



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

**PRODUCTION, PROCESSING AND MARKETING
OF POTATO IN KARNATAKA – AN ECONOMIC
ANALYSIS**

SHRINIVAS BHAJANTRI

MBA 925

**DEPARTMENT OF AGRICULTURAL MARKETING,
CO-OPERATION AND BUSINESS MANAGEMENT
UNIVERSITY OF AGRICULTURAL SCIENCES**

GKVK, BANGALORE- 560065

2011

PRODUCTION, PROCESSING AND MARKETING OF POTATO IN KARNATAKA – AN ECONOMIC ANALYSIS

SHRINIVAS BHAJANTRI

MBA 925

Project Report submitted to the

University of Agricultural Sciences, Bangalore

in partial fulfillment of the requirements for the degree of

Master of Business Administration

(Agribusiness Management)

BANGALORE

JULY, 2011



Affectionately Dedicated
To My Beloved
Parents, Sisters
&
My Guide

**DEPARTMENT OF AGRICULTURAL MARKETING,
CO-OPERATION AND BUSINESS MANAGEMENT
UNIVERSITY OF AGRICULTURAL SCIENCES
GKVK, BANGALORE- 560065**

CERTIFICATE

*This is to certify that the Project Report entitled, “**Production, Processing and Marketing of Potato in Karnataka – An Economic Analysis**” submitted by **Mr. Shrinivas Bhajantri**, ID No. **MBA 925** in partial fulfillment of the requirement for the degree of **MASTER OF BUSINESS ADMINISTRATION (AGRIBUSINESS MANAGEMENT)** to the University of Agricultural Sciences, Bangalore, is a record of bonafide research work done by him during the period of his study in this University under my guidance and supervision and the Project Report has not previously formed the basis for the award of any degree, diploma, associate ship, fellowship or other similar titles.*

Bangalore
July, 2011

Dr. B. M. SHASHIDHARA
Major Advisor

APPROVED BY:

Chairman : _____
(**B. M. SHASHIDHARA**)

Members : 1. _____
(**G. N. NAGARAJA**)

2. _____
(**H. CHANDRASHEKHARA**)

3. _____
(**M. R. GIRISH**)

4. _____
(**MANJUNATH, V.S.**)

ACKNOWLEDGEMENT

The task of acknowledging the help that was offered to me through this study by my teachers and friends is bigger than the study itself. I feel scanty of words to the magnitude of their help. I could not have completed this work, without their endless patience and affection. It gives me immense sense of gratification to place on records my profound gratitude and sincere appreciation to each and every one of those who have helped me in this endeavor.

*I would like to place on record my deep sense of reverence and gratitude to chairman of my advisory committee **Dr. B.M. Shashidhara**, Professor, Department of Agricultural Marketing, Co-operation and Business Management, UAS, Bangalore. I owe him a lot for his valuable suggestions, versatile guidance, intellectual discussion, unceasing support, untiring patience, constant incitement, stimulating ideas, critical comments, close console, punctuality, friendly atmosphere and a lot more. I feel privileged to have enjoyed an opportunity to be associated with him during my master degree programme.*

*I wish to place on record with great pleasure, my sincere thanks and gratitude to the members of my advisory committee, **Dr. G.N. Nagaraja**, Professor & Head, Dept. of Agricultural Marketing Co-Operation and Business Management, UAS, GKVK, Bangalore, **Dr. H. Chandrashekhara** Professor, Department of Statistics, UAS, GKVK, Bangalore. **Dr. M.R. Girish**, Assistant Professor, Department of Agricultural Marketing Co-Operation and Business Management and **Mr. Manjunath, V.S.**, Assistant Professor, NMIT, Bangalore. I am indebted to them for their valuable suggestions and constructive criticisms, which has helped me to complete my study.*

I gratefully acknowledge the co-operation and help extended by my teachers Dr. B.M. Ramachandra Reddy, Mr. T.N. Venkata Reddy, Mr. P.V. Ramegowda, Dr. M.S. Jayaram and Dr. C.P. Gracy for their kind co-operation and help during the course of my post graduation study in the Department of Agricultural marketing, Co-operation and Business Management.

The love, affection and patience of my family have been instrumental for me. Mere words cannot express the blessings my beloved parents Smt. Leelavati and Shri. Shivashankar Bhajantri, who have given me life and taught me the concept of life, They have been a fountain of inspiration throughout my life, without whose help, this work would have not been possible. I humbly dedicate this piece of work to my parents. On this memorable moment I remember with love, my sister Kaveri for her help, cooperation and constant support.

Friendship is the most important ingredient in the recipe of life and it adds more flavor when that is from different states with different language and culture. I am fortunate to have a myriad of friends here. I am thankful for the emotional support and encouragement from my beloved friends Mahendra, Gani, Tonni, Venki, Padmavathi, Guru, Anand, Bhushan, and Ravi. Thanks to all my dear friends who encouraged me in each and every step of the life during my post graduation and they deserve a more personal note of gratitude.

I express my sincere thanks to the staff of the Department of Agricultural Marketing Co-operation and Business Management and junior friends.

Bangalore

Shrinivas Bhajantri

July, 2011

Production, Processing and Marketing of Potato in Karnataka -An Economic Analysis

Shrinivas Bhajantri

Abstract

Potato (*Solanum tuberosum* L.) popularly known as 'The king of vegetables', is grown in more than 100 countries in the world. Karnataka is one of the important Potato growing state in the country grown mainly in the districts of Hassan, Belgaum, Chikkaballapur and Kolar. The study was conducted to analyze Production, Processing and Marketing of Potato in Karnataka. The study reveals that Hassan district alone account for more than 41 percent potato production in the state. However production (0.40%) and productivity (9.22%) in the district during the last 5 years has shown insignificant growth rate. In Belgaum district potato production and productivity has increased with a growth rate of 5.23 and 10.26 percent which is significant. The potato processing industry is growing significantly in Belgaum and Hassan districts with a growth rate of (1.97%) and (3.82%) indicating potential opportunity for the establishment of small scale potato processing industries in these districts. Potato is mainly marketed through regulated markets by the farmers. The important regulated markets for Potato are Bangalore, Hubli, Belgaum, Hassan, Chikkaballapur and Kolar. The study reveals that vast majority of farmers (64%) are selling directly to Commission agents/Wholesalers in regulated markets. The producer who sold potato through Producer - Wholesaler - Retailer - Consumer realized the highest share (65%) in consumer rupee compared to other channels indicating the efficiency of this channel.

Bangalore
17/08/2011

Dr. B. M. Shashidhara
Major Advisor

ಕರ್ನಾಟಕದಲ್ಲಿ ಆಲೂಗಡ್ಡೆಯ ಉತ್ಪಾದನೆ, ಸಂಸ್ಕರಣೆ ಮತ್ತು ಮಾರಾಟದ ಕುರಿತು ಒಂದು ಆರ್ಥಿಕ

ವಿಶ್ಲೇಷಣೆ

ಶ್ರೀನಿವಾಸ ಭಜಂತ್ರಿ

ಸಾರಾಂಶ

ಆಲೂಗಡ್ಡೆ ಒಂದು ಪ್ರಮುಖ ತರಕಾರಿ ಬೆಳೆಯಾಗಿದ್ದು ವಿಶ್ವದ ನೂರಕ್ಕಿಂತ ಹೆಚ್ಚು ದೇಶಗಳಲ್ಲಿ ಬೆಳೆಯಲಾಗುತ್ತಿದೆ.ಭಾರತದಲ್ಲಿ ಉತ್ತರ ಪ್ರದೇಶ ಮತ್ತು ಪಶ್ಚಿಮ ಬಂಗಾಳ ರಾಜ್ಯಗಳು ಆಲೂಗಡ್ಡೆ ಉತ್ಪಾದನೆಯಲ್ಲಿ ಕ್ರಮವಾಗಿ ಮೊದಲು ಮತ್ತು ಎರಡನೇ ಸ್ಥಾನದಲ್ಲಿವೆ. ಕರ್ನಾಟಕವು ಆಲೂಗಡ್ಡೆ ಬೆಳೆಯಲ್ಲಿ ಪ್ರಮುಖವಾದ ರಾಜ್ಯ. ಕರ್ನಾಟಕ ರಾಜ್ಯದ ಹಾಸನ, ಬೆಳಗಾಂ, ಚಿಕ್ಕಬಳ್ಳಾಪುರ ಮತ್ತು ಕೋಲಾರ ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಆಲೂಗಡ್ಡೆಯನ್ನು ಹೆಚ್ಚಾಗಿ ಬೆಳೆಯುತ್ತಾರೆ. ಈ ಅಧ್ಯಯನದಲ್ಲಿ ಕರ್ನಾಟಕದಲ್ಲಿನ ಆಲೂಗಡ್ಡೆಯ ಉತ್ಪಾದನೆ, ಸಂಸ್ಕರಣೆ ಮತ್ತು ಮಾರಾಟದ ಕುರಿತು ವಿಶ್ಲೇಷಿಸಲಾಯಿತು ಮತ್ತು ಅಧ್ಯಯನವನ್ನು ಉದ್ದೇಶಪೂರ್ವಕವಾಗಿ ಹಾಸನ ಮತ್ತು ಬೆಳಗಾಂ ಜಿಲ್ಲೆಗಳಲ್ಲಿ ನಡೆಸಲಾಯಿತು.ಈ ಅಧ್ಯಯನದಿಂದ ತಿಳಿದುಬರುವದೇನೆಂದರೆ ರಾಜ್ಯದಲ್ಲಿ ಉತ್ಪಾದನೆಯಾಗುವ ಆಲೂಗಡ್ಡೆಯಲ್ಲಿ ಶೇಕಡ 41 ರಷ್ಟು ಹಾಸನ ಜಿಲ್ಲೆಯೊಂದರಲ್ಲಿ ಉತ್ಪಾದಿಸಲಾಗುತ್ತದೆ. ಆದರೂ ಕಳೆದ 5 ವರ್ಷದಿಂದ ಜಿಲ್ಲೆಯಲ್ಲಿ ಆಲೂಗಡ್ಡೆಯ ಉತ್ಪಾದನೆ ಮತ್ತು ಇಳುವರಿಯಲ್ಲಿ (0.40%) ಮತ್ತು (9.22%) ರಷ್ಟು ಅಭಿವೃದ್ಧಿ ಕುಂಠಿತವಾಗಿದೆ. ಬೆಳಗಾಂ ಜಿಲ್ಲೆಯಲ್ಲಿ ಆಲೂಗಡ್ಡೆಯ ಉತ್ಪಾದನೆ ಮತ್ತು ಇಳುವರಿಯಲ್ಲಿ (5.23%) ಮತ್ತು (10.26%) ರಷ್ಟು ಅಭಿವೃದ್ಧಿಯನ್ನು ಕಾಣಬಹುದು. ಬೆಳಗಾಂ ಮತ್ತು ಹಾಸನ ಜಿಲ್ಲೆಯ ಆಲೂಗಡ್ಡೆ ಸಂಸ್ಕರಣಾ ಉದ್ಯಮಿಯಲ್ಲಿ ಅಭಿವೃದ್ಧಿ ಕಂಡುಬಂದಿದ್ದು ಜಿಲ್ಲೆಗಳಲ್ಲಿ ಸಣ್ಣ ಪ್ರಮಾಣದ ಸಂಸ್ಕರಣಾ ಉದ್ಯಮಿಯನ್ನು ಪ್ರಾರಂಭಿಸುವಲ್ಲಿ ಸಂಭವನೀಯ ಅವಕಾಶವನ್ನು ಸೂಚಿಸುತ್ತದೆ.ಪ್ರಮುಖವಾಗಿ ರೈತರು ಆಲೂಗಡ್ಡೆಯನ್ನು ನಿಯಂತ್ರಿತ ಮಾರುಕಟ್ಟೆಗಳ ಮೂಲಕ ಮಾರಾಟ ಮಾಡಿರುತ್ತಾರೆ.ಕರ್ನಾಟಕದಲ್ಲಿ ಮುಖ್ಯವಾಗಿ ಬೆಂಗಳೂರು, ಹುಬ್ಬಳ್ಳಿ, ಬೆಳಗಾಂ, ಹಾಸನ, ಚಿಕ್ಕಬಳ್ಳಾಪುರ ಮತ್ತು ಕೋಲಾರ ಆಲೂಗಡ್ಡೆಯ ವ್ಯಾಪಾರ ವಹಿವಾಟು ನಡೆಯುವ ಪ್ರಮುಖ ಕೃಷಿ ಮಾರುಕಟ್ಟೆಗಳಾಗಿವೆ.. ಈ ಅಧ್ಯಯನದಿಂದ ತಿಳಿದುಬರುವದೇನೆಂದರೆ 64ರಷ್ಟು ರೈತರು ನಿಯಂತ್ರಿತ ಮಾರುಕಟ್ಟೆಗಳಲ್ಲಿ ನೇರವಾಗಿ ದಲ್ಲಾಳಿಗಳಿಗೆ ಅಥವಾ ಸಗಟು ವ್ಯಾಪಾರಸ್ಥರಿಗೆ ಮಾರಾಟ ಮಾಡುತ್ತಾರೆ. ಉತ್ಪಾದಕ - ಸಗಟು ವ್ಯಾಪಾರಸ್ಥ - ಚಿಲ್ಲರೆ ವ್ಯಾಪಾರಸ್ಥ - ಗ್ರಾಹಕ ಈ ಮಾರಾಟ ಮಾರ್ಗದ ಮೂಲಕ ಆಲೂಗಡ್ಡೆಯನ್ನು ಮಾರಾಟ ಮಾಡಿದಾಗ ಅತಿ ಹೆಚ್ಚು ಭಾಗವನ್ನು (65%) ರೈತ ಪಡೆಯಬಲ್ಲ. ಇದು ಈ ಮಾರ್ಗದ ಕಾರ್ಯಕ್ಷಮತೆಯನ್ನು ಸೂಚಿಸುತ್ತದೆ.

ಬೆಂಗಳೂರು

18/08/2011

ಡಾ. ಬಿ. ಎಮ್. ಶಶಿಧರ

ಪ್ರಧಾನ ಸಲಹೆಗಾರರು

CONTENTS

Chapter	Title	Page No.
I	INTRODUCTION	1-9
II	REVIEW OF LITERATURE	10-28
III	METHODOLOGY	29-41
IV	RESULTS	42-74
V	DISCUSSION	75-82
VI	SUMMARY AND POLICY IMPLICATIONS	83-88
VII	REFERENCES	89-97

LIST OF TABLES

Table No.	Particulars	Page No.
4.1	Socio economic profile of the respondents	43
4.2	Occupation of the farmer	44
4.3	Land Holding of the respondents	44
4.4	Area, production and productivity of Potato in Belgaum district	45
4.5	Area, production and productivity of Potato in Hassan district	46
4.6	Area, production and productivity of Potato in the state	46
4.7	Details regarding the place of sale, agency to/ through whom sold and quantity sold by various categories of potato producers	48
4.8	marketing cost of potato producers (Per acre)	50
4.9	Costs and returns of village level traders of potato	52
4.10	Costs and returns of Commission agents of potato	54
4.11	Costs and returns of Wholesalers of potato	56
4.12	Costs and returns of Trader cum retailers of potato	58
4.13	Costs and returns of Retailers of potato	60
4.14	Costs and returns of Cart vendors of potato	61
4.15	Price spread in different channels identified in the marketing of potato	63
4.16	Potato processing industries in Belgaum district	67
4.17	Potato processed products sold by the processing industries in Belgaum district	68
4.18	Potato processing industries in Hassan District	68

Table No.	Particulars	Page No.
4.19	Quantity of potato processed products sold by the processing industries in Hassan district	69
4.20	Age group of the respondents	69
4.21	Literacy level of the respondents	70
4.22	Family size of the respondents	70
4.23	Average monthly Income of the respondents	71
4.24	Quality attributes selected for consumer preference for Potato Chips.	72
4.25	Quality attributes of Potato chips for consumers	73

LIST OF FIGURES

Fig. No.	Particulars	Between Pages
3.1	Map showing the location of the study area	30-31

Introduction



CHAPTER I

INTRODUCTION

Potato is a major food crop, grown in more than 100 countries in the world. According to FAO (2008), Potato is consumed by more than one billion people in the world. It is a high quality vegetable cum food crop and used in preparing more than 100 types of recipes. The protein content of Potato has a high biological value than cereals and considered to be better than milk. Hence, Potato is supplementing meat and milk products by lowering energy intake and also by reducing food cost.

Potato (*Solanum tuberosum* L.) popularly known as 'The king of vegetables', has emerged as fourth most important food crop in India after rice, wheat and maize. Indian vegetable basket is incomplete without Potato. Potato is a nutritionally superior vegetable due to its edible energy and edible protein. It has become an integral part of breakfast, lunch and dinner among the larger population. Being a short duration crop, it produces more quantity of dry matter, edible energy and edible protein in lesser duration of time compared to cereals like rice and wheat. Hence, Potato is considered to be an important crop to achieve nutritional security of the nation.

1.1 Origin of Potato

South America is known to be native of Potato. In 1537, the Spaniards first came into contact with Potato in one of the villages of Andes. In Europe, Potato was introduced between 1580 A.D. to 1585 A.D. in Spain, Portugal, Italy, France, Belgium and Germany. In India it was introduced by the Portuguese sailors during early 17th century and its cultivation was spread to North India during the British period.

1.3 Potato Production in the World

Potato is grown in more than 100 countries in the world. China ranks first, followed by Russia and India. China, India, USA, Ukraine, Germany and Poland put together constitute more than 62 per cent of total global production.

