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Abstract

Purpose: In Pakistan, sugarcane possesses significant importance in national agriculture to produce crystalline sugar and sugary production. However, the production is stagnant and faces multiple issues. This study aims to evaluate and solve the challenges that sugarcane farmers face in Sindh, providing evidence from sugarcane-rich district Ghotki.

Methodology: We collected the data from sugarcane farmers in four areas of the Ghotki district via five in-depth interviews and five focus group discussions.

Findings: The results pointed out that the sugarcane farmers are small landholders, and the sugarcane crop is their only source of livelihood. The significant challenges they faced were the sugarcane production system, land preparation, planting seasons, small landholdings, lack of capital, social problems, transportation, harvesting, and credit shortage.

Unique Contribution to Practice and Policy: These findings are crucial for responsible institutions, mainly agriculture extension in the province, to devise policies to improve their livelihoods. If the government takes necessary action on these challenges, production and yield can increase in-country and the national economy by exporting refined crystalline sugar.

Keywords: *Sugarcane Farmers' Challenges, Solution, Sugarcane Production*

INTRODUCTION

Despite all adversities, the agricultural sector is the backbone of Pakistan's economy and provides direct or indirect livelihood to 62 percent of the rural areas (PES, 2018). In Pakistan, sugarcane is grown widely to produce raw and refined sugar, brown sugar (locally called *Shakkar*), jaggery (locally called *Gur*), and molasses. Its main product and by-products have expanded international trade and played a dominant role in the economic and fiscal position. It also produces essential items for industries like crystalline sugar, bagasse, chipboards, plastic, chemicals, paper industry, detergents, fibers, and molasses.

Globally, 120 countries produce sugarcane, with an average sugarcane yield of around sixty metric tons/ha. Brazil, Egypt, China, India, and Thailand are its primary producers. Brazil is the largest cultivator and produces around twenty-nine million metric tons of sugarcane (Walton, 2021). In contrast, Egypt and India are getting 105 and 66 tons/ha, respectively (Raja, 2005). However, during the last few years, Pakistan's average yield of sugarcane cultivation has ranged between forty to fifty tons/ha, which is the lowest among sixteen sugarcane-producing countries (PES, 2018). The sugarcane crop in Pakistan is the major cash crop and has an essential earning source and employment for the farming community. The crop is cultivated widely in Punjab, Sindh, and Khyber Pakhtunkhwa provinces.

In retrospect, increasing cultivation of the sugar industry impacts economic development and provides a national exchequer. Sugarcane crop cultivation in Pakistan is considered the primary origin of revenue because sugarcane crop produces billion of rupees for the economy in term of taxes and duties. Besides, the refine sugarcane varieties and production must be increased to provide sufficient raw material for the sugarcane factories in the country and to increase employment. Nevertheless, the work done to improve the sugarcane is lagging, mainly in Sindh, where most of the province's farmers are located. Therefore, the present case study evaluates the significant challenges sugarcane farmers face in Sindh province of Pakistan, district Ghotki.

The present study assesses the primary problems sugarcane farmers face. We collected the data through five in-depth interviews and five focus group discussions. The current case study after the introduction is divided into the literature review, methodology, results and discussion, and conclusion sections.

LITERATURE REVIEW

Agro-ecosystems are a rigid process that involves various inputs (containing ecosystem services) to produce numerous outputs (Chavas & Paul, 2008). Agriculture can provide labor, capital, and food to raise employment in industry and increase demand in rural areas for employment to consumer products (Norton et al., 2014). Traditionally, agriculture is a sector that provides fiber and food in the economy. Despite all human developments, agriculture remains the primary source of economic development in developing countries like Pakistan, which contributes 19 percent to the national GDP (Anam & Shafique, 2017; PES, 2018).

Sugarcane crop is cultivated in approximately eighty countries in tropical and semitropical areas of the world and stores high concentrations of sucrose (Thomas & Cobill, 2008). Sugarcane is the second large cash crop after wheat in Pakistan and plays an essential role in uplifting farmers (Lail et al., 2011). In 2012-13, total sugarcane production was estimated to be near about 1.17 million ha with an output of sixty-six million tons (Muhammad & Iqbal, 2014). There is a difference between the actual and acquired output of sugarcane production in Pakistan. The reasons include lack of technology, unavailability of water sources, use of inputs at inappropriate times, and lack of knowledge about insect pest control, which negatively affects the out production of sugarcane and reduces the cost of production (Nazir et al., 2013). The difference between actual and potential yield is improper

management and post-harvesting losses (Agriculture, Supply & Price Department, GoS, n.d.). The production process is not mechanized and is mostly labor-intensive. Most farmers do not follow the latest techniques like timely irrigation, spray, fertilizers, use of farmyard manure.

