Research Study No. 2015/02

RELATIONSHIP BETWEEN WHOLESALE PRICES, RETAIL PRICES AND EXPORT PRICES OF BASMATI RICE IN HARYANA

Usha Tuteja

Agricultural Economics Research Centre

University of Delhi

Delhi -110 007

November, 2015

PREFACE

The present study sponsored by the Ministry of Agriculture, Government of India aimed at analyzing issues related to basmati rice in Haryana. The primary as well as secondary sources of data were used to fulfill the specific objectives of the study. Primary data were collected through a field survey of 150 farmers growing basmati paddy in the selected three districts of Haryana.

The results of this study reveal (i) India produces about 7-8 million tonnes of basmati rice primarily in three major states – Haryana, Punjab and Uttar Pradesh (ii) the steady increase in production of basmati rice and demand in the world market has made India a leading exporter in the world (iii) the results of intra year variability show that 30 per cent of basmati rice is exported in January, February and March (iv) per farm production of basmati paddy on sampled farms was around 113 qtls during 2013-14. A small part of the produce was retained for domestic consumption and other purposes. The marketed surplus of Basmati 1121 and 1509 was 16529 qtls and 1532 qtls. Farmers realized a price of Rs. 3607 and Rs. 3364 per qtl respectively for these varieties (v) the per hectare net returns from cultivation of Basmati 1121 and 1509 were Rs. 108903 and Rs. 113569 respectively during 2013-14 (vi) farmers sold basmati paddy through village market and commission agents (vii) producers of Basmati 1121 and 1509 received 66.41 and 63.62 per cent of consumer's rupee (viii) other intermediaries such as wholesalers, retailers and exporters earned margin between 4.34 and 11.43 per cent (ix) stakeholders – wholesalers, retailers and exporters perceived variety of problems during the process from production to exports.

Basmati rice is a great strength of India since its quality in terms of grain length and aroma can hardly match any other variety of rice in the world. There has been commendable increase in the production of basmati in the country due to area expansion and yield enhancement. The steady increase in production and growing demand in the world market has made India a leading exporter in the world. India has potential to further increase production of basmati rice primarily through yield enhancement. This is essential for maintaining the position as a leading exporter in the world market. Therefore, ensuring profitability of basmati rice on sustainable basis through suitable policy reforms appears to be a pre-requisite for successful strategy. These reforms include favourable price regime, technology for raising the existing level of productivity, financial support, rural infrastructure and above all, multi-pronged government support in particular, simplifying the procedures for exports.

We are grateful to Prof. Pami Dua, Chairperson, GB, for her constant encouragement to complete this study. We express our thanks to the Ministry of Agriculture, Government of India for providing support during the course of this study. Thanks are due to the coordinator of the study, Dr. C.S.C. Sekher, Associate Professor, Institute of Economic Growth, Delhi for providing the study design, tabulation scheme and useful comments on the draft report. We are thankful to Deputy Directors, Agriculture of Selected districts for the useful discussion on various aspects of the project. Thanks are due to study team for contribution during the course of this study. Author gratefully acknowledges the support of all the staff members of the AER Centre, Delhi University.

November, 2015 **Usha Tuteja**

Project Team

Project Leader
Dr. Usha Tuteja

Field Survey and Inputting of Primary Data
Dr. Subhash Chandra
Dr. Vishnu Shanker Meena
Ms. Nandini Pandey
Mr. Vishal Dagar

Primary and Secondary Data Analysis
Mr. Narinder Singh

Bibliographical Assistance
Ms. Nandi Negi

Word Processing
Mr. Sri Chand

Contents

LIST OF TABLES

Chapter-1
Introduction

Rice is an important staple food grain for more than 60 per cent of the world population. Therefore, it has shaped culture, diet and economics of thousand of million households across the globe. Considering the importance of rice in human food, the United Nations designated 2004 as the International Year of Rice. The common uses of rice include ready to eat products (popped & puffed rice, rice flakes, canned rice and fermented products). In addition, rice straw is used as cattle feed, for thatching roof and in cottage industry for making ropes, hats, mats, etc. Rice husk and bran are also used as animal feed, fuel, making paper and medium of cooking.

India is the second largest producer of rice after China in the world. It grows large number of varieties across the regions. Basmati is very special and regarded as the gold standard of rice. It is one of the India's great national treasures, at par with saffron from Kashmir, pepper from Kerala and tea from Darjeeling. What makes basmati so special? After all, there are thousands of rice varieties in India. Why is basmati deserving special attention?. First of all, basmati is the Indian rice that we have grown in the foothills of the Himalayas for many centuries. Secondly, the best kinds of basmati have long grains that stay separate and distinct, even when they are cooked. The third reason is fragrance. So basmati is one of the world's most special rice varieties. It is not just the flavor and the shape of the grain, it is also that distinctive aroma that few other rice breeds can hope to match.

India produces about 7-8 million tonnes of basmati rice (12 million tonnes of paddy at 66 per cent conversion ratio) primarily in three states namely, Haryana, Punjab and Uttar Pradesh. It is one of the major export items from India. The exports of basmati rice touched about 3 million tonnes, equivalent to Rs. 15336 crore during 2011-12. Pusa Basmati 1121 &1509 which are hybrid varieties and yield higher than traditional basmati have become popular in Iran and other export markets of West Asia.

1.1 Basmati Production in India:

During the past two decades, area, production, productivity, availability and exports of basmati rice from India increased manifolds which provided ample opportunities to producers and exporters in major basmati growing states such as Haryana and Punjab.

Table-1.1
Area, Production and Yield of Basmati Rice in Major Growing States of India (2013 & 2014)

Area : 000 ha.
Production: '000 Tonnes
Yield: Kgs/ Ha

Sl. No.	State	2013			2014		
		Area	Production	yield	Area	Production	yield
1.	Punjab	590.01 (35.17)*	2292.75 (34.65)	3885	857.68 (40.18)	3498.88 (39.88)	4079
2.	Haryana	711.11 (42.39)	2898.98 (43.82)	4077	832.54 (39.00)	3701.88 (42.19)	4446
3.	Uttar Pradesh	318.75 (19.00)	1270.09 (19.20)	3985	354.39 (16.60)	1260.69 (14.37)	3557
4.	Uttrakhand	18.30 (1.09)	54.16 (0.82)	2960	20.34 (0.95)	66.41 (0.76)	3265
5.	Jammu & Kashmir	37.28 (2.22)	92.66 (1.40)	2486	68.45 (3.21)	240.77 (2.74)	3517
6.	Himachal Pradesh	1.00 (0.06)	3.40 (0.05)	3400	0.45 (0.03)	2.15 (0.03)	4777
7.	Delhi	1.00 (0.07)	4.09 (0.06)	4090	0.70 (0.03)	3.00 (0.03)	4286
	Total	1677.45 (100.00)	6616.13 (100.00)	3944	2134.55 (100.00)	8773.78 (100.00)	4110

*Percentage of total
Source: Rice Exporters Association, New Delhi

Traditionally, basmati rice is a crop of north-west Himalayas in India. This area is blessed with producing extra long slender aromatic grain that elongate at least twice of the original size with soft and fluffy texture upon cooking and has delicious taste. Also, known as king of rice, basmati uses less water and fertilizer, has high export potential and its straw is used for livestock feed, rather than burning in the field and creating atmospheric pollution.

Production of basmati rice is concentrated in north-west Indian states – Haryana, Punjab, Western Uttar Pradesh and to a limited extent in Uttrakhand, Himachal Pradesh, Jammu & Kashmir. Currently, Haryana is the leading producer of basmati in India. The production of basmati in India was 6616 thousand tonnes in 2013. The share of Haryana in total basmati production was about 43.8 per cent followed by Punjab with 34.7 per cent and Uttar Pradesh with 19.2 per cent. Haryana and Punjab together constituted more than 75 per cent of basmati rice produced in India. It may be noted that production of basmati rice has increased by 32.61 per cent in 2014 over 2013. The highest increase may be observed in Haryana and Punjab. The yield rate of basmati rice was 3944 kgs/ha which rose to 4110 kgs/ha in 2014. It is worth recording that Haryana was leading in productivity.

1.2 Exports of Basmati Rice:

In India, export expansion is widely regarded as a means to attain a higher rate of economic growth. Since 1991, a number of measures have been undertaken to correct the "anti export bias" of previous policy regimes. Export performance of India improved during the post 1991 period. The Foreign Trade Policy for 2004-05 (FTP, 2004) announced in 2004 aimed at doubling India's share in global trade within a fix time frame and using trade policy as an effective instrument of economic growth and employment generation.

Rice is a major export commodity from India. The steady increase in production and growing demand for basmati in the world market has made India an important exporting country in the world. The quantum of basmati exports from India was around 267 thousand tonnes in 1991-92 which rose to 849 thousand tonnes in 2000-01 and increased phenomenally to a record scale of 3145 thousand tonnes in 2011-12. Similarly, the value too rose from around Rs. 499 crore in 1991-92 to Rs. 2155 crore in 2001-02 and further to Rs. 15335 crore in 2011-12 which turns out around 1080 percentage points increase in quantum and 2972 percentage points increase in value. The per unit price also followed the upward trend and rose from Rs. 1873 per qtl in 1991-92 to Rs. 2538 per qtl in 2000-01 and further escalated to Rs. 4876 per qtl in 2011-12.

Table-1.2
Export of Basmati and Non Basmati Rice from India (1991-92 to 2011-12)

Quantity:Thousand tonnes
Value: Rs. Crore
Per Unit Value: Rs/Qtl

	Basmati			Non- Basmati			Total		
Year	Quantity	Value	Per Unit value	Quantity	Value	Per Unit value	Quantity	Value	Per Unit value
1991-92	266.53	499.18	1873	411.94	256.41	622	678.47	755.59	1114
1992-93	324.79	800.64	2465	255.62	174.96	684	580.41	975.6	1681
1993-94	527.23	1061.26	2013	565.19	225.46	399	1092.42	1286.72	1178
1994-95	442.13	865.32	1957	448.5	340.47	759	890.63	1205.79	1354
1995-96	373.31	850.67	2279	5040.7	3717.41	737	5414.01	4568.08	844
1996-97	523.16	1247.64	2385	1989.04	1924.72	968	2512.2	3172.36	1263
1997-98	593.32	1685.62	2841	1795.74	1985.38	1106	2389.06	3671	1537
1998-99	597.79	1876.91	3140	4365.89	4403.85	1009	4963.68	6280.76	1265
1999-00	638.38	1780.34	2789	1257.79	1345.58	1070	1896.17	3125.92	1649
2000-01	849.02	2154.94	2538	682.27	777.26	1139	1531.29	2932.2	1915
2001-02	667.07	1842.77	2762	1541.49	1331.37	864	2208.56	3174.14	1437
2002-03	708.79	2058.47	2904	4259.08	3772.77	886	4967.87	5831.24	1174
2003-04	771.49	1993.05	2583	2640.57	2174.94	824	3412.06	4167.99	1222
2004-05	1163	2823.9	2428	3615.1	3945.02	1091	4778.1	6768.92	1417
2005-06	1166.57	3043.1	2609	2921.6	3178.17	1088	4088.17	6221.27	1522
2006-07	1045.73	2792.81	2671	3702.22	4243.1	1146	4747.95	7035.91	1482
2007-08	1183.36	4344.58	3671	5286.08	7410.03	1402	6469.44	11754.61	1817
2008-09	1556.41	9477.03	6089	931.89	1687.37	1811	2488.3	11164.4	4487
2009-10	2016.87	10889.46	5399	139.54	365.3	2618	2156.41	11254.76	5219
2010-11	2027.62	9781.07	4824	91.759	220.71	2405	2119.379	10001.78	4719
2011-12	3145.225	15335.8	4876	3953.94	22085.84	5586	7099.165	37418.64	5271
CGR(1991-92 to 1999-00)	0.102	0.152	0.045	0.132	0.202	0.06	0.121	0.171	0.045
CGR(1999-00 to 2011-12)	0.128	0.184	0.049	0.127	0.182	0.049	0.127	0.183	0.049
CGR(1991-92 to 2011-12)	0.124	0.180	0.050	0.135	0.199	0.056	0.131	0.187	0.049

Source: Agricultural Statistics at a glance, Custom and DGCIS

The export of non-basmati rice has also picked up substantially in quantum and value over the years. However, one may observe fluctuating trends. India exported 412 thousand tonnes of non-basmati rice in 1991-92. With continuing upward trend, non-basmati exports rose to a record level of approximately 3954 thousand tonnes during 2011-12.

The highest quantum of rice was exported in the year 2007-08. Although, India exported 5286 thousand tonnes of non-basmati rice earning Rs. 7410 crore in this year, the quantum and value dropped in 2008-09 due to the ban imposed by the Government of India on exports of non-basmati rice to build the buffer stocks at the

domestic level. We have calculated compound growth rates of quantity, value and per unit price of basmati rice exported from India. The rate of growth was above 10 per cent per annum for quantity and value in each time period. On the other hand, it was around 5 per cent per year for per unit price irrespective of time period.

Currently, India is one of the leading exporters of basmati rice in the world. Several factors have been responsible for this achievement. Some of these include research efforts in developing suitable varieties, adoption of suitable farm management practices and liberalization of trade policy by the government and the zeal of exporters to establish themselves as reliable and dependable suppliers of basmati and non-basmati rice in the global market. In a nutshell, basmati rice is higher priced in international market than non-basmati rice.

We have also tried to examine the intra-year variability in quantity, value and per unit price of basmati rice exported from India. We have estimated coefficient of variation in these parameters during 2012-13, 2013-14 and 2014-15. Table 1.3 presents information on monthly quantity, value and per qtl price of exports of basmati and non-basmati rice. It may be observed that around 30 per cent of quantity of basmati rice was exported in January, February and March during 2012-13. The months of September and October were found relatively lean months. However, the pattern of exports of basmati rice during 2013-14 deviated and the highest quantity was exported in the month of April followed by June. Next year, around 33 per cent of basmati rice was exported in February and March. The per qtl price of basmati rice in import market increased by 26.25 per cent between 2012-13 and 2014-15. One may observe variations in price per qtl across the months in the year. The coefficient of variation was found highest for value in 2012-13 and 2013-14 and for quantity in 2014-15.

We have also analysed intra year variations in quantity, value and per unit price of non-basmati rice in 2012-13, 2013-14 and 2014-15. Month wise variations in these parameters are a common feature in all these years. It could be observed that the highest quantity of non-basmati rice was exported in the month of December in 2012-13 and in September, 2014-15. The intra year variations could be also observed in value and per unit price realized from the export of non-basmati rice. It may be mentioned that per qtl price of non-basmati realized from exports was higher

in March than other months during 2012-13, July in 2013-14 and September in 2014-15. The estimated coefficient of variation in per qtl price could be observed lower than basmati rice in each analysed year, while it was more than 0.20 in quantity and value. It implies that quantity and value experienced higher variability in comparison to price.

Table-1.3 (a)
Quantity, Value and Per Unit Price of Basmati and Non Basmati Rice Exported from India (2012-13 to 2014-15)

Qty in Thousand Tonne
Value in Rs. Crore

Basmati Rice

	2012-13			2013-14			2014-15		
Month	**Qty**	**Value**	**Per unit price (Rs/ Qtl)**	**Qty**	**Value**	**Per unit price(Rs/ Qtl)**	**Qty**	**Value**	**Per unit price (Rs/ Qtl)**
April	278.80	1241	4451	392.80	2590	6594	285.11	2428	8517
May	322.91	1566	4851	345.19	2417	7003	337.15	2905	8616
June	346.91	1818	5241	378.79	2825	7459	364.64	3082	8452
July	299.99	1641	5471	333.99	2540	7606	233.77	1963	8398
August	248.88	1391	5588	275.84	2130	7722	217.36	1829	8414
Sept	230.43	1327	5757	206.88	1687	8157	203.73	1660	8147
Oct	193.70	1056	5451	180.19	1426	7912	295.15	1946	6592
Nov	207.96	1164	5599	252.29	1903	7541	298.27	2102	7049
Dec	286.55	1718	5996	376.61	3126	8299	382.72	2580	6741
Jan	318.08	1870	5880	345.69	2871	8304	350.32	2276	6497
Feb	335.40	2076	6189	350.09	3005	8582	468.91	2255	4810
March	387.47	2531	6531	319.01	2781	8716	434.99	2404	5526
Total	**3457.08**	**19399**	**5611**	**3757.36**	**29300**	**7798**	**3872.11**	**27429**	**7084**
C.V*	**0.20**	**0.26**	**0.10**	**0.22**	**0.22**	**0.08**	**0.26**	**0.19**	**0.18**

Non Basmati

April	275.27	565	2053	392.94	907	2308	390.78	1015	2598
May	715.88	1514	2115	473.33	1090	2303	425.08	1066	2508
June	593.23	1284	2164	559.85	1372	2451	493.05	1253	2542
July	486.14	988	2033	652.76	1701	2606	535.36	1321	2468
August	467.97	965	2062	708.77	1786	2520	699.34	1731	2475
Sept	451.29	981	2174	790.71	2033	2571	886.44	2410	2718
Oct	644.19	1393	2162	622.47	1585	2546	822.94	2108	2562
Nov	627.78	1379	2197	422.48	1056	2499	726.34	1825	2512
Dec	808.43	1780	2202	663.59	1579	2380	594.62	1477	2485
Jan	551.94	1189	2154	600.33	1517	2527	780.79	1978	2533
Feb	469.22	1040	2216	618.62	1552	2509	647.86	1323	2042
March	557.65	1320	2367	512.69	1314	2563	648.92	1414	2179
Total	**6648.98**	**14399**	**2166**	**7018.53**	**17493**	**2492**	**6354.75**	**16184**	**2547**
C.V*	**0.25**	**0.26**	**0.04**	**0.20**	**0.22**	**0.04**	**0.24**	**0.28**	**0.07**

Source: All India Rice Exporters Association, New Delhi originally from DGCIS,Calcutta
** CV- coefficient of variation*

Table-1.3 (b)
Monthly Percentage Change in Export Price of Basmati Rice from India

Month	2012-13	2013-14	2014-15
April			
May	0.09	0.00	0.01
June	0.08	0.06	-0.02
July	0.04	0.06	-0.01
August	0.02	-0.03	0.00
September	0.03	0.02	-0.03
October	-0.05	-0.01	-0.19
November	0.03	-0.02	0.07
December	0.07	-0.05	-0.04
January	-0.02	0.06	-0.04
February	0.05	-0.01	-0.26
March	0.06	0.02	0.15
Total	**-0.14**	**-0.03**	**0.28**

Table-1.3 (c)

Monthly Percentage Change in Export Price of Non Basmati Rice from India

Month	2012-13	2013-14	2014-15
April			
May	0.03	0.00	-0.03
June	0.02	0.06	0.01
July	-0.06	0.06	-0.03
August	0.01	-0.03	0.00
September	0.05	0.02	0.10
October	-0.01	-0.01	-0.06
November	0.02	-0.02	-0.02
December	0.00	-0.05	-0.01
January	-0.02	0.06	0.02
February	0.03	-0.01	-0.19
March	0.07	0.02	0.07
Total	**-0.09**	**-0.03**	**0.17**

We have already noticed that exports of basmati rice from India increased several folds during the past two decades. India exports basmati rice to a large number of countries but major importers are a few countries. Saudi Arab and Iran with more than 50 per cent share in export are major buyers of Indian basmati rice. Other important importers are United Arab Emirates, Iraq, Kuwait, Yemen Republic, Qutar, United Kingdom, USA and Jordan are next ranking importers. Omen, Netherlands, Australia and Mauritius also import Indian basmati in small quantities. It is important to note that share of Saudi Arab and Iran in total exports increased

Table-1.4
Export of Basmati Basmati from India
(2012-13, 2013-14 & 2014-15)

Qty - '000MT
Value- Rs. Crore
Unit Price -(Rs./qtl)

Country Name	2012-13					2013-14					2014-15				
	Qty	% share	Value	% share	Unit Price	Qty	% share	Value	% share	Unit Price	Qty	% share	Value	% share	Unit Price
Saudi Arab	6811.93	19.69	3659.08	18.85	5372	8261.19	22.01	6717.06	22.93	8131	9669.31	26.12	7260.78	26.31	7509
Iran	10822.19	31.28	6463.50	33.30	5972	14404.54	38.37	10975.71	37.47	7620	9355.68	25.27	6758.97	24.49	7224
U Arab Emts	2346.40	6.78	1311.20	6.76	5588	1479.03	3.94	1185.96	4.05	8018	2786.01	7.53	1929.97	6.99	6927
Iraq	2042.66	5.90	1076.67	5.55	5271	2196.05	5.85	1599.72	5.46	7285	2354.48	6.36	1587.39	5.75	6742
Kuwait	1633.17	4.72	1059.68	5.46	6488	1755.37	4.68	1513.06	5.17	8620	1664.69	4.50	1533.23	5.56	9210
Yemen Republic	1723.50	4.98	878.19	4.52	5095	1468.40	3.91	1107.79	3.78	7544	1743.70	4.71	1201.00	4.35	6888
Qatar	611.88	1.77	403.77	2.08	6599	295.55	0.79	262.21	0.90	8872	1241.15	3.35	1138.38	4.12	9172
U K	1924.35	5.56	849.98	4.38	4417	1188.52	3.17	785.75	2.68	6611	1363.96	3.68	900.13	3.26	6599
U S A	915.44	2.65	561.69	2.89	6136	1033.91	2.75	870.31	2.97	8418	892.23	2.41	805.40	2.92	9027
Jordan	896.45	2.59	441.37	2.27	4924	790.94	2.11	624.09	2.13	7890	618.15	1.67	457.67	1.66	7404
Oman	401.03	1.16	244.36	1.26	6093	431.45	1.15	355.46	1.21	8239	562.64	1.52	422.29	1.53	7506
Netherland	600.59	1.74	288.89	1.49	4810	435.33	1.16	299.02	1.02	6869	522.33	1.41	364.76	1.32	6983
Australia	202.64	0.59	145.39	0.75	7175	232.98	0.62	206.58	0.71	8867	273.13	0.74	254.22	0.92	9308
Mauritius	256.33	0.74	160.04	0.82	6244	264.92	0.71	217.96	0.74	8227	286.90	0.77	234.25	0.85	8165
% Share of Total India's Basmati Export		**90.14**		**90.39**			**91.20**		**91.22**			**90.04**		**90.03**	

Source:

continuously. It was largely due to popularity of PUSA Basmati 1121 in these countries. All these countries together imported around 90 per cent quantity of Indian basmati rice in 2012-13, 2013-14 and 2014-15 (Table-1.4).

An examination of per qtl price realised from exports of basmati rice in different countries (Table-1.4) indicates that it ranged between Rs. 4924 and Rs. 7175 in 2012-13. The price escalated next year during 2013-14 and basmati exports fetched a price of Rs. 8867 per qtl in Australia. Even the lowest price obtained was Rs. 6869 per qtl from Netherland. Next year, 2014-15, presents a mixed pattern in price realization across the importing countries. In five countries, realization from basmati exports increased while in remaining nine countries price declined during 2014-15.

1.3 Literature Survey:

Before setting the objectives for the study, it would be useful to survey literature for understanding the issues in production and marketing of basmati rice. We have divided literature survey into three parts. At first, we present papers exclusively carried out for basmati rice, while, in second and third parts, we concentrate on issues related to rice including exports of rice.

Part-1

Ali and Flinn (1989)[1] in their paper estimated farm-specific profit inefficiency among Basmati rice producers in Pakistan from a variable-coefficient profit frontier. Authors conclude that better use of existing technology provides substantial opportunity to improve the profitability of Basmati rice in Gujranwala district. The mean level of inefficiency in farm resources and price levels was 28 per cent, with a wide range (5-87 per cent). Average loss of profit was Rs 1,222 per hectare. Socio-economic factors related to loss in profit were education, non agricultural employment and credit constraint of selected farm households and institutional determinants of profit loss were water constraint and late application of fertilizer. The Punjab-wide benefits of increasing farmer's profit efficiency are large. A 25 per cent reduction in loss in profit among Basmati rice producers may generate over Rs 240

[1]Mubarik, Ali and John C. Flinn. (1989). Profit Efficiency among Basmati Rice Producers in Pakistan Punjab. *American Journal of Agricultural Economics,* 71 (2): 303-310p.

million extra profits in each rice season. The authors explain the benefits of promoting increased efficiency in Basmati rice production.

