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Production and marketing Constraints of maize in Karnataka state

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ABSTRACT: In recent years, both India's production and consumption patterns have undergone significant shift. The production pattern as well as its consumption pattern has dramatically changed in India in the recent past. However, the average crop yield of 2.5 t/ha is still very low as compared to the other Asian countries like Bangladesh (6.8 t/ha), China (5.7 t/ha), Indonesia (4.6 t/ha) and Pakistan (3.8 t/ha) in 2012. Major challenge is in the maize is abiotic stresses, which makes the crop vulnerable to drought. The target beneficiaries of the study are, farmers, policy maker and the marketers. This study looked at the increase in maize production, area, and productivity in the Bagalkot and Belagavi districts of Karnataka state. Additionally, an effort has been made to research the problems that farmers were facing when maize was grown and sold in the study area. Total 120 maize growers were picked out of Bagalkot and Belagavi district. For the current study, information pertaining to the 2018–19 agricultural year was used, and primary data were gathered using the personal interview method and a pre–tested schedule. it was observed that variation in area from year after year growth rate of area has been increased by 2.11 percent. CV of area in all the district greater than the CV of entire state (14.64 percent) and mixed trend has been observed in both production and the productivity of maize According to farmers, over 80% of farmers believe that a lack of capital and limited credit availability during production is the most serious limitation to production, ranking first on the list of constraints, and high plant protection chemical costs (47.50 percent). The biggest issues with marketing are a lack of storage and warehouse facilities (31 percent), poor transportation, and high transportation costs. Involvement of middlemen during marketing to obtain fair prices.

Keywords: Production, Constraints, middlemen, capital, farmers and Productivity.

INTRODUCTION

In comparison to the 21.24 million tonnes produced in the kharif 2021–22 on an area of only 8.15 million hectares, India produced 31.51 million tonnes in 2020–21 on a surface area of 9.9 million hectares (agricoop.nic). It is believed that the United States of America (USA), which produces 30% of the world's maize, is the key driver of the US economy had a 17.84 lakh tonnes and 5918 kg/ha, respectively, production and productivity (Unnamalai, 2013). The cultivation of maize has started increasing in the few recent years. The water requirement for this crop is very less. The spatio-temporal variations in projected changes in temperature and rainfall are likely to lead to differential impacts on maize yield in the different regions in India (Kattarkandi *et al.*, 2010). Maize, mainly rainfed *Kharif* crop is grown both in *Kharif* and *Rabi* season. In *Kharif*, it is sown in March-July till mid-August and harvested from mid-September. The arrivals extend from late September to February. The major states producing maize during the *Kharif* season are Karnataka, Telangana, Maharashtra, Madhya Pradesh, Uttar Pradesh, etc. In *Rabi*, it is sown in September-December in Bihar, Uttar Pradesh, Punjab and coastal region of Andhra Pradesh, Karnataka, etc. The arrivals start from late March and extend up to July (Anonymous, 2019). So many farmers are following the traditional agriculture practice, so in order to narrow down the research gap pertaining to input cost structure, marketing structure and price mechanism, there is a need of study on production and marketing constraints of maize. The phenomenal growth in the production and its spread across the regions proved maize a golden grain in India. Its diversified usage as food, feed and other multifarious industrial derivatives make the crop special and apart from any other cereals (Ranjit Kumar *et al.*, 2014).

The three primary types of maize consumption in India are feed, food, and industrial non-food items (mostly starch). The primary use and demand generator for maize is animal feed, which accounts for 63% of

overall consumption and 8% of maize used for human use. Karnataka, Andhra Pradesh, Punjab, Gujarat, Haryana, Telangana, Tamil Nadu, Bihar, and West Bengal are India's major consumption states (Rajalakshmi & Unnamalai 2016). Maize has most of the major nutrients which are essential for health and hence it is a staple food in many parts of the country. The utilization pattern of maize at present includes 51 per cent as poultry feed, 20-25 per cent as human food, 10-12 per cent as cattle feed, about 10-12 per cent going towards industrial processing like starch and brewery and 1 per cent as seed (DMR, 2012, USDA, 2013). In India, maize is emerging as third most important crop after rice and wheat. Due to comparatively low worldwide prices, Indian maize has lost its competitiveness on the global market. Since 2007, India has seen a rise in its exports of maize and maintained a competitive advantage through 2014. In 2014–15, the decline in global prices and subsequent drop in external demand caused local prices to fall below the MSP. In contrast, in 2015–16, a lack of domestic production caused prices to rise above international markets, rendering maize exports unprofitable in 2015 and 2016. However, in 2020–21, exports began to rise once more and reached 0.92 million tonnes (Source: F-Forecast, agriwatch.com).