METHODOLOGY

This research study employed the constructive paradigm to investigate challenges faced by sugarcane farmers in Ghotki, the district of Sindh province of Pakistan. This paradigm helps create the interconnection between the participant and the researchers. The qualitative case study explanatory method is used in an exploratory way. Key informants are in-depth participant interviews and focus group discussions from the farmers in four villages, i.e., Kacha Bhindi, Sundrani, Ghota, and Dilail.

Sampling

The sample is selected using the non-probability data collection approach with multi-stage sampling. Initially, we chose the sample based on purposive sampling, i.e., the sugar cane farmers in Ghotki, as they face many challenges. Then, we selected the participant from Ghotki district farmers in Kacha Bhindi, Sundrani, Ghota, and Dilail based on convenience sampling. We found that sugarcane farmers of these areas have many challenges relating to the sugarcane production system, land preparation, planting seasons, small land and lack of capital, social problems, transportation, harvesting, and credit shortage.

Data Collection

We utilized two primary qualitative data collection techniques, i.e., in-depth interviews and focus group discussions (FGDs), to collect the data from sugarcane farmers in Ghotki. Initially, five in-depth interviews were conducted to understand the crop's production system and critical issues with the help of an unstructured questionnaire. Then, we conducted five focus group discussions, each in Kacha Bhindi, Sundrani, Ghota, and two in Dilail due to high concentration. Each FGDs was orchestrated with the help of a semi-structured questionnaire for the data collection. It included open-ended and probing questions, mainly the "Why" techniques to let participants freely move with ideas coming out of FGDs. As we improved our questionnaire after each FGD, it became more structured during confirmatory FGDs, implying the researchers are exploring further, and similar themes emerge from the data. Once data was saturated, we carefully transcribed the audio recordings in a text format.

RESULTS AND DISCUSSION

Validity and Reliability

The researcher plays the role of the instrument in any qualitative research study. The researcher's personal biases from past experiences can affect the validity and reliability of the data and results. Therefore, we carefully dealt with the issue of personal biases throughout the research to maintain the validity and reliability of the study.

Descriptive Results

The data is collected from the farmers in the age group of twenty-five to forty-five years. The literacy rate among the farmers was high as seventy-five percent of respondents were un-educated. It is concluded that the main problems faced by the farmers regarding sugarcane production were lack of irrigation water, non-availability of improved varieties of sugarcane, Land preparation, \ of inputs, disease and insect pests, weeds, and marketing problems.

Challenges

Land Preparation

In Sindh, most farmers are uneducated, and they use old technology for land preparation and do not know about different equipment and the latest technology used nowadays. Improper land preparation is also another challenge for sugarcane yield in Ghotki. Sugarcane crop plays a vital role in producing the cane root system and achieving the adjusted level of the crop (Sugarcane, 2017). Using different equipment other than simple cultivation is significant for decent seedbed preparation to get good germination and better crop stand. Land should be prepared by deep plowing at least after every subsequent year. The use of more efficient equipment other than a simple cultivator is essential. Information about the extent of use of several types of equipment used by the farmers, such as disc plow, gobble-disc-harrow, cultivator, leveler, and a bullock for land preparation, was collected. Besides, we also found that the primary use of modern equipment for plowing was present in the study area.

Planting Seasons

Sugarcane production is conducted in the autumn and spring season. Autumn planting has proved high yield and high sugarcane juice recovery than spring planting. October planting of sugarcane gives the growth. The crop looks gorgeous from June to July but is or before July if there are excessive rains or windstorms. There are two planting seasons of sugarcane crops, including spring and fall. The fall sugarcane planting starts from the last week of September, and it continues to the middle of October in Sindh. Spring sugarcane planting starts from mid of February and continues until the end of March in Sindh. These planting seasons are strictly followed, reason late planting can reduce thirty percent of sugarcane yield. September sugarcane cultivation usually produced twenty-five to thirty percent much higher yield. The choice of a suitable planting procedure and schedule substantially influences sugarcane crop growth, yield, and maturity. Moisture and low-temperature stress are detrimental to germination and subsequent establishment in areas where winter is severe enough to restrict growth or even kill sugarcane. Therefore, planting material may only be available in autumn, thus necessitating pre-winter planting. In tropical regions, mainly where irrigation is not practiced, sufficient precipitation in the atmosphere should be the benchmark for planting.

Small Land and Lack of Capital

Small land and lack of capital are other problems for Ghotki sugarcane farmers. Most of the farmers hold land of fewer than five acres. In addition, most farmers are poor, and they do not have much capital to invest in farming. In such conditions, farmers are exploited by the brokers and other financing institutions who provide them finance on a high markup ratio or metallic condition. Sugarcane crop cultivation is a high input demanding product in agriculture. The suitable application of the inputs is necessary for harvesting the potential yield. Many sugarcane crop producers are worried because inputs are too expensive and often unavailable when needed. Thus, farmers are forced to take that equipment in black, raising their cost of production. If hardly a farmer can get a good crop in these circumstances, they are suffering at the hands of the sugar mills mafia. The government fixed rate of about 180-200 is already low. Over that sugar, mill mafia forced the farmers to sell their crops at a much cheaper rate. Thus, most sugarcane crop farmers sell their products to intermediaries or big growers at a price below one-eighty. This year a similar case in mostly sugarcane crop growers in the Ghotki district.