Farooq (2001)[2] in his paper looks into supply response of basmati rice in Pakistan. Pakistan's stated policy is to increase basmati rice production through price support measures and liberalization of input markets. This study assesses the scope of price support policy to achieve growth targets. Whether, additional assistance is needed in the form of non-price policy measures. The econometric analysis is based on a profit function using farm household survey data from Punjab, Pakistan for 1995-1996. The results reveal that higher support prices are required to achieve production. Since these price levels may not be feasible, a more appropriate option may involve some inducements to expand paddy area and the area allocated to modern variety.

Brar et al. (2011)[3] based their paper on a field experiment to estimate the economics of basmati rice. The data used for economic analysis of basmati rice-wheat sequence under different methods of crop establishment relate to the years 2005-06 and 2006-07. Results show that the productivity of basmati rice-wheat sequence was significantly higher with TPBR (Transplanted Basmati Rice) than direct seeded basmati rice (DSBR) irrespective of seeding technique of succeeding wheat. Thus, transplanting basmati rice followed by zero tillage or conventional sowing of succeeding wheat was more profitable than direct seeding of basmati rice in basmati rice- wheat sequence.

Sidhu and Kumar (2014)[4] carried out study for the state of Punjab. The main objective of Agricultural Market Intelligence Centres (AMIC) in India is to maintain a balance between demand and supply of any agricultural commodity at a remunerative level for the farmers. The production of higher basmati than demand in

[2] Umar, Farooq; Trevor Young; Noel Russell and Iqbal, Muhammad. (2001). The Supply Response of Basmati Rice Growers in Punjab, Pakistan: price and non-price determinants. *Journal of International Development,* 13(2):227-237p.

[3] Brar, A.S; S.S. Mahal; G.S. Buttar and J.S. Deol. (2011). Water Productivity, Economics and Energetic of Basmati Rice (Oryza Sativa) Wheat (Triticum Aestivum) Under Different Methods of Crop Establishment. *Indian Journal of Agronomy,* 56 (4): 317-320p.

[4] Sidhu, J.S; Jasdev Singh and Raj Kumar. (2014). Role of market intelligence in Agriculture: A success story of basmati cultivation in Punjab. *Indian Journal of Economic Development,* 10 (1a): 26-31p.

India during 2011-12 resulted in crash of prices which made basmati cultivation unviable as compared to non basmati rice. Reacting to this basmati crisis, AMIC, PAU, Ludhiana advised the farmers through both print and electronic media to reduce area under basmati rice in order to match its demand and supply to earn better returns. The basmati growers responded to the AMIC's advice and reduced the area during 2012-13 and earned additional income of 381 crore. The average additional returns were estimated at Rs. 25400 per/ha. along with additional amount of three lakh tonnes of non-basmati rice. Thus, agricultural market intelligence played an important role in increasing the income of basmati growers and helped them in achieving the national objective of providing additional food grains to the society.

Ghani et al. (1993)[5] analyzed growth of rice and agricultural production over the last two decades. It has been due to increased production of food grains. The data used are regional distribution of specialty rice production and processing, crop duration and yield of some aromatic transplanted AMAN varieties for the year 1993. In addition, rice trade of selected rice exporting countries is examined. The authors suggest two options: First is pursuit of a coarse rice export strategy and the second is to diversify production out of coarse rice into diversified array of commodities. The results show that policy restrictions and cumbersome administrative impediments to rice exports should be eliminated in order to encourage exporters and to avoid losing export opportunities to competitors.

Nagaraju et al. (2002)[6] in their study examined an efficient system to establish relation among traditional and evolved basmati and semi dwarf non basmati (NB) rice varieties. The researchers selected three groups of rice; traditional basmati (TB), evolved basmati (EB) and non basmati (NB). The data used were classified in two classes of markers: fluorescence based inter simple sequence repeat (ISSR-PCR) and simple sequence repeat (SSR's). The findings show that fluorescence based ISSR-PCR markers could be clearly resolved on an ABI automated sequencing gel. The TB and EB varieties included in the study represent a major component of the

[5] Ghani, Abdul; Jeffrey C. Metzel and B. Lynn Salinger. (1993). Diversification within Rice: Production Opportunities and Export Prospects of Specialty Rice in Bangladesh. *The Bangladesh Development Studies,* 21(3):111-123p.

[6] Nagaraju, J.; M. Kathirvel; R. Ramesh Kumar; E.A. Siddiq and Seyed E. Hasnain. (2002). Genetic Analysis of Traditional and Evolved Basmati and Non-Basmati Rice Varieties by Using Fluorescence-Based ISSR-PCR and SSR Markers. *The National Academy of Sciences of the United States of America,* 99 (9):5836-5841p.

basmati gene pool of the Indian sub-continent. The markers specific to the TB varieties used in the present study should be further pursued to look for allelic association, thus helping breeders to shorten breeding cycles by rapid incorporation of basmati rice into breeding lines.

Part-2

Zulfiqar et al. (2009)[7] in their paper tried to identify various protection policies and interventions made for Basmati rice economy in Pakistan. It also estimated welfare effects associated with existing protection policies, interventions and implications of WTO's trade liberalisation in domestic economy and abroad. The study concluded that government policy interventions in price regime had lowered during post- WTO period as compared to pre- WTO period. This was evident from relatively narrowing gap between Pakistan's domestic price and export price of former period than that of pre- WTO period. The estimated welfare effects in terms of producers and consumers' surpluses revealed larger producers' gains relative to losses to consumers if trade was liberalised. Trade liberalisation simulations for world market also reflected higher gains to the domestic economy of Pakistan. Therefore, efforts should be geared up for trade liberalisation on global basis. The paper suggests that instead of coddling in State Trading Enterprises (STEs), the government should act as a facilitator of trade as envisaged in the 'Green Box' of Agreement on Agriculture and other WTO agreements. It should concentrate on research, development and out-reach related investments for improvement in productivity and quality of Basmati rice.

Mulik and Crespi (2011)[8] examined the controversy over granting of patent rights to three new strains of Basmati rice by the U.S. Results suggest that the introduction of a competing product that may infringe on India’s geographical indicator has lowered the product differentiation of Indian Basmati rice in key export markets. The study indicated that, residual demand elasticity for Basmati rice in the UK and Kuwait fell after the entry of a competitor in the four markets. RiceTec, who

[7] Zulfiqar, Muhammad; Dilawar Khan; Anwar F Chishti; Munir Khan; Wasiullah; Ajmal Waheed; Muhammad Zakir and Robina Karim. (2009). Trade Liberalisation Could Improve Producers Profitability in Agriculture: A Case of Basmati, Rice. *The Pakistan Development Review,* 48(4):771-782p.

[8] Mulik, Kranti and John M Crespi. (2011). Geographical Indications and the Trade Related Intellectual Property Rights Agreement (TRIPS): A Case Study of Basmati Rice Exports. *Journal of Agricultural & Food Industrial Organization,* 9(4):1-24p.

might have not been able to compete with India has been proactive in trade marking its Basmati variety or had TRIPS been more encompassing of traditional commodities like some countries. The study also states that the TRIPS agreement pertaining to geographical indications (GI) does not offer equal protection to other commodities as it does to wines and spirits. Since, increasing number of countries are involved in similar controversies surrounding protecting their traditional commodities (e.g., Jasmine rice in Thailand or Parmesan cheese in Italy), it is essential to revisit the TRIPS agreement and extend section 23 of the geographical indications to offer additional protection to agricultural commodities.

Ali (1995)[9] in his article investigates constraints in the second-generation Green Revolution by quantifying the causes of resource-use inefficiency and variation in input use in agriculture. A case study was carried out to understand socioeconomic conditions, institutional setting and physical environment in two representative rice-growing villages in Pakistan, Punjab and their role in formulating the farmers' production-related characteristics and farm management practices in the sequence. This study found a significant variation in input level and resource-use efficiency in Basmati rice production. On an average, Basmati rice production could be improved by 30 per cent at the existing level of input use. The differences in access to public infrastructure, socioeconomic conditions, resource-based and biophysical factors affected production by influencing farm management practices and farmers' production-related characteristics. The resource-use inefficiency in Basmati rice production was significantly explained by the institutional and socioeconomic factors that determined farmers' production-related characteristics and farm management practices. However, input use could be enhanced by improving marketing efficiency by removing unnecessary government interventions in input and output markets, providing the necessary physical infrastructure and technical and market information and streamlining the credit procedure. The study points out that researchers and policy makers should work together to improve socioeconomic conditions and institutional functions and develop site-specific technologies in order to improve farm management practices and enhance productivity.

[9] Ali, Mubarik (1995). Institutional and Socioeconomic Constraints on the Second-Generation Green Revolution: A Case Study of Basmati Rice Production in Pakistan's Punjab. *Economic Development and Cultural Change,* 43(4):835-861p

Grover (2012)[10] in his paper studied resource use pattern and economic viability and various biotic and abiotic constraints of basmati rice and non-basmati rice cultivation in Punjab. The study is based on the sample of 200 basmati rice growers spread over five districts of the state during 2008-09.Basmati cultivation saved around 18, 81, 70 and 39 per cent irrigation water, urea, DAP and zinc fertilizers respectively as compared to non-basmati rice crop. Basmati rice promised more returns over variable costs to the tune of Rs. 4562 per hectare over the non-basmati rice. It implies that basmati rice cultivation was both resource conserving as well as remunerative. The regression analysis has brought out that there existed scope to further increase use of human labour, plant population and insecticides/pesticides for improving the yield of basmati rice in the state. The price variability and difficulty to access price related information were the most important marketing problems for basmati rice. Sample farmers wanted the scientists to evolve new dwarf varieties to minimize the water logging losses. Basmati rice yield needs to be enhanced through genetically improved varieties. To encourage the farmers to increase area under basmati rice, the government needs to formulate a policy to ensure adequate support price for basmati rice on the pattern of non-basmati rice.

Aslam (1979)[11] restricts his paper to the European Community which comprises of nine countries and has been one of the most important market for high quality Basmati Rice. The objective of this paper is to examine the possibilities against the backdrop of the Rice Policy formulated by the Commission of the European Community. The rice exports to the E.C from Pakistan started in early sixties and increased from 3000 metric tons in 1961 to 6896 metric tons in 1963 and were mainly to the Benelux countries. The Benelux countries used to apply a zero import duty on their rice imports as compared to 15-27 per cent tariff imposed by other members of the community. The Benelux countries were also free from government control and interventions. However, it can be noticed that Pakistan's rice exports dropped to almost zero and there are 3 factors that explain Pakistan's poor performance between 1964 and 1969. When it comes to future prospects, Pakistan

[10] Grover, D.K. (2012). Basmati Rice Cultivation for Resource Conservation and use Efficiency in Context of Sustainable Agriculture in Punjab, *Indian Journal of Economic Development,* 8 (2):11-26p.

[11] Aslam. (1979). Rice Policy of the European Community and Prospects of Rice Export from Pakistan. *Pakistan Economic and Social Review,* 17(1/2):50-65p.

will have to strive hard to improve her performance in the E.C market. She faced a tough competition from exporters like Burma, U.S.A and Thailand. Pakistan can compete with these exporters by improving the quality and increasing the production of basmati rice which can be done by application of fertilizer, use of HYV seeds and adoption of better farming techniques.

David and Huang (1996)[12] in their paper attempted to explain variations in the level of rice price protection in nine selected Asian countries-Philippines, Indonesia, Thailand, Bangladesh, Pakistan, India, Japan, South Korea and Taiwan from 1960 to 1988 using econometric analysis of the determinants of rice price. The analysis confirmed earlier findings about the importance of economic development and resource endowments in explaining the pattern of agricultural protection. It also revealed the importance of price stabilization as a policy objective and relationship between cost reducing policies (technology generation and input price subsidy) and the rice price policy. An important finding of this study was that policies that reduce the unit cost of production, such as adoption of modern variety and favorable fertilizer pricing policies had lowered rice prices and major beneficiaries of those policies were consumers. The study emphasized that in order to escape from the trap of extreme high-cost protection, newly industrializing countries in South and Southeast Asia need to have foresight and determination in adopting industrial adjustment policies that will accelerate through education and training, shift of resources from rice to high-income-elastic farm products within agriculture and in the non- farm sector.

Sharma and Kumar (2001)[13] examined behavior of the procurement prices of wheat, rice and groundnut. The study focused on relationship between procurement prices and cost of production, farm harvest prices and wholesale prices. The variability in the prices of these selected commodities and the structure of markets were also examined in this study. The data for the study was collected mainly from published sources. Unpublished data on relevant variables were collected from the Ministry of Consumer Affairs, Ministry of Agriculture and Commission for Agricultural

[12] David; C. Cristina and Jikun Huang. (1996). Political Economy of Rice Price Protection in Asia. *Economic Development and Cultural Change,* 44(3):463-483p.

[13] Sharma; Anil and Parmod Kumar. (2001). An analysis of the Price Behavior Of Selected Commodities. *Planningcommission.Gov.In*, GoI

Costs and Prices (CACP). An important finding of the study was that procurement prices of cereals have been consistently fixed at a higher level than recommended by the CACP. The margin between the actual procurement prices and those that are recommended by the CACP was observed to be higher during the 1990s in comparison to the 1980s. The mean excess of the procurement prices actually announced by the government over the cost of cultivation (Cost A2 + family labour) also exhibits substantially higher incentives provided to the producers of cereals during the 1990s in comparison to the 1980s. The examination of price variations showed that there had been acceleration in the rate of growth of the nominal as well as real prices of cereals. This was in sharp contrast to the trends observed during the 1980s, when the real prices of these crops exhibited a significant decline. A comparison in variations of prices of selected commodities showed that price fluctuations were generally higher in the case of coarse cereals, groundnut and groundnut oil as compared to rice and wheat. Among the selected commodities, price variability had been least in the case of rice. The results also indicated that despite significant reduction in inter-year variability of wheat prices during the 1990s, variability within a year had shot up during this period. The study emphasized to focus on all important factors which determine procurement prices. There is hardly any need for raising procurement prices to higher levels.

Sekhar (2008)[14] in his paper attempted to analyze the current global crisis in the availability and prices of rice by drawing upon the long-term developments in the rice market. The world rice market has traditionally been thin, with average traded volume of about 5 per cent of the world rice production between1960-2000. The instability and thinness in the world rice markets were shown to be mainly due to the predominantly precautionary export policies of major exporting countries, which in turn are a result of domestic food security considerations. The instability in the world rice market can be largely attributed to the predominantly precautionary motives of stock- holding by the major exporting countries, which in turn, is linked to the high geographical coincidence of production, consumption and higher levels of poverty in Asia. The study sums up that the world rice market needs a seller of last resort and the possibilities of evolving a global food reserve system or other similar options need to be urgently explored.

[14] Sekhar, C. S. C. (2008). World Rice Crisis: Issues and Options. *Economic and Political Weekly,* 43 (26/27):13-17p.

Dorosh (2008)[15] argues that liberalized international trade provides the best mechanism for stabilizing prices and food supplies in most years, but appropriate contingency policies are needed for years in which international prices are extraordinarily high. More explicit commitments to cereal trade liberalization within South Asia would also promote region-wide food security and help avoid a repetition of supply disruptions that raised food prices sharply in Afghanistan and Bangladesh. The study states that private sector international trade is generally more efficient than either public stocks or public trade in stabilizing prices because competitive private markets can react more quickly to changing market conditions than public institutions. Moreover, private trade often involves lower overall costs (increased economic efficiency) and minimal fiscal costs to the government. In order to verify that private markets for imported grain are working well, margins between import parity (inclusive of taxes) and domestic wholesale prices can be monitored. The study concluded that there is always a possible scenario of complete disruption to trade coinciding with major production shortfalls, but in most years, large stocks are unnecessary and come at a high opportunity cost. South Asia enjoyed success in enhancing food security by promoting agricultural growth (a supply side policy) while promoting equitable growth and, in some countries, using transfer programs to directly increase access to food by poor households (demand side policies). Continuing the past successful policies, including promotion of private sector trade, with flexible adjustments to cope with new risks and contingencies, it is likely to be the best path to enhance food security and reduction in poverty.

Acharya et al.(2012)[16] in their study examined the transmission of prices of rice and wheat from the world markets to the domestic markets, especially to the farm gate during the world food crisis of 2007-08 by using both econometric tools and policy analysis approaches. The study observed that there is integration among geographically dispersed rice wholesale markets. The rice retail markets exhibit the same pattern of integration like wholesale markets. The primary markets of rice showed remarkable degree of integration, though these were geographically

[15] Dorosh, Paul A. (2008). Regional Trade and Food Price Stabilization in South Asia: Policy Responses to The 2007-08 World Price Shocks. *The Pakistan Development Review,* 47(4):803-813p.

[16] Acharya, S.S.; Ramesh Chand; P.S. Birthal; Shiv Kumar and D.S. Negi. (2012). Market Integration and Price Transmission in India: A Case of Rice and Wheat with Special Reference to the World Food Crisis of 2007/08, *www.fao.org*, Rome, Italy.

dispersed. The vertical transmission of rice prices from wholesale to farm gate (primary markets) was quite smooth. There was a long-run equilibrium between wholesale and farm gate prices and farm gate prices move in tandem with wholesale prices. However, speed of adjustment and dynamics of price transmission varied between markets of north and south. No co-integration was observed between domestic and international rice prices. The results of regression of Minimum Support Prices (MSPs) of rice and wheat with international prices also corroborate to earlier observations that high global prices have impacted farm gate prices in India, not directly but through their influence on the decision of the government related to the levels of fixation of guaranteed support prices.

Kurosaki (1996)[17] in his paper empirically examined spatial and inter temporal price relations of grains in Pakistan's Punjab. Investigation on spatial price relations after harvest found that farm-gate prices of wheat were mostly explained by the support price whereas those of Basmati paddy had more unexplained variation. This author suggested that gap was due to a difference in the price support mechanism. In the second empirical investigation, inter temporal price relations and effects of public wheat release on them were examined using wholesale market prices. It was found that wheat prices regularly increased at the rate of storage costs in the first half of a good year, but the price rise was repressed by the government release in the second half in a normal year. Prices were found to be integrated spatially and inter-temporally so that their excess volatility was prevented. Prices in the private channels reflect the ongoing market conditions including government interventions. The relations of these prices need to be analysed comprehensively.

Kumar and Sharma (2003)[18] attempted to check efficiency of regulated markets in Haryana at the macro and micro levels for the paddy crop. Market integration has been used as an indicator of market efficiency. This paper states that regulated markets have helped in reducing many illegal exactions earlier charged by the traders and so have mitigated the handicap experienced by the producers-sellers in their market transactions. These markets have undoubtedly ensured a better

[17] Kurosaki, Takashi. (1996). Government Interventions, Market Integration, and Price Risk in Pakistan's Punjab. *The Pakistan Development Review,* 35(2):129-144p.

[18] Kumar, Parmod; R.K. Sharma. (2003). Spatial Price Integration And Pricing Efficiency At The Farm Level: A Study of Paddy in Haryana. *Indian Journal of Agricultural Economics*, 58(2):201-217p

marketing environment both for the sellers and buyers. As most part of the agricultural produce comes in the ambit of wholesale markets, the major question in the present debate is how efficiently these regulated wholesale markets run their business. The study sets the objectives to document whether: i) liberalization process has improved the efficiency of regulated markets and ii) to see the structural and pricing efficiency across different farm size groups at the farm gate level. Authors analyze market integration among wholesale paddy markets with the help of co-integration and error- correction mechanism (ECM). This is followed by an analysis of market structure and prices at the farm gate level with the help of primary data generated by the household survey of 400 farmers in two districts (Karnal and Kaithal) in Haryana. At the micro level, agricultural markets of both the districts i.e., Karnal and Kaithal appeared to be efficient. As a result, all the farmers sold their produce in the regulated markets. Lack of scientific storage, market intelligence and insufficient institutional credit were the cause of concern as these affected farmers adversely.

Reddy and Sen (2004)[19] conducted their study in the Sone canal command area in the state of Bihar. A sample of 270 farms comprising 207 marginal (< 1 hectare), 31 small (1-2 hectares), 22 semi-medium (2-4 hectares) and 10 medium (4-10 hectares) farms was selected from different locations of the canal command through stratified random sampling method. Data pertaining to the agricultural year 2001- 2002 were collected through personal interview method. The study reveals the existence of technical inefficiency in the production of rice in the study area. Yield of rice can be considerably improved without increasing the level of inputs in the study area if the inefficiency is reduced. Technical inefficiency in the production of rice is negatively related with farm size, education of the farmer, experience, extension contacts, quality land and positively related with age and fragmentation of the land. Caste of the farmer and location of the farm in the canal command do not have any influence on inefficiency. Similarly, number of farm workers in the family does not show any relation with inefficiency. In order to reduce inefficiency in the production of rice and wheat, measures like encouraging co-operative type of farming, land

[19] Reddy, A R and C. Sen. (2004). Technical Inefficiency in Rice Production and Its Relationship with farm-specific socio-economic characteristics. *Indian Journal of Agricultural Economics,* 59(2):259-267p.

consolidation, improving literacy rate, strengthening extension services and providing alternate employment opportunities should be taken up in this area.

Part-3

Dwivedi et al. (2011)[20] carried out an economic analysis of Basmati rice production in three villages namely Chakroi, Gharana and Gharani of C.D. Block of R.S.Pura, district Jammu. Almost all the farmers in these villages grow Basmati Rice on their farms. The study reveals that it is possible to increase production of Basmati Rice in the state and generate more potential for export of the scented crop. Around 0.85 lakh hectare of area is allotted to rice cultivation including both coarse as well as fine rice varieties in these three districts of the state. The area under basmati can be increased further by about 25 per cent by replacement of coarse varieties, which is estimated around 50 thousand hectares. Local basmati and basmati 370 are the most popular varieties grown in the said area. The study examined cost structure and returns of basmati rice on different farm size groups. The per hectare cost of cultivation worked out to Rs. 20914.02 on small farms, Rs. 20960 on medium farms, Rs. 18825 on large farms and Rs. 20233 at the overall level. The net income from basmati rice per hectare was Rs.32451 on small farms, Rs. 29888 on medium farms, Rs. 29505.78 on large farms and Rs. 30608.06 at overall level.

The recent study by Mukesh et al. (2013)[21] focused on the effects of different transplanting dates on yield and quality of basmati rice. Basmati rice is one of the most important agricultural produce when it comes to international trade. India is one of the major exporters of basmati rice accounting for 50-70 per cent of total basmati rice production. A field study was conducted at Rice Research Station, Kaul (Kaithal) of CCS Haryana Agricultural University during the kharif season in 2008 to study effect of transplanting dates on the yield and quality of basmati rice. It could be noticed that interaction effect of dates of transplanting and varieties was found significant in terms of yield. The findings show that tall varieties did not show decline in the yield because of transplanting dates, whereas, dwarf rice varieties showed a

[20] Dwivedi, Sudhakar; M.C. Dwivedi; and Tarunvir Singh. (2011). An Economic Analysis of Basmati Rice Production in Jammu district of Jammu and Kashmir. *Journal of Research, SKUAST-J,* 10 (1):93-99p.

[21] Mukesh; Ishwar Singh; R.K. Pannu; Dasharath Prasad and Asha Ram. (2013). Effects of Different Transplanting Dates on Yield and Quality of Basmati Rice (Oryza Sativa) Varieties. *Indian Journal of Agronomy*, 58 (2): 256- 258p.

decline with a delay in transplantation. It can be seen that delay in planting recorded a higher hulling and milling percentage, better rice recovery when it is compared to 25th July and 10th June planting. The varieties did not differ in hulling and milling percentage, but the recovery was higher in tall varieties than dwarf varieties.

Another paper by Khatkar et al. (2014) [22] tested extent of market co-integration of prices of Paddy among major markets in Haryana, Amritsar and markets of Punjab by using Johansen Granger Causality Test. It also captures speed of adjustment to deviations in long run equilibrium in Paddy markets by using Vector Error Correction Model. India's basmati (aromatic) rice exports crossed a record of two million tonnes (mt) in the last financial year, in the process helping the country to recoup some of the losses suffered because of more than two-year-long ban on non-basmati rice exports. In Haryana, about 40 percent of the total area under rice is allocated to basmati paddy. During 2008-09, area under basmati rice has crossed more than 60 percent of the total area under rice primarily due to popularity of PUSA 1121 under the category of basmati. In value terms, the export of basmati rice has crossed 19,400 crore in the last fiscal against Rs. 9,476 crore achieved during 2008-09. This has gone a long way in wiping off an annual loss of around Rs. 7,000 crore that India suffered because of ban on non-basmati rice exports imposed couple of years ago to check rising local prices.

