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Analyzing the Maize Value Chain in RASHAKAI, District Nowshera

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Abstract Maize originated for many years in Mexico as it's an abundant crop in many other countries. People use it differently, like to make cereals, flatbreads, popcorn, and so on, but with a growing population, it's vital to grow more and more crops. The Khyber Pakhtunkhwa province was one of the first to export whole maize to European countries. Even many horticulture crops grow in Pakistan due to its favorable environment. But as the population increases, there is a desperate need to cultivate more crops for people and export. You can say that we need to improve our agriculture system. Also, it reduces food reliance on other countries. Additionally, the farming area contributes to 18% of GDP. It's a source of foreign exchange currency.

But there is a lack of development factors such as irrigation, system, and facilities; therefore, these areas are of concern. Because of this, most of the benefits we can enjoy are limited. However, if we plan and manage carefully, then we can have many of them. As far as extending the agriculture potential is concerned, Pakistan does not get the benefits until it establishes its brand name. In other words, this research methodology reveals areas where we placed less effort to implement our strategies to gain more advantages.

Keywords Maize Value Chain, RASHAKAI

1. Introduction

As we know, maize is the highest growing yield in Pakistan. But with a rapidly growing population, the demand for food is increasing day by day. Many foods from our daily lives are made from maize, like cereals, popcorn, snacks, food, etc. And the demand is also increasing rapidly as the population increases. In the whole world, maize is now the main crop that we consume for food. So, in Pakistan, this crop is nourishment for not only people but also for animals. However, as raw material, it can also be used in animal feed, poultry feed, and in many other food industries.

Sindh and Baluchistan only contribute 1% to produce maize for export, while Kashmir only contributes 0.122 million tons in the fall. Khyber Pakhtunkhwa harvests 60 different kinds of crops, including seeds, oils, oats, vegetables, and other items. Due to its unbeatable environmental conditions. It is possible to extend maize crops when temperatures reach 50-60 degrees Celsius in the winter. As to grow crops, the pH level should be between 50-60. Since the weather is warm in winter, maize crops need a lot of warm temperatures and heat. So, it's possible to plant maize from March-October. Germination takes place best at 21 ºC, while harvesting takes place best at 32 ºC. To cultivate this crop, farmers blend 300-400 tons of barnyard into the soil.