Technical Problem

The technical problem is also another challenge faced by the sugarcane farmers in Ghotki. Many of the farmers still use the traditional way of sugarcane production. Farmers are not ready to adopt the latest technology for getting a higher yield. The main challenge faced by the farmers is the lodging of

the cane, which proves lower sugarcane recovery. Researchers have developed many planting techniques such as trench and pit planting to overcome these challenges, but their adaptation is stagnant at the farmer's side. Farmers did not give much attention to excellent land preparation. Another major challenge the sugarcane crop producers face is the heavy infestation of sugarcane crops with diseases and insect pests. Sugarcane crop is infested by various insects such as sugarcane root, stem, Pyrilla, Gurdaspur, and top. Besides this, the red rot of sugarcane is a significant disease-causing considerable damage to the crop. Inadequate application of the pesticide makes the condition more harmful. Most sugarcane crop growers do not apply inputs as needed due to a shortage of capital that leads to poor production.

Social Problem

The next challenge faced by the sugarcane growers in Ghotki is social problems. The most social challenges the sugarcane producers face are top cutting and cane theft. Many sugarcane producers think that the nearby people cut the cane top, primarily for their cattle. In addition, the children take sugarcane for chewing as it seems to be one of the significant social problems for sugarcane farmers. In addition, the sugarcane farmers faced many challenges in sugarcane production. There is a dire need for the country's state to pay special attention to those challenges faced by farmers.

Farmers should be given credit on easy conditions. Timely providing inputs to sugarcane growers at a fair price should be considered mandatory. The government should fix the price of sugarcane production by keeping the production and carrying cost in view. The agricultural extension department should play a positive role in developing better production technology and modern research for the farmers. Under the current scenario, these measurements are necessary; otherwise, the sugarcane cultivation area will decrease.

Harvesting

Sugarcane crop harvesting means a large piece of agricultural machinery used to harvest and partially process sugarcane (Wikipedia). Most of the farmers in Ghotki do their harvest without experimenting with the latest technology. Due to lack of technology and modernization, sugarcane farmers suffer from the high cost of production and low recovery. Sugarcane harvesting is done by hand, which leads to use of labor intensively. On average, one farmer can harvest twenty-five muds (10000 kg) of cane in a day. The best time for harvesting is when the crop is twelve to fourteen months old.

Transportation

Transportation is a primary source of sugarcane transportation to the factories. Delay in transportation may create a severe problem since this affects production costs (Paitoon et al., 2001). Transportation is also a challenging factor for sugarcane growers in Ghotki. Most sugarcane growers in selected regions are small farmers operating with their families, and most of them do not possess a vehicle and pay a high cost for transportation. During the harvesting season, farmers see an extreme shortage of vehicles.

Credit Shortage

Credit means something about gains or addition to esteem or reputation. (Mariam-webster). Credit also means a contract in which borrowers get a sum of money (something having value) then repay some later date mentioned in the contract with some interest (Investopedia). It was estimated that in the backward area of Pakistan, particularly Sindh, many sugarcane farmers do not have sufficient resources to buy inputs (Abbas et al., 2021). Credit shortage is the main challenge for sugarcane producers in the Ghotki district. It seems that the credit impact on sugarcane crop production is positive in Pakistan.

In contrast, the influential sugarcane farmers get this loan quickly without any constraints, while small-scale sugarcane farmers have no access to these facilities. Most farmers are illiterate, and credit policies are too much complicated. Interest is very high, and the payout of this loan is complex, and they sometimes sell their land for returning the loan. Bank staff behaves very roughly with the farmers in getting the loan. Similarly, the credit amount is significantly less than the requirement. At the same time, in some areas, religious people do not allow them to get loans from the bank because credit amounts have interest prohibited in Islam.

CONCLUSION

Sugarcane is a worldwide agricultural crop cultivated in many countries. Sugarcane is used to produce raw and refined sugar, Brown sugar, jaggery, and molasses. Improving sugarcane varieties and production must increase cane yield per acre in the field and maximize sugar recoveries in the sugar factories. Its main product and by-product have increased international trade, and crop production played a dominant role in countries' economic and fiscal positions. The present study assesses the main problems faced by sugarcane farmers in Ghotki. The study gathered data from four villages of Ghotki, i.e., Kacha Bhindi, Sundrani, Ghoti, Dilail. Sugarcane farmers in Ghotki faced many challenges that included a sugarcane production system, land preparation, planting seasons, small land and lack of capital, social problems, transportation, harvesting, and credit shortage. The research is to explore and provide evidence to solve these challenges. If the government takes necessary action on these challenges, production and yield can increase in-country and the national economy by exporting refined crystalline sugar.

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