Chaudhry and Kayani (1991) [23] quantified and discussed implications of implicit taxes in Pakistan's agriculture. The methodology of the paper was confined to calculations of import and export parity prices of major agricultural commodities grown in Pakistan, by comparing them with domestic procurement prices. In the case of IRRI, domestic prices of rice and sugarcane were above the world level in some years of the study period. In the light of relative taxable capacities of agriculture and Pakistan's economy implicit taxes were much higher in agriculture than in other sectors of the economy. The abysmally low agricultural commodity prices and variations across commodities have tended to impair resource-use efficiency in agriculture, reduced growth and employment and accentuated the existing income

[22] Khatkar, R.K.; J.C. Karwasra; V.K. Singh and Jitender Kumar Bhatia. (2014). Market co-integration, price discovery and causation of basmati paddy in Haryana. *Indian Journal Economic Development,* 10 (1a): 38-44p.

[23] Chaudhry, M. Ghaffar; Kayani and Nighat Naheed. (1991). Implicit Taxation of Pakistan's Agriculture: An Analysis of the Commodity and Input Prices. *The Pakistan Development Review,* 30(3):225-242p.

inequalities. These trends are inconsistent with desired goals of economic development, policy of under-pricing of agricultural commodities needs to be abandoned. The paper emphasizes discontinuation of under-pricing of agricultural commodities is likely to release the huge resources for investment currently tied to institutional credit for agriculture.

Iqbal (1993)[24] in his paper states that rice trade was in the private sector prior to the 1970s, but the fall of Dacca in 1971, resulted in the diversion of the rice previously supplied to East Pakistan to the international markets. During this period, worldwide commodity boom led export price of rice to rise more than double in 1973-74 compared to 1972-73. In order to maximize revenue, the government created a huge gap between the international price and the domestic price by restricting exports. As a result ,rice exports declined in 1972-73 and price could not rise up to 1975-76 despite increasing trends in output. The government allowed dealers to sell a quota of Basmati Rice (l/5th of total delivered to the procurement Centres) in local market creating scarcity in the market which dropped procurement price while consumer prices went up. The analysis of effects of Rice Price distortions indicated that main factors resulting in negative transfers to producers had been price support and state trading followed by implicit taxation through overvalued exchange rate. On the other hand, the consumers had been consistent beneficiaries of government intervention.

Samal and Mishra (2003)[25] analyzed benefits accrued to India from rice exports in the post GATT (General Agreement on Tariffs and Trade) period and suggest future strategies to increase the exports of rice. The study is based on data collected from various published sources for the period 1990-91 to 2002-03. Findings reveal that India has increased the exports post World Trade Organization (WTO) of both basmati and non basmati rice in volume and value terms in spite of wide fluctuations in the exports of non basmati rice over the years. The increase in basmati exports was 75 per cent, while that of non basmati rice was 462 per cent in

[24] Iqbal, Nuzhat. (1993). Economic Analysis of the Effects of Rice Price Distortions in Pakistan: 1975-90. *The Pakistan Development Review* 32(4):859-872p.

[25] Samal, P; A.K. Mishra. (2003). GATT Commitments and Rice Exports: Issues for the Indian Rice Sector. *Indian Journal of Agricultural Economics,* 58(3):400-401p.

the quinquennium ending 2002-03 over 1994-95 in value terms. In basmati exports, there is an increasing trend and the exports reached to 8.52 lakh tonnes during 2000-01. The non-basmati export has reached to a record level of 45.41 lakh tonnes during 1995-96. Before the existence of WTO, India used to export maximum quantities of non-parboiled rice in non-basmati categories. Out of the three components of the Agreement on Agriculture, i.e. Market Access, Export Subsidies and Domestic Support, India has benefitted from market access agreement and has expanded its rice exports to 50 countries. The study suggests the following short-term and long-term measures to boost rice exports: (i) fixing the support price of rice by looking into the prevailing international prices, buffer stock position and domestic production scenario; (ii) promoting infrastructure development for storage and handling at ports and godowns; (iii) looking for new rice markets around the globe; and (iv) more public and private funds should be diverted for rice research to break the yield barriers in irrigated ecosystems, development of technologies for japonica rice, organic rice and increase in the yield of unfavorable ecosystems.

Sekhar (2003)[26] attempted to understand implications of agricultural trade liberalization in determining the role of major producers/exporters in world rice markets. The likely implications for India are traced through linkage between domestic and world markets. The paper is based on secondary data. The sample period chosen for the study is 1962-1995 for international sector and 1970-1995 for domestic sector after the green revolution in India. The results indicate that the world markets for rice are mainly influenced by production in the major exporting and importing countries and income levels in the major importing countries. The supply is highly inelastic. The world price of rice appears to move in tandem with that of wheat.

The findings about the Indian sector are a mixture of the expected and the unexpected. The supply response is quite low as established by various empirical studies. Supply and demand functions show expected results. Export supply shows positive response to relative price, although with an insufficient coefficient. Export demand function shows high elasticity with respect to Indian export price relative to that of Thailand and Pakistan. This implies that Indian export price needs to be

[26]. Sekhar, C.S.C. (2003). Agricultural Trade Liberalisation Likely Implications for Rice Sector In India. *Indian Journal of Agricultural Economics*,58(1); 42-63P

competitive vis-s-vis Pakistan and Thailand to grab the export markets for rice, which are likely to be sizeable in the near future.

The suggested policy implications are as under:

1. India must continue to follow the current buffer stock policy to protect its poor consumers from the price shocks resulting from volatility in international grain markets. Efforts should be made to improve the purchasing power of the poor rather than hastily unloading the stocks in the already depressed world markets.

The future increases in demand for cereals have to be met only through yield improvements since the scope for area increase is almost negligible. Therefore, strategies should be devised to improve technology for the dry regions of the country.

2. Public investment in agriculture, particularly in irrigation sector, needs to be stepped up.

India must invest in domestic infrastructure, effective and efficient input and output markets, a more equitable distribution of land and other productive resources. The distribution of benefits will be determined by the distribution of productive assets.

A study by Mallik (2005)[27] shows that India being one of the major exporters of rice in the world tends to confront several policy issues related to exports. In India, increase in export has been considered as a means to attain economic growth. The appreciation of rupee vis-à-vis US dollar raises concerns regarding its adverse consequences on exports. The paper has been divided into four sections; section-1 covers the growth performance of India's exports since 1950-51 while section-2 focuses on exchange rate and observes a positive association between exchange rate and exports. Section-3 of the paper discusses trade policy and its role in the growth. The last section presents the findings of the study and its implications for India's export strategy. The trade policy measures taken in post-1991 period, include removal of quantitative and other restrictions on both exports and imports, reduction of tariffs and simplification of administrative procedures.

[27] Mallik, Jayanta Kumar. (2005). India's Exports: Policy Defeating Exchange Rate Arithmetic. *Economic and Political Weekly*, 40(52):5486-5496p.

Basmati rice has been cultivated in the Indian subcontinent for thousands of years and originates from North India and present day Pakistan. It is one of the important export commodities from India. Basmati rice production in India is spread over the states of Punjab, Haryana, Rajasthan, Jammu & Kashmir, Himachal Pradesh, Delhi, Uttarakhand, Uttar Pradesh and Bihar. The above review of literature reveals that most of the studies focused on analyzing the profit efficiency, institutional and socio economic constraints in rice price protection, role of markets, government interventions, price behavior of basmati rice.

Although, some scholars have worked on market co-integration, price discovery and related issues for the states of Punjab and Haryana, analysis of relationship between different prices like wholesale price, retail price, farm gate price and export price is limited. Despite price being an important component in determining efficiency of agricultural commodities, none of the studies focused on India and covered this relationship in the context of Basmati rice and that too in the major basmati rice growing state of India i.e. Haryana. In this background, it would be useful to carry out a detailed study of relationship between wholesale price, retail price, farm gate price and export price of Basmati rice in the state of Haryana.

1.4 Objectives:

Food security, nutritional security, sustainability and profitability are the main focus of present and future agricultural development. The crop rotation of rice-wheat largely adopted in irrigated areas of Haryana has posed serious challenges in future for sustainability of agriculture in the state. Adoption of basmati in cropping systems could improve productivity and also the agro-eco-systems of the region. Further, irrigation requirements of the area could be reduced through adoption of basmati, thereby reducing pressure on depleting water table. In addition, basmati being a high value crop will help in reducing production risk in mono-cropping and will raise income of the farmers. This study aims to analyze issues related to basmati production, marketing and perceptions of stake holders such as producers, wholesalers, retailers and exporters of basmati rice in Haryana.

The specific objectives of the study are as under:

i) To analyse economics of major basmati varieties grown by the farmers in Haryana.

ii) To study the marketing pattern of basmati producers.
iii) To study divergence among producer price, wholesaler price, retailer price and exporter price of basmati rice.
iv) To analyse perceptions and problems of above stakeholders.

1.5 Study Design and Methodology:

This study is conducted in the state of Haryana. It is based on published and un-published sources of secondary and primary data. The relevant information about the state and districts was obtained from various issues of the Statistical Abstract of Haryana, Government of Haryana, Panchkula. Further, district-wise data on area, production and yield of basmati were obtained from Statistics Department of Haryana. The data on exports of basmati rice were culled from the APEDA website. The Agri-net and FAO websites were also used to collect relevant information. The required preliminary information regarding the selection of blocks and villages was obtained from the district officials. The meetings with the Deputy Director of Agriculture of selected districts were useful and informative. The sampling design for primary survey for study was decided as per the study design provided by the coordinator.

The scope of the study is confined to basmati rice in Haryana. Three districts namely, Kaithal, Jind and Sonipat with highest share of area under basmati rice in Haryana were selected for in-depth study. The selection of respondents is based on multistage sampling design. At the first and second stages, basmati rice producing districts and blocks in these districts were selected. At the third stage, villages were selected on the same criterion. A questionnaire was canvassed to the farmers growing basmati rice. All farm size categories i.e. marginal, small, medium and large were covered in the sample. The number of farm households in each category was decided according to their proportion at the district level. The primary data pertaining to the year 2013-14 were collected from 150 farmers.

The popular basmati varieties grown in Haryana are Pusa Basmati-1121, Pusa Basmati-1509, Pusa Basmati-1, CSR-30, Pusa Basmati-1401, Super, etc. The total basmati area in Haryana was 741 thousand hectares in 2013-14. Out of which, more than 50 per cent of area was devoted to Pusa basmati-1121. The next was Pusa Basmati-1509 covering more than 15 per cent of area. The remaining varieties

covered rest of the area. Considering the importance of Pusa basmati-1121 and Pusa basmati-1509, we have carried out in-depth analysis for these varieties. The reason for higher proportion of area under Pusa-1121 is better crop output and popularity in the export market. It has superior grain length and excellent elongation upon cooking and therefore, it has caught the fancy of the Iranian and other International markets.

In addition, ten wholesalers, ten retailers and seven exporters of basmati rice from the selected districts were surveyed to analyse prices and problems of stakeholders dealing with basmati rice.

1.6 Analytical Framework:

The study has used simple statistical techniques for the analyses of primary and secondary data. For examining variations, coefficient of variation was used to interpret instability in quantity, value and per unit price of basmati rice.

The socio-economic characteristics of sampled farmers were analyzed through tables created by calculation of percentages, averages, etc. The similar simple methods were used for examining cost, returns and profitability of basmati rice on sampled farms. The multiple responses were used to analyze problems of wholesalers, retailers and exporters. The time series secondary data were obtained for quantity, value and per unit price of exports of basmati from India to other countries for the time period 1991-92 to 2011-12. The exports of basmati to major countries were also analysed for 2012-13, 2013-14 and 2014-15.

The study has several limitations. First and foremost, availability of secondary data about basmati rice is inadequate. Even, time series information on area, production and yield of basmati in the major growing states and at the all India level is not available. Further, it is very difficult to obtain required information from exporters since they do not wish to share quantity and price of basmati exported by them to various countries.

1.7 Organization of the Study:

The study is divided into eight chapters. Chapter-1 is introductory and presents an overview of basmati rice in India, objectives of the study, literature survey, research methodology and organization of the study. Chapter-2 deals with main features of selected districts and status of basmati rice in Haryana. Chapter-3 summarizes demographic characteristics and crop pattern of sampled farmers. Chapter-4 is devoted to the empirical findings on economics of basmati cultivation. Chapter-5 presents marketing scenario of basmati rice in Haryana. Chapter-6 is devoted to the price patterns of basmati rice for wholesalers, retailers and exporters. The next chapter examines the perceptions of stakeholders. Final chapter presents summary and conclusions of the study.

Chapter - 2

Basic Indicators of Selected Districts and Status of Basmati Paddy in Haryana

After presenting research methodology adopted for the selection of study area, sampling design, data collection and analytical framework used in the light of specific objectives of the study in Chapter-1, we provide a brief background of the selected districts and status of basmati paddy in terms of area, production and yield in Haryana in this chapter which is divided into two sections. One section is devoted to each aspect

Section-1

Selected Districts

Now, we present main indicators of selected districts for the study. In particular, we have included those indicators which affect development of agriculture.

Sonipat

Sonipat, is an ancient town in the state of Haryana. The district Sonipat comprises of three sub-divisions, namely, Gannaur, Sonipat and Gohana and seven blocks (Gannaur, Sonipat, Rai, Kharkhoda, Gohana, Kathura and Mundlana). The district was carved out of Rohtak and was made a ful fledged district on 22 December 1972. Sonipat with an area of 2,13,080 ha. lies in the south-east of the state of Haryana , north of the Union Territory of Delhi and is bounded by the districts of Rohtak, Jind and Panipat. It shares an inter-state boundary with district Meerut, Uttar Pradesh. The river Yamuna runs along the eastern boundary of the district and separates it from Uttar Pradesh.

The climate of the district Sonipat is dry with an extremely hot summer and a cold winter. The weather becomes comparatively mild during the monsoon period (July to September). The post-monsoon months i.e. October and November constitute a transition period, prior to the onset of winter. The district experiences high humidity during the monsoon period. The period of minimum humidity (less than 20%) is between April and May every year.

According to the Population Census of India, 2011, total population of the district was 14.5 lakh persons. Of this, urban population formed small part and was

4.53 lakh persons. The district is primarily rural in nature and the major economic activity of the workers is agriculture. The rural population of the district was 9.97 lakh persons. The working population of district Sonipat comprised of 27.11% cultivators, 19.45% agricultural labourers and the rest were non-agricultural workers.

Around 53.48% of geographical area is cultivated in Sonipat. The average size of holding is 1.35 ha. Agriculture is well developed in the district due to availability of irrigation facilities which is carried out by tube-wells and canals. Sweet water is available in plenty throughout the district. The percentage of gross area irrigated to total cropped area is 100.00. The same is true for net irrigated area as well. The crop intensity was around 187. The crop pattern in Sonipat was found skewed towards rice and wheat. The yield rate of rice was found above the state level while vice-versa was noticed for wheat. The soil of the district is a good alluvial loam with sufficient moisture and is mostly rausli in texture (Table 2.1).

The infrastructure in the Sonipat district comprises banks, primary agricultural co-operative credit societies and regulated markets. The road length per lakh population was around 98 kms.

Jind

Jind district was an integral part of Kurukshetra in the traditional geographical account. The district lies in the North of Haryana between 29.03' and 29.51' north latitude & 75.53' and 76.47' east longitude. The districts of Panipat, Karnal and Kaithal respectively lie on its east and north-east. Its boundary line on the north forms the inter-state Haryana- Punjab border with Patiala and Sangurar districts of Punjab. In the west and south-west, it has a common boundary with district Hissar and Fatehabad and in its south and south-east lie the districts of Rohtak and Sonipat respectively. The district comprises three sub-divisions: Jind, Narwana and Safidon.

According to the Population Census of India, 2011, Jind had a population of 136,089 persons. The rural population constituted 54 per cent while 46 per cent of population resides in urban areas. The population density was 494 persons per sq. km. The percentage of literate population to total population in Jind was 72.7 per cent which is slightly higher than the state of Haryana. The sex ratio in the district was 870 females per 1000 males.

Out of total geographical area in Jind, net sown area was 49.79 per cent and tube-wells are the main source of irrigation. The net irrigated area constituted 99.2 per cent of the net sown area. The cropping intensity in the district was around 201 per cent and the average size of operational holding was 2.6 ha against 2.25 ha. in Haryana.

The share of gross cropped area under important crops reveals that cereals covered around 75 per cent of GCA. Oil seeds were grown on 0.92 percent of GCA. Cotton occupied sizeable share (13.18 per cent of GCA). The yield rates of cereals were almost the same as the state.

The climate of Jind district is dry, hot in summer and cold in winter. The year is divided into four seasons. The cold season from November to March is followed by hot season which lasts till the onset of the south-west monsoon.

The area of Jind district is irrigated by two canal systems, viz. the Western Yamuna (Jumna) Canal and the Bhakra Canal. These two systems are interlinked by the Narwana and Barwala link canals of the Bhakra Canal system. Infrastructure in Jind district comprises banks, primary agricultural co-operative credit societies and regulated markets. The road length per lakh population was around 67 kms (Table 2.1).

Kaithal

Kaithal is the north eastern district of Haryana state and is located between 29°31':30°12' north latitudes and 76°10:76°42' east longitudes. It is surrounded by Jind, Kurukshetra and Ambala districts of Haryana and Patiala district of Punjab in the north.

The district of Kaithal is under control of Ambala division and administratively, divided into seven development blocks, namely, Kaithal, Pundri, Rajaund and Guhla. There are 277 villages and 253 Panchayats in Kaithal district. It consists of two tehsils, namely Kaithal and Guhla and five sub-tehsils, namely, Pundari, Rajaund, Dhand, Kalayat and Siwan. The name of Kaithal, Pundri, Pharal, Siwan and Kalayat show that the soil of Kaithal has cultural rich heritage.

As per Population Census of India, 2011, total population of the district was 10.74 lakh. The share of rural and urban population was 8.38 lakh (78.03 per cent)

and 2.36 lakh (21.97 per cent), respectively with an average density of 464 persons per sq km. The male and female ratio in the population of the district was 1000:881. Literacy was recorded as 76.64 per cent during 2011.

The Ghaggar and Markanda rivers are important seasonal rivers in the district and flow through the northern part of the district (covering Guhla block) in the west and enters Patiala district of Punjab. The share of net sown area in the total geographical area is 52.89 per cent. Agriculture is well developed in the district since entire net area sown and gross cropped area is irrigated. Canal is the main source of irrigation. The cropping intensity was around 189 and the average size of operational holding was 2.75 ha. in the Kaithal district.

The soil of Kaithal is sandy to sandy loam in texture. The main crops grown in the district are paddy in Kharif and wheat in rabi season followed by some area under American cotton. The farmers also grow moong to meet out their domestic requirement. The yield rates of paddy and wheat were 2901 kg/ha and 5451 kg/ha. during 2011-12. The productivity of paddy was observed below the state level while vice versa is true for wheat.

The climate of Kaithal district can be classified as tropical steppe, semi arid and hot which is primarily dry with hot summer and cold winter except monsoon season when moist air of oceanic origin penetrates into the district. There are four seasons in a year. The hot weather starts from mid March to last week of June followed by monsoon which lasts up to September. The transition period from September to October forms the post-monsoon season. The winter season starts in November and goes up to first week of March.

Agriculture is modernized in Kaithal district as fertilizer consumption was 251 kg/ha. which is higher than the state (220 kg/ha.). The infrastructure comprises of primary agriculture cooperative societies and regulated markets. The district is well connected by road as road length per lakh of population is 170 kms (Table 2.1).

Table-2.1

BASIC INDICATORS OF SELECTED DISTRICTS IN HARYANA

S. No.	Particulars	Sonipat	Jind	Kaithal	Haryana
I	**Population**				
	Population (2011) (lakh)	14.50	13.34	10.74	253.51
	Rural (lakh)	9.97	10.29	8.38	165.09
	% of Rural Population	68.76	77.14	78.03	65.12
	Urban (lakh)	4.53	3.05	2.36	88.42
	% of Urban Population	31.24	22.86	21.97	34.88
	Population Density (per sq. km)	683	494	464	573
	Sex Ratio	853	870	881	877
	Literacy Rate 2011 (percent)	79.12	71.44	69.15	76.64
II	**Workers***				
	Cultivators	27.21	44.02	34.24	27.82
	Agricultural Labourers	19.45	19.5	22.91	17.14
	Agricultural Workers	46.66	63.52	57.15	44.96
	Non-Agricultural Workers	53.34	36.48	42.85	55.04
III	**Area Cultivated and Irrigation**				
	% of Net Area Sown to Geographical Area	53.48	49.79	52.89	54.14
	Average size of Holdings (in ha.) (2011-12)	1.35	2.61	2.75	2.25
	Percentage of Gross Area Irrigated to Total Cropped Area (2010-11)	100	96.9	100.00	87.5
	Percent of Net Irrigated Area to Net Area Sown (2011-12)	100	99.2	100.00	87.4
	Cropping Intensity (%) 2011-12	186.98	200.84	189.05	184.71
IV	**Percentage of GCA under important crops**				
	Rice	29.97	24.02	41.81	19.02
	Jowar	2.37	0	0	1
	Bajra	3.61	5.92	0.26	8.88
	Maize	0.19	0	0.05	0.17
	Wheat	51.36	45.46	45.55	39.01
	Total Cereals	87.5	75.4	88.89	68.08
	Gram	0	0	0.02	1.22
	Mash	0	0	0.05	0.03
	moong	0	0.1	0.18	0.26
	Masur	0	0	0.10	0.06
	Other Pulses	0.66	0	0.00	0.33
	Total Pulses	0.66	0.1	0.35	1.9
	Total Foodgrains	88.16	75.5	89.24	69.98
	Rapeseed and Mustard	0.73	0.92	0.21	8.26
	Total Oilseeds	0.73	0.94	0.21	8.41
	American Cotton	0.25	12.72	2.18	8.99
	Desi Cotton	0	0.46	0.06	0.28
	Cotton	0.25	13.18	2.24	9.27

…..contd. Table-2.1

S. No.	Particulars	Sonipat	Jind	Kaithal	Haryana
V	**Yield Rates(Kg/ha.)**				
	Rice	2407	2582	2901	3044
	Jowar	500	0	0	500
	Bajra	2309	2079	2040	2040
	Maize	2727	0	0	2727
	Wheat	5521	5235	5451	5183
	Total Cereals	4174.2	4149	4200	4096
	Gram	0	0	0	924
	Mash	0	0	450	366
	Moong	450	558	550	486
	Masur	0	1286	1399	893
	Total Pulses	1095	400	143	870
	Total Foodgrains	4151	4143	4196	4010
	Rapeseed and Mustard	1652	1693	1394	1394
	Total Oilseeds	1304	1556	1250	1383
	American Cotton	705	696	796	750
	Desi Cotton	0	425	0	416
	Cotton	705	688	796	739
VI	**Input Use**				
	Fertilizer (kg/ha) (2012-13)	506.32	438.55	475.43	406.5
	Number of Tractors (per 000 ha of NSA) (2012-13)	99.74	59.29	62.43	76.07
VII	**Miscellaneous**				
	No. of Primary Agriculture Cooperative Societies	34	30	35	656
	No. of Banks per lakh population	146	107	133	137
	Total Road Length per lakh Population (2011-12)	98	85	170	107
	No. of Regulated Markets per lakh ha of Net Sown Area (2008-09)	2	3	3	3

Source: Various issues of Statistical Abstract of Haryana, Government of Haryana

Section-2

Area, Production and Yield of Basmati Paddy in Haryana

Diverse agro-climatic conditions in Haryana are conducive for cultivation of alternate rabi and kharif crops including horticultural crops such as vegetables. Since, one third of the state territory falls within the geographical coverage of the National Capital Region, there is a tremendous scope for commercial cultivation of vegetable crops, fruits, flowers, etc. In addition, establishment of agro-processing industries has a good potential. Especially, owing to its proximity to Delhi, there is vast potential for processing of fruits and vegetables.