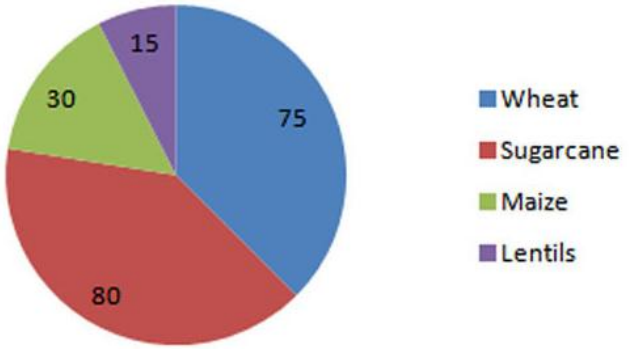

Figure 1: Percentage Share of Maize Area under Different Productivity

Table 1: Region in Hectares, Production in Tones and Yield in Kgs

	2014-15			2015-16			2016-17		
District	Area	Production	Yield per Hectare in Kg	Area	Production	Yield per Hectare in Kg	Area	Production	Yield per Hectare in Kg
Khyber Pakhtunkhwa	442489	885937	2002	447980	849203	1896	451580	865762	1917
Abbottabad	15007	23268	1550	14603	22301	1527	15153	22180	1464
Bannu	4844	9090	1877	3987	7545	1892	3971	7372	1856
Battagram	19117	37207	1946	19108	30699	1607	17047	28559	1675
Buner	49098	77329	1575	47937	75510	1575	46936	72789	1551
Charsadda	16578	37779	2279	16319	38330	2349	16127	37754	2341
Chitral	5820	17460	3000	5394	13485	2500	5515	14326	2598
D.I.G. Khan	1564	3888	2486	943	2369	2512	1310	3396	2592
Dir Lower	5495	10884	1981	9495	21850	2301	20727	29420	1419
Dir Upper	5830	11630	1995	5895	11749	1993	5795	11475	1980
Hangu	6072	5345	880	7615	6853	900	4114	3862	939
Haripur	40051	56870	1420	40994	55646	1357	39952	47327	1185
Karak	63	68	1079	80	85	1063	83	82	988
Kohat	1396	1868	1338	1422	1903	1338	1447	1936	1338
Kohistan	26380	55831	2116	26385	53607	2032	26390	59048	2238
Lakki	644	1221	1896	916	1768	1930	554	1028	1856
Malakand	4769	10797	2264	4782	10940	2288	4710	10618	2254
Mansehra	56712	133749	2358	55897	99673	1783	57956	106129	1831
Mardan	29229	94565	3235	28992	89651	3092	28344	89232	3148
Nowshera	12340	33095	2682	12131	33042	2724	10839	30879	2849
Peshawar	16754	29311	1749	16000	29532	1846	16352	30192	1846
Shangla	38042	62780	1650	37453	62510	1669	36774	61425	1670
Swabi	25531	58479	2291	29834	64142	2150	29957	66286	2213
Swat	61067	113315	1856	61600	115734	1879	61420	130296	2121
Tank	86	108	1256	198	279	1409	107	151	1411
Tor Ghar	0	0	0	0	0	0	0	0	0

Khyber-Pakhtunkhwa harvests 57% of these crops, while 68% harvests from all over the country. The city Khyber-Pakhtunkhwa is the second largest in growing crops, but crop production is low in this country. Even the corn growth rate is high in the Kharif season. Unfortunately, there is no better way to harvest it. If we overview a growing rate in last year, then it was 70,0000 tons. Or in 1971, the production rate was 705 tons. As each year passes, its rates are decreasing because, according to experts, its rate will be 9,000 tons in 2022. Maize is a significant crop. Therefore, it takes more time to grow than vegetables and other crops. It usually takes 150-160 days for maize to grow, while vegetables take 80-90 days. Climate and the environment also play a significant role in producing crops.

Climate Change also impacts crops in different ways like time, temperature, water availability, time availability, etc. Floods are also common during the monsoons, which adversely affect crop production and the horticulture system.

The reality is that Khyber Pakhtunkhwa only contributes 18.9% of Pakistan's GDP. Even the regions that are underdeveloped have a direct impact on the suitability of maize in KP.

In this study, you will know the methodology and strategies to implement to grow more and more crops. This research also covers the detailed discussion, conclusions, and factors affecting production. In addition to learning about the wheat-growing region in South Dhaka, you will learn about the significance of cows in terms of production, markets, business, climate, branding, as well as distribution of food.

2. Methodology

KPK is known for maize production, and the province is also known for this. There is a rising demand for maize in the Nowshera district of Khyber Pakhtunkhwa, where the latitude is 34.1166° N, and the longitude is 72.0216° E.

Here, maize production is high, and the maize is of export quality. According to the study, Rakahshai is known for its production of maize using both old and new techniques. However, in many places where crops can also be grown, harvesting can be significantly increased if the environment is suitable for them.

An excellent analysis by Debertin explains the benefit (Net Revenue) as a short-term income and short expenses (TC).

where

TR-TC

TR=P X Q (Profit)

So,

R= Production Rate of Crop

Q= Quantity Rate of Crop

Vi= Denotes the input price of crops

Xi= Denotes input level/ Quantity of input level

Whereas,

$$Cost\ Benefit\ Ratio\ (CBR) = \frac{Gross\ Revenue}{Total\ Cost}$$

The additional information got through observation and research from the University of Agriculture, Peshawar, and various analyses from esteem chain entertainers. Furthermore, we conducted numerous interviews to explore crucial and specific intercession spaces.

Provisional Scenario

Genotype's (GEI) climates play an enormous role in growing crops. Since conditions play a significant role in the implementation of GEI, we must know them as well. Various districts are included, such as Nowshera, Punjab, Swat, D.I.G. Khan, etc.