Table 1.1 Top Potato producing countries in the world

Country	Production (Lakh Metric tonnes)	Per centage
China	570.60	26.39
Russian Federation	372.70	17.24
India	344.00	15.92
Ukraine	220.62	10.20
United States	210.97	9.76
Germany	116.24	5.38
Poland	103.69	4.80
Belarus	88.50	4.09
Netherlands	67.77	3.13
France	66.80	3.09
Total	2161.90	100

Source: Food & Agricultural Organization (FAO)

1.4 Potato Production in India

In India, Potato is cultivated in almost all states under diverse agro-climate conditions. About 85 per cent of Potatoes are cultivated in Indo-gangetic plains of North India. The states of Uttar Pradesh, West Bengal, Punjab, Bihar and Gujarat accounted for more than 80 per cent share in total production. The state wise production of Potato is furnished in Table 1.2.

Table 1.2 State wise production of Potato in India

Sl. No.	States	Production. ('000 t)	Per centage
1.	U.P.	9821.7	43.31
2.	West Bengal	7076.6	31.21
3.	Punjab	1338.1	5.90
4.	Gujarat	1088.7	4.80
5.	Bihar	1062.8	4.69
6.	Madhya Pradesh	752.6	3.32
7.	Assam	589.1	2.60
8.	Karnataka	361.0	1.59
9.	Haryana	323.9	1.43
10.	Uttaranchal	261.2	1.15
	Total	22675.7	100

Source: Food & Agricultural Organization (FAO)

1.5 Potato Production in Karnataka

Karnataka is one of the important Potato growing states in peninsular India. Potato is one of the important crops in six districts of the state. The state's agro-climatic conditions favour its cultivation during two seasons a year. Potato is predominantly grown in Bangalore, Belgaum, Chikmagalur, Dharwad, Hassan and Kolar districts. It is mainly grown as *kharif* crop in Belgaum, Chikmagalur, Dharwad and Hassan districts, whereas, it's grown as a *rabi* crop in Kolar and Bangalore districts. The *rabi* crop is irrigated, whereas the *kharif* is totally rainfed. Potatoes produced in *kharif* account for the major proportion (70%) of the Potatoes produced in Karnataka. Hassan district stands first in area followed by Belgaum and Kolar districts.

Table 1.3 District wise production of Potato in Karnataka

Sl. No.	Districts	Production (tonnes)	Per centage to total
1	Hassan	91733	40.88
2	Kolar	47274	21.07
3	Belgaum	30109	13.42
4	Chikmagalur	17761	7.92
5	Chickballapur	15935	7.10
6	Bangalore – Rural	15724	7.0
7	Dharwad	5851	2.61
	Total	2,24,387	100.00

Source: www.karnatakastat.com

1.6 Potato processing

Potato processing is very old and has been practiced in the highland of Peru-Bolivia for 2000 years by the Inca Indians who created chuno and papa seca, the naturally freeze dried and dried forms of Potato. In India, Potato processing on commercial scale was first started by Col. Rennick in 1911, who established a factory at Narkanda in Himachal Pradesh to produce Potato meal.

The demand for processed Potato is likely to increase in India due to increased urbanization, preference for fast foods, rising per capita income and because of increased demand for convenience food. The most popular processed products are chips and French fries. Processing is mainly confined to developed countries and it is only in its infancy in most of the developing countries with the exception of China (12%), Korea (6%) and Mexico (8%). In India, processing of Potatoes constitutes less than 0.5 per cent of the annual production.

Potato can also be processed into a variety of products ranging from Potato powder, Potato starch, and frozen Potato flakes, Potato preserved in vinegar granules, baby food and alcohol. Expansion of

processing industry is also desirable to avoid gluts and the consequent difficulty of storing large quantities of Potatoes during periods of extremely high temperatures. With the growing realization that processed Potatoes fetch considerable higher returns than fresh Potatoes, processing activity is likely to look up sharply in the coming years. There is considerable scope for expansion of this processing industry in India.

Fresh Potato consumption, once the mainstay of world Potato utilization is decreasing in many countries, especially in developed regions. Currently, more Potatoes are being processed to meet the rising demand from the fast food, snack and convenience food industries. The major drivers behind this development include growing urban population, rising incomes, the diversification of diets.

Potatoes are commonly regarded as a bulky, perishable, and a high transport cost commodity with limited export potential, confined mostly to cross-border transactions. These constraints have not hampered the international Potato trade, which has doubled in volume and risen almost fourfold in value since the mid-1980s. This growth is due to unprecedented international demand for processed products, particularly frozen Potato products. To date, developing countries have not been beneficiaries of this trade expansion. As a group, they have emerged as leading net importers of the commodity.

Table 1.4 Status of Potato processing industry in the India

Company	Market Share
PEPSICO. INDIA LTD	45.0 %
HALDIRAM'S	27.0 %
ITC	11.0 %
OTHERS INCLUDING PARLE	17.0 %
Total	100

(Source: www.indiastat.com)

In India, Potato processing industry mainly comprises four segments: Potato chips, French fries, Potato flakes/powder and other processed products such as dehydrated chips, *Alu Bhujia*, *Samosa*, and *Tikkis*. However, Potato chips still continue to be the most common and popular processed product and presently constitute 85% of snack business worth Rs 25 billions and account over 60% of the total Potato processing capacity of the industry. PepsiCo India Ltd with 45% market share is the snack food leader followed by 27% share by Haldiram and 11% by Indian Tobacco Company (ITC). The production of Potato flakes/powder is witnessing an impressive growth with their share in total processing sector touching about 17.6% in 2005. Multinationals like M/s PepsiCo India Holdings Pvt. Ltd. and M/s McCains Food Ltd are steadily consolidating their market shares with diverse processed, frozen, canned and value-added Potato products and simultaneously other foreign multinationals are directly or indirectly tying up with their Indian counterparts on different collaborative ventures to supplement and diversify this emerging sector. The utilization of raw material by the Potato processing industries in the state during 2007 was about 4.40 lakh tonnes which are hardly 2% of the total Potato production. During 2008, about 10 lakh tonnes of Potatoes were processed both by the organized and unorganized sectors and out of which the food arm of PepsiCo India Holdings Pvt. the increase in the area under the potato cultivation in Hassan district alone utilized around 1.5 lakh tonnes of Potato for different products. About 28 industries manufacturing Potato chips, flakes and French fries have been installed in the organized sector in state from just 4 or 5 companies in 2003). Till 2002, all the major Potato processing industries were located in and around particularly at Chennai, Delhi, Kolkata and Bangalore. This is possible mainly due to increased demand of processed Potato products in the country and the suitability and availability of indigenously developed Potato processing varieties, like 'Kufri Chipsona-1', 'Kufri Chipsona- 2' and 'Kufri

Chipsona-3'. Presently, these varieties are the choice of processing sector for the production of quality Potato chips and French fries.

1.7 Marketing of Potato in Karnataka

Potatoes are mainly sold in the regulated markets by the farmers. The steady growth of arrivals of commodities in the regulated markets is the result of the improvement and beneficial effect of the regulated markets owing to which the sale of agricultural produce in the village has been observe to dwindle over time. This has led to considerable improvement in the market structure, conduct and performance. The major regulated markets for Potato are Bangalore, Hubli, Belgaum, Hassan, Chikkaballapur and Kolar. Bangalore attracts the largest share of arrivals of Potato among these markets. The major arrivals of Potato in these markets are during October and March months corresponding to *kharif* and *rabi* crop harvest. During off-season Potato from other states like Punjab and Uttar Pradesh arrive in these markets.

1.8 Importance of the study

In Karnataka, Potato is grown in only few districts. Hassan district alone account for more than 41 per cent of total Potato production in the state. The other important Potato growing districts are Kolar, Belgaum, Chickmagalore and Chickballapur. The area, production and productivity in the state has increased marginally during last decade. Traders also making profits by selling the table Potato instead of selling seed Potato. Value Added Products are increasing day by day as more and more companies are entering in this sector

The market size for the food consumption in India is expected to reach US\$ 344 billions by 2025. There is a huge potential for processed Potato products such as Potato flakes, Potato powder, frozen Potatoes, frozen French fries Potato chips/wafers are one of the most popular

snack items consumed throughout world. It is by far the largest product category within snacks, with 85 per cent of the total market share. India is one of the largest snack markets in the Asia-Pacific region contributing three per cent to the total Asia-Pacific snack market share. There is a huge potential for processed Potato Products such as Potato chips, Wafers, Potato flakes, Potato Powder, Frozen Potatoes, and Frozen French Fries....etc in India. To meet the burgeoning demand, Potato processing is emerging as a fastest growing industry with the entry of numbers private players.

The study will be useful in assessing the area, production and productivity of Potato and also growth and potential of Potato processing industry in the state. The results of the study will be useful for policy makers, farmers and input agencies involved in promotion of Potato cultivation in formulation policies and strategies to boost the production of Potato.

Keeping this in mind, the study was undertaken with the following objectives.

1.10 Objectives:

1. To analyze the area, production and productivity of Potato in the state.
2. To examine the channels involved in the marketing of Potato.
3. To examine the growth and potential of Potato processing industry in the selected districts.
4. To study the consumer preference for branded and unbranded Potato processed products.

1.11 Hypothesis:

1. The area, production and productivity in the state has increased marginally.
2. Wholesalers and commission agents have monopoly control over the Potato market.
3. The demand for Potato from processing industry is increasing exponentially in the state.
4. The unbranded Potato chips are more popular among the consumers.

1.12 Limitations of the study

The present study is confined to Hassan and Belgaum districts. The study was carried out by using primary as well as secondary data. The primary data was collected from farmers and intermediaries involved in the marketing of Potato through Personal Interview Method to know the cost incurred by them in the marketing of Potato. Farmers in the study area are predominantly small, medium land holders. The processing industries in study area are rather few and small have been considered for the study. Hence, it would be difficult to draw precise generalizations regarding the implications of the study. The findings in this study, interpretations and conclusions drawn could be best seen with in these limitations.

Review of Literature



CHAPTER II

REVIEW OF LITERATURE

A review of the research work done earlier pertaining to the present study has been presented below. The reviews examined are related to Production, Processing and Marketing of Potato. The review of literature is presented under the following sub headings.

2.1. Analysis of the area, production and productivity of Potato in the state.

2.2. Channels in the marketing of Potato.

2.3. The growth and potential of Potato processing industry.

2.4. Consumer preference for branded and unbranded Potato processed Products.

2.1 Analysis of the area, production and productivity of Potato in the state

Singh (1993) productivity of Potato crop under riverbed cultivation is about 330 quintal per hectare which is about 50 per cent higher than under field situations. Cultivation of Potato both under riverbed and fields is a profitable proposition but it requires heavy investment too. Farmers face many constraints in the availability of inputs. Area has potential to produce even high yields of Potato which may be achieved by relaxing the constraints in farm supplies.

Singh and Mathur (1994) in their study “Growth and instability in production and prices of Potato in India, *Agricultural Situation in India*” assessed instability in Potato production in India by using the co-efficient of variation. It was found that the area and production were unstable because of the response of Potato production to prices of competing crops and the adoption of modern technology, respectively.

Handiganur (1995) in their study “Economics of production and processing of grapes in Bijapur district, Karnataka” analyzed the growth rates of area, production and productivity of grapes in Bijapur district from 1978-79 to 1992-93. Growth rate analysis had showed an increase of 7.12 per cent of area in Bijapur district and an increase of 0.6 per cent in area, 2.80 per cent in production and 2.0 per cent in productivity of grapes was observed in Karnataka state. The increase in production and productivity was due to the use of improved cultural practices, increased use of manures, fertilizers and plant protection chemicals.

Patil (1995) in their study “Yield gaps and constraints in groundnut production in Karnataka – An Economic Analysis” estimated the compound growth rates of area, production and productivity of groundnut in Dharwad district and at the state level for the period from 1984-85 to 1993-94 and found that the growth rate in area (0.51%) was positive but not significant as compared to the significant growth rates in production (6.89%) and productivity (6.34%). During the same period, growth rates in area (5.24%), production (10.00%) and productivity (4.63%) of groundnut for the state as a whole were positive and significant.

More (1999) in their study “Economics of production and marketing of banana in Maharashtra state” analyzed the growth rate in area, production and productivity of banana in Nanded district, Parbhani district and Maharashtra state as a whole (4.50%) due to suitability of climate to cultivate banana in addition to more awareness of farmers towards horticultural crops in Nanded district. In Nanded district production growth rate had shown higher growth rate (21.04%). The higher growth in production was contributed mainly by significant increase in area coupled with productivity. The growth rate of productivity was high (1.43%) in Maharashtra state as a whole as

compared to Nanded (1.40%) and Parbhani (0.90%) district. It was due to the use of improved cultural practices, higher use of manures and fertilizers, more use of other inputs and also increased yield levels in other districts of the state.

Pervez (2001) in their study “Dynamics of food grains production in Pakistan, *The Asian Economic Review*” analyzed the growth in area, production and yield of major crops of Pakistan for a period 1970-71 (period I) to 1984-85 (period II). The study revealed that the increase in crop production was contributed largely by area than by productivity in Punjab and Sindh during period I. Sindh region recorded a higher growth in area, production and yield as compared to Punjab in period II. It was also observed that Punjab recorded a low degree of instability in growth rates in most of the crops as compared to Sindh region in period II.

Gangal (2002) in the study “Performance of banana plantation in North Karnataka – An economic analysis” analyzed the growth rate in area, production and productivity of banana in North Karnataka and Karnataka state as a whole. The growth rate in area (6.69%) in Karnataka state between 1980 and 2000 was substantially higher than all the other major banana growing states and all India average.

Lakhana (2003) in their study “Production, price behavior and export of groundnut in India with special reference to Gujarat state- An economic analysis” had analyzed the growth rates of area, production and productivity of groundnut in Gujarat for pre-TMO (1970-71 to 1985-86), post-TMO (1986-87 to 2001-02) and for over all period (1970-71 to 2002-02) of selected markets Rajkot, Junagadh, Kalawad and Amrelin. The post-TMO period had witnessed positive growth rates in area, yield, and production. Growth of all the variables were found to be positive in over all period, however they were not significant. Growths rate of area for Junagadh and Rajkot districts as well as for the state of Gujarat as a

whole were positive and significant. However, growth rates of yield were negative throughout the study area during pre-TMO. During post-TMO growth rates of all variables were found to be positive.

Singh and Srivastava (2003) in their study “Growth and instability of sugarcane production in Uttar Pradesh: A regional study. *Indian Journal of Agricultural Economics*” analyzed the growth and instability in sugarcane area, production and productivity in Uttar Pradesh for different regions for the period from 1980-81 to 1998-99. Semi-log equations were fitted to estimate compound growth rates and coefficient of variation analysis to study the instability. Area, production and productivity under sugarcane registered a significant and positive growth rate in all the study regions and state as a whole. The variability coefficient was relatively higher in the central region but, Western and Eastern region registered the lowest.

Varghese (2004) In their study “Trend analysis in area, production, productivity and price behavior of cardamom in Kerala. *Indian Journal of Agricultural Economics*” worked out the trend in area, production and productivity of cardamom in Kerala for a period from 1970-71 to 2002-03 using semi-logarithmic growth equation. The area under cardamom registered a negative growth rate (-1.216%) which was significant. The output showed an average annual growth rate of 4.14 per cent and yield registered an average annual growth rate of 5.51 per cent.

According to study “Growth trends in area, production and productivity of coconut in India. *Indian Journal of Agricultural Economics*” conducted by Lathika and Kumar (2005) analyzed the growth trends in area, production and productivity of coconut for different coconut producing states/union territories in India. The period had been divided into two sub-periods as phase I (1951 to 1995) and phase II (1996 to 2002). Area showed positive growth in both phases for selected states

except for the Andaman and Nicobar islands where the growth was negative (-9.69) in II phase. Production also showed a positive growth in all the states in both the phases and Andhra Pradesh had highest growth in II phase (16.69%). The growth rate of productivity showed negative growth in Kerala and Orissa in the I phase, Karnataka in the II phase.

Bhullar (2005) studied the “trends in production of dry chillies in India” and found that Andhra Pradesh, Karnataka, Maharashtra and Orissa put together account for 75.00 per cent of the total Indian production. Punjab state occupied 3.10 per cent of area and was ranked eighth during 1974-77, which decreased substantially to only 0.46 per cent in 1998-2001. Production-wise, Punjab accounted for 4.61 per cent of production during 1974-77, which fell to 0.74 per cent during 1998-2001. There had been significant improvement in the productivity of chillies at 1945 kg per ha, followed by Punjab at 1688 kg per ha Rajasthan at 1064 kg per ha and Arunachal Pradesh at 1272.7 kg per ha and Gujarat 786 kg per ha.

Harbans and Sharma (2006) studied the economics of potato production based upon primary survey of 50 growers selected randomly from lahaul valley during 2001-2002 this crop was found to be the most capital and labour intensive due to substantial cost incurred on seed ,fertilizer and human labour. Out of the total cost of ₹ 74,461 the human labour alone accounted for around 30 per cent followed by seed (18 %). As such, the cost benefit ratio over all paid out cost was 1:2.51 while on total cost it was 1:1.03. The analysis showed that there is a lot of scope for increasing the profit from potato crop by rationalizing the use of human labour, manures and fertilizers.

Saraswat and Rane (2006) conducted a study on “production and marketing of peach fruit a case study of Rajgarh area of district Sirimour in Himachal Pradesh” 50 farmers were randomly selected for the detailed

study. The compound growth rate with respect to area and production showed that the area under peach increased at the rate of 4.31 per cent per annum. The highest area under peach was recorded in Sirmour district, whereas district Mandi registered the highest rate of production growth in the state i.e., 9.32 per cent per annum. The district wise production scenario indicated that there are variations out of 12 districts only 4 districts had registered a positive growth in production i.e., solan (22.55%) followed by Una Bilaspur and Mandi.