Table 2.2 indicates percentage of gross cropped area devoted to different crops in Haryana during 1980-81, 1990-91, 2000-01 and 2011-12. The agro-climatic variations in Haryana are large and hence, state is bestowed with a variety of crops. In dry areas of Bhiwani, oilseeds and pulses dominate the crop pattern while in

Karnal wheat and paddy are the main crops. Wheat (27.07 Per cent) followed by bajra (15.92 per cent), gram (12.19 per cent) and rice (8.86 per cent) were the principal crops of the state during 1980-81 (Table 2.2). In addition, cotton was also grown on almost 6 percentage points of gross cropped area. The fact remains that crop pattern in Haryana was dominated by food grains, which occupied 72.54 per cent of GCA in 1980-81. The share of food grains dropped to 70.60 per cent in 2011-12. The proportion of area under wheat and rice increased while bajra has indicated a decline of around 7 per cent. It appeared that traditional crops like pulses lost heavily while wheat and rice gained significantly. Pulses lost area by almost 13 per cent between 1980-81 and 2011-12. This shift could be attributed to expanding irrigation facilities in Haryana. After harvesting wheat and paddy, other crops are generally sown as pure crop or mixed crops. The land unsuitable for main crops is often devoted to other crops. Information presented in Table 2.2 suggests that main crops occupy major share of area and rest of GCA is devoted to other crops.

Table-2.2

Percentage of Gross Cropped Area under Important Crops in Haryana

Year	GCA* ('000 ha.)	Rice	Wheat	Bajra	Maize	Gram	Total Pulses	Other Food Grains	Total Food Grains	Mustard	Cotton	Other Crops
1980-81	5462	8.86	27.07	15.92	1.3	12.19	14.55	4.84	72.54	5.49	5.79	16.18
1990-91	5919	11.17	31.25	10.28	0.58	10.96	12.53	3.1	68.91	8.00	8.29	14.80
2000-01	6115	17.24	38.5	9.94	0.25	2.03	2.56	2.54	71.03	9.08	9.08	13.2
2011-12	6489	19.02	39.01	8.87	0.17	1.22	1.89	1.64	70.60	8.25	9.27	11.88

*Gross Cropped Area
Source: Director of Land Records, Haryana

Having analyzed macro level scenario of acreage allocation in Haryana, we present area, production and yield of basmati at the district level in Table-2.3. It may be observed that Jind, Kaithal and Sonipat are the leading districts in terms of area allocated to basmati rice. These districts together contributed more than 40 per cent in total acreage of the state. The next ranking district with around 11 per cent share in area was Karnal. Panipat, Sirsa, Fatehabad and Hissar also recorded significant area under basmati rice. Further, Kaithal and Jind were also found leading districts in

terms of production. There contribution was 14.81, 14.71 and 11.17 per cent respectively in total production of basmati rice in Haryana. However, these districts were not front runners in terms of productivity. Sirsa followed by Fatehabad indicated much higher yield rate of basmati rice in comparison to other producing districts of the state.

Table – 2.3

Area, production and Yield of Basmati Rice in Haryana during 2013-14

Area: '000 ha
Production: '000 tonnes
Yield:kg/ha.

S.N.	Districts	Area	%	Production	%	Yield
1.	Hissar	39	5.26	103	5.21	2641
2.	Fatehabad	43	5.80	140	7.08	3256
3.	Sirsa	51	6.87	198	10.01	3882
4.	Bhiwani	16	2.16	28	1.42	1750
5.	Rohtak	47	6.33	80	4.04	1702
6.	Jhajjar	21	2.83	44	2.22	2095
7.	Sonipat	90	12.13	221	11.17	2456
8.	Gurgaon	0	0.00	0	0.00	0.00
9.	Mewat	0	0.00	0	0.00	0.00
10.	Faridabad	10	1.35	26	1.31	2600
11.	Karnal	79	10.65	207	10.47	2620
12.	Panipat	57	7.68	146	7.38	2561
13.	Kurukshetra	30	4.04	83	4.20	2767
14.	Kaithal	105	14.15	293	14.81	2790
15.	Ambala	5	0.67	11	0.56	2200
16.	Panchkula	0	0.00	0	0.00	0.00
17.	Yamuna Nagar	17	2.29	51	2.58	3000
18.	Jind	109	14.69	291	14.71	2670
19.	Mahendragarh	0	0.00	0	0.00	0.00
20.	Rewari	0	0.00	0	0.00	0.00
21.	Palwal	23	3.10	56	2.83	2435
	State	742	100.00	1978	100.00	2666

Source: Government of Haryana.

Chapter-3

Demographic Profile and Cropping Pattern of the Sampled Farms

This chapter aims to analyse demographic characteristics, land details and crop pattern of sampled farm households. In fact, issues related to cultivation and marketing of basmati paddy at the micro level considered for analysis in this study are complex and cannot be taken up for investigation in isolation without considering some of the basic characteristics of the sample households. We have included those characteristics that have a definite bearing on basmati production and sale by the farmers.

3.1 Demographic Characteristics:

We begin with analyzing size of family, education of the head of selected farm households and caste composition. These factors play an important role in adoption of technology and area allocation to various crops. The farm households comprised 412 males, 376 females and 431 children at the aggregate level. The highest number of persons could be observed in case of large size households. The average size of family presented in Table 3.1 reveals that average size of family was 8 persons at the aggregate level. The marginal and large farm households indicated higher size of family in comparison to small and medium farm households.

Table-3.1
Population of Sampled Households in Haryana
(Numbers)

FARM SIZE	ADULT			CHILDREN	TOTAL	AVERAGE FAMILY SIZE
	Male	Female	Total			
MARGINAL	45	36	81	40	121	8.6
SMALL	51	46	97	55	152	6.1
MEDIUM	68	61	129	58	187	6.4
LARGE	248	233	481	278	759	9.3
TOTAL	412	376	788	431	1219	8.1

Source: Field Survey

Education is a catalytic factor in attaining efficiency in management of skills and capacity to improve and innovate. Among the selected households, more than half of them attained education upto matric level. Around 5 and 29 per cent heads studied upto primary and high school level. It is depressing to note that 13 per cent

heads at the overall level were illiterate despite implementation of Serve Shiksha Abhiyaan in the state of Haryana. The level of education of heads varied across farm size. In particular, share of illiterate heads was observed equal in large and small categories of households. It may be recorded that the share of head of households attaining education upto higher secondary and college level superseded in medium farm size category.

Table-3.2
Education of the Head of Sampled Households

(No of HHlds)

FARM SIZE	ILLITERATE	PRIMARY	MIDDLE	HIGH SCHOOL	HIGHER	COLLEGE	TOTAL
MARGINAL	1	2	1	3	7	0	14
SMALL	4	0	3	9	8	1	25
MEDIUM	1	0	7	9	6	6	29
LARGE	13	6	9	23	22	9	82
TOTAL	19	8	20	44	43	16	150
% DISTRIBUTION OF EDUCATION OF THE HEAD							
MARGINAL	7	14	7	21	50	0	100
SMALL	16	0	12	36	32	4	100
MEDIUM	3	0	24	31	21	21	100
LARGE	16	7	11	28	27	11	100
TOTAL	13	5	13	29	29	11	100

Source: Ibid

Distribution of Respondents by Caste:

Caste can influence the farmers' decision to grow specific crops. Some castes may be specialized in undertaking specific activities while traditions in some other castes may preclude farmers from undertaking a specific enterprise. In the questionnaire, we had enquired about the caste of respondents. Table-3.3 presents details of the caste of respondents. Most of the respondents belonged to general category followed by OBC at the aggregate level. In marginal and medium farm households, the proportion of general category households was higher than large and small households. The OBC farm households constituted 28 and 24 per cent of small and large households surveyed by us. Thus, more than 70 per cent of surveyed farm households belonged to general category. Only 5.3 per cent were SC households and their proportion was found higher in small category. It may be mentioned that ST category households were non-existent.

Table-3.3
Caste Composition of Sampled Households

(No of HHlds)

FARM SIZE	SC	ST	OBC	OTHERS	TOTAL
MARGINAL	1	0	1	12	14
SMALL	2	0	6	17	25
MEDIUM	1	0	3	25	29
LARGE	4	0	23	55	82
TOTAL	8	0	33	109	150
% DISTRIBUTION OF CASTE COMPOSITION					
MARGINAL	7.1	0.0	7.1	85.7	100
SMALL	8.0	0.0	24.0	68.0	100
MEDIUM	3.4	0	10.3	86.2	100
LARGE	4.9	0.0	28.0	67.1	100
TOTAL	5.3	0.0	22.0	72.7	100

Source: Ibid

3.2 Land Details:

After analyzing demographic features of sample farm households, we will examine status of land resources during the reference year. Land details assume a special significance in rural areas because they determine economic and social status of the farmers. The status of land holdings of sampled households indicates that selected farm households owned 483 hectares of land at the aggregate level. As expected, land owned by large farm households was higher than small and medium farmers. The average size of holding was 4.99 hectares. Clearly, large farm households operated an area of 7.6 hectares per household. Other categories of farm households operated less than 3 hectares of land. In particular, average size of holding of marginal farmers was only 0.56 hectare. Thus, a positive relationship emerged between farm size and land operated by the farm households. An examination of land resources of sampled farmers revealed that all categories of farmers leased in land and it was observed higher in the case of large farmers in comparison to other categories of farmers. Along with the practice of leasing in land among farm households, the practice of leasing out land was also prevalent but was found lower in comparison to leasing in land. The leased out land at the overall level was 37.23 hectares. Once again, large category leased out 34.80 hectares while it

was nil in the case of marginal and small farmers. These results imply that majority of sampled farmers were owner cultivators. A fraction of cultivated land was found leased in. It appeared that the system of leasing out was not popular among the selected farmers (Table 3.4).

Table-3.4
Area Owned, Leased-in, Leased-out and Average Size of Holdings of Sampled Households

(ha.)

FARM SIZE	OWNED	LEASED-IN	LEASED-OUT	NET OPERATED	AVERAGE SIZE OF HOLDINGS
MARGINAL	7.69	0.20	0.00	7.89	0.56
SMALL	28.13	6.58	0.00	34.70	1.39
MEDIUM	62.32	23.51	2.43	83.41	2.88
LARGE	384.86	272.87	34.80	622.93	7.60
TOTAL	483.00	303.16	37.23	748.93	4.99

Source: Ibid

Farm size plays an important role in decision making about the crop pattern, input use and adoption of technology. An examination of per household net operated land on sampled farms in Table 3.4 indicates that it was 4.99 hectares per household at the overall level. Large category farmers operated 7.60 hectares per household while small and medium farmers operated around 1 and 3 hectares of land. Thus, disparities in owning and operating land across the farm size were found sharp and were in favor of large category farm households.

3.3 Status of Irrigation of Land Holdings:

The status of irrigation is an important factor in realizing productivity per unit of land. Table 3.5 reveals that land operated by farmers at the aggregate level was fully irrigated. In particular, land operated by individual category of farm households was also fully irrigated. We had also sought information about sources of irrigation during our survey. It was observed that tube wells are the major source of irrigation. Around 82 per cent of operated land was irrigated by tubewells at the overall level. In case of marginal farmers, entire land was irrigated by tubewells. Canals irrigated

around 4 per cent of land and the proportion of irrigated land by canals was found higher in the case of large farmers in comparison to others. Some farmers combined tubewells and canal for watering their fields. The sources such as tanks are non-existent. Around 13 per cent of area was irrigated by combining canals and tubewells together as a source of irrigation. Except marginal farmers all other categories used canals and tubewells together for the purpose of irrigation but the area irrigated by combined sources ranged between 10.50 and 16.50 per cent of operated land by different categories of farmers.

Table-3.5
Irrigation Details of Sampled Land Holdings

FARM SIZE	IRRIGATED (in ha)					UN-IRRIGATED (in ha)	TOTAL
	Canal	Tubewell	Canal+TW	Others DE	Total		
MARGINAL	0.00	7.89	0.00	0.00	7.89	0.00	7.89
SMALL	0.40	30.66	3.64	0.00	34.70	0.00	34.70
MEDIUM	2.43	65.60	13.76	1.62	83.41	0.00	83.41
LARGE	27.11	508.90	82.86	4.05	622.93	0.00	622.93
TOTAL	29.95	613.05	100.26	5.67	748.93	0.00	748.93
% DISTRIBUTION OF IRRIGATED AREA BY SOURCE							
MARGINAL	0.00	100.00	0.00	0.00	100.00	0.00	100.00
SMALL	1.17	88.34	10.50	0.00	100.00	0.00	100.00
MEDIUM	2.91	78.65	16.50	1.94	100.00	0.00	100.00
LARGE	4.35	81.70	13.30	0.65	100.00	0.00	100.00
TOTAL	4.00	81.86	13.39	0.76	100.00	0.00	100.00

Source: Ibid

3.4 Cropping Pattern:

Crop pattern signifies proportion of cultivated area under different crops at a point of time. Crop pattern of an area depends on soil, water and temperature. There are two important harvests in Haryana and crops are grown primarily in two seasons-kharif and rabi. With adequate availability of irrigation facility, river beds are most suitable for cultivation of summer season crops grown between April to July. Farmers decision to grow a particular crop during a season is mostly based on profitability, resource availability, requirement for domestic consumption, payment in kind and feed for the livestock.

Table-3.6 Cropping Pattern of Sampled Farms

FARM SIZE	STUDY CROP BASMATI-1121	STUDY CROP BASMATI-1509	OTHER BASMATI	NON-BASMATI	WHEAT	BAJRA	MUSTARD	COTTON	MAIZE	OTHER CROPS	TOTAL
AREA SOWN (in ha)											
MARGINAL	6.03	0.40	0.20	0.00	6.88	0	0.08	0.20	0.00	1.17	14.97
SMALL	27.64	1.21	1.32	0.00	32.38	0	0.00	1.42	0.61	2.87	67.44
MEDIUM	55.85	3.56	8.50	4.35	73.49	0	0.00	1.82	0.61	15.05	163.23
LARGE	332.46	31.26	80.84	18.82	530.86	1.82	2.83	43.30	9.11	155.89	1207.18
TOTAL	421.97	36.44	90.85	23.17	643.61	1.82	2.91	46.74	10.32	174.99	1452.83
PERCENTAGE OF TOTAL AREA SOWN											
MARGINAL	40.27	2.70	1.35	0.00	45.95	0.00	0.54	1.35	0.00	7.84	100.00
SMALL	40.98	1.80	1.95	0.00	48.00	0.00	0.00	2.10	0.90	4.26	100.00
MEDIUM	34.21	2.18	5.21	2.67	45.02	0.00	0.00	1.12	0.37	9.22	100.00
LARGE	27.54	2.59	6.70	1.56	43.97	0.15	0.23	3.59	0.75	12.91	100.00
TOTAL	29.04	2.51	6.25	1.59	44.30	0.13	0.20	3.22	0.71	12.04	100.00

Source: Ibid

Since, one of our main objectives is to assess the cost of cultivation and the returns generated from basmati paddy grown by the sampled farmers in kharif reason, it is pertinent to examine crop pattern adopted by the sampled farm households. The information about crop pattern of selected farmers was collected during the survey. These results are presented in Table 3.6 According to the survey, paddy and wheat dominated crop pattern of the sampled farm households at the aggregate level. This result was found uniform for all categories although share of GCA devoted to these crops varied in each farm size. Paddy including basmati and non-basmati shared 39.39 per cent of GCA at the aggregate level. We have already mentioned that we will focus on in-depth study of Pusa Basmati-1121 and Pusa Basmati 1509. It may be observed that percentage of GCA devoted to Basmati 1121 was 29.04 per cent while a lower share of GCA was allotted to Basmati 1509 and other basmati varieties. It may be further noted that 1.59 per cent of GCA was allotted to non-basmati rice. Farm-size variations were large in the allocation of area to basmati varieties. Particularly, small and marginal farmers devoted 41 and 40 per cent of GCA to Basmati 1121. On the other hand, large farmers allocated around 28 per cent of GCA to basmati 1121. In ranking, wheat was recorded as priority crop which received around 44 per cent of GCA at the aggregate level. It is worth noting that none of the surveyed farm household category devoted less than 44 per cent GCA to wheat. Cotton followed by maize and mustard were also grown by the sampled farmers. In particular, 3.22 per cent of GCA was devoted to cotton by farmers at the overall level. Others also allotted at least 1 per cent of GCA to cotton. A summary of results on area allocated to different varieties of basmati by the sampled farmers reveals that share of area devoted to Basmati 1121 + Basmati 1509 of total basmati area was 83.45 per cent of total basmati area at the overall level. In case of marginal farmers it was the maximum i.e, around 97 per cent of total basmati area. Other categories also devoted more than 80 per cent of total basmati area of basmati 1121+1509 during the reference year.

3.5 Area under Different Varieties of Basmati Paddy:

A distribution of area devoted to various basmati varieties by the farmers is depicted in Table-3.8. Results show that around 77 per cent of total basmati area was devoted to Basmati 1121. Specially, marginal and small farmers allotted 91 and 92 per cent of basmati area to this variety. It implies that Basmati 1121 is very

popular among farmers. Further, Basmati 1509 received 6.63 per cent of total basmati area and it was found higher in case of large farm households than other group of households. The sampled farmers also grew basmati muchad and 1.79 per cent of total basmati area was devoted to this variety. It may be noticed that marginal and medium farmers did not grow this variety. In addition to these three varieties of basmati, sampled farmers also devoted around 15 per cent of basmati area to other varieties which include PUSA 1401, PB-1, PB-3, CSR-30, etc. The medium and large farmers devoted relatively higher share of area to these varieties in comparison to marginal and small categories of farmers.

Table-3.7

Area under Study Crops on Sampled Farms

FARM SIZE	AREA UNDER THE STUDY CROPS BASMATI 1121+1509 (ha.)	% SHARE OF AREA
MARGINAL	6.43	1.40
SMALL	28.85	6.29
MEDIUM	59.41	12.96
LARGE	363.72	79.34
TOTAL	458.42	100.00

Source: Ibid

Table-3.8

Variety-wise Area under Basmati Paddy on Sampled Farms

AREA SOWN (ha)					
FARM SIZE	BASMATI 1121	BASMATI 1509	BASMATI MUCHAD	OTHER BASMATI VARIETIES	TOTAL
MARGINAL	6.03	0.40	0.00	0.20	6.64
SMALL	27.64	1.21	0.51	0.81	30.17
MEDIUM	55.85	3.56	0.00	8.50	67.91
LARGE	332.46	31.26	9.31	71.53	444.56
TOTAL	421.97	36.44	9.81	81.04	549.27
PERCENTAGE OF AREA SOWN					
MARGINAL	90.85	6.10	0.00	3.05	100.00
SMALL	91.62	4.02	1.68	2.68	100.00
MEDIUM	82.24	5.24	0.00	12.51	100.00
LARGE	74.78	7.03	2.09	16.09	100.00
TOTAL	76.82	6.63	1.79	14.75	100.00

Other includes Pusa-1401, PB-1, Pb-3, CSR-30, etc. varieties.

Source: Ibid

Chapter-4

Economics of Cultivation of Basmati Paddy in Haryana

Economics or profitability of various crops is the most important determinant of production of agricultural commodities governing the behaviour of producers. In reality, perceptions of profitability derive crop options. Farmers grow crops, which offer the highest returns per unit of their precious resources such as land and expensive inputs. Profitability being a catalytic factor in increasing production of agricultural commodities, it is proposed to analyze related issues such as marketed surplus, cost of cultivation and profitability of Pusa Basmati 1121 and Pusa Basmati 1509 grown in kharif season on the sampled farms in Haryana during 2013-14.

In this chapter, analysis of gross and net returns from cultivation of selected crops is based on data collected during the field survey in selected three districts of Haryana. The discussion is confined to above mentioned two varieties of basmati paddy in kharif season. Further, net returns from these selected varieties of Basmati paddy are computed. The variable costs constituted human labour (hired and family), machine labour, seed, fertilizer, plant protection, manure and irrigation. We have also included cost on storage, transportation and marketing. The net returns for each crop were worked out by subtracting costs from gross returns. Gross returns for these crops were calculated on the basis of the value of the main product and by product. It may be mentioned that net returns and profitability are used interchangeably in the analysis.

Now, we present results of primary data on various aspects related to basmati paddy grown on sampled farms during the year 2013-14. Specifically, empirical findings on marketed surplus, cost of cultivation and economics of production are discussed in the following sections.

4.1 Area, Production, Consumption and Marketed Surplus:

In the preceding chapter, we have discussed crop pattern and area under to different varieties of basmati paddy on the sampled farms during 2013-14. The proportion of produce available as marketed surplus for disposal in the market depends on the level of production and retention. Normally, farmers retain a part of output for consumption of family, seed requirement, animal feed and other purposes.

The pattern of area, production, consumption, retention for future use, wastage, quantity sold and price realized from the sale of Pusa Basmati 1121 is presented in Table-4.1. It may be noticed that sampled farmers devoted around 422 hectares to this crop and produced 17017 qtls. Out of total produce, they consumed 295 qtls. and retained around 90 qtls. for future use. They also incurred wastage of approximately 104 qtls of basmati production. The remaining produce of 16529 qtls was disposed off in the market. They realized a price of Rs 3607 per qtl after selling the produce. As expected, production, consumption and retention for future use were several times higher in case of large farmers when compared to marginal and small farmers. It may be noticed that marginal farmers disposed 232 qtls of Pusa Basmati 1121 but the price realized by them was higher than other categories. It could be due to better quality of their produce. The per farm results suggest that average quantity sold was 110 qtls. Each sampled farmer retained 1.97 qtls for domestic consumption and 0.60 qtl for future use.

Table-4.1

Production, Consumption and Other Details of Basmati 1121 on Sampled Farms in Haryana

Farm Size	No. of HHs	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage (qtls)	Sold (qtls)	Price (Rs/qtl)
MARGINAL	14	6.03	254	18.7	1.7	1.3	232	3824
SMALL	25	27.64	1028	31.25	6.75	1.9	988	3511
MEDIUM	29	55.85	2157	51.85	4.7	19.55	2081	3627
LARGE	82	332.46	13579	193.3	76.6	81.7	13228	3608
TOTAL	150	421.97	17017	295.1	89.75	104.45	16529	3607

Per Farm

Farm Size	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage (qtls)	Sold (qtls)
MARGINAL	0.43	18.11	1.34	0.12	0.09	16.56
SMALL	1.11	41.12	1.25	0.27	0.08	39.52
MEDIUM	1.93	74.38	1.79	0.16	0.67	71.76
LARGE	4.05	165.59	2.36	0.93	1.00	161.32
TOTAL	2.81	113.45	1.97	0.60	0.70	110.20

Source: Field Survey

Table-4.2

Production, Consumption and Other Details of Basmati 1509 on Sampled Farms

Farm Size	No. of HHs	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage	Sold (qtls)	Price (Rs/qtl)
MARGINAL	1	0.40	16	0.3	0.25	0	15	3200
SMALL	1	1.21	66	1	0.5	0	65	2900
MEDIUM	3	3.56	134	3	2	0	129	3567
LARGE	19	31.26	1365	25.5	13	3.25	1324	3357
TOTAL	24	36.44	1581	29.8	15.75	3.25	1532	3354

Per Farm

Farm Size	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage (qtls)	Sold (qtls)
MARGINAL	0.40	16.00	0.30	0.25	0.00	15.45
SMALL	1.21	66.00	1.00	0.50	0.00	64.50
MEDIUM	1.19	44.67	1.00	0.67	0.00	43.00
LARGE	1.65	71.86	1.34	0.68	0.17	69.66
TOTAL	1.52	65.89	1.24	0.66	0.14	63.85

Source: ibid

Next, we discuss area, production, consumption and related factors for Pusa Basmati 1509 on sampled farms during the reference year. Table 4.2 suggests that sampled farmers produced 1581 qtls of Basmati 1509 which resulted in per farm production of 65.89 qtls. On an average, they retained 1.24 qtls for domestic consumption and 0.66 qtl for future use. A marginal quantity of 0.14 qtl per farm was wasted in the process. The remaining quantity of 63.85 qtls of Basmati 1509 per farm was disposed in the market. It may be pointed out that each category of farmers retained a part of produce for self consumption. One may observe class disparities in the production as well as in the consumption. The marginal farmers sold only 15.45 qtls per farm against 69.66 qtls by the large farmers. This result is on the expected lines.