Scope and Limitations

As per studies, ranchers think that crop production is less as compared to wealth. Many significant factors depend on it.

- Farms Ground
- Pay Rate
- Showcasing

So, it found that ranchers have to pay more time and energy to increase production. Additionally, a marketing competitor analyzed different crops (vegetables, maize, wheat, and sugarcane) in Khyber Pakhtunkhwa.

Significance of the study

It is possible to generate high profits through the harvesting and cultivation process by sharing different strategies with marketing analysis, scientists, and contextual analyzers. Because everyone interested in investigating maize production, advertising, costs, and stakeholders in the value chain can gain from this investigation.

Accomplish the Accompanying Objectives

1. Calculate the Cost of Productions through tools
2. Showcasing the cost and analyzing whether you're getting profit or not as per the market competitor
3. Identify any inadequacies, incompetence's, or risks associated with the corn and maize value chain.
4. Identify key players and their roles.

Methodology Summarized

In this study, which involves a proper investigation process, we analyze a variety of facts and figures:

1. Observation
2. Questions
3. Hypothesis
4. Predictions
5. Result

In Pakistan, the agricultural sector has become increasing due to enormous significant efforts. An integral aspect of the area involved blossom growth, restoration, cultivation of different crops, vegetable development, and flowering plants. All these factors contribute about 21% to Pakistan's economy.

Framework about risk analysis

The purpose of a framework is to clarify different questions. It concludes that how we can grow crops more efficiently. We also analyze what happens if any disaster like a flood occurs, then how can we protect the crops because usually crops are ready to harvest in March-May, and these are the seasons when there is a danger of flooding.

Risk Evaluation

Many factors are hurdles in the production process. The issue of disasters is common and can happen naturally, but what can we do to overcome it? Here are some questions that need an answer.

Can we follow any precautions?

This portion involves what to do when disaster comes and if there is no transportation available. Because it can be massive damage or the production is low even.

What Goals are involved in short-term and long-term benefits?

The study and research involved Agrarian theory, according to which if we implement data execution steps through devices, it will be possible for farmers to increase yields and green products. He also suggested using various means to share creation works:

So, the numerical calculation is:

$$F(X) = Y$$

So, creation innovations are accomplished in three ways:

- Creation Work
- Benefit Capacity
- Cost Work

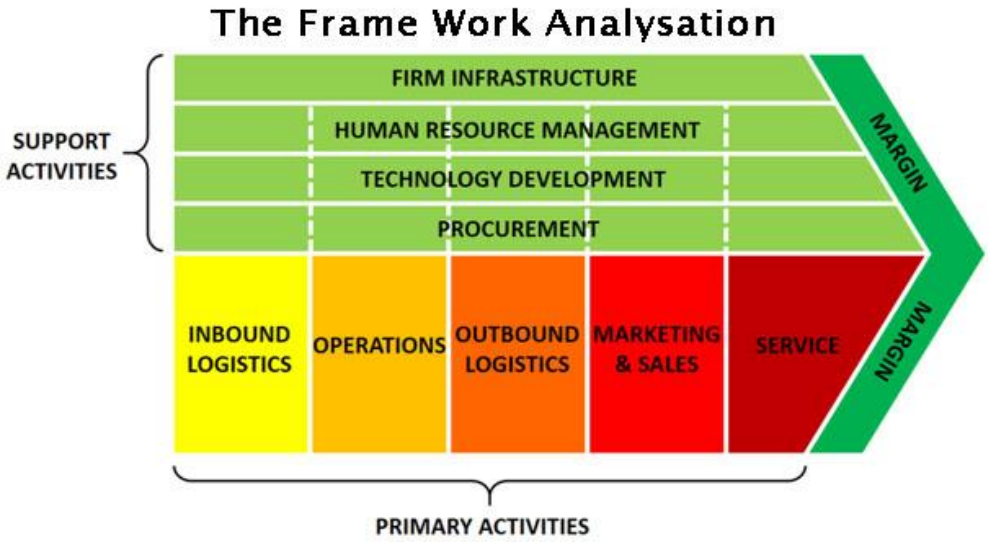

Figure 2: Michel porter value chain activities model

3. Results and Discussion

3.1 Analysis of Costs

So, the studies prove that Pakistan and all other nations have to bear transportation cost, production cost, advertisement, distance all conclude in marketing accommodation. Marketing conducts and analyzes long-run coordination, thus ensuring a better data flow from local businesses to financial societies. Observations conducted in Pakistan showed that a large part of the agricultural sector had excellent integration.