Kareemulla *et al.* (2007) conducted a study on production and marketing of Indian Gooseberry – AONLA (*Emblic officinalis* Gaertn.) in Pratapgarh district of Uttar Pradesh. He reported that the area occupied by amla based farming system grew at a growth rate of 4.02 per cent during the period 1995-2005. The production of aonla had increased from 47329 to 82690 tonnes in the reference period at a growth rate of 5.2 per cent and the average productivity increased from 5.7 to 6.5 t per ha.

2.2 Channels involved in the marketing of Potato.

Vedani and Gracy (1995) Analysed the marketing cost for Jasmine flowers in the Mysore city for the year 1992-93 and was observed to be more than 15 per cent of the value of the flowers sold by the farmers under this marketing channel further they studied the performance of marketing channel which was identified as

Producer - Trader – cum-commission agent - retailers - consumers

They found that producer's net share was as low as 45 per cent. The trader-cum commission agent and retailer cost and margin was 6.02 and 45.78 per cent respectively. All the farmers opined that non-availability of adequate financial help for cultivating the crop was a major

production problem. About 85 per cent of the farmers felt that commission charges were high.

Shyamasundar *et al.* (1995) in their study identified the four important marketing channels followed in disposal of onion:

Producer - Village level trader - Wholesaler - Retailer - Consumer

Producer - Wholesaler - Retailer - Consumer

Producer - Commission agent - Trader - Trader cum - Retailer - Consumer.

Producer - Commission agent - Cart Vendor - Consumer.

The producers got the highest net price per quintal in channel-2 (₹ 163.57) and lowest in channel-I.

Singh (1996) studied price spread of citrus fruit in mid hill of Jammu and Kashmir. An overall view of results revealed that producers share in consumer's rupee was 35.71 per cent in channel-I (Producer - Pre- harvest contractor- Retailer -Consumer) and 81.25 per cent in channel-2 (Producer- Retailer - Consumer).

More (1999) in his study on economics of production and marketing of banana in Maharashtra state identified two important channels through which banana from the study area passed from the production to the ultimate consumers. They were,

Channel -1: Producer - Commission agent - Cum - Wholesaler - Retailer - Consumer

Channel -II: Producer - Commission agent - Distant market

The estimated marketing cost of producer - seller was ₹ 15.17 per quintal, while it was ₹ 38.01 per quintal in commission agent - cum

wholesaler and ₹ 52.24 per quintal in retailer. The producers share in consumer's rupee was 58.44 per cent.

Vasudev and Chowdry (1999) identified two marketing channels which were predominant in marketing of tomato in all the three regions of Andhra Pradesh, viz.,

Channel-I: Producer - Commission Agent - Secondary Wholesaler - Retailer - Consumer.

Channel-II: Producer - Commission Agent - Primary Wholesaler - Retailer - Consumer.

The producer's share in consumer's rupee was found to be substantially higher in channel-I over channel-II in all the regions (coastal Andhra, Rayalseema and Telangana) of Andhra Pradesh, indicating better efficiency of channel-I over channel-II.

Shivanand (2002) studied the performance of banana plantation in north Karnataka and identified two important marketing channels through which banana was transferred from producer to ultimate consumer.

Channel - I: Producer - Commission agent cum wholesaler - Retailers - consumers.

Channel - II: Producers - Village traders - Consumers.

Nearly 70 per cent of the farmers produce was sold through commission agent cum wholesale and remaining 30 per cent was sold through village level traders.

Sundarvaradarajan and Jahanmohan (2002) in the study "Marketing Cost, Margin, Price Spread and Marketing Efficiency of

Cashew in Tamil Nadu” Studied the marketing cost, margin, price spread and marketing officers of cashew in Tamil Nadu, observed following five different marketing channels of cashew.

- 1] Farmer - village trader - wholesaler - processor trader
- 2] Farmer - cooperative marketing society.
- 3] Farmer - commission agent – wholesaler - processor.
- 4] Farmer - processor.

A majority of the farmers (60%) adopted channel-I. followed by channel-2 (26.25%), channel 3 (10%) and channel 4 (3.75%).

Gangal (2002) in the study “Performance of banana plantation in North Karnataka – An economic analysis” Studied the performance of banana plantation in North Karnataka and identified two important marketing channels through which banana were transferred from producers to ultimate consumers.

Channel-I: Producer - commission agent – cum – wholesales - Retailers - consumers.

Channel-II: Producers - village traders’ - consumers.

Nearly 70% of the farmers as well as producers were sold through commission agent cum wholesaler and remaining 30% was sold through village level traders.

Arun Pandit *et al.* (2003) studied the Potato marketing in India. The study revealed that the Indian marketing system suffers from high marketing cost, high middleman’s margin, low producers share and inadequate marketing infrastructure, their solutions were, grading should be followed rigorously, marketing cost could be reduced by

establishing cold stores in producing areas. Regulation of Potato market could be done by establishment of more processing units.

Dhage and Rahane, (2003) In this study “Marketing of Grapes in Nashik district.” estimated the per quintal cost of marketing of grapes in Nashik district; The study revealed that at the overall level the average per quintal cost of marketing worked out to ₹ 557.10 and the major items of cost of marketing were packing (35.32%) followed by transport (32.23%) and commission (19.39%). Per quintal cost of marketing observed to increase with an increase in size group of holding.

Ladaniya and Wanjari (2003) Conducted a study on marketing pattern of ‘Mosambi’ sweet orange in selected district of Maharashtra. In the study, it was noticed that, farmers with small mosambi plantations were more inclined to sell produce to pre-harvest contractors. This type of decision making by the producers it was attributed to lack of will to take risks associated with marketing and lack of financial assistance required during mosambi production process, while growers with large plantations farmers sold mosambi fruits themselves in distance market. Market efficiency was higher when farmers themselves marketed fruit in distance market. It was also opined that, as the market distance and number of intermediaries increased in marketing cost and margins of cost marketing also increased. Further it was noticed that the market efficiency and share of farmers in consumer’s price was decreased.

Khunt *et al.* (2003) in their study “Economics of Production and marketing of pomegranate” Conducted study on utilization and disposal pattern of pomegranate in the Bhavnagar district of Saurashtra region, Gujarat. It was evident from the study that marketable surplus was 98.38 per cent. The share of home consumption, relatives and religious purposes were negligible and loss due to damage was only 0.83 per cent. The disposal pattern of pomegranate marketable samples in different

market stated that majority of the farmer (33) had disposed off 59.01 per cent of their pomegranate production in the local market i.e. Bhavnagar city. A few of the pomegranate grower (5) sold their fruits in Rajkot city (12.31%) very little portion of their pomegranate production was sold in other distance places. The marketing cost of pomegranate showed that, transport cost i.e. ₹ 29.52 per quintal (50.46%) formed that total market cost and other important items of marketing cost were packing charges (18.08%), grading cost (16.26%) and loading-unloading charges (11.47%). All items put together the total marketing cost per quintal amounted to ₹ 58.50 and the net price received by the growers was ₹ 859.66 per quintal.

Navadkar *et al.* (2005) in their study “Marketing of Vegetables Grown Around Pune City” conducted study on marketing of vegetables grown around Pune city and revealed that, per quintal cost of marketing of selected vegetables was more in terminal market (₹ 112.67 per quintal) than in primary market (₹ 57.84 per quintal). The proportionate share of transportation and commission charges to total marketing cost were significantly more in terminal marker. The producers’ share in consumes’ rupee was observed to be the least in terminal market for vegetable like cabbage and the highest in bhendi in the same market.

2.3 Growth and potential of Potato processing industry.

Hemachand Jain (1989) in his study on “Economics of processing units of arhar pulse in Narasingpur district (MP)” indicating that the fixed and variable costs accounted for 45 and 55 per cents, respectively. The cost of processing of arhar dal was ₹ 61.62 per quintal. The main problems of arhar processing were inadequate availability of raw materials, problems of transportation for disposal of processed material, short supply of power leading to under utilization of plant which declined output and efficiency of machinery and labor.

Srivastava (1989) in their study “Agro processing industries: potential, constraints and task ahead” assessed the constraints faced by agro-processed industries. The factors such as age old technology, over utilization of energy, lack of economics of scale in production and increased marketing cost were identified as the major problems faced in agro-processing.

Srinivas et al. (1989) conducted a “study on growth and economics of mustard processing units in Hissar district (Haryana)” where in the cost of processing per quintal of oilseed was ₹ 9.24 and ₹ 11.22 for the oil mills, expellers and kohlu, respectively, indicating the increasing in processing cost per unit with the decrease in plant size.

Pawar et al. (1990) conducted study on “Economics of agro-processing units in Maharashtra” and average processing cost worked out to ₹ 12241.05 and ₹ 7716.71 per unit of huller and rice mill, respectively. The proportion of fixed cost to total cost of processing was more in rice mills (33.94%), compared to huller (26.16%). The variable cost accounted for 59.09 and 64.75 per cents in case of rice mills and hullers, respectively.

Venkatechaiah (1992) studied “the economics of ground nut processing units in Andra Pradesh” and found the direct relationship between the total capital investment and the oil mill size. It was also observed that the capital invested per quintal of oil production was ₹ 161.01 in baby expeller mills, ₹ 112.24 in 2- chamber expeller mills and ₹ 83.86 in 3-chamber expeller mills. He had also observed that the major problems faced by the groundnut processor were the high competition within the processing units for getting raw material, frequent price fluctuations of raw material, irregular supply of power, high taxing for the commodities, low per centage of recovery due to lack of modernization of machinery and non-availability of sufficient raw

material for crushing. All these resulted in low returns and high cost of processing leading to lower net profit.

Subrahmanyan and Sudha (1993) in their study “Economics feasibility of establishing a small scale cooperative unit in rural areas: Case study of Tomato”. Studied that the main problems faced by small scale fruit and vegetable processing vegetable processing units in marketing of their products. Besides the main constraint of low domestic house hold demand, these units had to face stiff competition for marketing their produce from well established big manufacturers whose brand names are familiar with common household consumers.

Talathi *et al.* (2003) in their study on “value addition and employment generation in mango processing factories conducted in Ratnagiri and Sindhudurg districts of Maharashtra state” observed that, the gross added value was ₹ 1726.39 (152.41 %) in pulp, ₹ 1522.26 (507.42%) in pickle, ₹ 7782.31 (114.87%) in squash and ₹ 161.25 (53.75%) in case of raw slices in brine. As regards the net added value it was 65.40 per cent, 16.67 per cent, 203.38 per cent and 12.04 per cent, respectively. Pickle was the most profitable product of mango, followed by pulp, squash and raw slices in brine.

2.4 Consumer preference for branded and unbranded Potato processed products.

Mjaerum and ROER (1992) in their study “Consumer preference - culinary Potato” conducted market survey to know the preference for Potato varieties in Norway”. On the basis of consumer preference tests with 9 varieties during 1988-89, those varieties which were judged best for quality were indicated. The results suggested that Norwegian consumers preferred relatively mealy types with a distinct Potato flavor. Peik and Pimpernel came top in both years in most districts.

Seibel (1993) In the study “Consumer expectations on the quality of foods of vegetable origin” identified that, as a consequence of growing environmental and nutritional awareness, consumers, particularly younger people, want expect information about food and had certain expectations on the quality of vegetable foods. Questions concerning to raw materials and food components, particularly additives, manufacturing processes of these components and the plant food itself, as well as the control measures applied during the production of vegetable foods were considered to be important.

Bhuian (1998) in the study “Developing country consumer fast food preferences: an empirical examination in Saudi Arabia” examined consumer food preferences in Saudi Arabia, where US fast food companies had been mushrooming since the early 1990s. With a sample of 250 fast food restaurant patrons, the study examined the attributes of fast food restaurants that were important to consumers, the pattern of fast food purchases, and the variations in fast food preferences and purchase behavior. The results indicated that the top five important service attributes were cleanliness, taste, friendliness, speed, and variety. In this market, people most often ate fast food for dinner, followed in preference by lunch; breakfast was not popular as yet. With respect to the frequency of purchase, the amount spent per visit, the type of fast food restaurant preference, and the type of fast food menu preference, there exist differences across various consumer demographics.

Rani and Ezekiel (2001) in their study “Potato processing in unorganized sector and quality of Potato chips available in the market” conducted market surveys at Shimla, Mohali and Chandigarh, during February-March 2001 to collect information on the quantity and quality of processed Potato products produced under the unorganized sector. The Results revealed that Potato chips, Potato sticks, and Potato 'bhujia'

were the most common processed products available in the market. The quality of the product was poor due to poor quality of Potatoes used, thin slices and unsatisfactory packaging.

Jame *et al.* (2001) in their study “Market status of different processed Potato products in Meerut, Ghaziabad and Delhi” carried out a survey to assess the market share of different processed Potato products in Meerut, Ghaziabad and Delhi, India. The Results revealed that processed Potato products constitute a sizeable portion of snack foods. Unorganized sector had got strong market presence in the market in the processed Potato products category, particularly in case of Potato chips where it shared equally with branded chips. However, 'lachha' and 'bhujia' market was still dominated by branded players. The author suggested that Potato processing in unorganized sector had a great promise provided they got an assured supply of processing quality Potatoes year round.

Verma *et al.* (2001) in their study “Consumption behavior of Potato products in rural and urban areas of Meerut district” conducted a benchmark survey in rural and urban areas of Meerut, during the years 1999 and 2000 to evaluate the consumption rate of different Potato products. The data revealed that Frito Lay were more popular, with a consumption rate of 10.7-27%, followed by PikNik Potato pops (9-11%). The people in rural areas and general markets preferred to eat chips and local 'namkeens' (9-33%). The Haldiram (9-30%), Crax (11-14%) and 'namkeens' (33-39%) were more popular in rural and urban areas, respectively.

Thakare and Gupta (2005) in their study “Consumer preference of mushroom in selected districts of Chhattisgarh plain” investigated the preference for different products and varieties of mushrooms in a sample of 64 consumers from 3 districts (Raipur, Durg and Bilaspur)

Chhattisgarh, India (32 each from rural and urban areas). Majority of the consumers were aware of the nutritive value of mushrooms (urban: 93.7%; rural: 75.0%), and preferred fresh mushrooms (urban: 81.2%; rural: 68.7%). Oyster mushroom was the most preferred variety by rural consumers (75.0%), while oyster and white button mushrooms were preferred by more 90% of urban consumers. Majority (71%) of rural consumers used mushrooms as a vegetable. High income consumers (33.7%) were more likely than low (21.3%) and medium (27.4%) income groups to buy mushrooms at a higher price. About 75% and 44% of rural and urban consumers, respectively, believed that mushrooms were not sufficiently available in the market. It was concluded that consumers in the studied districts had high preference for mushrooms.

Padilla *et al.* (2007) In their study “Consumer Preference and Willingness to Pay for an Officially Certified Quality Label: Implications for Traditional Food Producers” carried out a study in Chile in order to evaluate consumer preference and willingness to pay for a certified quality label on traditional food products, employing a conjoint analysis method. A total of 234 individuals were interviewed in two Chilean cities, Santiago and Talca. A homemade blackberry (*Rubus ulmifolius*) marmalade and three product attributes with their respective levels were chosen (price, quality label and jar appearance). Nine hypothetical product concepts were generated applying an orthogonal design. Respondents were asked to rank the product concepts according to their preferences. The results obtained through the conjoint model suggested that an “officially certified quality label” was the most important attribute influencing consumer choice behavior. Likewise, a positive willingness to pay for such an attribute was observed. As a differentiation and quality management tool, an official certified quality label seems to be a good alternative to improve the situation and market opportunities for small farmers. It was important to notice that this study corresponded to the

first empirical approach carried out in Chile, which related the conjoint analysis method with consumer preferences for this kind of food product.

Hein *et al.* (2008) in their study “Comparison of Five Common Acceptance and Preference Methods” compared three consumer acceptance methods (9-point hedonic, labeled affective magnitude and unstructured line scales) and two consumer preference methods (best–worst scaling and preference ranking) in terms of the results they generated aspects of implementation. Consumers in Australia evaluated six samples in duplicate by acceptance ratings and preference ranking, and 10 triads for best–worst scaling. While all test methods detected a significant difference between samples ($p < 0.05$), a larger F-value or improved discrimination, was produced by best–worst scaling compared to acceptance methods. Significant pair-wise sample comparisons were also observed among the methods. Preference maps of individual test methods further illustrated similar sample preferences with regard to sensory properties of products. Comparison of discriminability across methods by Generalized Procrustes Analysis (GPA) found that the patterns of sample discrimination were very similar. Results indicated that under controlled laboratory testing conditions greater discrimination occurred by best–worst scaling. However, similar conclusions were reached when determining whether consumer acceptance or preference was obtained by the 9-point hedonic scale, labeled affective magnitude, unstructured line scale or preference ranking. Sample size, product type and type of data produced should be taken into account when selecting a test method.

Hu *et al.* (2009) in their study “Consumer Acceptance and Willingness to Pay for Blueberry Products with Nonconventional Attributes” examined the consumer acceptance and willingness to pay for three nonconventional attributes associated with six processed blueberry

products through an in-store conjoint experiment survey. Both credence and experience attributes were considered, including whether the products were produced locally, and whether they were organic or sugar-free. The results indicated heterogeneity in consumer preference and willingness to pay for different attributes across product categories. Local products and organic formulations generally received positive willingness to pay across all products. This information had implications for blueberry growers and retailers who were trying to create and position value-added products for maximum revenue.