It would be useful to combine basmati 1121 and basmati 1509 for examining the overall scenario. This information is presented in Table 4.3. The sampled farmers allocated an area of 458 hectares and produced 18599 qtls during the reference year. The per farm area under these varieties was 3.06 hectares and production was

123.99 qtls. Each household retained 2.17 qtls for domestic consumption and stocked 0.70 qtls for future use. A small wastage of 0.72 qtl per farm was recorded. After retaining a part of produce for consumption and future use and accounting for wastage, each farmer sold around 120 qtls of this high value grain in the market. The farm size variations were significant. The large farm category sold 177 qtls per farm against around 18 qtls by marginal and 42 qtls by small farmers during 2013-14.

Table-4.3

Production, Consumption and Other Details of Basmati 1121 & Basmati 1509 on Sampled Farms

Farm Size	No. of HHs	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage	Sold (qtls)	Price (Rs/qtl)
MARGINAL	14	6.43	270	19.00	1.95	1.30	247	3785
SMALL	25	28.85	1094	32.25	7.25	1.90	1053	3474
MEDIUM	29	59.41	2291	54.85	6.70	19.55	2210	3624
LARGE	82	363.72	14944	218.80	89.60	84.95	14552	3585
TOTAL	150	458.42	18599	324.90	105.50	107.70	18062	3586

Per farm

Farm Size	Area (ha)	Production (qtls)	Consumption (qtls)	Retained / stocked for future use(qtls)	Wastage (qtls)	Sold (qtls)
MARGINAL	0.46	19.25	1.36	0.14	0.09	17.66
SMALL	1.15	43.76	1.29	0.29	0.08	42.10
MEDIUM	2.05	79.00	1.89	0.23	0.67	76.21
LARGE	4.44	182.24	2.67	1.09	1.04	177.46
TOTAL	3.06	123.99	2.17	0.70	0.72	120.41

Source: ibid

4.2 Cost of Cultivation:

The utilization of HYV seeds, fertilizer, pesticides, tractor and tube wells play an important role in boosting the agricultural development of a region. Haryana is using these inputs for a long time. The consumption of fertilizer in the state was 386 kg./ha. during 2010-11. The nitrogenous fertilizers were preferred over phosphatic and potassic fertilizer. The state of Haryana has already moved towards agricultural mechanization. Use of tractors, tube wells and pumping sets is common in the state. It may be pointed out that Haryana is ahead of other states in the production as well as distribution of high yielding variety seeds. These were used on 98.5, 66.7 and 97.6 per cent of cultivated area in case of wheat, rice and bajra, while for maize, it was 70.0 per cent during 2009-10.

Table-4.4

Cost of Production Details of Basmati 1121 on Sampled Farms

	Marginal	Small	Medium	Large	Total
Input cost (Rs)					
Seed	8000	31725	68415	322131	430271
Irrigation	19770	63325	122700	634190	839985
Manure & Fertilizer	36775	165109	355458.5	1951304	2508646
Labour (bullock+manual)	114825	516605	1095550	6238520	7965500
Machinery hired/owned (charges)	31720	157350	284700	1294336	1768106
Pesticides/ Weedicides	29100	175750	351500	1613090	2169440
Any other cost (specify)	0	0	1000	0	1000
I) Input cost (Rs)	240190	1109864	2279323.5	12053571	15682948
Area (ha.)	6.03	27.64	55.85	332.46	421.97
Storage, transportation & marketing Cost (Rs)					
Storage	701	2902	9988	48849	62440
Transportation	7964	35875	67144	388555	499538
Marketing and other (market fees, cess, if any, etc.) costs	16071	48279	69987	436647	570984
Any other cost (specify)					
II) Storage, and marketing cost (Rs)	24737	87056	147119	874051	1132962
Production (qtl)	254	1028	2157	13579	17017
TOTAL COST (I+II)	264927	1196920	2426443	12927621	16815910

per ha

Input cost (Rs/ha)					
Seed	1327	1148	1225	969	1020
Irrigation	3279	2291	2197	1908	1991
Manure & Fertilizer	6099	5973	6365	5869	5945
Labour (bullock+manual)	19042	18690	19617	18765	18877
Machinery hired/owned (charges)	5260	5693	5098	3893	4190
Pesticides/ Weedicides	4826	6358	6294	4852	5141
Any other cost (specify)	0	0	18	0	2
I) Input cost (Rs)	39833	40153	40813	36256	37166
Area	6.03	27.64	55.85	332.46	421.97
Storage, transportation & marketing Cost (Rs/ha)					
Storage	116	105	179	147	148
Transportation	1321	1298	1202	1169	1184
Marketing and other (market fees, cess, if any, etc) costs	2665	1747	1253	1313	1353
Any other cost (specify)					
II) Storage and marketing cost (Rs)	4102	3150	2634	2629	2685
Production (qtls)	42	37	39	41	40
TOTAL COST (I+II)	43935	43303	43447	38885	39850

Source: Ibid

We begin with paddy which is the most important among kharif crops in Haryana. It is also one of the key crops grown world over and central to the lives of billions of people in the world. Around 9 per cent of arable land of the world is devoted to this single crop. Asia accounts for over 90 per cent of the world's production with India, China and Indonesia as the major producers. However, a small proportion of production is traded in the world market. India is one of the major exporters of rice in the world. It can be grown under diverse conditions but requires a lot of irrigation. The varieties of rice are short, medium or long grain, aromatic, waxy (sticky) or non-waxy.

With this brief introduction, we analyze cost of cultivation of basmati paddy 1121 and basmati 1509 during the reference year. As a part of cost, we have also included storage, transportation and marketing cess, etc.

We have provided details of cost of cultivation of basmati-1121 in Table- 4.4 .The per hectare cost of the basmati 1121 cultivation was Rs 39850 at the aggregate level. Evidently, maximum proportion of cost was incurred on human labour followed by fertilizer including manure and pesticides. These items constituted 47.37, 14.91 and 12.90 per cent of total cost of cultivation of basmati-1121. The share of these items in total cost was more than 75 per cent. In the array, expenditure on irrigation was the next item of the cost and constituted approximately 5 per cent of total cost.

The sampled farmers also incurred Rs 148 and Rs 1184 per hectare as a cost of storage and transportation. Food grains including paddy are bulky in nature and require higher space both in storage and transportation. This causes relatively higher cost of storage and transportation per unit of produce. Often, higher cost of transportation restricts the movement from surplus to deficit areas. This also results in lower price of the produce in growing states and higher price in the deficit states. Owing to these reasons, marginal and small farmers sell their produce immediately after the harvest and realize low price due to higher supply in the harvesting months.

Table-4.5

Cost of Production Details of Basmati 1509 on Sampled Farms

	Marginal	Small	Medium	Large	Total
Input cost (Rs)					
Seed	360	1350	4194	36258	42162
Irrigation	700	2220	6390	61165	70475
Manure & Fertilizer	1945	5820	17305	165041	190111
Labour (bullock+manual)	6300	17400	50420	449050	523170
Machinery hired/owned (charges)	2000	6000	14960	132750	155710
Pesticides/ Weedicides	1500	4800	12000	122025	140325
Any other cost (specify)	0	0	0	0	0
I) Input cost (Rs)	12805	37590	105269	966289	1121953
Area (ha.)	0.40	1.21	3.56	31.26	36.44
Storage, transportation & marketing Cost (Rs)					
Storage	0	0	620	2225	2845
Transportation	1280	1980	3478	51962	58700
Marketing and other (market fees, cess, if any, etc) costs	1024	3828	9564	87704	102120
Any other cost (specify)					
II) Storage, marketing and cost (Rs)	2304	5808	13662	141891	163665
Production (qtl)	16	66	134	1365	1581
TOTAL COST (I+II)	15109	43398	118931	1108179	1285618
	per ha				
Input cost (Rs/ha)					
Seed	890	1112	1178	1160	1157
Irrigation	1730	1829	1794	1956	1934
Manure & Fertilizer	4806	4794	4859	5279	5217
Labour (bullock+manual)	15567	14332	14158	14364	14356
Machinery hired/owned (charges)	4942	4942	4201	4246	4273
Pesticides/ Weedicides	3707	3954	3370	3903	3851
Any other cost (specify)	0	0	0	0	0
I) Input cost (Rs)	31641	30962	29559	30909	30787
Area	0.40	1.21	3.56	31.26	36.44
Storage, transportation & marketing Cost (Rs/ha)					
Storage	0	0	174	71	78
Transportation	3163	1631	977	1662	1611
Marketing and other (market fees, cess, if any, etc) costs	2530	3153	2686	2805	2802
Any other cost (specify)					
II) Storage and marketing cost (Rs)	5693	4784	3836	4539	4491
Production (qtls)	40	54	38	44	43
TOTAL COST (I+II)	37334	35745	33395	35447	35278

Source: Ibid

The surveyed farmers spent Rs 2685 per hectare on storage, transportation and marketing cost. It may be noticed that cost of cultivation of Basmati 1121 varied across the farm sizes. In case of human labour, small farmers incurred lower cost in comparison to other categories. Surprisingly, cost of human labour per hectare on marginal farms was higher than the large farms. Also, cost of cultivation of basmati paddy 1121 could be observed maximum on marginal farms. It was largely due to higher expenditure on irrigation and some other items.

The information related to expenditure incurred by the growers of Pusa Basmati 1509 on various inputs used by them and associated cost in terms of storage, transportation and marketing cost is presented in Table 4.5. Clearly, cost of cultivation of this variety on sampled farms at the aggregate level was Rs. 35278per hectare during the reference year. It may be observed that cost of cultivation of Basmati 1509 was lower in comparison to Basmati 1121. Like Basmati 1121, marginal farmers incurred higher cost per hectare in comparison to other categories. The expenditure on human labour was the highest irrespective of farm category. In case of marginal farmers, around 42 percent of the cost was spent on this item alone. Other categories of farmers also incurred around 40 per cent of total cost on human labour. The high cost of human labour was due to shortage which resulted in higher wages in turn increasing the cost on this item. Further, cost of fertilizer and machinery were other major items which constituted sizeable proportion of the total cost. None of the farm categories spent less than Rs. 4000 per hectare on these items. We could not find a clear cut advantage of family labour on marginal and small farms. The expenditure on pesticides and weedicides ranged between Rs 3370 and Rs 3954 per hectare. All these input items constituted around 87 per cent of total cost of cultivation at the overall level. The remaining 13 per cent of cost was incurred on storage, transport and marketing.

The combined results of basmati 1121 and 1509 on cost of cultivation are presented in Table 4.6. The per hectare cost of cultivation was Rs 39485 at the aggregate level during the reference year. Like separate results of basmati 1121 and basmati 1509, marginal farmers incurred higher cost in comparison to other categories of farmers. Among the included items, human labour, fertilizer and pesticides constituted 46.90, 14.91 and 12.76 per cent of the total cost.

Table-4.6

Cost of Production Details of Basmati 1121 & Basmati 1509 on Sampled Farms

	Marginal	Small	Medium	Large	Total
Input cost (Rs)					
Seed	8360	33075	72609	358389	472433
Irrigation	20470	65545	129090	695355	910460
Manure & Fertilizer	38720	170929	372764	2116345	2698757
Labour (bullock+manual)	121125	534005	1145970	6687570	8488670
Machinery hired/owned (charges)	33720	163350	299660	1427086	1923816
Pesticides/ Weedicides	30600	180550	363500	1735115	2309765
Any other cost (specify)	0	0	1000	0	1000
I) Input cost (Rs)	252995	1147454	2383593	13019859	16803901
Area (ha.)	6.43	28.85	59.41	363.72	458.42
Storage, transportation & marketing Cost (Rs)					
Storage	701	2902	10608	51074	65285
Transportation	9244	37855	70623	440517	558238
Marketing and other (market fees, cess, if any, etc) costs	17095	52107	79551	524351	673103
Any other cost (specify)	0	0	0	0	0
II) Storage and marketing cost (Rs)	27041	92864	160782	1015941	1296627
Production (qtls)	270	1094	2291	14944	18599
TOTAL COST (I+II)	280036	1240318	2544374	14035800	18100528

per ha.

Input costs (Rs/ha)					
Seed	1299	1146	1222	985	1031
Irrigation	3181	2272	2173	1912	1986
Manure & Fertilizer	6017	5924	6275	5819	5887
Labour (bullock+manual)	18824	18507	19289	18387	18517
Machinery hired/owned (charges)	5240	5661	5044	3924	4197
Pesticides/ Weedicides	4756	6257	6119	4770	5039
Any other cost (specify)	0	0	17	0	2
I) Input cost (Rs)	39318	39767	40122	35796	36656
Area	6.43	28.85	59.41	363.72	458.42
Storage, transportation & marketing Cost (Rs/ha)					
Storage	109	101	179	140	142
Transportation	1437	1312	1189	1211	1218
Marketing and other (market fees, cess, if any, etc) costs	2657	1806	1339	1442	1468
Any other cost (specify)					
II) Storage and Marketing cost (Rs)	4202	3218	2706	2793	2828
Production (qtls)	42	38	39	41	41
TOTAL COST (I+II)	43520	42985	42828	38590	39485

Source: Ibid

Thus, these three items alone formed around 75 per cent of cost. The next item was machinery with an expenditure of Rs 4197 (10.63%). The expenditure on these four items across farm size ranged between Rs 4197 and Rs 19289. The cost of human labour was high due to shortage and escalating wages. In addition to cost of inputs, sampled farmers spent on storage, transportation and marketing. All these associated costs together formed around 7 per cent of the total cost. Farm size variations are a common phenomenon in the expenditure incurred by the sampled farmers on various items in cultivation of basmati paddy. Surprisingly, cost of several items on marginal and small farms was higher than the overall level.

4.3 Economics of Basmati Paddy Cultivation:

Having analysed cost of Basmati 1121 and Basmati 1509 cultivation, we now discuss economics of cultivation on the sampled farms during the reference year. Table 4.7 presents area, production, prices realized by the producers, gross returns, total cost, net returns per hectare and per qtl and per farm value of marketed surplus of Basmati 1121. One may notice from Table 4.7 that per hectare yield of basmati 1121 on sampled farms was 40 qtls. Clearly, marginal farmers grew higher quantity per unit of land in comparison to other categories. The sampled farmers realized a price of Rs 3607 per qtl during 2013-14. Evidently, marginal farmers received higher price in comparison to other categories of the farmers. The gross and net returns per hectare from cultivation of basmati 1121 were Rs 148754 and Rs.108903 respectively. Like per unit price, marginal farmers reaped higher gross and net returns per hectare. Further, wide variations may be noticed in the gross returns and net returns per qtl from cultivation of basmati 1121 during 2013-14. Obviously, marginal farmers emerged greater beneficiaries than other categories of surveyed farmers. The value of marketed surplus disposed off by the farmers was Rs 397672 per farm during the reference year. Since, production of large farmers was higher than other categories; their marketed surplus was also recorded maximum. As expected, large group followed by medium farmers indicated higher marketed surplus in comparison to small and marginal farmers who allocated low area to basmati 1121 due to tiny pieces of their land holdings. This implies that marketed surplus of basmati 1121 is primarily concentrated in the hands of large land owning class who constitute low proportion in number.

Table 4.8 presents the status of gross and net returns per hectare and per qtl, marketed surplus and price realized by sampled farmers from the sale of basmati 1509 during 2013-14. At the overall level, sampled farmers produced 1581 qtls from an area of 36.44 hectares. The per qtl price realized by the farmers from the sale of basmati 1509 was Rs 3354 at the aggregate level. Evidently, price received by the medium farmers was higher than other categories. The gross and net returns per hectare from cultivation of basmati 1509 worked out Rs 148847 and Rs 113569 respectively. We could not ascertain any relationship between returns per hectare and farm size. However, these could be noticed maximum on small farms. Further, an examination of gross and net returns per qtl from cultivation of basmati 1509 at the overall level were computed Rs 3430 and Rs 2617 respectively during 2013-14. The medium category of farmers could reap higher returns in comparison to other categories. The value of marketed surplus per farm was Rs 214169 at the aggregate level. As expected, it was much higher on large farms in comparison to other categories of surveyed farms.

Finally, we present economics, returns and marketed surplus on the sampled farms by combining the results of basmati 1121 and basmati 1509 during the reference year. Table 4.9 points out that surveyed farmers produced 18599 qtls from an area of 458.42 hectares. Evidently, production on large farms was higher than other farm categories due to allocation of higher acreage. The gross and net returns per hectare from cultivation were estimated Rs 148761 and Rs 109276 respectively. It is worth mentioning that returns per hectare were found highest on marginal farms. The per qtl gross and net returns also followed the same pattern. As a result, these were also maximum on the marginal farms. The per qtl gross and net returns were worked out Rs 3667 and Rs 2693 respectively. The value of marketed surplus was Rs 64422232 at the overall level. The share of marginal, small, medium and large category farms was 1.44, 5.55, 12.43 and 80.48 per cent respectively. Evidently, large category farmers emerged as a dominant group due to concentration of land in their hands.

Table-4.7

PROFITABILITY OF Basmati 1121, 1509 and Basmati 1121+1509 On Sampled Farms

Farm Size	Area (ha)	Production (qtl)	Price received on sale (Rs)	GROSS RETURNS (Rs)	TOTAL COSTS (Rs)	NET RETURNS (Rs)	GROSS RETURNS PER HA (Rs)	NET RETURNS PER HA (Rs)	GROSS RETURNS PER QTL (Rs)	NET RETURNS PER QTL (Rs)	VALUE OF MARKETED SURPLUS (Rs)	VALUE OF MARKETED SURPLUS Rs./Farm
Basmati 1121												
MARGINAL	6.03	254	3824	989919	264927	724992	164167	120232	3905	2860	886347	63310
SMALL	27.64	1028	3511	3714250	1196920	2517330	134376	91074	3613	2449	3468905	138756
MEDIUM	55.85	2157	3627	8007002	2426443	5580559	143372	99924	3712	2587	7540879	260030
LARGE	332.46	13579	3608	50059191	12927621	37131569	150574	111689	3687	2735	47754688	582374
TOTAL	421.97	17017	3607	62770361	16815910	45954451	148754	108903	3689	2700	59650818	397672
Basmati 1509												
MARGINAL	0.40	16	3200	52480	15109	37371	129678	92344	3280	2336	49440	49440
SMALL	1.21	66	2900	196680	43398	153282	161999	126253	2980	2322	187050	187050
MEDIUM	3.56	134	3567	486920	118931	367989	136725	103330	3634	2746	458400	152800
LARGE	31.26	1365	3357	4688295	1108179	3580116	149965	114517	3434	2622	4445170	233956
TOTAL	36.44	1581	3354	5424375	1285618	4138757	148847	113569	3430	2617	5140060	214169
Basmati 1121 + 1509												
MARGINAL	6.43	270	3749	1042399	280036	762363	161998	118478	3868	2829	926937	
SMALL	28.85	1094	3402	3910930	1240318	2670612	135539	92554	3575	2441	3580980	
MEDIUM	59.41	2291	3625	8493922	2544374	5949548	142973	100145	3708	2597	8011238	
LARGE	363.72	14944	3563	54747486	14035800	40711685	150521	111932	3664	2724	51851075	
TOTAL	458.42	18599	3567	68194736	18100528	50094208	148761	109276	3667	2693	64422232	

Source: ibid

Chapter-5

Marketing of Basmati Produce

Introduction:

During the 1960s and 1970's, India's agricultural policy was framed with the objective of attaining food security and price stability. These policies were based on controls on marketing, pricing, storage, transport, and quantitative restrictions on trade. As a result of public investment in the agricultural sector, spurred by "The Green Revolution" of the 1960s, agriculture grew by over 4 percent per annum in the 1970s and 1980s. This rate, however, was not sustainable. A slowdown in public investment, low yield growth and environmental problems including declining water table led to lower agricultural performance in the 1990s. During this period, domestic economic reforms and the WTO Agreement on agriculture constituted two important policy changes. The impact of the economic reforms was indirect by raising per capita income which led to change in food consumption pattern. The WTO Agreement brought some tariff reforms through liberalizing agricultural trade through removal of quantitative restrictions on imports. India's focus on liberalizing agricultural trade is partially set out in the Tenth Five Year Plan (2002-07). The strategy to raise agricultural output included increasing crop intensity, adoption of modern technology to increase productivity and diversification of cropping pattern.

India has an Agricultural Produce Market Regulation Act (APMRA) in which every regulated market has a market committee where farmers, traders, commission agents, local bodies and the state government are represented. Prices are fixed through an open auction in a transparent manner in front of an official of the auction committee. The main criticism of regulated markets is that they do not reduce the long chain of intermediaries between the farmer and the consumer, which adds to the cost of agricultural commodities for consumers on the one hand and decreases returns for farmers on the other.

5.1 Status of Regulated Markets in Haryana:

The Royal Commission on Agriculture (1928) pointed out that there was no common yardstick to measure the quality of produce, the weights and measures were un-standardized and the private market operators exploited the farmers. It recommended enactment of market legislation to curb rampant malpractices and realize better returns. In that context, Haryana state being a part of undivided Punjab

enacted the Punjab Agriculture Produce Markets Act, 1939. This act was further amended in 1961 and operational in the state as per Manual of Haryana State Agricultural Produce Marketing Law published by Haryana State Agricultural Marketing Board, Panchkula. According to model APMC rules, 2007 circulated by the Ministry of Agriculture, Government of India, Haryana has notified the rules for contract farming only under the state APMC Act. Under this act, all the markets of the state have been regulated. The transactions in these markets are conducted under set rules on regulations. A large number of market committees were set up by the state government to supervise the functioning of agricultural produce markets. The Haryana State Agricultural Marketing Board was established in 1969 under this market Act to guide, supervise and control the market committees of the state for better and efficient marketing of agricultural produce.

Table-5.1

STATUS OF REGULATED MARKETS IN HARYANA (2009-10)

District	Number of Regulated markets	Number of Sub-yards	Average number of villages served per regulated market	Average area served per regulated market (Sq.Kms.)
Ambala	7	9	69	225
Panchkula	3	3	75	299
Yamunanagar	7	10	88	253
Kurukshetra	7	13	58	219
Kaithal	7	16	39	331
Karnal	10	8	42	254
Panipat	5	4	36	254
Sonepat	3	9	107	707
Rohtak	3	4	49	582
Jhajjar	2	3	126	917
Faridabad	2	3	69	358
Palwal	4	1	N.A.	N.A.
Gurgaon	4	4	88	346
Mewat	4	3	N.A.	N.A.
Rewari	2	6	200	791
Mahendragarh	4	8	92	465
Bhiwani	7	9	63	683
Jind	6	10	51	450
Hissar	6	22	45	664
Fatehabad	7	15	35	360
Sirsa	6	18	54	713
Total	**106**	**178**	**64**	**417**

Source: Statistical Abstract of Haryana, 2009-10

It is evident from Table 5.1 that Haryana has unevenly spread net work of regulated markets across the districts. The highest number of regulated markets was observed in Karnal district while Jhajjar, Faridabad and Rewari districts have shown

as low as two markets each. In the table, information is also presented on average number of villages served per regulated market. In Rewari, each regulated market covered 200 villages that is too high. It implies that most of the farmers have to carry their agricultural produce for sale in the far off regulated markets which increased cost of transport, wastage of energy and time.

Now we analyse marketing of basmati paddy in Haryana.

5.2 Disposal of Basmati Paddy:

We have already analysed marketed surplus of basmati paddy with the sampled farmers in the previous chapter. It depends on availability which includes stocks from previous year and production in the current year minus retention by the farmers for consumption, seed, feed and other purposes. The quantity of basmati paddy available with the sampled farmers was disposed off either in the village market or to commission agents or in the regulated market, etc. We begin with analyzing the disposal pattern of Pusa Basmati 1121 which is a dominant variety as all the respondents had sown this variety which accounted for around- 91 per cent of total area under basmati paddy on sampled farms during 2013-14. Table 5.2 provides information on marketing channels adopted by the sampled farmers for the sale of Pusa Basmati 1121.