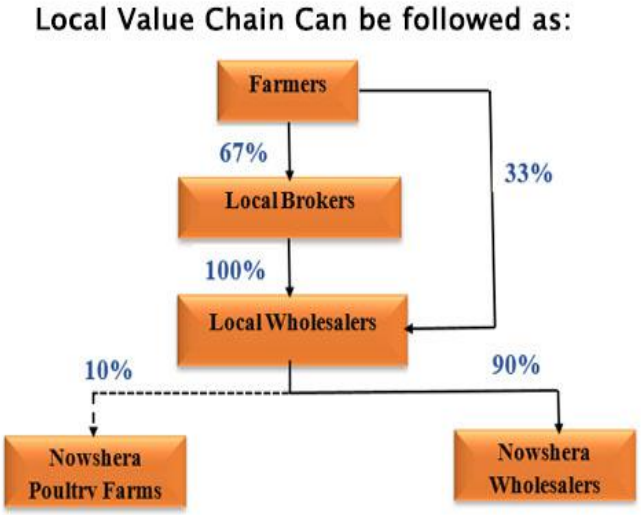

Figure 3: Level of market member along the maize quality chain

Similarly, we found similar results in the investigations targeted at reconciling the corn/maize markets. Michael Porter proposed how to achieve a competitive advantage through adding esteem within your organization in his 1985 book, and he first discussed the concept of esteem chains in 1990. Hence, it was adopted to advance agricultural interests. Greeff, one of the most renowned authors, analysts, and economists, also presented the concept of Global Commodity Chains (GCC) during the 1990s (Mele, Coulibaly, and Hell, 2007).

Advantages and Delivering Products

An increased value chain is considered a means to enhance cultivation and grow crops. It is also considered an ideal growth plan. The idea of a value chain means that farmers and producers can contribute well to enhancing public financial progress through utilizing trade benefits. This idea also proposed the betterment of new

processes, improving capabilities, and increasing the scope of ventures. It becomes easier for individual makers and whole nations to create advantages through such studies. As per the World Bank report, an "Esteem Chain" explained that you have to do a lot of work to get high selling of products and services. The book also points out that raw materials, labor, and delivering products to consumers form a sequenced series of actions. It is the process of converting raw materials into a finished product to sell to final customers.

Table 2: Maize Crop Seed Varieties

List of Maize Crop Seed growing varieties in the study area

Name	Seed Rate
BABAR	-
JALAL	-
PAHARI	-
AZAM	-
30Y87	35000 Seeds/Acre
Pioneer-3025	28000-35000 seeds/acre
Pioneer-30K08	28000-35000 seeds/acre
CS-200	28000-35000 seeds/acre
CS-220	28000-35000 seeds/acre
CS2Y10 (Yellow)	28000-35000 seeds/acre
OPV Seed Rate	12-16 Kg/Acre
Hybrid seeds	8-10 kg per acre
Karamat	-
Qayyum-2019	-
CS-240	-
CS-5800	-
Pahari	30000 seeds/acre
Iqbal	30000 seeds/acre
Ds960 Hybrid corn of DARAIN Seed	8-10 kg per acre
Gorilla	per acre

Agro-food value chains would include, for example, input supply and care, preparing, loading, bundling, and delivering. This study concludes that business exercises help to develop beneficial techniques and approaches.

By Porter (2002), these valuable exercises discuss frameworks, human capital, social capital, and innovation advancement. This system allows manufacturers to negotiate with mill owners and utilize local markets in local towns.