Luckow and Delaturty (2009) in their study “A Consumer Study of Probiotic Non-dairy Juice Drinks” evaluated consumer acceptance for the appearance, aroma, texture and flavor of probiotic fruit juices in Cork, Ireland. Novel blackcurrant juices containing probiotic cultures (*Lactobacillus plantarum* 299v) were compared with conventional blackcurrant juices by descriptive analysis. The probiotic juices were found to contain aromas (‘perfumey’, ‘dairy’) and flavors (‘sour’, ‘savory’) characteristic of functional ingredients. Subsequent testing took place in a local shopping centre, where consumers (n=425) were presented with two randomly coded blackcurrant juice samples. One of the products was a natural blackcurrant juice, and the other was a commercially processed blackcurrant juice containing probiotic cultures. Consumers were instructed that one of the juice samples contained "special ingredients" designed to improve their health. Consumers were asked to assess their overall impression of both juices and to rate their acceptance of the sensory characteristics of both juices. Furthermore, based on their overall impressions and guided by their individual expectations, consumers were asked to identify the juice they perceived to be the ‘healthiest’ (e.g., containing the "special ingredients"). Juice preference was dependent on gender and age. In general, consumers selected their most preferred juice product as the ‘healthiest’ sample.

Behrens *et al.* (2010) In their study “Consumer Purchase Habits and Views on Food Safety: A Brazilian Study” evaluated the attitudes towards food safety among consumers in the city of São Paulo, the major consumer market in Brazil. Focus group sessions were conducted with 30 adults responsible for food choices and purchases. Results indicated a preference for supermarkets over street markets, for the variety of foods, convenience and confidence in the safety assurance. On the other hand, the “naturalness” of the products in the street markets was the main reason for purchases in those places. Participants showed concerns with respect to food additives, hormones and pesticides - technological rather than “natural” hazards. Minimally processed and ready-to-eat foods were considered convenient products meeting the need for time/labor-savings in the kitchen, although suspicion about wholesomeness and safety came up among consumers. In conclusion, this study suggested that Brazilian regulators should create more effective risk communication combining technical information with actual consumer perceptions of food risks.

Methodology

CHAPTER III

METHODOLOGY

This chapter deals with the description of the study area, the sampling techniques adopted, the method of survey, the nature and sources of data and the various tools and techniques employed in analyzing the data.

The methodology adopted has been presented under the following major heads:

- 3.1 Description of the study area
- 3.2 Sampling procedure adopted
- 3.3 Nature and source of data
- 3.4 Analytical techniques employed

3.1 Description of the study area

Karnataka is the eighth largest state in India with an area of 190 lakh ha. It is situated between 11.5⁰ and 19.0⁰ N latitude and between 74⁰ and 78⁰ E longitude in the Southern plateau. The state receives the average annual rainfall of about 1139 mm both from South-West and North-East monsoon. The important crops grown in the state are Jowar, Ragi, Maize, Bajra and Wheat among cereals; Red gram, Green gram, Tur and Bengal gram among pulses; Groundnut, Sunflower and Safflower among oilseed crops and Cotton, Sugarcane and Tobacco among commercial crops.

Karnataka comprises of 29 districts of which 12 districts are located in Northern part of the state and rest in Southern part of the state. Hassan and Belgaum districts were chosen for study.

Hassan District

Hassan District is situated in between 12° 13' and 13° 33' North latitudes and 75° 33' and 76 ° 38' East longitudes. The district has a total area of 6826.15 Sq. Km. District has 8 taluks comprising 2369 villages. The average rainfall is about 1031 mm annually. The main soil types are red soil, red sandy soil, mixed soil and silty clay soil. Coffee, black pepper, potato, paddy and sugarcane are the major agricultural crops. The soils of the Western taluks are mostly suitable for irrigated and plantation crops like paddy, sugarcane coffee, tea, pepper, cardamom, and areca. The soils of the Eastern taluks comprising of Hassan, Channarayapattana, Arsikere and Holenarsipur taluks are suitable for growing crops like paddy, sugarcane, coconut, Potato, vegetables and plantain crops under irrigated conditions and ragi, other millets, pulses, groundnut, cotton, potato and jowar under rain fed conditions.

Belgaum District

Belgaum District is located at North-Western of Karnataka state between 15° 23' to 16° 58' N latitude and 74° 05' to 75° 28' longitude. District is surrounded by Bijapur, Bagalkot, Dharwad and Karwar districts of Karnataka state and Sangli, Kolhapur, Ratnagiri districts of Maharashtra state. The total geographical area of the district is 13,415 sq.km which stands in second place in the state and consists of ten taluks. The district receives an average rainfall of 808mm.

The major soils of this region are medium to deep clay with light black, reddish sandy and red sandy loam. The cropping pattern of the district shows that food grains occupied a major portion of cultivated area (5,66,698 ha) of food grains, Cereals millets constitute 84.45 per cent and pulses constitute about 15.55 per cent. The total food crops

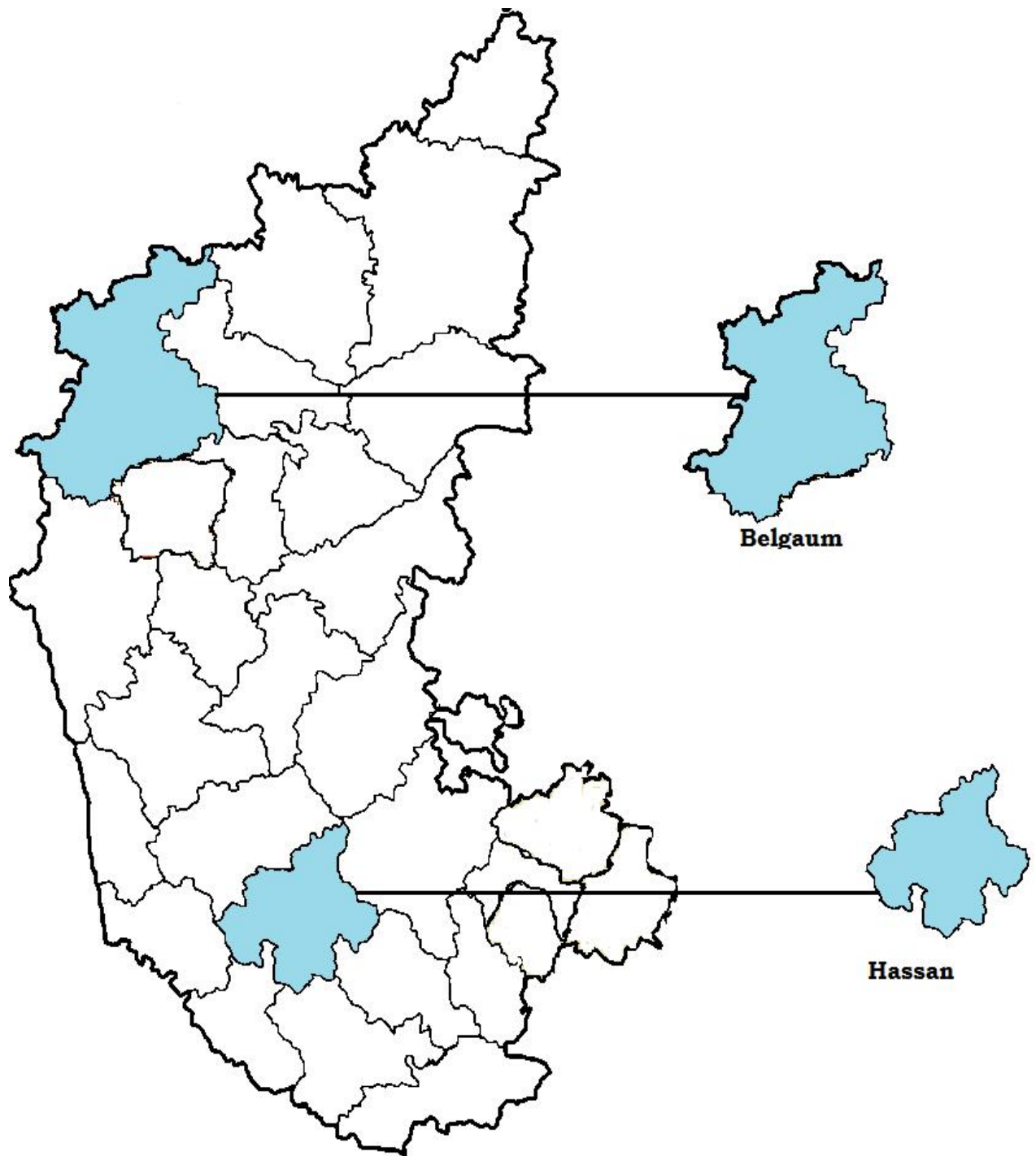


Fig 1. Map showing the location of the study area

grown including fruits and vegetables occupied 73 per cent of the gross cropped area and net irrigated area is 3, 45,817 ha.

3.2 Sampling procedure

The study was conducted in Hassan and Belgaum districts of Karnataka state. These districts were selected based on highest area and production under Potato crop among districts of Karnataka. In each district four taluks were selected. Further, three villages were selected for the purpose of collecting primary data from the respondents.

In each district, 30 farmers including fifteen small farmers and fifteen large farmers were selected. Thirty consumers were also selected randomly. Besides 15 market intermediaries were selected randomly. Thus, the total sample size for this study constituted 150 respondents from 2 districts. The data collection was done by personal interview method with pre-tested structured schedule prepared for the purpose. The data collection was done during the month of March 2011.

Details of respondents, districts and taluks selected for the study in Karnataka

Sl. No	Districts	Taluks	Farmers	Consumers
1.	Hassan	Hassan	10	20
		Arakalgudu	10	05
		Alur	5	05
		Beluru	05	-
2.	Belgaum	Bailhongal	10	05
		Belgaum	5	20
		Kanapur	10	05
		Hukkeri	05	-
Total Respondents		120	60	60

Sl. No.	Market intermediaries	Belgaum	Hassan	Total
1	Village level trader	3	2	5
2	Commission agents	2	3	5
3	Wholesalers	3	4	7
4	Trader-cum-retailers	2	2	4
5	Retailers	3	2	5
6	Cart vendors	2	2	4
	Total	15	15	30

3.3 Nature and Sources of Data

3.3.1 Primary data

The primary data for the study was collected from the respondents by personal interview method using pre-tested schedule. The primary data collected was based on the memory of the respondents. The primary data on the socio-economic characters of the farmers, land holding, family size, etc. were collected. Besides, the data on quantity and value of various physical inputs used and the yield obtained in case of Potato were collected.

3.3.2 Secondary data

The secondary data was collected from Department of Agriculture, Horticulture, KSAMB and Agricultural Produce Market Committee in Hassan and Belgaum districts. The data related Potato processing units was collected from the Directorate of Industries, FICCI (Federation of Industrial Chamber of Commerce in India) etc.

3.4 Analytical Techniques Employed

Growth Rate Analysis:

For evaluating the trend in area, production and productivity under Potato in Karnataka state and in the study districts. The following growth model was employed.

$$Y_t = abut..... (1)$$

Where,

Y_t = area/production/productivity in the year 't'

a = intercept indicating Y in the base period ($t = 0$)

b = Regression coefficient

t = Time period in years

u_t = Disturbance term for the year 't'.

Equation (1) was converted into the logarithmic form in order to facilitate the use of linear regression. Taking logarithm on both sides of the equation (1).

$$\ln Y = \ln a + t \ln b + \ln U_t (2)$$

This is of the following form,

$$Q_t = A + Bt + e_t$$

Where,

$$Q_t = \ln Y_t$$

$$A = \ln a$$

$$B = \ln b$$

$$e_t = \ln e_t$$

The linear regression of the above form was fitted separately for area, production and productivity of Potato. The values of 'a' and 'b' were estimated by using ordinary least squares technique.

Later, the original 'a' and 'b' parameters in equation (1) were obtained by taking antilogarithms of 'a' and 'b' values as,

$a = \text{Anti } A$

$b = \text{Anti } B$

Average annual compound rate was calculated as

$b = 1 + g$

$g = b - 1$

To obtain per centage compound growth rate, the value of g was multiplied by 100.

3.5. Marketing aspects of Potato

3.5.1 Definitions of the terms used in this study

Village level trader

Is a person who purchases the agricultural produce directly from the farmers for the purpose of selling.

Commission Agent

Is a person who on behalf of his principal and in consideration of commission upon the amount involved in each transaction keeps in his custody the goods of his principal and sells the same and holds himself liable to deliver to the buyer and to make payment of its value to his principal.

Wholesalers

Wholesaler of Potato at the regulated markets sales the Potato through their wholesale shops to various categories of retailers or to others.

Trader - Cum - Retailer

Those who purchase the commodity at the regulated market and sell at shandies to consumers.

Market intermediaries

Market intermediaries are those individuals who specialize in performing various marketing functions, involved in purchase and selling of Potato as it moves from producers to consumers.

Marketing Channel

Marketing channel consists of various agencies, which perform the various marketing functions in sequence as the Potato moves from the producers to the ultimate consumers.

Farmers Net Price

This refers to the price per unit that farmers realized after deducting the marketing costs from the actual price per unit of Potato.

Marketing margin

This refers to the costs and net share to the different market functionaries who are involved in the Marketing of the produce.

Producer's share in the consumer's rupee

Refers to the farmer's net price expressed as per centage of the retail price of Potato.

Price spread

Refers to the difference between the net price the farmer received and retailer price of the Potato.

Gross return

Total value produce is referred to as the gross return.

Net return

Net return obtained by subtracting the total cost from gross return. Tabular analysis was used to work out the cost and returns of the different market intermediaries.

3.5.2 Marketing costs incurred by the farmers

Based on the information obtained from the producers the average marketing costs were worked out for both the categories of producers viz small and large categories of producers expenses incurred on gunny bags, bagging, transportation, loading and unloading commission charges, market cess and other miscellaneous expenses were considered. All these together called as marketing costs of Potato.

Weighted average price received by producers in each category was worked out by dividing the total sale value by the quantity of Potato sold by each category of respondents. The average marketing cost per quintal of each item was worked out by dividing the total cost of that item by the total quantity of Potato sold. Thus, the total cost of marketing of Potato grown in an acre of land was worked out for both the categories of producers. Further, each item of cost was expressed as a per cent of the total costs.

Opinions of the producers regarding production and marketing problems faced by the producers of Potato were tabulated and presented in a frequency table.

3.5.3 Average Cost and Return of Market Intermediaries

Village level traders incurred expenses on loading and unloading, transportation, *hamali*, commission, market cess etc where they had handled other commodities along with Potato. The costs chargeable to Potato were apportioned according to the per centage of turnover that Potato sale contributed to the total turn over the proportion was worked out based on the information that was obtained from the respondents. Since they marketed the Potato in different centers, it was decided to use the weighted average value to arrive at the cost and returns of these intermediaries.

Commission Agents

They incurred expenses on shop rent, salary and wages of permanent and temporary employees, electricity charges, License fee, taxes, stationery articles and miscellaneous expenses were considered in working all the cost of marketing of the commission agent.

Wholesalers

They incurred expenses on shop rent, salary of the staff, *hamali* charges, license fee and taxes paid, telephone bill, electricity charges, stationery, articles and other miscellaneous expenses.

Retailers

They incurred expenses on shop rent, transportation, electricity charges, salary or wages to helpers and other miscellaneous expenses.

Trader- Cum - Retailers

They incurred expenses on transportation, *hamali* charges license fee and other miscellaneous expenses.

Cart Vendors

They incurred expenses on the cost of using the cart, lighting charges and other miscellaneous expenses. During late evening and night times they use some lighting source like kerosene lamps for selling which was also considered as one of the items of costs. Cost of using the cart was arrived at by taking the actual hire charges of the cart per day or per month. When the cart was owned by him, the cost of the using cart was arrived at by taking 15 per cent of the value of the cart plus repair charges for the study period. The cost of using the cart thus arrived was apportioned to the total Potato marketed based on the percentage contribution of Potato to the total volume of business. The average costs and returns of, the above intermediaries operating in Belgaum and Hassan markets were worked out separately. The average of each item of cost was worked out by dividing the total cost of that item by the number of intermediaries in that group. Each cost item was expressed as a per centage to the, total costs. The opportunity cost of working capital or operational expenses for all the intermediaries worked out at the rate of 15 per cent and apportioned to the period of the study. The gross returns were worked out as the difference between the sale value and purchase value. The net return was obtained by subtracting the total cost from gross return. Net return per quintal handled was worked out by dividing the total net return by the number of quintals or Potato handled. The same procedure was used to work out the profitability of different market intermediaries.

3.5.4 Price spread

The Price spread was worked out by taking the difference between the consumer's price and the net price received by the producers.

I. Channel: (Belgaum)

Producer - Wholesaler – Retailer - Consumer

II. Channel: (Hassan)

Producer - Commission Agent - Wholesaler – Retailer - Consumer

III. Channel: (Belgaum)

Producer - Village Level Trader – Wholesaler - Retailer - Consumer

IV. Channel (Belgaum)

Producer - Commission Agent - Wholesaler - Retailer- Consumer

The market margin for each intermediary was calculated separately by considering the weighted average price of buying Potato and that obtained by selling it. For the purpose of calculating price spread it was contemplated to use the weighted average prices, received or paid the various intermediaries. In order to get the weighted average prices the sum of total values of quantities handled by the intermediary and the previous intermediary divided by the sum of the total was quantities of the produce handled by the intermediary and the previous intermediary. This price was considered as the price received by the previous intermediary and as equivalent to the price paid by the subsequent intermediary. The Commission Agents do not actually buy the produce but sell it on behalf of the producers or principals for a commission. The commission agent charged per cent of the sale value of Potato as their commission thus. The gross margin at commission agent level was 4 per cent. However, the commission agent had to incur certain incidental expenses to his business. This was deducted from the gross margins to arrive his net margin.

In all the cases the difference between the *prices* paid and the prices received was taken as the absolute value of price spread. The components of this price spread were the expenses, the value of wastages and net profit at each level of sale. The value of wastages was arrived at by multiplying total quantity of wastage with the: average selling prices at each intermediary levels.