Table-5.2
MARKETING CHANNELS FOR BASMATI 1121 ONSAMPLED FARMS IN HARYANA

Farm Size	VILLAGE MARKET	COMMI-SSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS
No. of Households Marketing through various channels					
MARGINAL	3	11	0	0	0
SMALL	7	18	0	0	0
MEDIUM	16	14	0	0	0
LARGE	32	55	0	0	0
TOTAL	58	98	0	0	0
% of Total Households in the Size Group Marketing through various channels					
MARGINAL	21.4	78.6	0.0	0.0	0.0
SMALL	28.0	72.0	0.0	0.0	0.0
MEDIUM	55.2	48.3	0.0	0.0	0.0
LARGE	39.0	67.1	0.0	0.0	0.0
TOTAL	38.7	65.3	0.0	0.0	0.0

Source: Field Survey

Table-5.3

MARKETING CHANNELS FOR - BASMATI 1509 ON SAMPLED FARMS

Farm Size	VILLAGE MARKET	COMMI-SSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS
No. of Households Marketing through various channels					
MARGINAL	0	1	0	0	0
SMALL	0	1	0	0	0
MEDIUM	0	3	0	0	0
LARGE	1	18	0	0	0
TOTAL	1	23	0	0	0
% of Total Households in the Size Group Marketing through various channels					
MARGINAL	0.0	100.0	0.0	0.0	0.0
SMALL	0.0	100.0	0.0	0.0	0.0
MEDIUM	0.0	100.0	0.0	0.0	0.0
LARGE	5.3	94.7	0.0	0.0	0.0
TOTAL	4.2	95.8	0.0	0.0	0.0

Source: Ibid

Table-5.4

MARKETING CHANNELS FOR BASMATI 1121 & BASMATI 1509 ON SAMPLED FARMS

Farm Size	VILLAGE MARKET	COMMISSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS
No. of Households Marketing through various channels					
MARGINAL	3	11	0	0	0
SMALL	7	18	0	0	0
MEDIUM	16	14	0	0	0
LARGE	32	55	0	0	0
TOTAL	58	98	0	0	0
% of Total Households in the Size Group Marketing through various channels					
MARGINAL	21.4	78.6	0.0	0.0	0.0
SMALL	28.0	72.0	0.0	0.0	0.0
MEDIUM	55.2	48.3	0.0	0.0	0.0
LARGE	39.0	67.1	0.0	0.0	0.0
TOTAL	38.7	65.3	0.0	0.0	0.0

Source: Ibid

It is evident that 65.3 and 38.7 per cent of Basmati 1121 growers disposed their produce through commission agents and in the village market. The percentage of farmers opting for these channels varied across the farm categories. Among, medium farmers, 55.2 per cent sold their produce in the village market. But only 21 per cent among marginal farmers adopted this channel. It may be noticed that small and marginal farmers depended relatively more on commission agents and therefore, around 72 and 79 per cent of them disposed their basmati 1121 through this channel. It could be due to advance loans taken by these groups from commission agents for the purchase of expensive inputs and other domestic needs and hence, they had to sell their produce through them to repay loans.

Table-5.5

QUANTITY OF BASMATI SOLD THROUGH VARIOUS CHANNELS BY SAMPLED FARMERS DURING 2013-14

Farm Sze	VILLAGE MARKET		COMMISSION AGENT		REGULATED MARKET		GOVT AGENCIES		OTHERS (SPECIFY)		TOTAL	
	QTY SOLD	PRICE	QTY SOLD	PRICE	QTY SOLD	PRICE	QTY SOLD	PRICE	QTY SOLD	PRICE	QTY SOLD	PRICE
BASMATI-1121												
MARGINAL	27.1	3181	204.8	3909	---	---	---	---	---	---	232	3824
SMALL	283.6	3865	704.5	3369	---	---	---	---	---	---	988	3511
MEDIUM	1176.1	3757	905.0	3458	---	---	---	---	---	---	2081	3627
LARGE	7050.6	3814	6177.9	3372	---	---	---	---	---	---	13228	3608
TOTAL	8537.3	3806	7992.1	3395	---	---	---	---	---	---	16529	3607
Basmati 1509												
MARGINAL	0.0	---	15	3200	---	---	---	---	---	---	15	3200
SMALL	0.0	---	65	2900	---	---	---	---	---	---	65	2900
MEDIUM	0.0	---	129	3567	---	---	---	---	---	---	129	3567
LARGE	52.3	3300	1271	3359	---	---	---	---	---	---	1324	3357
TOTAL	52.3	3300	1480	3356	---	---	---	---	---	---	1532	3354
Basmati 1121 & Basmati 1509												
MARGINAL	27.1	3167	220	3821	---	---	---	---	---	---	247	3749
SMALL	283.6	3758	769	3271	---	---	---	---	---	---	1053	3402
MEDIUM	1176.1	3742	1034	3492	---	---	---	---	---	---	2210	3625
LARGE	7102.8	3757	7449	3378	---	---	---	---	---	---	14552	3563
TOTAL	8589.6	3729	9472	3420	---	---	---	---	---	---	18062	3567

Source: ibid

The marketing channels adopted by the sampled farmers for the disposal of basmati 1509 deviated from basmati 1121. Only 4.2 percent producers sold their produce in the village market. The remaining 95.8 per cent disposed their marketed surplus through commission agents. Surprisingly, each producer in marginal, small and medium category opted for this channel. We have already explained the reason for this option by small land owners. In fact, they are always hard pressed for financial resources and therefore, even some of their urgent needs remain unmet. In case of emergency, they resort to loans from commission agents and sell their produce to them for payment of these loans. (Table 5.3)

Table-5.6

PERCENTAGE OF QUANTITY SOLD THROUGH VARIOUS CHANNELS BY SAMPLED FARMERS - Basmati 1121

Farm Size	VILLAGE MARKET	COMMI-SSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS (SPECIFY)	TOTAL
MARGINAL	11.7	88.3	---	---	---	100
SMALL	28.7	71.3	---	---	---	100
MEDIUM	56.5	43.5	---	---	---	100
LARGE	53.3	46.7	---	---	---	100
TOTAL	51.6	48.4	---	---	---	100

Source: ibid

Table-5.7

PERCENTAGE OF QUANTITY SOLD THROUGH VARIOUS CHANNELS BY SAMPLED FARMERS - Basmati 1509

Farm Size	VILLAGE MARKET	COMMISSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS (SPECIFY)	TOTAL
MARGINAL	0.0	100.0	---	---	---	100
SMALL	0.0	100.0	---	---	---	100
MEDIUM	0.0	100.0	---	---	---	100
LARGE	3.9	96.1	---	---	---	100
TOTAL	3.4	96.6	---	---	---	100

Source: ibid

Table-5.8

PERCENTAGE OF QUANTITY SOLD THROUGH VARIOUS CHANNELS BY SAMPLED FARMERS - Basmati 1121 & Basmati 1509

Farm Size	VILLAGE MARKET	COMMISSION AGENT	REGULATED MARKET	GOVT AGENCIES	OTHERS (SPECIFY)	TOTAL
MARGINAL	10.9	89.1	---	---	---	100
SMALL	26.9	73.1	---	---	---	100
MEDIUM	53.2	46.8	---	---	---	100
LARGE	48.8	51.2	---	---	---	100
TOTAL	47.6	52.4	---	---	---	100

Source: ibid

We have also tried to draw the overall scenario of marketing channels adopted by the sampled farmers for the sale of basmati paddy by combining basmati 1121 and basmati 1509. Table 5.4 depicts information on marketing channels adopted by the sampled farmers for the disposal of their paddy produce during the reference year. It is evident that 38.7 per cent farmers opted village market while a large proportion of farmers i.e. 65.3 per cent adopted disposal of produce through commission agents. The differences exercised by the farmers among options across farm size were found significant. It may be pointed out that less than 30 per cent of marginal and small farmers sold their basmati produce in the village market. At the same time, proportion of medium farmers adopting this channel for sale of basmati was around 55 per cent. Some of the sampled farmers combined both the channels for disposal of basmati produce during 2013-14. The number of respondents in each farm size is fixed and therefore, same farmers sold Basmati 1121 and 1509produce through the above channels and hence, there is no difference in percentage at the overall level. These are similar to 1121 because all respondents grew this variety.

5.3 Marketwise Disposal of Basmati Paddy:

After analyzing marketing channels adopted by the sampled farmers for the sale of Basmati paddy produced by them, it would be useful to examine the quantity sold through these channels and price realized by them. Table 5.5 provides this information for basmati-1121. Results show that 16529 qtls of Basmati 1121 were disposed off by the sampled farmers at the aggregate level. Wide variations could be observed across different categories of farmers. In particular, marginal farmers sold only 232 qtls against 13228 qtls by the large land owning big farmers. The similar type of disparities could be noticed in quantity sold through village market and commission agents. When we look at the price realized by different categories of farmers at the aggregate level, clearly, marginal farmers reaped higher price in comparison to other categories. It could be due to better quality of their produce. The same is true when produce was sold through commission agents. However, scenario in the village market deviated from the aggregate level. The small farmers realized a higher price per qtl of Basmati 1121 in comparison to other categories. In a nutshell, neither quantity disposed nor price realized from the sale of Basmati 1121 through different channels were found uniform across the farm categories.

The findings about the share of marketed surplus of basmati 1121 disposed through various marketing channels reveal that sampled farmers sold 51.6 per cent of their produce in the village market and rest of approximately 48 per cent was disposed through commission agents. The pattern of disposal of different categories of farmers was not uniform. The marginal and small farmers preferred sale through commission agents while medium and large farmers depended more on the village market. As a result, they disposed relatively higher percentage of the marketed surplus of basmati 1121 in the village market. It may be mentioned that the sampled farmers didn't opt for other marketing channels such as government agency to dispose marketed surplus of this variety during the reference year. (Table-5.6)

.

Having discussed the quantity and price realized from sale of basmati 1121through different channels by the sampled farmers during 2013-14, we have examined the scenario for basmati 1509. The information presented in Table 5.5 indicates that quantity of basmati 1509 sold through different channels by farmers was much lower in comparison to basmati 1121. It was 1532 qtls at the aggregate level and farmers reaped a price of Rs 3354 per qtl. Obviously, quantity sold by large farmers was several times higher in comparison to marginal, small and even medium farmers. In this case, producers largely adopted sale of basmati 1509 through commission agents and therefore, only 52.3 qtls were sold in the village market against 1480 qtls disposed through the commission agents. The disposal of basmati 1509 in the village market was nil by marginal, small and medium farmers. An average price of Rs. 3356 per qtl was realized by the farmers from sale through commission agents and it was observed higher for medium farmers in comparison to other categories.

The information related to percentage of marketed surplus of basmati 1509 disposed by the farmers through various marketing channels reveals (Table 5.6) that sampled farmers had great preference for commission agents in disposing this variety of basmati and therefore, 96.6 per cent of the marketed surplus was disposed through this channel. A small proportion of the marketed surplus of basmati 1509 was sold in the village market. It may be recorded that marginal, small and medium farmers disposed entire marketed surplus of basmati 1509 through commission agents during 2013-14.

An overall scenario of sale of basmati produce through different channels by the sampled farmers is depicted in Table 5.5. The sampled farmers disposed 18062 qtls of both varieties during 2013-14 and realized a price of Rs. 3567 per qtl. The quantity sold was highest by large farmers while the price realized was the maximum by marginal farmers. Further, around 8590 qtls and 9472 qtls were sold in the village market and through commission agents. It may be pointed out that the price realized in the village market was higher than sale through commission agents. The small farmers in the village market and marginal farmers through commission agents realized higher price for their basmati produce in comparison to other categories of farmers.

Table 5.6 also provides percentage quantity of marketed surplus of basmati disposed through various marketing channels. It is evident that sampled farmers sold marketed surplus in the village market and through commission agents. However, they indicated higher preference for the latter. As a result, around 52.4 per cent of the marketed surplus of basmati was disposed through this channel. The remaining 52.4 per cent of the produce was sold in the village market. Particularly, marginal farmers sold 89 per cent of marketed surplus through commission agents.

5.4 Month-wise Disposal of Basmati Paddy:

Agricultural commodities are characterized by a definite season of production. Some crops are grown in rabi season while other crops are produced in kharif season and zaid season. Even within a season, there are early and late varieties of the crops. Some varieties take short duration in maturity while others take relatively longer time in the process of production. Therefore, availability of agricultural commodities is not uniform throughout the year. This results in month to month variations or intra year variations in price of agricultural commodities. Normally, prices are low after the harvest due to huge arrivals in the mandies in turn creating excess supply over the demand. On the other hand, prices rise in lean months due to contraction/reduced supply of agricultural commodities.

During the course of field survey, we had collected information on month wise disposal and price realized by the producers of Basmati 1121 and 1509 during 2013-14. The results for Basmati 1121 are presented in Table-5.9.

It is evident that farmers sold 6485 qtls of Basmati 1121 in November, 2013 immediately after the harvest in the village market and realized a price of Rs. 3711

per qtl. They also disposed off 6676 qtls of produce through commission agents in the same month but realized a lower price of Rs. 3421. The difference in price could be due to direct sale of produce to the traders in the village market. In this medium of sale, farmers save cost of transportation and marketing. In December, 2013 sampled farmers sold 1377 qtls and 437 qtls in the village market and through commission agents. The price realized in the village market during this month was almost the same but in the case of commission agents, it was higher by Rs. 207 per qtl. over the previous month. The balance of produce stored for future sale was disposed in January, 2014. The quantum of sale in village market and through commission agents was 459 qtls and 879 qtls respectively. The price realized in the village market was higher by Rs. 358 per qtl while it was marginally lower by the sale through commission agents. The last lot of Basmati 1121 was sold by the farmers in February, 2014 in the village market but the price realized was not attractive for the farmers since it was slightly higher than harvesting months. Thus, sampled farmers reaped limited profit from stocking produce of Basmati 1121 for future sale in February, 2014.

The month wise disposal of Basmati 1509 by the producers deviated from Basmati 1121 during the reference year. The sampled farmers primarily sold their produce through commission agents. Only insignificant quantity of 52.3 qtls in January 2014 was sold in the village market by realizing a price of Rs. 3300 per qtl. A significant quantity of marketed surplus i.e 1374 qtls was sold through commission agents at a price of Rs. 3212 in November 2013. The highest price was realized by the medium farmers. In December 2013, merely 32 qtls were sold to the commission agents but the price realized was higher by more than Rs. 500 per qtl. Next month in January 2014, 74 qtls of Basmati 1509 was disposed by producers through commission agents and received a price of Rs. 3600 per qtl. In a nutshell, commission agents were the major source of disposal of produce for Basmati 1509 during the reference year (Table- 5.10).

Table-5.9
MONTHWISE QUANTITY OF BASMATI 1121 SOLD BY SAMPLED FARMERS IN EACH CHANNEL -

	November 2013		December 2013		January 2014		February 2014	
	QTY	PRICE	QTY	PRICE	QTY	PRICE	QTY	PRICE
VILLAGE MARKET								
MARGINAL	27.1	3167	0.0	---	0.0	---	0.0	---
SMALL	237.6	3750	46.0	3800	0.0	---	0.0	---
MEDIUM	931.5	3773	209.6	3575	0.0	---	35.0	3900
LARGE	5288.9	3731	1121.5	3783	458.7	4067	181.5	3700
TOTAL	6485.0	3711	1377.1	3709	458.7	4067	216.5	3767
COMMISSION AGENT								
MARGINAL	153.8	3873	51.0	3850	0.0	---	0.0	---
SMALL	558.5	3313	118.0	3383	28.0	2800	0.0	---
MEDIUM	710.0	3369	50.0	3800	145.0	3950	0.0	---
LARGE	5253.9	3377	218.0	3667	706.0	3609	0.0	---
TOTAL	6676.1	3421	437.0	3628	879.0	3600	0.0	---

Table-5.10
MONTHWISE QUANTITY OF BASMATI 1509 SOLD BY SAMPLED FARMERS IN EACH CHANNEL

	November 2013		December 2013		January 2014		February 2014	
	QTY	PRICE	QTY	PRICE	QTY	PRICE	QTY	PRICE
VILLAGE MARKET								
MARGINAL	0.0	---	0.0	---	0.0	---	0.0	---
SMALL	0.0	---	0.0	---	0.0	---	0.0	---
MEDIUM	0.0	---	0.0	---	0.0	---	0.0	---
LARGE	0.0	---	0.0	---	52.3	3300.0	0.0	---
TOTAL	0.0	---	0.0	---	52.3	3300.0	0.0	---
COMMISSION AGENT								
MARGINAL	15.5	3200	0.0	---	0.0	---	0.0	---
SMALL	64.5	2900	0.0	---	0.0	---	0.0	---
MEDIUM	87.0	3500	22.0	3600	20.0	3600.0	0.0	---
LARGE	1207.3	3182	10.0	3900	54.0	3600.0	0.0	---
TOTAL	1374.2	3212	32.0	3750	74.0	3600.0	0.0	---

Table-5.11
MONTHWISE QUANTITY OF Basmati 1121 & Basmati 1509 SOLD BY SAMPLED FARMS IN EACH CHANNEL

	November 2013		December 2013		January 2014		February 2014	
	QTY	PRICE	QTY	PRICE	QTY	PRICE	QTY	PRICE
VILLAGE MARKET								
MARGINAL	27.1	3167	0.0	---	0.0	---	0.0	---
SMALL	237.6	3750	46.0	3800	0.0	---	0.0	---
MEDIUM	931.5	3773	209.6	3575	0.0	---	35.0	3900
LARGE	5288.9	3731	1121.5	3783	511.0	3988	181.5	3700
TOTAL	6485.0	3711	1377.1	3709	511.0	3988	216.5	3767
COMMISSION AGENT								
MARGINAL	169.2	3812	51.0	3850	0.0	---	0.0	---
SMALL	623.0	3271	118.0	3383	28.0	2800	0.0	---
MEDIUM	797.0	3383	72.0	3739	165.0	3908	0.0	---
LARGE	6461.1	3341	228.0	3677	760.0	3608	0.0	---
TOTAL	8050.3	3386	469.0	3636	953.0	3600	0.0	---

Source: ibid

We had combined Basmati 1121 and Basmati 1509 for examining month wise variations in disposal and price realized at the overall level. The information on monthly disposal pattern of entire basmati marketed surplus sold by the sampled farmers along with price realized during various months is presented in Table-5.11. It may be observed that sampled farmers sold 6485 qtls and 8050 qtls of marketed surplus in the village market and through commission agents during the harvesting month of November 2013. The price realized was Rs 3711 per qtl and Rs 3386 per qtl respectively. Next month in December 2013, they disposed 1377 qtls and 469 qtls through these marketing channels and received a price of Rs 3709 and Rs 3636 per qtl. After withholding the produce for two months, they disposed 511 qtls and 953 qtls of marketed surplus of basmati in the village market and though commission agents in January 2015. The price realized from sale through the first channel was was found higher in comparison to the second channel. The terminal lot of around 217 qtls of marketed surplus of basmati was sold through commission agents in February 2014. It fetched a price of Rs 3767 per qtl. Farm size variations were common in month wise disposal of marketed surplus of basmati. But, most of the producers preferred sale in the harvesting months of November and December 2013. It was largely due to price risk, storage problems and cash requirement to fulfill various obligations.

5.5 Sources of Supply of Basmati Rice for Intermediaries:

It is a common knowledge that demand and supply of agricultural commodities are equally important to maintain equilibrium in the economy. The excess supply or short supply affects the prices in turn influencing the demand for the products by consumers. Therefore, sources of supply for stakeholders need to be analysed. This is important for assuring remunerative prices to producers and making goods available to consumers at reasonable price.

Considering the importance of supply, we had carried out primary survey of 10 wholesalers, 10 retailers and 7 exporters through which we had gathered information on sources of supply of basmati rice in particular, about our study crops i.e. Basmati 1121 and Basmati 1509. It was found that various intermediaries source their supply from different sources. Tables 5.12 to 5.15 provide information on sources of supply of basmati rice for wholesalers, retailers and exporters.

Wholesalers of basmati rice constitute an integral part of supply chain who purchase commodity in huge quantity and sell to retailers in small lots after adding their margin. Table-5.12 indicates that surveyed wholesalers procured their supplies from rice millers. Around 50 per cent of them reported that they also purchased basmati rice from other wholesalers. Further, 20 per cent stated that they also arrange supply of grain from commission agents who source the supply from rice millers.

Often, consumers purchase basmati rice from retailers. The surveyed retailers informed that they source their supply primarily from wholesalers of basmati rice. In addition, they also arrange supply from other retailers. Besides, 60 per cent retailers stated that at times, they purchase directly from village traders and lift the supply directly from any source.

All surveyed exporters of basmati rice had their own premises with facilities of storage, milling, cleaning and packaging. They reported that entire supply of Basmati is purchased through commission agents in the form of paddy which they arrange to mill and process in their own units. It is convenient in terms of saving time and cost.

Table-5.12
Source of Supply for the Wholesalers of Basmati Rice in Haryana during 2013-14

Source	Rank 1	Rank 2	Rank 3
Number sourcing from			
Farmers	0	0	0
Commission Agents	0	2	0
Other wholesalers	0	5	0
Millers	10	0	0
Others	0	3	0
Total	10	10	0
Percentage			
Farmers	0	0	0
Commission Agents	0	20	0
Other wholesalers	0	50	0
Millers	100	0	0
Others	0	30	0
Total	100	100	0

Source: ibid

Table-5.13

Source of Supply for the Retailers of Basmati Rice in Haryana during 2013-14

Source	Rank 1	Rank 2	Rank 3
Number sourcing from			
Farmers	0	0	0
Commission Agents	0	0	0
Wholesalers	10	0	0
Other retailers	0	2	0
Millers	0	2	0
Others	0	6	0
Total	10	10	0
Percentage			
Farmers	0.00	0.00	0.00
Commission Agents	0.00	0.00	0.00
Wholesalers	100.00	0.00	0.00
Other retailers	0.00	20.00	0.00
Millers	0.00	20.00	0.00
Others	0.00	60.00	0.00
Total	100.00	100.00	0.00

Source: ibid

Table-5.14

Source of Supply for the Exporters/Millers of Basmati Rice in Haryana during 2013-14

Source	Rank 1	Rank 2	Rank 3
Number sourcing from			
Farmers	0	0	0
Commission Agents	7	7	0
Wholesalers	0	0	0
Other retailers	0	0	0
Other exporters	0	0	0
Other millers	0	0	0
Others	0	0	0
Total	7	7	0
Percentage			
Farmers	0.00	0.00	0.00
Commission Agents	100.00	100.00	0.00
Wholesalers	0.00	0.00	0.00
Other retailers	0.00	0.00	0.00
Other exporters	0.00	0.00	0.00
Other millers	0.00	0.00	0.00
Others	0.00	0.00	0.00
Total	100.00	100.00	0.00

Source: ibid

Chapter-6

Price Pattern over Time and Space

Price of agricultural commodities has multiple implications for all stakeholders. In a comparative economy, prices provide signals to producers in decision making what and how much to be produced with the available land and other resources to maximize returns from farming. They also guide consumers in budgeting their income to maintain optimum standard of living. In brief, prices help in balancing demand and supply, allocation of scarce resources, budgeting income of households and regulating the movement of agricultural items across the regions.

Agricultural prices play an important role in the resource allocation, distribution of income and in inducing capital formation in India. Realizing their importance, Raj Krishna (1963) viewed them as an integral part of growth policy. The prices of foodgrains are the most basic among the price structure of agricultural commodities. Exceptional rise in their prices touches economic life at many points by affecting the consumption and real income of the people. The agricultural commodities move from farm to the ultimate consumer through different stages. The stake holders in the process are farmers, wholesalers, retailers and exporters.

Considering the importance of prices, this chapter is devoted to the analysis of price pattern of basmati rice at the producer's, wholesaler's, retailer's and exporter's level in the selected districts of Haryana.

6.1 Producer's Price and Price Spread:

Producer's price is the price received by the farmer after selling his produce. A farmer has to incur some cost in selling his produce. Such cost may cover expenditure on bags, loading, transportation, unloading and octroi charges. The actual price accruing to the farmer is net of all these costs. In exceptional cases, where the produce is lifted by the buyer from the farmer's premises, the price received by the latter is the same as the producer's price because the marketing cost is zero. The producer's price can be derived after netting out marketing cost per unit incurred by the farmer from sale price of the producers.

Price spread is difference between the price paid by the consumer (retail price) and price received by the producer. It is normally calculated as percentage of consumer's rupee received by the producer.

Price Spread = Retail Price – Producer's Price

The difference indicates extent of the margin/mark up in the sale price, which includes intermediate cost and trade margins at every stage of supply chain. The smaller margin indicates the efficiency in the marketing system. The ratio of producer price to retail price is always less than one unless there are wide fluctuations causing trade losses. This ratio indicates the producer's share in the consumer's rupee. Table-6.1 depicts producer's price and price spread of Pusa Basmati 1121 and Pusa Basmati 1509 .