Analysis of Value Chain

Developing successful promotion foundations requires the participation of relevant individuals.

Now the question arises why the self-esteem value chain is essential? How will methods be implemented? Identify what kind of issue to highlight?

So, if we divide the value chain into different parts, it's easy to understand it. Analyzing a chain means recognizing and assessing its sponsors at every stage. In addition, it includes assessing activities that add value to sponsors, assigning costs, and valuing them.

Figure 4: Location Rashakai SEZ and study research area

Figure 5: Village, Population Hubs around Rashakai SEZ and sample collecting area for case study and research study

Design of Chain/ chain/connect through different sections

So, the exhibition at UNIDO that took place in 2009, A worth chain can provide you with different information and steps that:

How to sell products/ crops?

What are the major threats to this entire chain?

In a value chain, a phase of creation provides a capacity that makes critical contributions to the viable activity of the chain and the process, creates esteem (Anandajayasekeram and Berhanu, 2009). Therefore, it prevents any sudden change in relationships between entertainers.

When and how to change the way we value creation and work?

The review results showed that 67 % of tested farmers sold their products to town dealers and 33 % directly to local wholesalers. According to our investigation, town brokers gathered harvests for neighborhood wholesalers with a commission.

Only 7% of Rashakai neighborhood wholesalers dealt with Nowshera and nearby poultry ranches, while 93% dealt with Nowshera and Peshawar wholesalers.

Figure 6: Lharif: Variation in Crop acreage (Th Ha) with water availability (MAF)

In light of the examination study and contextual investigation, it is possible to determine the unique selling point because of the perception found in the examination region. Nearby worth chains are as per the following;

Chain 1: Farmers – Nearby wholesalers - Nowshera wholesalers - Nowshera poultry farms

Chain 2: Farmers - Nearby wholesalers - Nowshera poultry ranch

Chain 3: Farmers - Nearby wholesalers - Nowshera poultry farm

There are three classes in terms of time, quality, and environment. Rakashai is also home to five main villages, Sowkai, Bara Banda, Risalpur, and Raj Muhammad Kalli.

The household size in villages is 9 to 10 individuals per house. There is a 35 percent literacy rate in rural areas. Several rural communities have fields where subsistence farming takes place. For determining maize yields in particular regions, Cobb-Douglas methods apply.

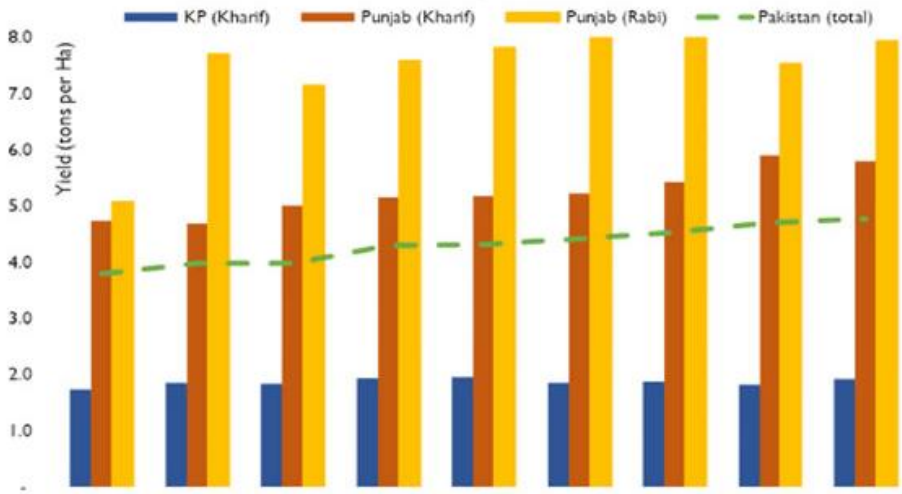

Figure 7: National yield masks Spring Corn potential

Where abouts;