Conjoint Analysis:

Conjoint analysis is a marketing research technique that can provide valuable information for new product development and forecasting, market segmentation, pricing decisions, advertising, distribution, competitive analysis and repositioning.

It is a technique used in assessing consumers' value judgments. In the present study, it is used to measure the consumer's preference for branded and unbranded Potato processed products.

One of the important requirements for conjoint analysis is the identification of critical attributes to describe the preferences for Food retail chains and the specific and feasible levels of these attributes. On the basis of the objective attributes and then respective levels with orthogonal variables 19 cards were developed. The respondent is first asked to rank the set of profiles, or cards according to his or her preference. On each of these profiles, all factors of interest are represented and a different combination of factor levels appears. The task of respondents is to rank each profile from the most to the least preferred. From these rankings or scores, conjoint analysis derives utility scores for each factor level. These utility scores, analogous to regression coefficients are called part-worth and can be used to find the relative importance of each factor.

This study, the additive conjoint model was used instead of other forms like the interactive and the multiplicative models. The model has been formulated as:

$$Y = \sum_{i=1}^n \sum_{j=1}^m V_{ij} X_{ij} \text{ ----- (3)}$$

Where,

Y = consumers' overall evaluation of the food retail chain alternative.

V_{ij} = part worth associated with 'j' (1, 2, 3,m) of attributes 'i' (1,2,n) and

X_{ij} = dummy variable representing the preference of the j^{th} level of i^{th} attribute.

For this study, profile describing alternatives was constructed by combining levels of six attributes. The attributes and their levels were identified through discussions with the consumers during the survey and also on consultation with marketing specialists.

Results



CHAPTER IV

RESULTS

The study was conducted in Belgaum and Hassan districts of Karnataka. The primary data was collected from the sample farmers spread over four taluks of Belgaum namely Bailhongal, Belgaum, Kanapur and Hukkeri and four taluks of Hassan namely Hassan, Arakalgudu, Alur and Beluru. The data was subjected to various statistical tools to draw meaningful conclusions. The results of the study are presented in this chapter under the following heads.

- 4.1 General characteristics of sample farmers.
- 4.2 Area, Production and Productivity of Potato in Karnataka.
- 4.3 Marketing channels of Potato.
- 4.4 Growth and potential of Potato processing industry.
- 4.5 Consumer preference for Branded and unbranded Potato chips.

4.1 General Characteristics of Sample Farmers

An understanding of general characteristics of sample farmers is expected to provide a bird's eye view of the general features prevailing in the study area. Therefore, an attempt has been made in the study to analyze some of the important characteristics of the sample farmers. The general characteristics of the respondents are presented in the following Tables 4.1.1, 4.1.2, and 4.1.3.

4.1.1 Socio economic profile of the respondents

It could be seen from the Table 4.1 that the average age of the respondents (Potato growers) was about 47 years. It could be further observed that majority of the respondents were literate (70%), having their education ranging from primary to college level. The remaining 30

per cent of growers were illiterates. From the Table it could also be seen that the average size of the family was about seven.

4.1.2 Occupation of the respondents

It could be seen from the Table 4.2 that 78 per cent of the respondents in Belgaum district are mainly depending on Agriculture and the remaining 22 per cent of the respondents depends on subsidiary occupation. In the case of Hassan 80 per cent of the respondents depends on the Agriculture as a major source of income and remaining 20 per cent of the respondents earning from subsidiary occupation.

4.1.3 Land Holdings size of the respondents

It could be seen from the Table 4.3 that the total land holding size of the respondents was 2.30 ha, out of which of which 1.22 ha was irrigated and remaining 1.08 ha was rain fed in Belgaum district and in case of Hassan total land holding size of the farmer was 2.89 ha out of which 1.38ha is irrigated and 1.51 ha is rain fed. As a whole total land holding was 2.66 ha out of which 1.3 ha was irrigated and 1.29 ha is rain fed.

Table 4.1 Socio economic profile of the respondents

Sl. No	Particulars	Unit	Belgaum (n=30)	Hassan (n=30)	Pooled (n=60)
1	Age	Years	47.14	47.16	47.15
2	Family size	No	6.48	6.98	6.73
3	Education				
	Illiterate		8(26.6)	10(33.3)	18(30)
	Primary		10(33.3)	8(26.6)	18(30)
	High school		8(26.6)	10(33.3)	18(30)
	College		4(13.5)	2(6.8)	6(10)
	Total		30(100)	30(100)	60(100)

Table 4.2 Occupation of the respondents

Sl. No	occupation	Unit	Belgaum	Hassan	Pooled
1	Agriculture	No	23 (78)	24 (80)	47 (78.3)
2	Subsidiary occupation	No	7 (22)	6 (20)	13 (21.63)
	Total	No	30(100)	30 (100)	60

Table 4.3 Land holding size of the respondents

Sl. No	Land Holding	Unit	Belgaum	Hassan	Pooled
1.	Irrigated	Hectares	1.22	1.38	1.3
2.	Rain fed	Hectares	1.08	1.51	1.29
	Total	Hectares	2.30	2.89	2.66

4.2 Area, Production and Productivity of Potato in Karnataka**4.2.1 Area, production and productivity of Potato in Belgaum district**

The growth rates in respect of area, production and productivity of Potato in Belgaum district for the period from 2004 to 2010 is depicted in the Table 4.4. It could be seen from the Table that area with respect to Potato crop in Belgaum district is decreasing with a negative growth rate of 4.56 per cent. The Production of Potato in the district has shown fluctuations with a growth rate of 5.23 which is insignificant. However, productivity is increasing with a growth rate of 10.26 per cent which is significant.

4.2.2 Area, production and productivity of Potato in Hassan district.

The growth rates in respect of area, production and productivity of Potato in Hassan for the period from 2004 to 2010 have been depicted in the Table 4.5. It was seen from the Table that area with respect to Potato

crop in Hassan district is increasing with a growth rate of 9.72 per cent which is highly significant. Production has shown insignificant growth rate of 0.40 per cent. However, productivity is decreasing with a negative growth rate of 9.22 per cent which is insignificant.

4.2.3 Area, production and productivity of Potato in the state.

The growth rates in respect of area, production and productivity of Potato in the state for the period from 2001 to 2010 have been depicted in the Table 4.6. It was seen from the Table that area with respect to Potato crop in the state is increasing with a growth rate of 22.98 per cent which is highly significant. Production has shown positive growth rate of 14.84 per cent which not significant. However, productivity is decreasing with a negative growth rate of 7.11 per cent which is in significant.

Table 4.4 Area, production and productivity of Potato in Belgaum district

Sl. No	Years	Area (ha)	Production (mt)	Productivity (mt/ha)
1	2003-04	7314	74408	10.17
2	2004-05	4726	48432	10.25
3	2005-06	5527	98906	17.90
4	2006-07	4880	85770	17.58
5	2007-08	5391	95442	17.70
6	2008-09	4850	85735	17.68
7	2009-10	4690	82835	17.66
Annual compound growth rate		-4.56(NS)	5.23(NS)	10.26*
P value		0.121	0.298	0.036

(Source: District Horticultural Department Belgaum)

Table 4.5 Area, production and productivity of Potato in Hassan district

Sl. No	Years	Area (ha)	Production (mt)	Productivity (mt/ha)
1	2003-04	35363	177929	5.03
2	2004-05	36151	183135	5.07
3	2005-06	38540	223846	5.81
4	2006-07	42834	301985	7.05
5	2007-08	43353	145117	3.35
6	2008-09	57496	120805	2.10
7	2009-10	59321	261436	4.41
Annual compound growth rate		9.72**	0.40 (NS)	-9.22 (NS)
P value		0.00092	0.954	0.228

(Source: District Horticultural Department Hassan)

Table 4.6 Area, production and productivity of Potato in Karnataka

Sl. No	Years	Area (000 Ha)	Production (000MT)	Productivity (MT/Ha)
1	2001-02	32.36	459.98	14.260
2	2002-03	38.3	452.46	12.436
3	2003-04	39.16	473.41	12.727
4	2004-05	50.65	149.28	3.103
5	2005-06	65.5	682.1	10.414
6	2006-07	71.6	606.3	8.468
7	2007-08	67.9	572.4	8.43
8	2008-09	81.1	460.3	5.676
9	2009-10	286.1	2,321.10	8.113
Annual Compound growth rate		22.98**	14.84 (NS)	-7.11 (NS)
p-value		0.0018	0.1337	0.2523

(Source: www.indiastat.com)

Note: * indicates significant at 5 levels
 ** indicates significant at 10 level
 NS indicates Non significance

4.3 Channels of Potato marketing

The respondents in both the districts have chosen mainly three market intermediaries, namely village level traders, commission agents, wholesalers and direct sale to market their produce. The results on the marketing channels are presented in Table 4.3.1.

4.3.1 Place of sale of Potato by farmers

Farmers in the study region choose different channels of markets. The channels chosen by the farmers vary from season to season. Further, it also depends on their socio economic conditions of the respondents. The method of disposal of Potato by farmers is presented in the Table 4.7

It could be seen from the Table that majority of the large farmers sell their produce (86%) to wholesalers and commission agents. A few large farmers (14%) sell their produce directly to village level trader.

The marginal and small farmers favour village level trader for selling their Potato. For example the sale of Potato by marginal farmers to village level trader account for 40 per cent followed by small farmers 31 per cent.

Few marginal and small farmers are also selling directly to the consumers (10% and 15% respectively). Though few farmers participated in the direct sale, nearly 25 per cent of marginal farmers and 35 per cent of the small farmers were involved in selling to commission agents. The marginal and small farmers selling to wholesalers are also quite substantial (25% and 19% respectively).

Table 4.7 Place of sale of Potato by farmers

Sl. No	To whom sold	Marginal farmers	percentage	Small farmers	percentage	Large farmers	percentage	Average
1	Village level trader	8	40	6	31	3	14	28
2	Wholesaler	5	25	4	19	9	46	30
3	Commission agents	5	25	7	35	8	40	34
4	Direct sale	2	10	3	15	0	00	8
Total		20	100	20	100	20	100	100

4.3.2 Marketing costs of Potato producers (Per acre)

Producers of Potato had to incur a considerable amount of expenditure towards the cost of gunny bags, bagging, transportation, loading and unloading, weighment, commission charges, market Cess and other miscellaneous items like boarding, lodgings etc. to market their produce. All these expenses are together called as marketing costs. The results of analysis of marketing costs incurred by the different categories of respondents are presented in the Table 4.8.

It is evident from the Table that cost of gunny bags, transportation, commission, loading and unloading charges were the important items of expenditure. All these together constituted 77.50 per cent of the total marketing cost.

Producers incurred a higher commission charges per acre (₹ 3457.75). This is true even in case of transportation cost also. Producers paid ₹ 2086.63 as transportation cost. The cost of gunny bags and bagging charges together accounted for 15.43 per cent and 3.47 per cent of the total marketing costs, respectively. The expenses towards *hamali*, market cess and other miscellaneous items together accounted for 4.10, 1.39 and 10.08 per cent of marketing cost respectively.

The total cost of marketing per quintal was ₹ 143. The price realized was ₹ 762.5 per quintal. It is interesting to note that the net prices per quintal received by producers were ₹ 619.5.

Table 4.8 Marketing cost of Potato producers (Per acre)

Sl. No	Particulars	Producers	
A	Transactions		
1	Quantity sold (qtls)	70.11	
2	Sale value (Rs)	52760	
3	Sale price(Rs/ctl)	762.5	
4	Marketing cost per quintal	143	
5	Net price (Rs/ctl)	619.5	
B	Costs (Rs)	Amount (₹)	Per centage
1	Gunny bags	1561.58	15.43
2	Bagging	345.78	3.47
3	Weighment	345.78	3.47
4	Loading and Unloading	691.55	6.93
5	Transportation	2086.63	20.48
6	<i>Hamali</i>	417.33	4.10
7	Market cess	138.31	1.39
8	Commission Charges	3457.75	34.66
9	Miscellaneous expenses	1049.30	10.08
	Total cost (₹)	10093.99	100.00

4.3.3 Costs and returns of various market intermediaries

An analysis of costs and returns of various intermediaries involved in marketing of Potato would help to understand the existing market practices. Besides this also helps to know the various services rendered by these intermediaries and their economic performance in the marketing of Potato, the market intermediaries studied were village level traders, commission agents, wholesalers, trader-cum-retailers, retailers and cart vendors. The intermediaries operating in Belgaum and Hassan regulated market were considered in this study as major portion of the produce was sold in these two markets by the sample producers.

4.3.3.1 Costs and returns of village level traders of Potato

The results on costs and returns of village level traders are presented in Table 4.9. The important costs incurred by these traders were on transportation, commission charges, wastage and loading, and unloading charges etc. It could be seen from Table 4.9 that on an average 2,413.20 quintal Potato valued at ₹ 1447920 was handled by each of the village level trader during the study period. The total marketing cost incurred was ₹ 219601 the commission charge was the major item of cost, which formed 43.96 per cent of the total cost and followed by transportation cost which accounted for 16.48 per cent. It could be noted that wastage and loading and unloading charges accounted for 10.99 and 10.99 per cent of the total cost respectively. The other expenses incurred towards market cost like *hamali*, weighment charges, and miscellaneous expenses together accounted for 15.39 per cent of the total cost.

It is further observed from the table that on an average, each village level trader handled Potato worth ₹ 1147920 realizing a gross return of ₹ 349980 Thus the net return earned from Potato trade was ₹ 130378.80 per acre and same per quintal of Potato was ₹ 54.03.

Table 4.9 Costs and returns of village level traders of Potato

Sl. No	Particulars	Quantity (qtl)	Price (₹/qtl)	Total value (₹)
A	Transactions			
	Purchase	2413.20	600	1447920
	Sale	2397.20	750	1797900
	Gross return			349980
B	Costs		Amount (₹)	Percentage
1	Transportation		36198	16.48
2	Wastage cost		24132	10.99
3	Loading and unloading		24132	10.99
4	<i>Hamali</i> charges		4826.40	2.20
5	Commission Charges		96528	43.96
6	Market cess		4826.40	2.20
7	Weighment charges		4826.40	2.20
8	Miscellaneous expenses		24132	10.99
	Total		219601.20	100.00
C	Total cost/qtl		91	
D	Net return (A-B) ₹		130378.80	
E	Net return /qtl (₹)		54.03	

4.3.3.2 Costs and returns of Commission agents of Potato

The commission agents play a prominent role in the marketing of Potato by providing a link between producers and the wholesalers. These commission agents collect commission from the producers at a specific rate 6.26 per cent for the service they render in the process of marketing of the produce.

The results on costs and returns of commission agents operating in Belgaum and Hassan markets are presented in Table 4.10. On an average the commission agents in Belgaum market handled 5.423.30 quintals of Potato valued at ₹ 4067475 On the other hand in Hassan market the commission agents handled 8,336.70 quintals of Potato valued at ₹ 6460942.5 the Table indicates that commission agents in Belgaum incurred on an average total cost of ₹ 77282.02 as against ₹ 118797.97 by their counterparts in Hassan. The major item of this cost in Belgaum was towards miscellaneous expenses (35.09%) which include convenience, refreshments, and gifts Contribution to charitable purpose etc., and It is interesting to note that miscellaneous expenses., and the per quintal cost was ₹ 5 per quintal, followed by salary of the staff (21.05%), shop rent (7.02%), License fee and taxes paid (3.51%), Expenses on stationary (28.07%), Telephone and electricity charges (5.26%).

It could be further observed from the Table that in the Hassan market, commission agents incurred a total cost of ₹ 285657.02 The major item of this cost was towards miscellaneous expenses which accounted for (35.09%) per cent followed by the expenses on stationary (28.07%), salary of the staff (21.05%), license fee and taxes paid (3.51%) and miscellaneous expenses per quintal marketing cost was ₹ 5, shop rent (7.02%).The total income retained in the form of commission by commission agents in Belgaum and Hassan markets was ₹ 254623.93

Table 4.10 Costs and returns of Potato Commission agents

Sl. No	Particulars	Belgaum		Hassan	
A	Transactions				
1	Quantity handled (qtl)	5423.3		8336.7	
2	Average sale price (₹/qtl)	750		775	
3	Sale value (₹)	4067475		6460942.5	
4	Commission received (%)	6.26		6.26	
5	Gross commission realized	254623.93		404455	
B	Costs (₹)	Amount (₹)	Percentage	Amount (₹)	Percentage
1	Shop rent	5423.3	7.02	8336.7	7.02
2	salary of the staff	16269.9	21.05	25010.1	21.05
3	License fee and taxes paid	2711.65	3.51	4168.35	3.51
4	Telephone and electricity charges	4067.475	5.26	6252.52	5.26
5	Expenses on stationary	21693.2	28.07	33346.8	28.07
6	Miscellaneous expenses	27116.5	35.09	41683.5	35.09
	Total	77282.02	100.00	118797.97	100.00
C	Total cost/qtl	14.25		14.25	
D	Total net return (A-B) ₹	177341.91		285657.02	
E	Net return/qtl (₹)	32.7		34.27	

and ₹ 404455 respectively. The net return to commission agents in these markets after deducting all costs was ₹ 177341.91 and ₹ 285657.02 respectively. On an average each commission, agent earned a net profit of ₹ 32.70 and ₹ 34.27 per quintal of Potato transacted in Belgaum and Hassan markets respectively. Commission agents at Hassan market handled a comparatively larger quantity than those at Belgaum market.

4.3.3.3 Costs and returns of Wholesalers of Potato

Wholesalers operating in Hassan market purchases Potato from producers through commission agents. But, in case of Belgaum market, they purchased directly from producers. Potato purchased was sold at their wholesale yards located in the regulated market to retailers of the local or other nearby markets.

The results on costs and returns of wholesalers of Belgaum and Hassan markets are presented in Table 4.11.

