total costs.)

Figure 3. *Gross Margins and Net Return.*

Figure 3 shows that rice growers in selected study area who cultivate rice obtained gross margin 28197.1Rs/Acre, while the net return of rice production was calculated as 7443.05Rs/Acre. Input output ratio as 1:1.7 means while using 1 input getting 1.7 outputs.

5. Discussion

Production of crops depends upon soil fertility, climatic condition, use of quality inputs and suitable marketing condition. It is, therefore, considered to have brief meaningful discussion of cost of production and production of rice crop, production potentials. Study revealed that overall cost rice was 60991Rs/Acre and yield was obtained from rice as 68.74mounds per. Gross revenue was received by the rice growers as 68434 Rs/Acre. Study results further indicate that rice growers obtained gross margin as 28197.1 Rs/acre, while using 1 input rice growers receiving 1.7output. The study was compared with the study of Anwar Hussain on economic analysis of rice crop cultivation in district swat. Study was conducted at during 2010 to make economic analysis of rice (Oryza sativa) crop cultivation in district Swat. Three tehsils namely Kabal, Matta and Barikot were selected on the basis of purposive sampling technique. Primary data were collected from 100 respondents (farmers) randomly selected through structured questionnaire. For data analysis, benefit cost ratios, log-linear Cobb-Douglas production function, Wald test and marginal rate of substitutions were estimated. According to the results maximum benefit cost ratio was noted for variety Fakhr-e-Malakand (3.41) followed by Basmati-385 (3.37). This indicates that Fakhr-e-Malakand is the most profitable variety of rice as compared to all other rice varieties. The output elasticities of area, tractor hours, fertilizer, seed, labour and pesticides were observed as 0.3112, 0.0012, 0.5924, 0.6212, 0.5124 and 0.0013, respectively. The input-output relationship holds increasing returns to scale. The farmers should be advised to cultivate high yielding varieties like Fakhr-e-Malakand and also use improved seed.

Therefore the result shows rice gives better yield i.e 68.74monds per acre was obtained by using quality inputs and better management. Result highlighted that the production cost of rice crop were 60991Rs per acre and gross revenue was 68434 Rs/Acre.

6. Conclusion and Suggestions

This study was carried out to analyze the cost of production and revenue of rice crop in cropping zone of Sindh. The information was collected from selected rice growers. Information about rice crop and other necessary aspects was collected by comprehensive and pre tested questionnaire. Analytical techniques i.e. farm cost analysis, Net Return analysis; gross margin analysis etc, was used to access the results. Study revealed that overall cost rice was 60991Rs/Acre and yield was obtained from rice as 68.74mounds per. Gross revenue was received by the rice growers as 68434 Rs/Acre. Study results further indicate that rice growers obtained gross margin as 28197.1 Rs/acre, while using 1 input rice growers receiving 1.7output. It was concluded that proper land management and timely use of quality inputs enhances the rice yield.

• There is a need for Rice research programs and training for new technology of rice production.

- Need of advising of proper combination of inputs to the farmer, and need of subsidy on the inputs which will result in increase of per acre yield of Rice.
- Farmers facing the marketing problems. Government should make adequate policies and strengthen the marketing facilities.
- Buying inputs is a big problem for many farmers, due to unavailability of capital, need of credit facilities on reasonable interest rate to help farmers for buying input timely.

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