The natural log is Ln; Yi is the kilogram of maize delivered in each plot by each farmer; *s is the model coefficient; Ti is the tractor-hours per plot by each cultivator; Li is the labor-hours per plot by each farmer; Wi is the percentage yield: Number of water system applied per section of land by ith cultivator; Ui: Kilogram of Urea manure applied per section of land by ith cultivator; Di: Kilogram of DAP compost applied per section of

land by the producer; Ci: Liters of herbicides/pesticides applied per section of land by the ith cultivator; D1: Dummy variable 1, equivalents to 1 for half and half seeds, in any case, 0; D2: Dummy variable 2, equal to 1 in case FYM occurs, in any case, 0; V: Normally disseminated mistake term (~N(0, σ2)).

Producing maize has a gross benefit calculated by multiplying its yield and price. Maize production costs comprised material inputs, family labor opportunity costs, hired labor costs, and interest on cash costs. Total material costs included the costs of seeds, urea fertilizer, compound fertilizer, and farmyard manure on a hectare basis.

Calculation of total family labor costs is considered based on the family labor used in maize production activities such as plowing, harrowing, seeding, leveling, fertilizer application, inter-cultivation, repair of bunds, weeding, harvesting, transportation, milling, and drying, etc.

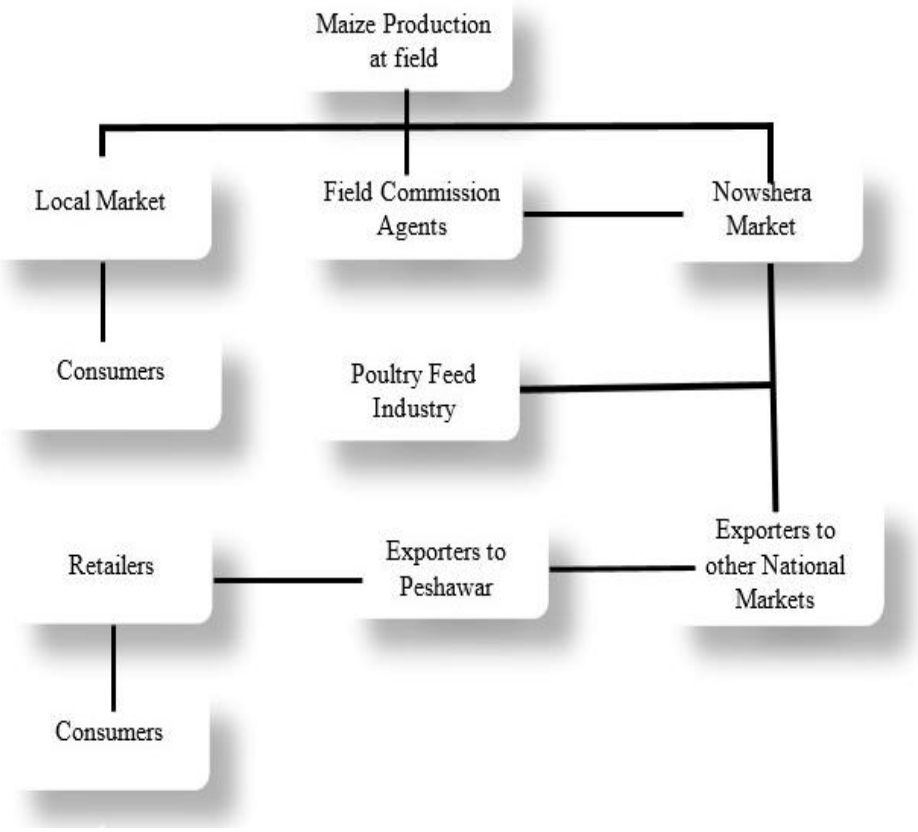

Figure 8: Current Maize Estimate Chain Map

Maize Selling Price

In a value chain, the costs of buying and selling dry maize rise from one market to the next as one action from upstream to downstream because of costs associated with an exchange. Maize prices vary with distance or topographic dispersion between ranchers and buying centers.

Barney (1990) said that leaders may seek their interests and that it is difficult to know who can and cannot be trusted. Ranchers' costs from exporters are relatively small in comparison with other brokers in the value chain.