The wholesalers of Belgaum and Hassan market transacted, on an average 3,019 and 3,791 quintals respectively. The average total marketing costs incurred to handle these quantities were ₹ 128706.5 and ₹ 239386 respectively. The major item of expenses of these intermediaries was the cost incurred on the salary of the staff. This alone accounted for 27.56 per cent in Belgaum and in case of Hassan the major item of expense of these intermediaries was the cost incurred on the services of *Hamalis* 27.17 per cent. *Hamalis* do the work of loading and unloading, grading, weighing, bagging, stitching and stocking. The next important item of cost was towards stationary. At Belgaum market, this item accounted for 23.46 per cent and at Hassan for 14.82 per cent of the total cost. Wastage accounted for 11.80 and 8.54 per cent of the total cost. Shop rent formed 4.69 and 2.73 per cent respectively.

Table 4.11 Costs and returns of Wholesalers of Potato

Sl. No	Particulars	Belgaum		Hassan	
A	Transactions	Purchased	Sold	Purchased	Sold
	Quantity (qtl)	3019	2969.91	3791	3763.1
	Price ₹/qtl	750	825	775	875
	Total value (₹)	2264250	2450175.75	2938025	3292712.50
	Gross return (₹)	185925.75		354687.50	
B	Costs (₹)	Amount (₹)	Percentage	Amount (₹)	Percentage
1	Shop rent	6038	4.69	6532	2.73
2	salary of the staff	35475	27.56	64516	26.95
3	<i>Hamali</i> charges	6038	4.69	65045	27.17
4	Wastage costs	15190	11.80	20450	8.54
5	Telephone and electricity charges	4038	3.14	8236	3.44
6	Expenses on stationary	30190	23.46	35480	14.82
7	Miscellaneous expenses	26190	20.35	31967	13.35
8	License fee and taxes paid	5547.5	4.31	7160	2.99
	Total	128706.5	100.00	239386	100.00
C	Total cost/qtl	42.63		63.15	
D	Total net return (A-B) ₹	57219.25		115301.50	
E	Net return/qtl (₹)	18.95		30.41	

The average gross income received by wholesalers was ₹ 185925.75 and ₹ 354687.50 in Belgaum and Hassan markets, respectively.

Wholesalers at Hassan market handled comparatively more quantity than those at Belgaum market. This enabled them to minimize the unit cost of handling. Even though they paid more salary of the staff, stationary, *hamali* charges, wastage costs, License fee and taxes etc. The average net returns realized by the wholesalers were ₹ 57219.25 and ₹ 115301.50 in Belgaum and Hassan, respectively these findings indicate that the economic performance of wholesalers at Hassan was better than those at Belgaum.

4.3.3.4 Costs and returns of Trader cum retailers of Potato

Trader-cum-retailers operating in Hassan and Belgaum markets purchased Potato from the wholesalers and marketed the same in shandies. Here intermediaries are held at various places. The results on costs and return of Trader-cum-retailers are presented in Table 4.12.

On an average, each intermediary operating in Belgaum and Hassan markets handled 37 and 47.50 quintals respectively. They incurred marketing expenses of ₹ 941.25 and ₹ 1242 in Belgaum and Hassan markets, respectively, in both the cases, the major item of cost was transportation accounting for 43.56 and 45.09 per cent of the total marketing cost in Belgaum and Hassan markets respectively. The cost of gunny bags accounted for 34.74 and 41.47 per cent respectively. License fee and miscellaneous expenses together formed 5.76 per cent at Belgaum and 5.39 per cent at Hassan markets. The gross return realized by the traders was ₹ 1809.60 and ₹ 3387.90 and net return worked out to ₹ 868.35 and ₹ 2145.90 at Belgaum and Hassan markets respectively. The net return per quintal of Potato handled was more in

Table 4.12 Costs and returns of Trader cum retailers of Potato

Sl. No.	Particulars	Belgaum		Hassan	
A	Transactions	Purchased	Sold	Purchased	Sold
	Quantity (qtl)	37	35.32	47.5	45.78
	Price ₹/qtl	815	905	825	930
	Total value(₹)	30155	31964.60	39187.50	42575.40
	Gross return (₹)	1809.60		3387.90	
B	Costs (₹)	Amount (₹)	Percentage	Amount (₹)	Percentage
1	Transportation cost	410	43.56	560	45.09
2	Cost of gunny bags	327	34.74	515	41.47
3	License fee	4.25	0.45	7	0.56
4	Wastage costs	150	15.94	100	8.05
7	Miscellaneous expenses	50	5.31	60	4.83
	Total	941.25	100.00	1242	100.00
C	Total net return (A-B) ₹	868.35		2145.90	
D	Net return/qtl (₹)	23.47		45.18	

Hassan market (₹ 45.18) than in Belgaum market (₹ 23.47). These findings of this indicate that the profitability of marketing of the trader-cum-retailers was higher in the Hassan market than that of their counterparts in Belgaum market.

4.3.3.5 Costs and returns of Retailers of Potato

Retailers operating in Hassan and Belgaum markets purchased Potato from wholesaler and sold to consumers through their retail shops. The results on costs and returns of Potato are presented in Table 4.13.

It could be seen from the Table that retailers of Belgaum and Hassan market handled 18.36 quintals and 28.16 quintals. They incurred marketing expenses of ₹ 610.35 and ₹ 749.05 respectively.

The expenditure on shop rent, transportation cost, salary of the staff, cost of gunny bags and wastage formed bulk of the total cost which together accounted for 84.70 and 84.77 per cent of the total marketing costs of the retailers of Belgaum and Hassan markets, respectively. Other cost components like electricity charges, license fee and miscellaneous expenses together accounted for 15.30 and 15.23 per cent respectively.

The gross return to retailers from the business was ₹ 1006.50 and ₹ 1568.92 in Belgaum and Hassan market respectively. The net return realized by them worked out to ₹ 535.15 and ₹ 1452.70 respectively.

4.3.3.6 Costs and returns of Cart vendors of Potato

Cart vendors operating, in Belgaum and Hassan markets purchased Potato from wholesalers and sold the same to consumers at their door step. The details of costs and returns of Potato are presented in Table 4.14.

Table 4.13 Costs and returns of Retailers of Potato (per week)

Sl. No	Particulars	Belgaum		Hassan	
A	Transactions	Purchased	Sold	Purchased	Sold
	Quantity (qtl)	18.36	17.15	28.16	27.53
	Price ₹/qtl	825.00	950	875	975
	Total value(₹)	15147.00	16292.5	24640	26841.75
	Gross return (₹)	1145.50		2201.75	
B	Costs (₹)	Amount (₹)	Percentage	Amount (₹)	Percentage
1	Shop rent	65	10.65	70	9.35
2	salary of the staff	140.6	23.04	195	26.03
3	Transportation charge	100.88	16.53	150	20.03
4	Wastage costs	45.08	7.39	45	6.01
5	Electricity charges	36.72	6.02	42	5.61
6	Costs of gunny bags	165.4	27.10	175	23.36
7	Miscellaneous expenses	50.8	8.32	65	8.68
8	License fee	5.87	0.96	7.05	0.94
	Total	610.35	100.00	749.05	100.00
C	Total cost/qtl	33.24		26.60	
D	Total net return (A-B) ₹	535.15		1452.70	
E	Net return/qtl (Rs)	29.15		51.59	

Table 4.14 Costs and returns of Cart vendors of Potato

Sl. No	Particulars	Belgaum		Hassan	
A	Transactions	Purchased	Sold	Purchased	Sold
	Quantity (qtl)	38.68	37.61	47.67	46.12
	Price ₹/qtl	795	845	805	860
	Total value(₹)	30750.60	31780.45	38374.35	39663.2
	Gross return (₹)	1029.85		1288.85	
B	Costs (₹)	Amount (₹)	Percentage	Amount (₹)	Percentage
1	Cost of using cart	77.36	24.00	85	22.85
4	Wastage costs	120.04	37.23	150	40.32
5	Lighting Charges	65	20.16	72	19.35
7	Miscellaneous expenses	60	18.61	65	17.47
	Total	322.4	100.00	372	100.00
C	Total net return (A-B) ₹	707.45		916.85	
D	Net return/qtl (₹)	18.29		19.23	

It could be seen from the Table that on an average each cart vendor at Belgaum and Hassan markets handled 38.68 and 47.67 qtls of Potato and realized gross return of ₹ 1029.85 and ₹ 1288.85 respectively. The total marketing cost incurred by them was ₹ 322.40 and ₹ 372 respectively. The expenses towards maintenance of cart, lighting charges and wastage were the major items of costs. These three together constituted 81.39 and 82.52 per cent of their total marketing costs, miscellaneous expenses together accounted for 18.61 and 17.47 Per cent respectively. The average net income per year realized by the cart vendors from this business was ₹ 707.45 at Belgaum markets as against ₹ 916.85 in Hassan market. It is interesting to note that the net return per quintal of Potato handled worked out to ₹ 18.29 and ₹ 19.23 respectively.

4.3.3.7 Price spread in different channels identified in the marketing of Potato

The price spread is one of the measures of market efficiency. It indicates the increase in the price of a commodity as it changes hand from one intermediary to another in the marketing channel. The price spread includes marketing cost incurred by various market intermediaries and their profits. The average total marketing cost incurred, the gross and net prices received per quintal by the producers of the pooled category were considered. The price spread in the Channel I to IV indicates the share of producers in the price paid by the consumers. The average price spread was worked out on per quintal basis. Results of the price spread analysis for all the channels are presented in Table 4.15.

Channel I: (Belgaum)

Producer - Wholesaler - Retailer - Consumer

Table 4.15 Price spread in different channels identified in the marketing of Potato

	Particulars	channel I	Channel II	Channel III	Channel IV
		Belgaum (Value in ₹/qtl)	Hassan (Value in ₹/qtl)	Belgaum (value in ₹/qtl)	Belgaum (Value in ₹/qtl.)
Producer	Gross price	750.00	775.00	600.00	750.00
	Marketing cost	132.00	154.00	85	140.00
	Net price	618.00	621.00	515	610.00
Village level trader	Purchase price			600.00	
	Costs			91.00	
	Value of wastage			10.00	
	Sale price			750.00	
	Profit			49.00	
Commission agent	Commission		34.27		32.7
	Costs		14.25		14.25
	Net receipts		20.02		18.45
Wholesaler	Purchase price	750.00	775.00	750.00	750.00
	Costs	42.63	63.15	42.63	42.63
	Value of wastage	5.03	5.39	5.03	5.03
	Sale price	825.00	875.00	825.00	825.00
	Profit	27.34	31.46	27.34	27.34
Retailer	Purchase price	825.00	875.00	825.00	825.00
	Costs	33.24	26.60	33.24	33.24
	Value of wastage	2.4	1.59	2.40	2.40
	Sale price	950.00	975.00	950.00	950.00
	Profit	89.36	71.81	89.36	89.36
Price spread		332 (34.94%)	354 (36.30%)	435 (45.78%)	340 (35%)
Producer's share in consumer rupee		(65.06%)	(63.70%)	(54.22%)	(64.21%)

Channel II: (Hassan)

Producer - Commission agent - Wholesaler – Retailer - Consumer

Channel III: (Belgaum)

Producer - Village level trader - Wholesaler - Retailer - Consumer

Channel IV: (Belgaum)

Producer - Commission agent - Wholesaler – Retailer- Consumer

Channel I (Belgaum): Producer - Wholesaler - Retailer - Consumer

From the Table 4.15, it could be seen that producers received a net price of ₹ 750 per quintal as Potato sold to the wholesaler in Belgaum market and it formed 65.06 per cent of the consumer rupee. The price spread (Difference between producer's net price and consumer price) was ₹ 332 which is 34.94 per cent of the consumer's rupee. The marketing cost of the producer per quintal was ₹ 132 which accounted for 13.89 per cent of the consumer's rupee. The cost incurred per quintal by the wholesaler was ₹ 42.63 and his net profit was ₹ 27.34 and they accounted for 4.48 and 2.87 per cent respectively of the consumer's price. The retailer incurred ₹ 33.24 towards marketing cost and the value of wastage was ₹ 2.40 and these two formed 3.4 and 0.25 per cent of the consumer's price. He earned a income of ₹ 89.36 per quintal which is 9.4 per cent of the consumer's price.

In this Channel price spread (₹ 332) is low when compared to Channel II, III and IV. And also producer share in consumer is 65.06 per cent which is higher compared to other channels.

Channel II (Hassan): Producer - Commission agent - Wholesaler -
Retailer - Consumers

This channel was used by the producers who brought their produce to the Hassan regulated market. In this channel, producers

received a net price of ₹ 621 per quintal after deducting the marketing cost of ₹ 154. Thus, producer received 63.70 per cent of the consumer price and his cost of marketing formed 15.79 per cent of it. Next important intermediary was the commission agent, who incurred ₹ 14.25 towards marketing cost and earned net income of ₹ 20.02 per quintal. This item formed 1.46 and 2.05 per cent to the consumer rupee. The wholesaler purchased Potato from the producers through commission agents and sold to retailers. In this process, wholesalers incurred a marketing cost of ₹ 63.15 and value of wastage was ₹ 5.39 per quintal and realized a net income of ₹ 31.46, which was about 3.22 per cent of the consumer rupee. The retailer purchase Potato from the wholesaler for sale to the consumers. He incurred a cost of ₹ 26.60. The value of wastage was ₹ 1.59. He realized a net return of ₹ 71.81 per quintal. The total price spread in this channel was ₹ 36.30 and accounted for 63.70 per cent of the consumer's price.

Thus, the above findings indicated that in this producer share in consumer rupee (63.70%) is relatively low compared to channel-I (65.06%).

Channel III (Belgaum): Producer - Village level trader - Wholesaler - Retailer - Consumer

In this channel, the producers sold their produce to the village level traders in their respective villages. These traders sold the Potato, in Belgaum market directly to the wholesalers. In this channel, producers realized a net price of ₹ 600 per quintal and incurred a cost of ₹ 85 per quintal. It could be seen that farmers in this channel got the lowest price when compared to the first two channels and it was only 45.78 per cent of consumer rupee.

The village level trader purchased Potato by paying ₹ 600 and sold it at ₹ 750 per quintal. He incurred a cost of ₹ 91 and realized a net profit

of ₹ 49 per quintal of Potato handled. He sold the produce directly to wholesalers. The wholesaler incurred a cost of ₹ 42.63 and his net profit was ₹ 27.34 per quintal. He sold the Potato to retailers at a price of ₹ 825 per quintal. The gross margin at retailers was ₹ 89.36 per quintal and this was 54.22 per cent of the consumer rupee.

From this, it could be inferred that the presence of village level traders reduced the share of producers in the consumer rupee. The producers who sold at Belgaum and Hassan markets realized a net price of ₹ 618 and ₹ 621 per quintal respectively. But the net price obtained by the producers in this channel was ₹ 515.

Channel IV (Belgaum): Producer - Commission agent - Wholesaler -
Retailer - Consumer

It may be recalled that, the producers sold Potato through commission agents in Belgaum market. Producers received a net price of ₹ 610 per quintal after deducting marketing cost of ₹ 140. Thus producer received 64.21 per cent of the consumer price and his cost of marketing formed 14.73 per cent of it. Commission agent, who incurred ₹ 14.25 towards marketing cost, earned net income of ₹ 18.45 per quintal. These items formed 1.94 per cent of the consumer rupee. The wholesaler purchased Potato from the producers through commission agents and sold it to retailers. In this, process, wholesaler incurred a marketing cost of ₹ 42.63 and the value of wastage was ₹ 5.03 per quintal and, realized a net income of ₹ 27.34 which was about 2.87 per cent of the consumer rupee. The retailer purchases Potato from the wholesaler for sale to the consumers. He incurred a cost of ₹ 33.24 per quintal; the value of wastage was ₹ 2.40. The marketing cost and value of wastage formed 3.49 and 0.25 per cent of consumer rupee, ₹ 89.36 per quintal which formed 9.4 per cent of consumer rupee, respectively. He realized a net earning the consumer rupee. The total price spread in this channel was

₹ 340 and accounted for 64.21 per cent of the consumer's price.

Thus, the above findings indicated that the producers who sold Potato through the channel-I in Belgaum market realized the highest share (65.06%) in consumer rupee as compared to channels II, III and IV.

4.4 The growth and potential of Potato processing industry

**Table 4.16 Potato processing industries in Belgaum district
(Kg/day)**

Sl. No	Manufacturer	Processing Capacity	Actual Processing	Total Sales
1	Shiva Engineers	400-500	150	120
2	Sai Food Processing	750-850	200	170
3	Sadanand Sweets	350-400	100	65
4	B & M Foods	300-350	100	70
5	Shradha Agro Exports	800-900	250	210

4.4.1 Potato processed products sold by the processing industries in Belgaum district

Quantity of Potato processed products sold by the processing industries in Belgaum district from the year 2004-05 to 2009-10 is presented in the Table 4.17. In the year 2004-05 quantity of Potato sold was 2385 quintals which got increased to 2680 quintals in the year 2009-10 with a significant growth rate of 1.97 per cent.

Table 4.17 Potato processed products sold by the processing industries in Belgaum district

Sl. No.	Year	Quantity sold (quintal)
1	2004-05	2385
2	2005-06	2545
3	2006-07	2198
4	2007-08	2173
5	2008-09	2643
6	2009-10	2680
Annual compound growth rate		1.97
P- Value		0.4308

(Source: FICCI)

Table 4.18 Potato processing industries in Hassan District (Kg/day)

Sl. No.	Manufacturers	Processing Capacity	Actual Processing	Total Sales
1	Prajval Enterprises	300-350	250	240
2	Manjunath Chips	250-300	150	140
3	Vaishnavi Chats	100-150	60	50
4	Sri Krishna hot chips	100-150	70	65
5	Gajanana foods	140-160	60	50

4.4.2 Quantity of Potato processed products sold by the processing industries in Hassan district

Quantity of Potato processed products sold by the processing industries in Hassan district from the year 2004-05 to 2009-10 is presented in the Table 4.19. In the year 2004-05 quantity of Potato sold was 1785 quintals which got increased to 2150 quintals in the year 2009-10 with a highly significant growth rate of 3.82per cent.