Objective: To identify constraints in production and marketing of maize.

Statement Problem. Despite the fact that there is a methodical approach that incorporates agricultural potential, problem-solving techniques, and indigenous farmer recognition for agricultural growth in the Karnataka, it is necessary to establish institutional and market links as well as build capacities and improve the production system in Karnataka. Various factors can give rise to inefficiencies to a marketing system. Technical impediments, such as a lack of market information, structural features, and government programmes and regulations, may be the source of these difficulties. Low producers' prices were frequently a result of the nature of the commodity on the one hand and the absence of an organized market structure not getting the desirable yield on the other.

Thus, the purpose of this study is to investigate maize production and marketing by which there is narrow down in the research gap. By calling attention to the answers to queries like: Who are the maize market actors and what are their activities in the system? It aims to close the information gap on the topic of interest. What marketing channels exist in the research areas? How do the market margins in those places look? from where the quality seed are getting? As a result, the primary goal of this study is to evaluate the maize production and marketing in the study areas.

MATERIAL AND METHODS

Both primary and secondary data were used to assess the specific study objectives. With the aid of a pre-tested schedule, primary data were gathered from a sample of farmers using the personal interview approach and secondary data was collected from Bagalkot and Belagavi district headquarters, A quick glimpse at the Karnataka State Agriculture Profile and the various Agriculture Produce Market Committees (APMC's) districts and AGMARKNET.AC.IN. It offers perspectives on the numerous obstacles of farmers in the research area during production and marketing of maize. Data pertaining to agriculture year 2018-19 is collected. With sixty farmers from Belagavi district and sixty farmers from Bagalkot district participating. It offers perspectives on the numerous obstacles farmers in the research area experience when producing and marketing of maize. The objectives specified for the goal of the current study were quantitatively evaluated using compound annual growth rate analysis and Garrett's ranking technique.

Growth rate Analysis. For fifteen years (2004-05 to 2018-19), maize crop performance was estimated about the quantity of crops produced and the productivity of the land. The study period was divided into four segments: Period-I (2004-05 to 2008-09), Period-II (2009-10 to 2013-14), Period-III (2014-15 to 2018-19), and Overall period (2004-05 to 2018-19) to demonstrate variance across segments (every five years).

The linear and compound growth rates were a workout to the increase of the maize crop after collecting time series data (from 2004-05 to 2018-19). Using the exponential function of the form, the compound growth rates of area, production, and productivity of the maize crop were calculated.

$$Y = A.B^t$$

The linear form of the equation is obtained by taking the logarithm of both sides:

$$\text{Log } Y = \text{Log } A + t \text{ Log } B$$

On writing Log A = a, Log B=b,

$$\text{Log } Y = y$$

Then, the equation becomes y=a+bt

Where,

y= dependent variable (Area, production and productivity)
t=Time/year (independent variable)
a=intercept
b=Regression coefficient of y on x

From the estimated function the compound growth rate

$$(CGR) = \text{Antilog } (b\text{-}1) \times 100.$$

Garrett's method of ranking: Utilising this strategy, the limitations in maize production and commercialization were evaluated. According to the severity of the problem, the farmers were asked to rate the presented limitations using this method. In order to convert the respondents' orders of merit into ranks, the following formula was utilized.

Percent position = $100(R_{ij} - 0.5)/N_j$.

Where, Rij =rank given forthe i^{th} factor by the j^{th} individual.

N_j =number of factors ranked by j^{th} individual.

By using the table provided by Garrett, the location of each rank's % so scores were created from obtained. The scores of individual respondents were then totaled up for each factor and divided by the overall number of respondents whose scores were added. The average scores for each element were ranked, and conclusions were formed from this arrangement.

RESULT AND DISCUSSION

A. Production and marketing Constraints of maize in Karnataka

Table 1 indicates the CAGR and CV in area, production and productivity of maize. It was observed that growth rate of area is recorded positive trend in period I and III (6.24 and 1.11, respectively), but negative in case of period-II (-2.05). In production mixed trend was recorded (positive and negative) and in entire period highest growth rate and highest degree of variance has been observed in the production, 5.18 and 31.40, respectively. Productivity has been declined over the period. During the study period area, production and productivity of maize in entire state were unstable, due to fluctuation in market price and climatic factors like, unseasonal rainfall, drought and huge shifting in real estate business.