Table-6.1
Price Spread of Pusa Basmati 1121 and Pusa Basmati1509 in Haryana

(a)	**PUSA Basmati 1121**	
	Producer's Price	Rs 5465
	Price Paid by consumer	Rs 8229
	Share of consumer's rupee received by the producer	66.41%
(b)	**PUSA Basmati 1509**	
	Producer's Price	Rs 5123
	Price Paid by consumer	Rs 8052
	Share of consumer's rupee received by the producer	63.62%

Source: Field Survey

6.2 Wholesaler's Price:

Wholesale prices are the most important segment of prices. These reflect the overall demand and supply situation of commodity in the economy. It is the leader price, which sets stage for the farm harvest prices and the retail prices (Acharya, 1988). Therefore, we have presented details of wholesale price and margin for selected varieties of basmati in the surveyed area.

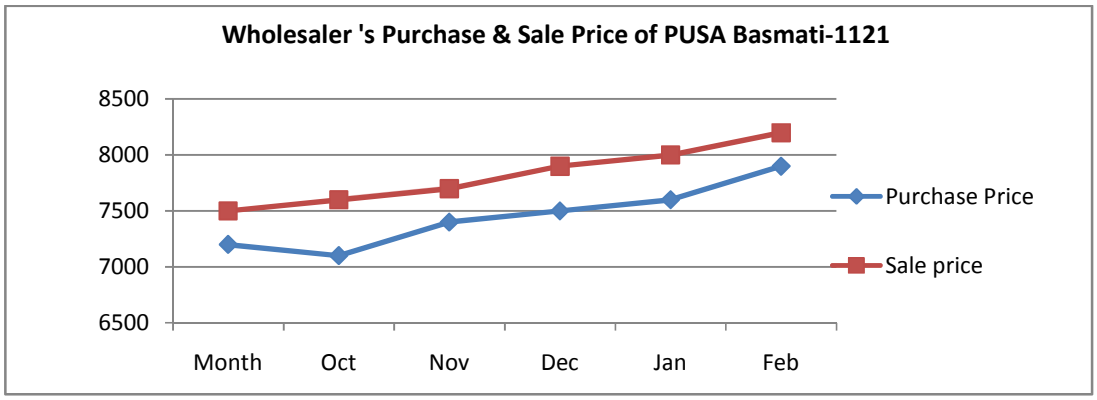
Now, we present purchase price, quantity sold, sale price, margin and percentage mark up earned by the wholesalers of basmati rice in selected districts (Table- 6.2).

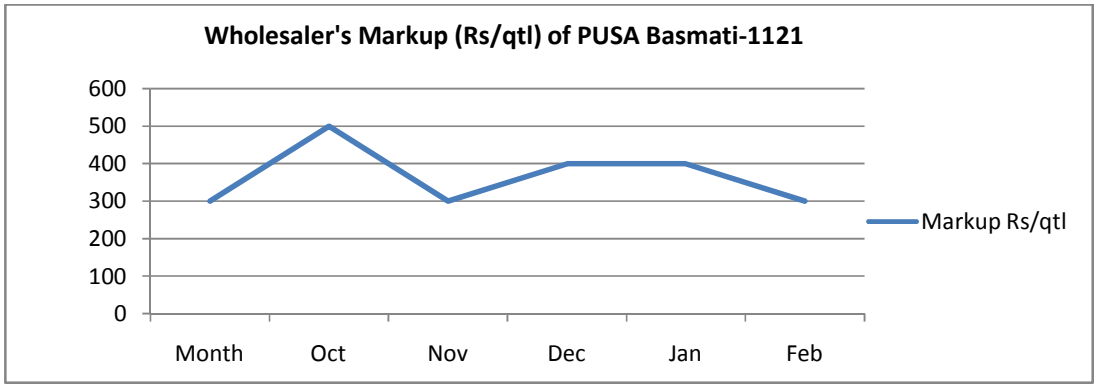
it may be observed that wholesale traders sold 18.97 qtls of basmati rice comprising 13.72 qtls of Pusa Basmati 1121and 5.25 qtls of Pusa Basmati 1509 during the referred months. Thus, sale of Pusa Basmati 1121 was much higher than Pusa Basmati 1509. The share of these varieties in total sale of Basmati rice was 76.69 and 23.31 per cent respectively. The quantity sold of basmati rice was noticed higher in the month of October in comparison to other months. The purchase price of basmati by the wholesalers was Rs. 7367 per qtl. during the study period. It was recorded highest in the month of March. Further, the sale price of basmati rice was Rs. 7687 per qtl. and it was found to be the highest in the month of March, 2015. The calculated mark up for the entire period was Rs. 320 per qtl at the aggregate level. The percentage mark up varied across the months and it was recorded highest in the month of November 2013. The overall margin was 4.34 for the considered period.

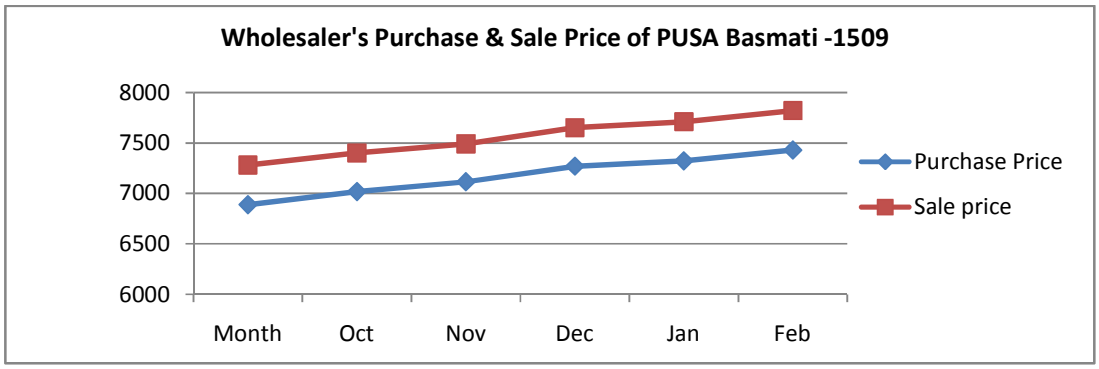
Table-6.2
Variety Wise Margins of Wholesalers of Basmati Rice in Haryana

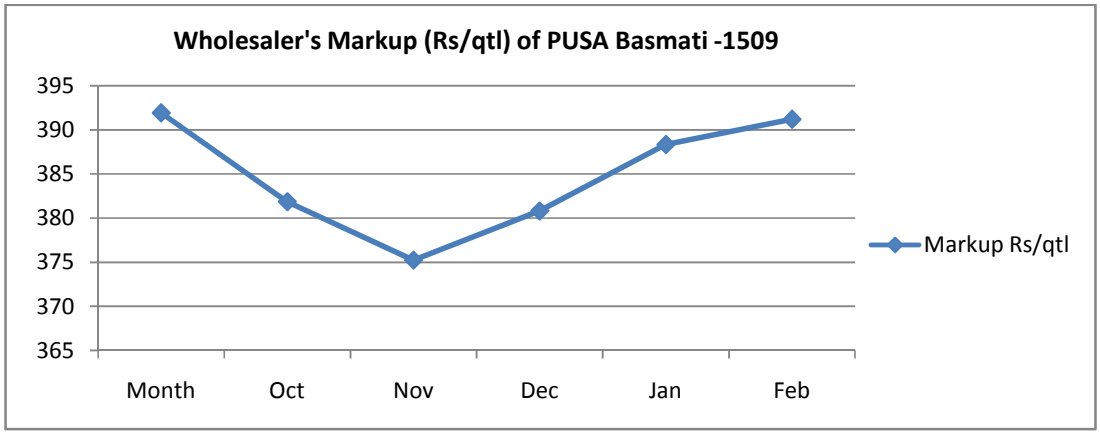
Month	Purchase Price	Qty sold	Sale price	Markup Rs/qtl	% markup
PUSA Basmati-1121					
October	7200	14.70	7500	300	4.17
November	7100	12.60	7600	500	7.04
December	7400	11.40	7700	300	4.05
January	7500	10.40	7900	400	5.33
February	7600	9.70	8000	400	5.26
March	7900	9.80	8200	300	3.80
Avg.	**7417**	**13.72**	**7783**	**366**	**4.93**
PUSA Basmati-1509					
October	6888	5.46	7280	392	5.69
November	7018	4.96	7400	382	5.44
December	7115	4.54	7490	375	5.27
January	7269	9.25	7650	381	5.24
February	7322	3.83	7710	388	5.30
March	7429	3.47	7820	391	5.27
Avg.	**7173**	**5.25**	**7558**	**385**	**5.37**
Overall					
October	7116	20.16	7421	305	4.29
November	7077	17.56	7563	486	6.86
December	7319	15.94	7651	332	4.54
January	7391	19.65	7715	323	4.38
February	7521	13.53	7885	364	4.84
March	7777	13.27	7885	109	1.40
Avg.	**7367**	**18.97**	**7687**	**320**	**4.34**

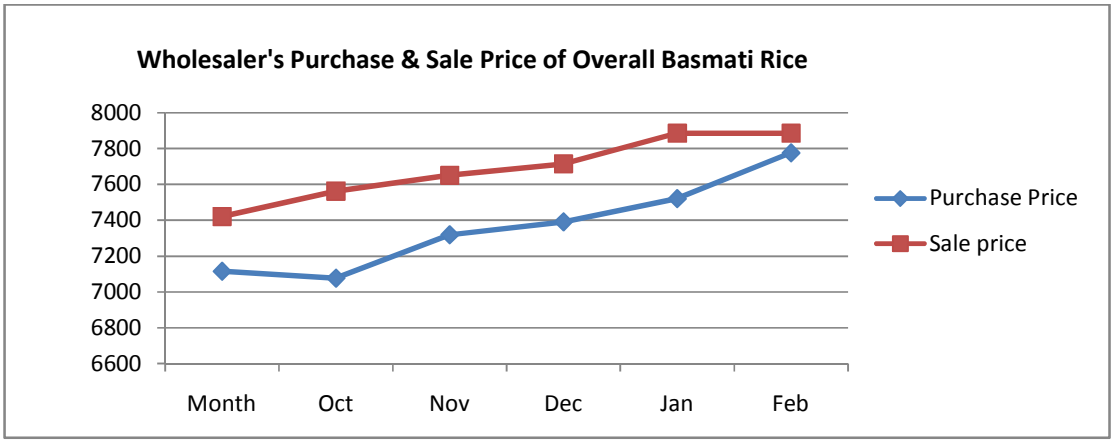
Fig-1

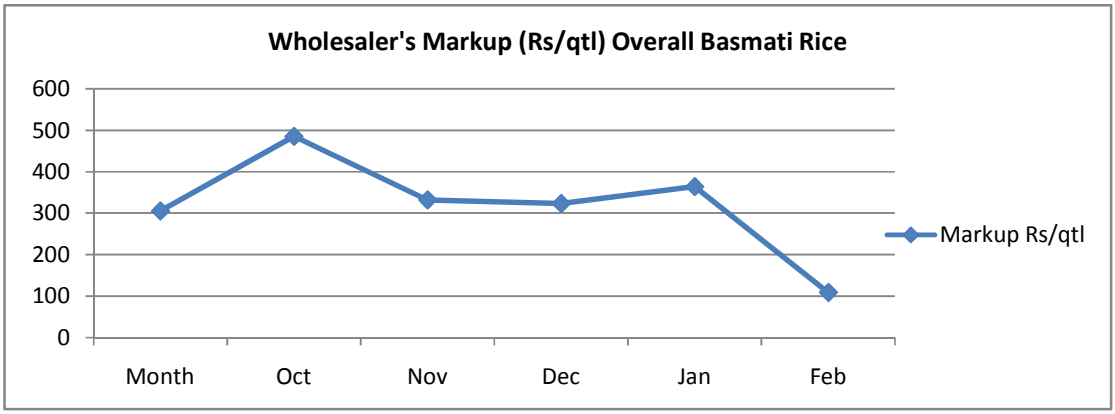

Wholesaler 's Purchase & Sale Price of PUSA Basmati-1121
8500
8000
7500
7000
6500
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price
Sale price


Wholesaler's Markup (Rs/qtl) of PUSA Basmati-1121
600
500
400
300
200
100
0
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl


Wholesaler's Purchase & Sale Price of PUSA Basmati -1509
8000
7500
7000
6500
6000
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price
Sale price


Wholesaler's Markup (Rs/qtl) of PUSA Basmati -1509
395
390
385
380
375
370
365
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl





The purchase price and sale price of Pusa Basmati 1121 were recorded Rs. 7417 and Rs. 7783 per qtl at the aggregate level. The price was found higher in the month of March in comparison to other months. The mark up and percentage mark up also showed variations across the months. The percentage mark up could be noted highest in the month of November, 2013.The quantity traded of Pusa Basmati 1121 was 13.72 qtls by the wholesalers. The sale was found highest during the month of October. The second variety i.e. Pusa Basmati 1509 showed an average sale of 5.25 qtls at the aggregate level. It was recorded higher in the month of January, 2014 in comparison to other months. Further, variations could be also noticed in purchase price and sale price at the wholesale level across the months. The sale price of this variety was found higher in the month of March in comparison to remaining months during the referred months. The percentage mark up ranged between 5.27 and 5.69 per cent for the wholesalers in the selected area. In brief, results show that sale and share of Pusa Basmati 1121 was significantly higher in comparison to Pusa Basmati 1509. It could be due to popularity of first variety at the consumer level.

We have also depicted wholesaler's purchase price, sale price and percentage mark up of Pusa Basmati 1121 and Pusa Basmati 1509 through figure-1.

6.3 Retailer's Price:

Retail prices relate to the price paid by the ultimate consumer while buying from a retailer. Retail prices of Pusa basmati 1121 and Pusa basmati 1509 are analyzed for the markets in selected districts for survey. Table 6.3 presents purchase price, sale price, margin and percentage mark up of these varieties.

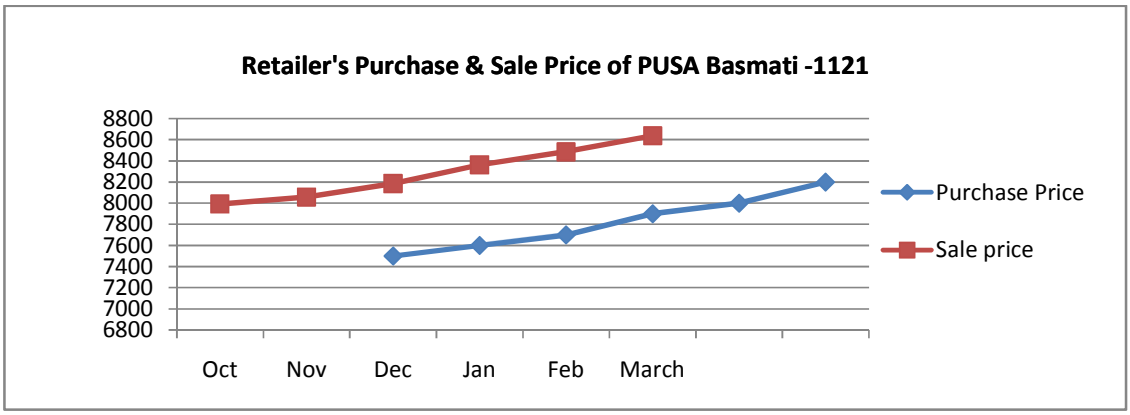
Table-6.3

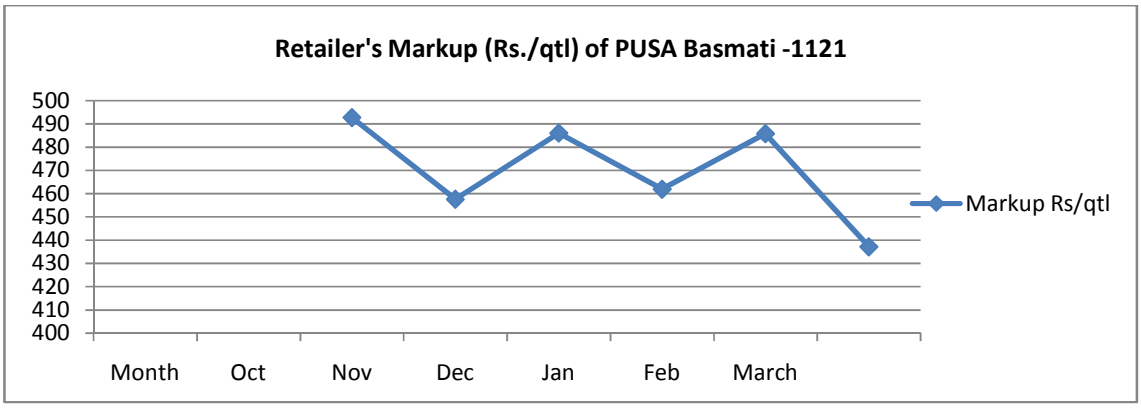
Variety Wise Margins of Retailers of Basmati Rice in Haryana

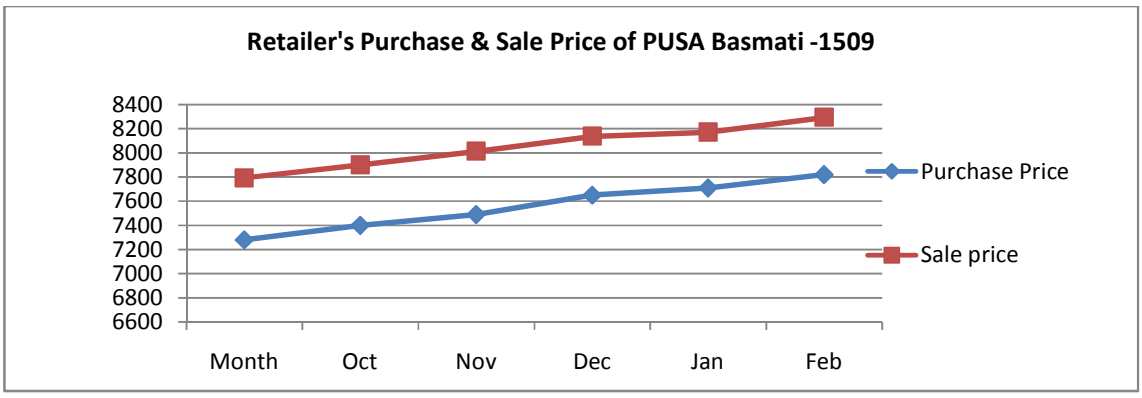
Month	Purchase Price	Qty sold	Sale price	Markup Rs/qtl	% markup
PUSA Basmati-1121					
October	7500	1.64	7993	493	6.57
November	7600	1.45	8058	458	6.03
December	7700	1.32	8186	486	6.31
January	7900	1.05	8362	462	5.85
February	8000	0.91	8486	486	6.08
March	8200	0.78	8637	437	5.33
Avg.	**7817**	**1.19**	**8229**	**412**	**5.71**
PUSA Basmati- 1509					
October	7280	0.84	7793	513	7.04
November	7400	0.72	7901	501	6.78
December	7490	0.64	8013	523	6.99
January	7650	0.51	8139	489	6.39
February	7710	0.43	8172	462	5.99
March	7820	0.38	8295	475	6.07
Avg.	**7558**	**0.59**	**8052**	**494**	**6.53**
Overall					
October	7421	2.48	7925	504	6.79
November	7563	2.17	8006	443	5.86
December	7651	1.96	8130	479	6.26
January	7715	1.56	8289	575	7.45
February	7885	1.34	8385	500	6.34
March	7885	1.16	8525	640	8.11
Avg.	**7687**	**1.78**	**8210**	**523**	**6.81**

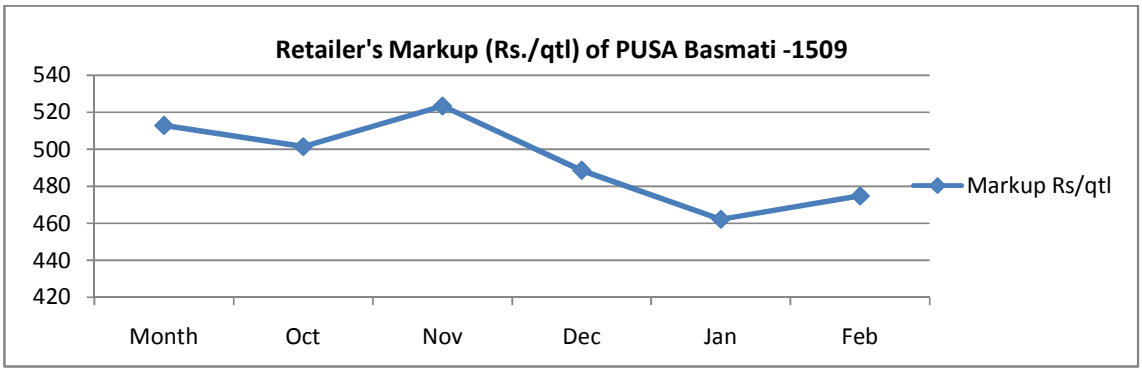
Source: Ibid

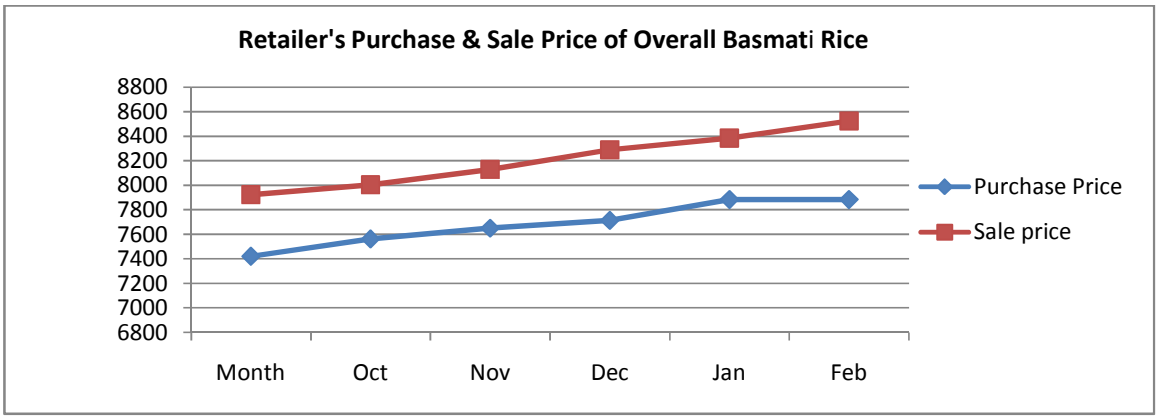
Fig-2

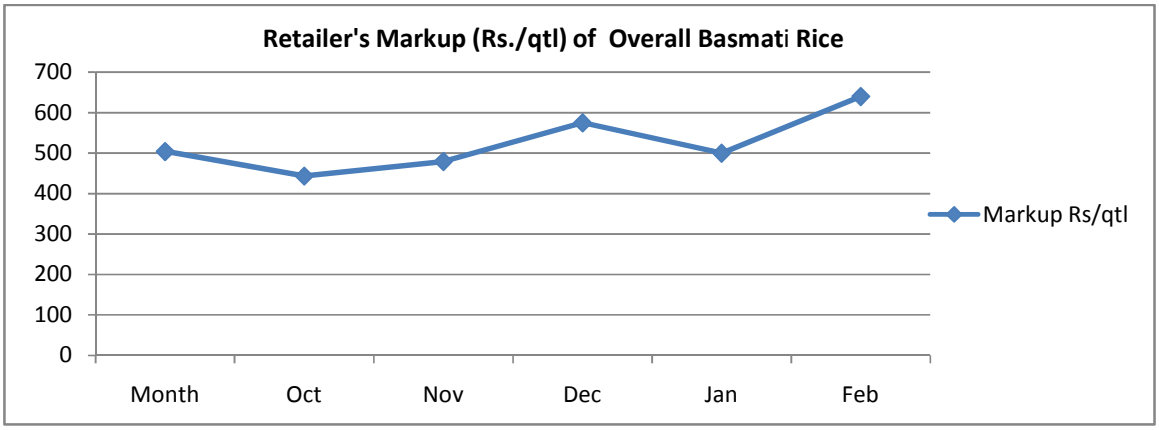

Retailer's Purchase & Sale Price of PUSA Basmati -1121
8800
8600
8400
8200
8000
7800
7600
7400
7200
7000
6800
Oct
Nov
Dec
Jan
Feb
March
Purchase Price
Sale price


Retailer's Markup (Rs./qtl) of PUSA Basmati -1121
500
490
480
470
460
450
440
430
420
410
400
Month
Oct
Nov
Dec
Jan
Feb
March
Markup Rs/qtl


Retailer's Purchase & Sale Price of PUSA Basmati -1509
8400
8200
8000
7800
7600
7400
7200
7000
6800
6600
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price
Sale price


Retailer's Markup (Rs./qtl) of PUSA Basmati -1509
540
520
500
480
460
440
420
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl





It may be observed that retailers sold an average quantity of 1.2 qtls per month of Pusa Basmati 1121 during the study period. The sale could be observed highest in the month of October. It may be due to festive season when consumers purchase premium quality of rice to be used at occasions. The average purchase price of retailers of Pusa Basmati 1121 was Rs. 7817 per qtl and price could be observed highest in the month of March, 2014. The retailers sold this variety at Rs. 8229 per qtl and once again sale price could be observed highest during the month of March, 2014. The average margin per qtl of grain was Rs. 412 which turns out as 5.7 per cent for the entire period. However, percentage margin was found higher in the month of December, 2013 in comparison to other months.