Table 4.19 Quantity of Potato processed products sold by the processing industries in Hassan district

Sl. No.	Years	Quantity sold(quintal)
1	2004-05	1785
2	2005-06	1810
3	2006-07	1950
4	2007-08	2017
5	2008-09	2034
6	2009-10	2150
Annual compound growth rate		3.82
P- Value		0.0007

(Source: FICCI)

4.5 Consumer Preference for branded and unbranded Potato Chips

Socio- economic profile of consumers of Potato Chips

Table 4.20 Age group of the respondents

Sl. No	Groups	Number	Per cent
a	Up to 20 years	11	18.33
b	21-30 years	31	51.66
c	31-40 years	10	16.66
d	41- 50 years	5	8.35
e	Above 50 years	3	5
	Total	60	100

The socio-economic profile of the consumers is presented in Table 4.20 Majority (51.66 %) of them belonged to the age group of 21-30 years followed by age groups of 20 years, 31-40 years, 41-50 years, more than 50 years and up to 20 years which accounted for 18.33 per cent, 16.66 per cent, 8.35 per cent and 5 per cent respectively.

Table 4.21 Literacy level of the respondents

Sl. No	Group	Number	Per cent
a	Up to SSLC	15	25
b	Up to pre-university	20	33.34
c	Graduates	25	41.66
d	Illiterates	00	00
	Total	60	100

Among the respondents majority are (41.66%) graduates followed by 25 per cent who had education up to SSLC and the remaining 33 per cent studied up to PUC.

Table 4.22 Family size of the respondents

Sl. No	Group	Number	Per cent
a	Small (≤ 3)	18	30
b	Medium (4-5)	37	61.66
c	Large (> 5)	5	8.34
	Total	60	100

The family size of the consumer respondents was analyzed and it can be observed that 61.66 per cent of them consisted of four to five members followed by 8.34 per cent of them who belonged to families which comprised of more than five members and 30 per cent of them with up to three members.

Table 4.23 Average monthly Income of the respondents

Sl. No	Group	Number	Per cent
a	₹ 6,000 to 15,000	17	28.34
b	₹ 15,000 to 25,000	18	30
c	Above ₹ 25,000	25	41.66
	Total	60	100

With regard to the monthly income of the sample consumers it was found that 28.34 per cent of them had monthly income ranging from ₹ 6,000 and ₹ 15,000 followed by 41.66 per cent of them with monthly income of above ₹ 25,000 and 30 per cent with income ranging from ₹ 15,000 to 25,000.

In the study, conjoint analysis was used to assess the preference of consumer for Potato chips. This technique focused on the evaluation of chips which were defined in terms of specific levels of attributes.

The procedure followed to conduct the conjoint analysis is explained through 5 steps process.

Problem formulation

This step involved first defining the chips attributes and the levels of the attribute to be chosen based on discussions with consumers and observations on the behavior of a of consumers. The attributes and the levels identified were presented in the Table 4.24.

Table 4.24 Quality attributes selected for consumer preference for Potato Chips

Sl. No	Attributes	Levels
1.	Brand	Branded
		Unbranded
2.	Price	High
		Medium
		Low
3.	Flavor	Average
		Good
		Excellent
4.	Packet size	<50gm
		50-100gm
		>100gm

Determining the product profiles

This step involves preparing the cards which describes the chips using attributes and levels in full profile approach. 9 profile plan cards were prepared using orthogonal design option available in the SPSS computer software.

Sample plan

To analyze the consumer preference for chips 60 respondents were selected randomly from Hassan and Belgaum districts.

Data collection

For this step 60 respondents were administered with 9 plan cards to be ranked from one to nine, before which they were briefed regarding what each item in the cards meant and how they were expected to rank.

The ranks have been noted down and for each respondent part-worth as well as relative importance scores were estimated using conjoint analysis in computer software SPSS. The results were presented in the Table 4.25.

Table 4.25 Quality attributes of Potato chips for consumers.

Attributes	Levels	Utilities	Relative importance (%)
Brand	Branded	0.570	12.64
	Unbranded	-0.570	
Price	High	0.747	30.12
	Medium	0.947	
	Low	-1.693	
Flavor	Average	-2.280	39.56
	Good	0.840	
	Excellent	1.440	
Packet size	<100gm	-0.707	17.68
	100-250gm	0.653	
	>250gm	0.053	

Analysis and interpretation

The part - worth of each attribute is calculated using regression analysis using SPSS software to translate the respondent's response relative importance values or utilities. The most important attribute indicated by consumers was Flavor. The importance attached to the flavor was 39.56 per cent. Among the three attributes average good and excellent flavors available, excellent flavour was the most preferred. This was reflected by the utility value attached to it 1.440. Average flavor was next in the order with a utility value of -2.280.

Next to flavor the consumers attached importance to price. The average importance attached to price was 30.12 per cent. The medium price is highest with the utility value 0.947 is most preferred by the consumers and the least importance was given to low price - 1.693. The next importance attached by the consumers to the quality. Its importance averaged at 17.68 per cent.

The third important determinant preferred by the consumers is quantity to the extent of 17.68 per cent. With respect to the packet size the first preference is for 100 gm followed by 100-250 and least was for above 250 gm.

With respect to brand the consumer's preference is highest for branded products and least for unbranded products.

Discussion



CHAPTER V

DISCUSSION

The results of the study presented in the results chapter are discussed in detail in this chapter. The main focus here is to throw a light on some of the causes responsible for the major trends observed in the findings. Keeping objectives of the study in mind, the results are discussed under the following heads:

5.1 General characteristics of the respondents

5.2 Area, Production and Productivity of Potato in Karnataka.

5.3 Marketing Channels of Potato.

5.4 Growth and Potential of Potato processing industries.

5.5 Consumer preference for Branded and unbranded Potato chips.

5.1 General Characteristics of the Sample Farmers

From the Table 4.1, 4.2, 4.3 it could be observed that, the average age of the sample farmers was about 47 years and the average family size of sample farmers was 6.73. Further, the main occupation of 47 respondents in the study area was agriculture and 13 farmers were having business as their subsidiary occupation.

So far as the literacy was concerned, it was observed that about 70 per cent of the respondents were literates and had completed the high school education followed by primary and college level. Potato being a high investment enterprise has been perceived by these respondents mostly due to their education. This might have enabled the respondents to allocate the manageable size of the area under Potato to get higher returns over other crops. It could also be seen that the average land holding of sample farmers in the study area was 2.6 ha, of which 1.3 ha irrigated land was followed by 1.29 ha of rain fed.

5.2.1 Growth and Status in Area, Production and Productivity of Potato in Belgaum district

The compound growth rate of area, production and productivity of Potato presented in Table 4.4. It could be seen from the Table that a negative and insignificant growth in area of Potato crop was observed in Belgaum district. This negative growth rate in area is mainly because of diversification from Potato to fruit crops like papaya and other vegetables crops. Productivity is increasing over the years with a significant growth because of improved varieties and better cultivation practices.

5.2.2 Growth and Status in Area, Production and Productivity of Potato in Hassan district

The compound growth rate of area, production and productivity of Potato in Hassan district presented in Table 4.5. It could be seen from the Table that the increase in the area under the Potato cultivation in Hassan district indicating the popularity of this crop. The growth rate in production of Potato was insignificant mainly due to pests attack and late blight disease which became very acute in recent years.

5.2.3 Growth and Status in Area, Production and Productivity of Potato in the state

The compound growth rate of area, production and productivity of Potato in the state is presented in Table 4.6. It could be seen from the Table that the increase in the area under the Potato cultivation in the state is due to more farmers are replacing other crops by Potato because of high popularization of Potato processed products and increase in price over the years contributing to grab the attention of the farmers towards Potato cultivation even though production and productivity being non significant.

5.3 Marketing of Potato

Cost and return of different market intermediaries

Village level Trader

During post harvest season of Potato, village merchants visit the villages and purchase the produce. They transport the Potato, procured from farmers and market in regulated markets, Belgaum and Hassan.

On an average, the merchants handled 2,413.20 quintals of Potato during rabi season (March-April). The average price paid to farmers was ₹ 600 per quintal of Potato which they sold at the price of ₹ 750 per quintal in marketing centers. The cost of marketing per quintal worked out to ₹ 101 including the wastage. They realized a net return of ₹ 49 per quintal. Thus on an average each village trader earn a net income of ₹ 118247 during study period.

Commission Agents

The commission agents play an important role in Potato marketing. They help the producers to store the produce, bargain for a better price and assured payments to the buyers.

On an average commission agent in Belgaum and Hassan markets handled 5423.3 quintals and 8,336 quintals of Potato respectively. They incurred an expenditure of ₹ 77282.02 and ₹ 118797.97 in Belgaum and Hassan markets respectively. In Hassan market per quintal cost and net profit accounted for ₹ 14.25 and ₹ 34.27 respectively, commission agents of Hassan market incurred cost as much as Belgaum commission agents incurred but they earned higher net income per quintal as compared to those in Belgaum market. This is because of the huge quantities they handle. It appears that the income earned by the commission agents was really high for the service rendered by him.

Wholesalers

The wholesalers formed the essential link between producers and retailers in Belgaum. In Belgaum and Hassan markets, the average quantity handled by each of them was 3019 quintal and 3,791 quintal during the study period. The cost of handling per quintal of Potato worked out to ₹ 42.63 and ₹ 63.15 the net return per quintal realized by them was ₹ 18.95 and ₹ 30.41 at Belgaum and Hassan, respectively. This shows that Wholesaler at Hassan was keeping higher margin compared to the wholesalers at Belgaum. The difference ₹ 11.46 in net return per quintal was due to high turnover and high unit price in Hassan market.

Trader - cum – Retailer

The Trader Cum Retailer is a market intermediary who comes between the wholesaler and retailer and was found operating in Belgaum and Hassan markets. These traders made purchase of Potatoes in regulated markets and supply them mainly to household consumers and also to hotels.

On an average, each trader handled 37 quintal in Belgaum district and 47.50 quintal at Hassan. The net income realized per quintal of Potato was ₹ 23.47 at Belgaum and ₹ 45.18 at Hassan. This indicates that the profit realized per quintal of Potato was higher, when compared to commission agents or wholesalers in both the centers.

Retailers

Retailers, who sell Potato in their established shops, handled relatively less quantity. They supplied Potato mainly to individual consumers.

The average quantity handled by each retailer of Belgaum and Hassan during study period was 18.36 quintal and 28.16 quintal

respectively. The average cost incurred to handle a quintal of Potato worked out to ₹ 33.24 and ₹ 26.60 the net return realized was ₹ 29.15 and ₹ 51.59 per quintal at Belgaum and Hassan respectively.

The net income per quintal at Hassan was higher when compared to Belgaum. This was mainly due to lower cost per quintal and handling of relatively more quantities of Potato by retailers at Hassan market.

Cart vendors

The cart vendors owned or hired a four wheeler cart. They purchase Potatoes from the wholesalers in small quantities and along with other vegetables like onion, tomato, cabbage etc., and sell to consumers in residential areas.

In this study, it was observed that on an average each cart vendor at Belgaum and Hassan handled 38.68 quintal and 47.67 quintal of Potato and incurred a total marketing cost of ₹ 707.45 and ₹ 916.85 respectively. Per quintal net profit earned by Cart-Vendor was higher when compared to trader cum retailer.

Channels of Potato marketing and price spread

Potato producers of Belgaum district opted for various marketing channels to market their produce.

Four marketing channels of Potato have been identified and they are as follows

Channel I: (Belgaum)

Producer - Wholesaler - Retailer - Consumer

Channel II: (Hassan)

Producer - Commission Agent - Wholesaler - Retailer - Consumer

Channel III: (Belgaum)

Producer - Village level trader - Wholesaler - Retailer - Consumer

Channel IV: (Belgaum)

Producer - Commission agent - Wholesaler - Retailer - Consumer

The total quantity of Potato sold by the sample farmers was 12620 quintals. Of this 21.17 per cent moved through the Channel-I, 44.55 per cent through Channel-II, 29.07 per cent through Channel-III, and 2.97 per cent through Channel-IV. The remaining 2.24 per cent was marketed in other centers. Hence, among the four channels, major portion of the produce was marketed, in channel-II in Hassan, the most popular among the producers.

The Price spread is one of the important measures of the market efficiency which indicates the share of producer in the consumer rupee. Besides this, it also indicates the share of various market intermediaries in the consumer rupee, for the services rendered by them in channelizing the commodity from the producer to the consumer.

The analysis of price spread indicated that farmers who sold their Potato through channel-I, in Belgaum market, realized 65.02 per cent of the consumer rupee, with a net price of ₹ 618 per quintal. The remaining 34.94 per cent was shared by the various marketing functionaries. The retailers in this channel accounted for the largest share of the consumer rupee (38.80%) where as the wholesalers share was (5.75%). The marketing cost incurred by the producers accounted for 13.89 per cent of the consumer rupee. The costs incurred by wholesalers and retailers allowed for 4.48 and 3.4 per cent of it respectively.

In Hassan market channel-II the farmer's share in the consumer rupee (63%) was relatively low as compared to Channel-I. the net price

received by producers was higher (₹ 621) than that of Channel-I. the market intermediaries in this channel shared 36.30 per cent of the consumer rupee. The marketing cost incurred by the producer accounted for 15.79 per cent of the consumer rupee. In this channel, the retailers accounted for the largest share in the consumer rupee (17.74%) where as the commission agents share was the least (4.53%). The wholesaler (7.56%) shared more than commission agents but less than the retailers.

In Channel-III of Belgaum market, the price spread analysis indicated that producers received 45 per cent of the consumer rupee which was the lowest when compared to all other channels. Producer's net price of ₹ 515 per quintal was also the lowest as compared to Channel-I and Channel-II of Belgaum market and Channel-II of Hassan market- marketing. Marketing cost incurred by the farmers accounted for 8.94 per cent of the consumer rupee. In this channel retailers had the highest share of the consumers rupee (38.70%).their net profit alone accounted for 36.78 per cent.

In channel-IV of Belgaum market, the price spread analysis indicated that producers received 64.21 per cent of the consumer rupee which was the highest compared to the channel-III and lowest in case of I channel. Marketing cost incurred by the farmers accounted for 14.73 per cent of the consumer rupee. In this channel, retailer had the highest share of consumer rupee (38.80%). The gross margin of commission agent was 1.39 per cent and of the wholesalers was about 5.71 per cent of the consumer rupee.

The price spread analysis indicated that producer received highest share in channel-I and lowest in channel-III. Hence, it could be inferred that channel-I was the best when compared to the other channels because number of market intermediaries are less in Channel-I. Thus, farmers who sold Potato to wholesalers directly in Belgaum regulated

market got the highest share and minimize the share of market intermediary in consumer rupee.

5.4.1 Growth and Potential of Potato processing industries in Belgaum District

The compound growth rate of Potato processing industry is presented in Table 4.17. It could be seen from the Table that quantity of Potato sold by the processing industries has shown a fluctuation with a significant growth rate of 1.97 per cent because of the facts that consumer preference for processed products of Potato is increasing over the years.

5.4.2 Growth and Potential of Potato processing industries in Hassan District

The compound growth rate of Potato processing industry is presented in Table 4.19. It could be seen from the Table that quantity of Potato sold by the processing industries has shown a fluctuation with a highly significant growth rate of 3.82 per cent because of the facts that consumer preference for processed products of Potato is increasing over the years.

5.5 Consumer preference for branded and unbranded Potato chips

The consumer preference for branded and unbranded Potato chips has been presented in the Table 4.25. It could be seen from the Table that 39.56% of the consumers gave first preference to flavor, with the utility of 1.440. The second preference was for price (30.12%), and for brand they gave least preference was for unbranded products.

Summary and Policy Implications



CHAPTER VI

SUMMARY AND POLICY IMPLICATIONS

Potato is grown in more than 100 countries of the world. Potato is a rich source of starch, contains significant amounts of vitamins and minerals. Potato is grown in an area of about 18.6 million in the world with a total production of 332 million Metric tons. It is also the fourth largest food producing commodity, after maize, rice and wheat in the world.

In India, Potato continues to be an important crop due to increasing access to irrigation and use of fertilizers, as well as improvement in post-harvest infrastructure. More than 80 per cent of the Potato crop is cultivated on the Indo-Gangetic plains during the winter season.

India's production of Potato is about 350 lakh MT. The production is largely concentrated in the Northern part of the country. Uttar Pradesh, West Bengal and Bihar contribute to almost 68 per cent of the total area and 78 per cent of the Potato production.

In India, the Potato prices are subjected to volatility. The area under Potato crop was at its high of 1.47 million hectares in 2008. During 2008, Potato production hit a record 30 million tonnes, resulting in a glut situation. It led to a sharp decline in prices, forcing farmers to dump the produce either in their farm or in the market. Further about 25 per cent of the Potatoes, are being wasted due to constraints in storage and transportation. In the absence of proper support measures, farmers have not brought new area under Potato cultivation during 2009. Hence, the acreage under Potato crop went down to nearly 1.2 million hectares during 2009. However, during 2010 Potato production estimates are nearly 30 million tonnes. The production of Potato has

gone up during the last ten years due to better varieties. The productivity level is nearly 20 tonnes/ha in India which is below the world average level of 35-40 tonnes/ha. Keeping these issues in mind, an attempt is made in the study to examine the production, processing and marketing of Potato in Karnataka with the following objectives

1. To analyze the area, production and productivity of Potato in the state.
2. To examine the channels involved in the marketing of Potato.
3. To examine the growth and potential of Potato processing industry in the selected districts.
4. To study the consumer preference for branded and unbranded Potato processed products.