Table 1: Growth rate and Instability in Maize Area, Production and Productivity in Karnataka state (2004-5 to 2018-19).

Particulars	Period I 2004-05 to 2008-09		Period II 2009-10 to 2013- 14		Period III 2014-15 to 2018-19		Overall period 2004-05 to 2018-19	
	CGR	CV (%)	CGR	CV (%)	CGR	CV (%)	CGR	CV (%)
Area	6.24	12.98	-2.05	6.76	1.11	12.53	2.11**	14.64
Production	8.73	28.52	-8.55	26.20	-2.00	14.61	5.18**	31.40
Productivity	4.06	16.08	-5.03	17.57	-0.54	13.43	2.35	18.26

Source: Directorate of Economics and Statistics

Note: *Significantat5%, **Significantat1%

Table 2: Production level constraints of maize crop in Karnataka state.

Sr. No.	Constraints	Mean score (n=120)	Garret's Rank
1.	Shortage of capital and low credit access during production	98 (81.66%)	I
2.	High cost of plant protection chemicals	86 (71.66%)	II
3.	Low knowledge regarding quality seed and non-available of quality of seeds	84 (70.00%)	III
4.	Lack of technical guidance about mechanized farming	46 (38.33%)	IV
5.	Crop damaged by stray animals, wild animals	41 (34.17%)	V
6.	No idea about hybrids and variety	34 (28.33)	VI

Source: Primary data

Note: (Figures in parentheses indicate percent to the total)

B. Production constraints

The production level constraints of maize growers are shown in Table 2. At the time of maize production, it was observed that the lack of capital and limited credit access during production were first in the list(I), for which the Garrett mean score was 81.66, followed by the high cost of plant protection chemicals (II), the lack of knowledge about high-quality seeds and their scarcity (III), the lack of technical guidance about mechanized farming (IV), and the crop being harmed by stray animals, (V), No idea about hybrids and variety (VI) with mean Garrett scores of 71.66, 70.00, 38.33, 34.17, and 28.33.

C. Marketing constraints

Table 3 depicts the marketing level constraints of maize growers at the time of marketing. it was noticed that Location of market far away from the production point was first in the list (I), for that Garrett mean score was 71.66 followed by more market price fluctuations (II), Lack of warehouses and storage facilities (III) Delay in procurement and payment due to intermediaries (IV), Distress sale after harvesting (V), Lack of market information (VI), with mean scores of 70.00, 30.83, 28.33, 26.66, and 25, respectively.

Table 3: Marketing level constraints of maize crop in Karnataka state.

Sr. No.	Constraints	Mean score (n=120)	Garret's Rank
1.	Location of market far away from the production point	86 (71.66%)	I
2.	More market price fluctuations	84 (70.00%)	II
3.	Lack of warehouses and storage facilities	37 (30.83%)	III
4.	Delay in procurement and payment due to intermediaries	34 (28.33%)	IV
5.	Distress sale after harvesting	32 (26.66%	V
6.	Lack of market information	30 (25%)	VI

Source: Primary data
Note: (Figures in parentheses indicate percent to the total)

CONCLUSIONS

The constraints faced by farmers during maize production were Shortage of capital and low credit access during production which is first in the list (I), for that mean score was followed by High cost of plant protection chemicals. Among the marketing level constraint, Location of market far away from the production point was first in the list, for which Garret's rank was first(I) and followed by more market price fluctuations. The government should make credit facilities easily accessible through financial institutions, create cooperative groups to reduce transportation costs, store their produce, and sell it during slow seasons, and eliminate middlemen during marketing to obtain fair prices in order to solve the problems. Hence, there is a need to develop mechanisms for strengthening the production and marketing-system of maize in Karnataka and traditional maize growing areas, so that the poverty ridden maize producers can also benefit (Gopinath & Chitra 2020). Maize has become one of the most important crops with its every part having economic value and immense scope for value additions. It is rightly called the queen of cereals. Capacity of Managing Challenges faced by the women entrepreneurs of informal sector, people's attention on consuming cereals has increased and the demand for these items has also boosted up).

FUTURE SCOPE

It will helpful for administrators to understand whether the crop profitable or not. If not one can take necessary action in order to improve the profitability of crop by extending the cultivation practices in the form of proper guidance and supply agri inputs Poultry industries heavily depends on maize as it forms 50-60% of input required for broiler feed.

Application of Research. Research can be applied in the field of production and marketing of maize to enhance the farmer's income.

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