3. Comparative Profitability Analysis

Advantage cost proportions are determined by dividing the gross creation value by the total creation price per hectare (Ozkan et al., 2004; Canakci et al., 2005; Demircan et al., 2006). A similar analysis of maize productivity depends on estimation.

Cultivation of Yellow Maize

KPK and Nowshera livestock managers will realize the importance of value and use; urban meat consumption will increase as livelihoods develop, and people will pay more attention to creatures. In this context, yellow maize plays a crucial role. To become a global leader in farming, it needs to have a modern, private area feed processing facility based on yellow maize.

Imposing deliberate constraints

Yet, reliable proof and successive evaluation of these issues are currently motivating genuine efforts to address them. There are various names for these drives, just as extensive laxity in their utilization.

Capacity

In Rashakai, grain storage is essential for producing maize advertising but is of inferior quality. Producers lose 30 percent of their harvest in stores on their ranches, which are inadequate.

4. Discussion

The study aimed to analyze the value chain of natural products, identify effective advertisement placement, and analyze the Maize Value Chain. In addition, the study provided recommendations to the value chain partners.

In light of the applied system for the investigation, we utilized the complete expense as promoting costs which includes:

- Handling cost
- Bundling and marking cost
- installments to a specialist
- Transport costs
- Stacking and offloading charges
- Cleaning cost
- gauging charges
- Stockpiling cost
- Cost of purchasing and exchange cost
- Vendor search cost and purchaser search cost

So Profitable analysis depends on different factors that are:

- Handling
- In the country and the cities, neighborhood processing activities
- Tasks requiring a higher level of processing

In Khyber Pakhtunkhwa, Rashakai conducted random surveys between 2019 and 20 among ranchers and those who had wheat and maize plants. The examination area has collected information about the relationship between quality and price.

The region has a long list of agribusiness inputs, materials, and composts that help grow maize. There has been an improvement in market access to nearby business sectors.

Item costs and homegrown promoting edges are significant pointers of market exercises. Many promoting administrations depend on interest. This sum is the cost of providing an assortment of showcasing administrations (Tomek and Robison, 1981).

We have calculated the total cost of planting maize per section of land by adding the creation and transportation costs associated with the maize crops. Compared to Rashakai towns, where ranchers own their land, repairs and maintenance costs for machinery, seed, work, data sources, and the water system are factor costs.

Further analyses and preparations are ongoing to infer conclusions and outcomes. The investigation region is known for the best quality and most elevated maze creation. Well-known varieties of corn and maize are grown there. One or two highly competent, semi-trained, and experienced individuals can handle these duties.

During the investigation, a few significant issues have been uncovered, including an inability to access assets for the plants on the board, high rates for horticultural materials, maize seeds that are typical for this time of year, and higher moving costs.

It may be necessary to introduce cultivars of maize that enhance yield and cause obstructions in the examination region. This study also examined the quality of varieties and their cost. It also highlighted the most successful maize farmers in the study.

5. Conclusions

After wheat and rice, maize is Pakistan's third most important cereal crop. Corn occupies 5% of the cultivated area, and food crops 8%. Most of the maize grown in Punjab and NWFP comes from these regions.

While the farming area contributes around 18% to the GDP, utilizes 42% of the entire workforce, and comprises 75% of total fares income. It is also a source of foreign exchange earnings. Our agricultural systems are constantly being reviewed and updated to ensure if they can produce good quality and quantity while meeting modern technological needs. With time, we have seen improvements in agricultural production.

The developed economies manufacture and plan new alternatives to improved agriculture constantly because this is a process of continuous improvement. Although our population is growing, agriculture should continue to improve in terms of local production and exports.

Horticulture is a particularly challenging one to grow in Pakistan because the value chain involves countless parties. As a result, it is becoming harder to reach the midpoints or higher of the world market. Providing safe and high-quality food varieties at a reasonable price is also a necessity. In addition, we also exchange, market, and process goods to satisfy customer demands for quality products that provide value-added features.

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