Methodology

Sampling procedure

The study was conducted in Hassan and Belgaum districts of Karnataka state. These districts were selected based on highest area and production under Potato crop among districts of Karnataka. In each district, three villages were selected to collect primary data from the respondents.

In each district, 30 farmers including small farmers, marginal and large farmers were selected. Thirty consumers were also selected randomly. Besides 15 market intermediaries were selected randomly. Thus, the total sample size for this study constituted 150 respondents from 2 districts. The data collection was done by personal interview method with pre-tested structured schedule prepared for the purpose. The data collection was done during the month of March 2011.

Data Collection

Primary data

The primary data for the study was collected from the respondents by personal interview method using pre-tested schedule. Majority of the respondents did not maintain records of expenditure and income from Potato cultivation. Hence, data collected was based on the memory of the respondents. The primary data on the socio-economic characters of the farmers, land holding, family size, etc. was also collected. Besides, the data on quantity and value of various physical inputs used and the yield obtained in case of Potato were collected.

Secondary data

The secondary data is collected from Department of Agriculture, Horticulture, KSAMB and Agricultural Produce Market Committee in Hassan and Belgaum districts. The data related Potato processing units was collected from the Directorate of Industries, FICCI etc.

Method of Analysis

The compound growth rate has been worked out for a period of seven years from 2003-04 to 2009-10 to analyze the growth in area, production and productivity in Belgaum and Hassan districts of Karnataka. Price spread was used to analyze the channels involved in the marketing of Potato in the study area. Further, the compound growth rate has been worked out for a period of six years from 2004-05 to 2009-10 to examine the growth and potential of Potato processing industries. Besides, conjoint analysis was used to study the consumer preference for branded and unbranded Potato chips in the study area.

Major Findings

The area with respect to Potato crop in Belgaum district is decreasing with a negative growth rate of 4.56 per cent which is insignificant. Production has shown fluctuation with a growth rate of 5.23 which is significant. The productivity is also increasing with a growth rate of 10.26 per cent which is significant.

Area with respect to Potato crop in Hassan district is increasing with a growth rate of 9.72 per cent which is highly significant. Production has shown insignificant growth rate of 0.40 per cent. The productivity is also decreasing with a negative growth rate of 9.22 per cent which is insignificant.

The farmer selling in regulated markets either to commission agents or to wholesaler is quite substantial (64 %) and nearly 28 per cent farmers also sell at village level and hardly few farmers (8%) are involved in direct sale.

Four major marketing channels were observed out for marketing of Potato in the study area.

Channel I: (Belgaum)

Producer - Wholesaler - Retailer - Consumer

Channel II: (Hassan)

Producer - Commission agent - Wholesaler - Retailer - Consumer

Channel III: (Belgaum)

Producer - Village level trader - Wholesaler – Retailer - Consumer

Channel IV: (Belgaum)

Producer - Commission agent - Wholesaler – Retailer - Consumer

The Producer who sold Potato through the channel-I (Producer - Wholesaler - Retailer - Consumer) in Belgaum market realized the highest share (65.02%) in consumer rupee as compared to other channels hence Channel-I is the efficient one compared to other channel.

Potato processing industry is growing significantly in Belgaum and Hassan districts which indicates their significant growth rate (1.97%) and (3.82%) in quantity of processed products they sold.

With respect to consumer preference for branded and unbranded Potato Chips the most important attribute was Flavor. Second importance is attached to Price. The consumers preferred quantity of 50-100 gm with a utility of (0.653). Branded chips were also an important attribute that was considered least by the consumers. The consumers have given least preference to the unbranded chips compared to branded chips.

Policy Implications

Major policy implications based on the findings of the study are summarized below

1. The analysis of the compound growth rate in Belgaum district has clearly indicated that the area under Potato has declined (-4.56%). However the production of Potato has increased with a compound growth rate of 5.23 per cent due to increase in productivity (10.26%).
2. In Hassan district area under Potato has increased with an annual compound growth rate of 9.72 per cent which is significant. However in respect of production (0.40%) and productivity (-9.22%) the compound growth rate is not significant.

3. The Producer who sold Potato through the channel-I (Producer - Wholesaler - Retailer - Consumer) realized the highest share (65%) in consumer rupee as compared to other channels indicating the efficiency of channel compared to other channels.
4. Small scale Potato processing industry is growing significantly in both Belgaum (1.97%) and Hassan districts (3.82%) in terms of production and sale indicating potential opportunity for establishment of small scale industries in both the districts.

References

CHAPTER VII

REFERENCES

- ARUN PANDIT, RAJESH, K., RANA, PANDU, N.K. and KUMAR, N.R., 2003, "Potato marketing in India". *Ind. Hort.*, pp. 35-36.
- BHUIAN, S.N., 1998, developing country consumer fast food preferences: an empirical examination in Saudi Arabia. *Journal of International Food and Agribusiness Marketing*, **10** (1): 1-13.
- BHULLAR, A. S., 2005, Estimating, export competitiveness of chilies from Punjab state. *Agricultural Marketing*, April-June, 2005, **36**: 43.
- BEHRENS, JORGE H., BARCELLOS, MARIA N., FREWER, LYNN J., NUNES, T.P., FRANCO, BERNADETTE D.G.M., DESTRO, MARIA T. AND LANDGRAF, MARIZA., 2010, Consumer Purchase Habits and Views on Food Safety: A Brazilian Study. *Food Control*, **21** (7): 963-969.
- DAS, MANISH AND EZEKIEL, R., 2007, Prospects of the processed Potato products in Patna, India. *Asian Journal of Horticulture*, **2** (2): 305-308.
- DANIEL, J.N., 2009, Value chain analysis in relation to processing and marketing of three underutilized fruits in India. *Acta Horticulture*, **806** (2): 505-512.
- DHAGE, S.K. AND RAHANE, R.K., 2003 Marketing of Grapes in Nashik district. *Indian Journal of Agricultural Marketing*, **17**(1): 93-99.

- DOUCHES, D.S., COOMBS, J., HAMMERSCHMIDT, R., KIRK, W.W. AND LONG, C., 2009, Kalkaska: A Round White Chip-Processing Potato Variety with Common Scab Resistance. *American Journal of Potato Research*, **86** (5): 347-355.
- FAO, 2008b FAO, 2008. Potato and Biodiversity. IYP Website, <http://www.potato2008.org/en/potato/biodiversity.html>
- GANGAL, S. M., 2002, Performance of banana plantation in North Karnataka – An economic analysis. *M. Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.
- HEMACHAND JAIN, 1989, Economics of processing units of Arhar pulse in Narasingpur district of Madhya Pradesh. *Indian journal of Agricultural Economics*, **44**(4): 317-318.
- HEIN, KAREN A., JAEGER, SARA R., TOM CARR, B. AND DELAHUNTY, CONOR M. 2008, Comparison of Five Common Acceptance and Preference Methods. *Food Quality and Preference*, **19** (7): 651-661.
- HARBANS LAL and K. D. SHARMA, 2006, The potato crop was found to be the most capital and labour intensive due to substantial cost incurred on seed, fertilizer and human labour, *potato journal*, **33**(3-4): 139-143.
- HANDIGANUR, S., 1995, Economics of production and processing of grapes in Bijapur district, Karnataka. *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.
- HU, WUYANG; WOODS, TIMOTHY AND BASTON, SANDRA., 2009, Consumer Acceptance and Willingness to Pay for Blueberry Products with Nonconventional Attributes. *Journal of Agricultural and Applied Economics*, **41** (1): 47-60.

- JAME, KAMAL., KUMAR, DINESH AND EZEKIEL, R., 2001, Market status of different processed Potato products in Meerut, Ghaziabad and Delhi. *Journal of the Indian Potato Association*, **28** (1): 169-171.
- KAREEMULLA, K., TEWARI, R.K., SINGH, B. AND KULDEEP KUMAR, 2007, Production and marketing of Indian Gooseberry – Aonla (*Emblica officinalis* Gaertn.) in Pratapgarh district of U.P. *Indian Journal of Agricultural Marketing*, **21** (3): 41-45.
- KUMAR, RAJ., PANDEY, S.K. AND KHURANA, S.M.P., 2005, Keeping quality of Potato processing cultivars during room temperature storage. *Potato Journal*, **32** (1/2): 55-59.
- KUMAR, PARVEEN., PANDEY, S.K., SINGH, S.V., SINGH, B.P., RAWAL, S. AND KUMAR, DINESH., 2008, Evaluation of nutrient management options for Potato processing cultivars. *Potato Journal*. **35** (1/2): 46-52.
- KHUNT, K.A., GAJIPARA, H. M., GADHVI, B. K.AND VEKARIYA,S. B., 2003 Economics of Production and marketing of pomegranate. *Indian Journal of Agricultural Marketing*, **17**(1): 100-107.
- LADANIYA, M.S. AND WANJARI VINOD., 2003, marketing pattern of 'Mosambi' sweet orange in selected district of Maharashtra. *Indian Journal of Agricultural Marketing*, **17**(1): 52-62.
- LUCKOW, T. AND DELAHUNTY, C. 2009, Which Juice is 'Healthier'? A Consumer Study of Probiotic Non-dairy Juice Drinks. *Food Quality and Preference*, **15** (7-8): 751-759.

- LAKHANA, B. RAMESH., 2003, Production, price behaviour and export of groundnut in India with special reference to Gujarat state- An economic analysis. *M.Sc. (Agri) Thesis (Unpublished)*, University of Agricultural Sciences, Dharwad.
- LATHIKA, M. AND KUMAR C.E. AJITH, 2005, Growth trends in area, production and productivity of coconut in India. *Indian Journal of Agricultural Economics*, **60**(4):686-697.
- MANIVEL, P., PANDEY, S.K., SINGH, S.V. AND KUMAR, DINESH., 2003, Performance of processing Potato varieties in northern hills. *Journal of the Indian Potato Association*, **30** (1/2): 17-18.
- MALI, B.K., BHOSALE, S.S. SHENDAGE, P. N. AND KALE, P.V., 2003, Economics of Production and Marketing of Banana in Jalgaon district of Western Maharashtra. *Indian Journal of Agricultural Marketing*, **17**(1): 173-181.
- MJAERUM, M. AND ROER, L., 1992, Consumer preference - culinary Potato. *Nordisk- Jordbruksforskning*, **74** (1): 145.
- MARWAHA, R.S., KUMAR DINESH, SINGH, S.V. AND PANDEY, S.K., 2009, Chipping and nutritional qualities of Indian and exotic Potato processing varieties stored under different conditions. *Journal of Food Science and Technology Mysore*, **46** (4): 354-358.
- MORE, S.S., 1999, Economics of production and marketing of banana in Maharashtra state. *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.
- NAVADKAR, D.S. SALE, D.L. AND PATIL, U.D. 2005, Marketing of Vegetables Grown Around Pune City. *Agricultural Situation in India*, **62**(3): 259-262.

- PATIL, S.M., 1995b, "Yield gaps and constraints in groundnut production in Karnataka – An Economic Analysis". *M.Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.
- PADILLA, CARLOS; VILLALOBOS, PABLO; SPILLER, ACHIM; AND HENRY, GUY., 2007, Consumer Preference and Willingness to Pay for an Officially Certified Quality Label: Implications for Traditional Food Producers. *University of Auckland Business Review*, **67** (3): 300-308.
- PATEL, N.H., PATEL, R.N., SINGH, S.V., PANDEY, S.K., KHURANA, S.M.P. AND KANBI, V.H., 2003, Assessment of processing Potato varieties for dry matter, yield and storage behavior at Deesa (Gujarat). *Journal of the Indian Potato Association*, **30** (1/2): 167-168.
- PAWAR. B. P.1996, Economics of processing of kokum fruits in South Konkan region of Maharashtra state. *M.Sc. Thesis*, University of Agricultural Sciences, Dapoli.
- PAWAR, P.P., RANI, R.C. AND SALE, D.L., 1990, Economics of Agro-processing units-A case study of paddy processing into rice, poha and murmur. *Indian journal of Agricultural Marketing*, **4**(1): 92-93.
- PERVEZ, W.M., 2001, Dynamics of food grains production in Pakistan. *The Asian Economic Review*, **2**(3): 438-446.
- RANI, MANJU AND EZEKIEL, R., 2001, Potato processing in unorganized sector and quality of Potato chips available in the market. *Journal of the Indian Potato Association*, **28** (1): 159-161.
- SARASWAT AND RANE, 2006, Production and marketing of peach fruit – A case study of Rajgarh village. *Ind. J. Agril. Mkting*, **8**(5): 318-325.

- SEIBEL, W., 1993, Consumer expectations on the quality of foods of vegetable origin. *Kongressband 1993-Hamburg Vorträge zum Generalthema des Qualität und Hygiene von Lebensmitteln in Produktion und Verarbeitung*, **7** (22).
- Shyamasunder, M.S., Manjareddy, C. and Lalith Achoth, 1995, "Price spread in marketing of irrigated onion – An Economic Analysis". *Agricultural Banker*, **19** (4) : 33-39.
- P. K. SINGH and V. M. PATEL, 1993, productivity of Potato crop under riverbed cultivation is about 330 quintal per hectare which is about 50 per cent higher than under field situations, *Indian Potato Association journal*, **20**(2): 155-161.
- SINGH, C. AND V.C. MATHUR., 1994, Growth and instability in production and prices of Potato in India. *Agricultural Situation in India*, **44**(6): 429 - 436.
- SINGH, R.S., 1996, Marketing of citrus fruits in mid hills of Jammu and Kashmir. *The Bihar Journal of Agricultural Marketing*, **4** (3):242-249.
- SINGH, S.V., PANDEY, S.K., KUMAR, DINESH. MARWAHA, R.S., KUMAR, PARVEEN and MANIVEL, P., 2008, Potential of advanced Potato (*Solanum tuberosum*) hybrids for processing in Agra and Indore region of west-central plains. *Indian Journal of Agricultural Sciences*, **78** (3): 198-202.
- SINGH, ARCHANA. AND SRIVASTAVA, R.S.L., 2003, Growth and instability of sugarcane production in Uttar Pradesh: A regional study. *Indian Journal of Agricultural Economics*, **58**(2):279-282.

- SINGH, S.V., MARWAHA, R.S. AND PANDEY, S.K., 2009, Suitability of Potato Varieties Grown in North-eastern Indian Plains for Processing. *Potato Journal*, **36** (1-2), June 2009.
- Shivanand, S.G., 2002, Performance of banana plantation in north Karnataka. An economic analysis. *M.Sc. (Agri.) Thesis*, Univ. Agril. Sci., Dharwad.
- SRINIVAS, SUSHIL KHARINTA AND SINGH, V.K., 1989, Growth and economics of mustard processing units in Hissar district. *Indian journal of Agricultural economics*, **44**(4): 316-317.
- SRIVASTAVA, U. K., 1989, Agro processing industries: potential, constraints and task ahead. *Indian journal of Agricultural Economics*, **44**(3): 242-255.
- SUBRAHMANYAN, K. V. AND SUDHA, M., 1993, Economics feasibility of establishing a small scale cooperative unit in rural areas: Case study of Tomato. *Indian journal of Agricultural economics*, **7**(1): 23-31.
- SUNDARAVARADARAJAN, K. R. AND JAHANMOHAN, K. R., 2002, Marketing Cost, Margin, Price Spread and Marketing Efficiency of Cashew in Tamil Nadu. *Agricultural Situation in India*, **59**(1): 9-16.
- THAKARE, A.B. AND GUPTA, S.P., 2005, Consumer preference of mushroom in selected districts of Chhattisgarh plain. *New Agriculturist*, **16** (1/2): 15-21.

- TALATHI, J.M., S.S. WADKAR AND H.K. PATIL., 2003, Variability in mango exports and export competitiveness. In Abstract on National Seminar on “Mango Challenges in management of production, post-harvest, processing and marketing” organized by Gujarat Agricultural University, Junagadh on 14-15 June, 2003, and p.122.
- VALENTIN, DOMINIQUE. PHU TU, VIET., HUSSON, FLORENCE AND DACREMONT, CATHERINE, 2010, Cultural Differences in Food Description and Preference: Contrasting Vietnamese and French Panelists on Soy Yogurts. *Food Quality and Preference*, **21** (6): 602-610.
- VASUDEVA, N. AND CHOWDRY, K. R., 1999, Marketing of tomato in Andhra Pradesh. *Indian Journal of Agricultural Marketing*, **13**(2): 53.
- VENKATECHIAIAH, K, 1992, Evaluation of groundnut processing units and marketing of their products in Cuddapah district, Andhra Pradesh. *M.Sc. Thesis*, University of Agricultural Sciences, Dharwad, P.130
- Vedini, K.H. and Gracy, C.P., 1995, “Marketing and price-spread of jasmine flower in Mysore city”. *Ind. J. of Agril. Mkting*, Conference Special Issue : pp. 50-51.
- VERMA, VIBHA, SINGH, LOKENDAR AND SINGH, RAJPAL. 2001, Consumption behavior of Potato products in rural and urban areas of Meerut district. *Journal of the Indian Potato Association*, **28**(1): 178-179.

VARGHESE, P.K., 2004, Trend analysis in area, production, productivity and price behavior of cardamom in Kerala. *Indian Journal of Agricultural Economics*, **59**(4): 788-807.

WANG, QINGBIN, SUN, JUNJIE AND PARSONS, ROBERT, 2010, Consumer Preferences and Willingness to Pay for Locally Grown Organic Apples: Evidence from conjoint Study. *HortScience*, **45** (3): 376-381.