It may be recorded that retailers sold less than half quantity of Pusa Basmati-1509 due to low demand. The sale could be observed higher in the month October 2013 than remaining months. The average purchase price of Pusa Basmati 1509 was Rs. 7558 per qtl and it was found highest in March 2014. The retailers sold this

variety to consumers at Rs. 8052 and earned a margin of Rs. 6.53 percentage points. The percentage mark up was observed highest during October, 2013. The total quantity of basmati sold by the retailers was 1.78 qtls per month during the study period. The sale was higher in the month of October followed by November, 2013. The purchase price of basmati by retailers was recorded Rs. 7687 per qtl being maximum in the months of February and March 2014. The retailers sold basmati at Rs. 8210 per qtl by earning a margin of Rs. 523 per qtl which turns out into 6.81 percentage points. The mark up could be observed higher in the month of March in comparison to other months.

We have also depicted retailer's purchase price, sale price and percentage mark up of Pusa Basmati 1121 and Pusa Basmati 1509 through figure-2.

6.4 Exporter's Price:

We have mentioned in chapter-1 that India exports rice into two main categories such as basmati (fragrant) and non-basmati (non-fragrant). In case of basmati rice, India dominates the world trade followed by Pakistan. Basmati rice is the leading aromatic fine quality rice traded in the world and it fetches higher export price in the International market. India is the largest producer and exporter of basmati rice in the world. The annual production of basmati rice in the country is between 8-10 million tonnes a year of which around two third is exported. Basmati exports from India peak during November-December to March-April. Gulf region is the major market for Indian basmati. Saudi Arab accounts for the major share of basmati exports from India. European Union is the next important market for Indian basmati.

The primary survey of exporters revealed (Table-6.4) that they exported an average quantity of 6990 qtls of Basmati 1121 and 1551 qtls of Basmati 1509 during the reference period of October 2013 to March 2014. Evidently, quantum of exports of Basmati 1121 was around four times as compared to Basmati 1509. It was largely due to international demand for this variety in countries like Iran. In December 2013, quantum of exports of above mentioned varieties was higher in comparison to other months under consideration. The per qtl price realized from exports of Basmati 1121 was Rs. 8127 while it was Rs. 7424 for Basmati 1509. The percentage mark up of exporters was 11.43 per cent and 10.50 per cent respectively for these varieties of basmati rice. The overall results show that exporters exported 8542 qtls per month

and realized a price Rs. 8000 per qtls. The profit margin was 11 per cent during the study period.

We have also depicted exporters purchase price, sale price and percentage mark up of Pusa Basmati 1121 and Pusa Basmati 1509 through figure-3.

To conclude, the exporters earned higher margins in comparison to domestic intermediaries including wholesalers and retailers.

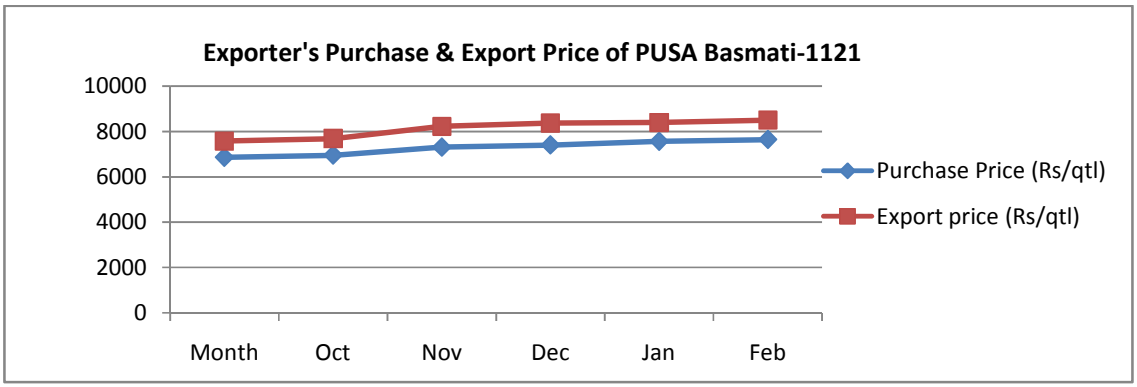
Table-6.4

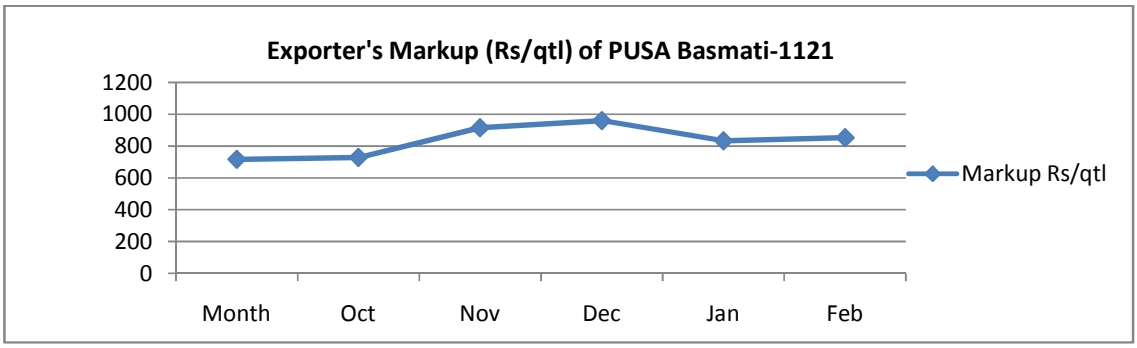
Variety Wise Margins of Exporters of Basmati Rice in Haryana

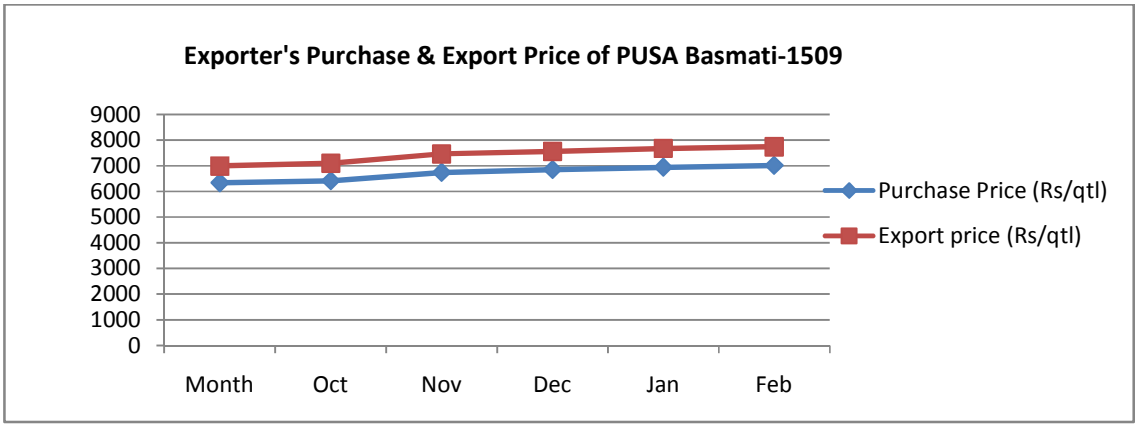
Month	Purchase Price (Rs/qtl)	Qty exported (qtls)	Export price (Rs/qtl)	Markup Rs/qtl	% markup
PUSA Basmati-1121					
October	6862	7457	7579	717	10.45
November	6960	8200	7689	729	10.47
December	7310	8271	8225	915	12.52
January	7410	7900	8369	960	12.96
February	7565	5457	8399	834	11.02
March	7650	4657	8502	853	11.15
Avg.	**7293**	**6990**	**8127**	**835**	**11.43**
PUSA Basmati-1509					
October	6340	1600	6994	654	10.32
November	6416	1900	7099	683	10.65
December	6745	2121	7461	716	10.62
January	6853	1371	7564	711	10.38
February	6943	1200	7680	737	10.62
March	7015	1114	7747	732	10.43
Avg.	**6719**	**1551**	**7424**	**706**	**10.50**
Overall					
October	6769	9057	7476	707	10.44
November	6858	10100	7578	720	10.50
December	7195	10393	8069	874	12.15
January	7327	9271	8250	923	12.60
February	7453	6657	8269	816	10.95
March	7527	5771	8356	829	11.01
Avg.	**7188**	**8542**	**8000**	**812**	**11**

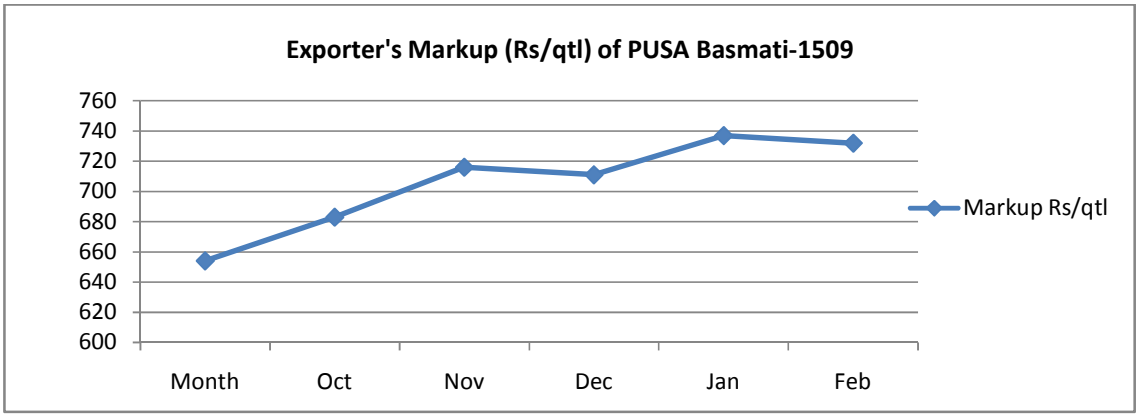
Source: Ibid

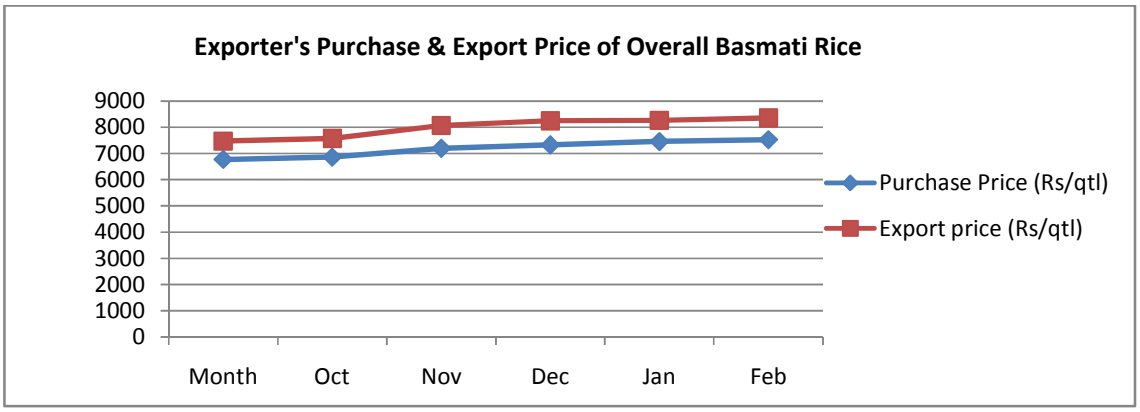
Fig-3

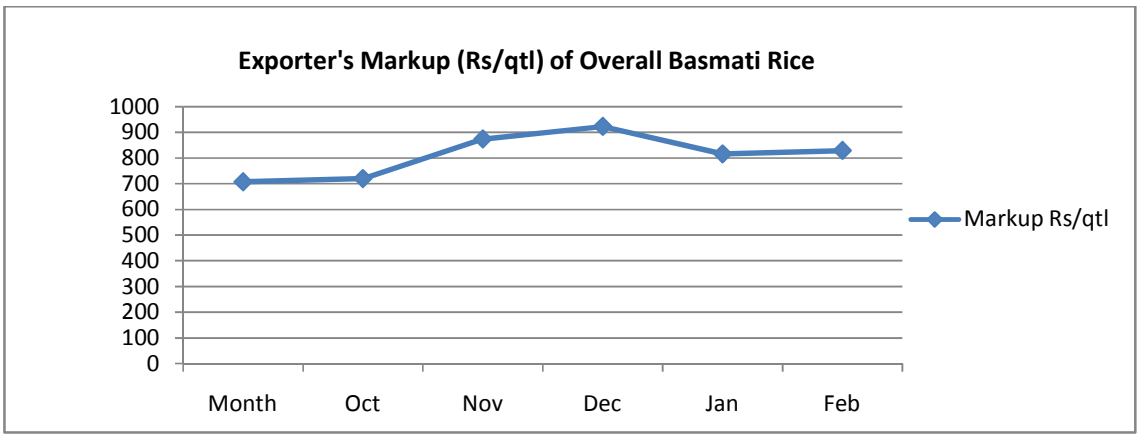

Exporter's Purchase & Export Price of PUSA Basmati-1121
10000
8000
6000
4000
2000
0
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price (Rs/qtl)
Export price (Rs/qtl)


Exporter's Markup (Rs/qtl) of PUSA Basmati-1121
1200
1000
800
600
400
200
0
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl


Exporter's Purchase & Export Price of PUSA Basmati-1509
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price (Rs/qtl)
Export price (Rs/qtl)


Exporter's Markup (Rs/qtl) of PUSA Basmati-1509
760
740
720
700
680
660
640
620
600
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl


Exporter's Purchase & Export Price of Overall Basmati Rice
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
Month
Oct
Nov
Dec
Jan
Feb
Purchase Price (Rs/qtl)
Export price (Rs/qtl)


Exporter's Markup (Rs/qtl) of Overall Basmati Rice
1000
900
800
700
600
500
400
300
200
100
0
Month
Oct
Nov
Dec
Jan
Feb
Markup Rs/qtl

Chapter-7

Perceptions of Stakeholders on Production and Trade of Basmati Rice

An understanding of the perceptions of stakeholders involved in the process of production to exports of basmati rice helps in initiating policy measures to improve production, profitability and exports. Therefore, this chapter is devoted to the analysis of perceptions of farmers, wholesalers, retailers and exporters of basmati rice in Haryana. The findings are based on the information collected during the field survey. We had enquired about the degree of problems faced by these groups during the process. The empirical results in the form of responses are reported in the forthcoming analyses.

7.1 Reasons for Cultivation of Basmati Rice:

Haryana was a non-paddy producing state prior to the advent of the Green Revolution. The crop was grown in some parts and therefore, area under paddy was only 246 thousand hectares during TE 1970-71 which increased several folds and became 1227 thousand hectares in TE 2011-12. This is due to a gradual increase in profitability of paddy in comparison to alternative kharif crops. The farmers therefore, are not ready to switch over to alternative kharif crops despite the advocacy by policy makers and agricultural scientists. Paddy consumes around 3,000 liters of water per kilo of rice produced. As a result, ground water level has reached to a critical stage in major growing areas. This is a great challenge for sustainability of agriculture and paddy in particular in future.

Basmati rice is a good alternative for paddy in Haryana. It has potential in terms of saving precious resources like water in addition to demand in the export market at the international level.

The degree of production risk in alternative crops is higher due to biotic and abiotic constraints. Climate change is further aggravating the risk. It is essential to improve productivity and reduce yield and price risk for alternative crops to encourage farmers to reduce area under paddy. In this back drop, it is important to understand the perceptions of sampled farmers about biotic and aboitic constraints of various kharif crops. We propose to discuss opinions of the farmers on these issues in this chapter.

Crops are affected negatively by aboitic and biotic stresses. Aboitic stress occurs in many forms such as drought, salinity, high temperature, high rainfall, high

wind and flood, etc. Aboitic stresses are harmful for the growth and productivity of crops. For instance, rice is highly susceptible to temperature stress during the reproductive and ripening stages. On the other hand, biotic stress is a stress that occurs as a result of harm done to crops by living organisms such as insect/pests, diseases and weeds. The relationship between biotic stress and yield of crops affects decisions of the growers, quality of the produce and profitability.

In the present study, we have used qualitative responses of the stakeholders to analyze perceptions regarding stresses in the form of constraints. Agricultural crops are affected from different abiotic and biotic stress conditions. Now, we present details of information gathered during the course of survey.

Agriculture is a risky business because it deals with uncertain factors such as weather and market conditions. These factors make income from agriculture uncertain. Therefore, selection of suitable crops through allocation of land is one of the most important decisions for the farmers. One of the suggested approaches is to reduce risk through crop diversification. Under this strategy, a farmer is likely to grow a number of crops that differ in constraints arising out of biotic and aboitic stresses.

During the course of our survey, we had asked farmers about the reasons for growing basmati paddy during kharif season in Haryana. The responses of farmers are presented in Table 7.1. It is evident that 99 per cent of sampled farmers rated profitability as the primary motive for cultivation of basmati rice. It is essential to mention that all categories of farmers provided high weightage to this reason. As a result, per cent of farmers citing profitability as a reason was above 90 per cent in each category. Further, farmers opined that suitability of land for basmati rice is also one of the reasons for land allocation to this crop. The marginal and medium farmers felt it more in comparison to other categories. We had also tried to seek responses of the farmers about attractive prices and stimulation received from the policies of the government. The response of farmers was found discouraging. Only 1 per cent farmers stated that these factors are important in decision making about area allocation to basmati rice. Thus, sampled farmers grew basmati rice primarily due to profitability followed by suitability of land.

Table-7.1

REASONS FOR GROWING BASMATI PADDY BY SAMPLED FARMERS

(NO OF HHLDS)

Reason	MARGINAL	SMALL	MEDIUM	LARGE	TOTAL
Home Consumption	0	0	0	0	0
Profitability	13	24	29	82	148
Land suitability	2	2	5	7	16
Government subsidies	1	1	0	0	2
Fits well with crop rotation	0	1	5	7	13
Any other	1	1	1	5	8
No of Farmers in the Size group	14	25	29	82	150
PERCENTAGE OF TOTAL FARMERS IN THE SIZEGROUP					
Home Consumption	0	0	0	0	0
Profitability	93	96	100	100	99
Land suitability	14	8	17	9	11
Government subsidies	7	4	0	0	1
Fits well with crop rotation	0	4	17	9	9
Any other	7	4	3	6	5
Total Farmers in the Size group	100	100	100	100	100

Source: Field Survey

7.2 Problems of Farmers:

It is common knowledge that both biotic ad aboitic factors affect crop production and threaten sustainability of crop production. Under these conditions, diverse agro-systems with different traits will be better able to perform. Farmers consider these problems while allocating land to various crops. We propose to discuss opinions of the sampled farmers on perceived problems in cultivation of basmati rice. This information is provided in Table 7.2 (a) & (b).

Around 86.7 and 94 per cent basmati growers stated that lower and unstable yield of basmati rice is a serious problem. Every one among the surveyed farmers stated that diseases create serious problems in raising yield. The damaging effects caused by insect/pests to the productivity of various crops are well evidenced in literature and measures of control are also provided by the agricultural scientist.

The problem of infestation of insect/pests was considered important by sizeable number of farmers. Also, weeds were stated as a problem by some sampled farmers. They reported that weeds affect crop by reducing productivity. Normally, crops are exposed to severe competition from self grown weeds which grow without human efforts and not wanted. They compete with the major crop for water, soil, nutrients and sun light. Therefore, proper control of weeds is a pre-

requisite for obtaining higher input efficiency. The basmati cultivators also opined that weeds are a problem because they affect production by reducing yield.

Table-7.2 (a)

MAJOR PROBLEMS PERCEIVED BY SAMPLED FARMERS IN CULTIVATING BASMATI PADDY

(No of Farmers)

Problem	RANK1	RANK2	RANK3	RANK4	TOTAL
Biotic problems					
1) Lower Yield	50	59	20	1	130
2) Unstable yield	41	74	24	2	141
3) Diseases	8	64	75	2	149
4) Insecticide/Pesticides	2	62	77	9	150
5) Weeds	23	70	51	3	147
Infrastructure related problems					
6) Erratic electricity supply	71	43	16	0	130
7) Non-availability of Inputs					
Seed	43	25	5	0	73
Fertilizers	53	66	9	0	128
Insecticides	42	42	10	0	94
Credit	32	46	22	6	106
Labour	17	54	53	16	140
8) Poor road network for transportation	62	51	7	5	125
9) Lack of/poor extension services /lack of technical knowhow	51	61	6	0	118
Marketing problems					
10) Price fluctuations	10	78	53	4	145
11) Lack of remunerative price	10	51	77	10	148
12) Lack of MSP/government procurement	13	47	60	27	147
13) Lack of market information	63	59	10	13	145
14) Collusion among traders/trade malpractices	46	56	46	0	148
15) Distant market	73	34	9	2	118
Environmental problems					
16) Poor quality of underground water	54	24	5	1	84
17) Adverse climate conditions	42	23	12	1	78
Any other	13	4	2	0	19

Source: Ibid

During our survey, we had asked some questions regarding qualitative assessment of sampled farmers about infrastructure related problems. These included erratic supply of power and non availability of inputs including seed, fertilizer, insecticides, credit and human labour. The poor network of roads and extension services were also added in the list. The shortage of human labour, power and fertilizer were considered important problems by the sampled farmers.

Surprisingly, availability of insecticides and credit were given relatively lower weight age by the surveyed farmers.

Table-7.2 (b)

PERCENTAGE DISTRIBUTION OF MAJOR PROBLEMS FACED BY SAMPLED FARMERS IN CULTIVATING BASMATI PADDY

REASON	RANK1	RANK2	RANK3	RANK4	TOTAL
Biotic problems					
1) Lower Yield	33.3	39.3	13.3	0.7	86.7
2) Unstable yield	27.3	49.3	16	1.3	94
3) Diseases	5.3	42.7	50	1.3	99.3
4) Insecticide/Pesticides	1.3	41.3	51.3	6	100
5) Weeds	15.3	46.7	34	2	98
Infrastructure related problems					
6) Erratic electricity supply	47.3	28.7	10.7	0	86.7
7) Non-availability of Inputs	0	0	0	0	0
Seed	28.7	16.7	3.3	0	48.7
Fertilizers	35.3	44	6	0	85.3
Insecticides	28	28	6.7	0	62.7
Credit	21.3	30.7	14.7	4	70.7
Labour	11.3	36	35.3	10.7	93.3
8) Poor road network for transportation	41.3	34	4.7	3.3	83.3
9) Lack of/poor extension services /lack of technical knowhow	34	40.7	4	0	78.7
Marketing problems					
10) Price fluctuations	6.7	52	35.3	2.7	96.7
11) Lack of remunerative price	6.7	34	51.3	6.7	98.7
12) Lack of MSP/government procurement	8.7	31.3	40	18	98
13) Lack of market information	42	39.3	6.7	8.7	96.7
14) Collusion among traders/trade malpractices	30.7	37.3	30.7	0	98.7
15) Distant market	48.7	22.7	6	1.3	78.7
Environmental problems					
16) Poor quality of underground water	36	16	3.3	0.7	56
17) Adverse climate conditions	28	15.3	8	0.7	52
Any other	8.7	2.7	1.3	0	12.7
Total Farmers	100	100	100	100	100

Source: Ibid

We also sought perceptions of sampled farmers about problems of marketing of basmati rice. When farmers opt to grow this crop, they face severe constraints due to price fluctuations, lack of remunerative prices, non-existence of the minimum support price for basmati rice, difficulty in access to information on price due to collusion among traders, It may be noted that these problems were rated as serious impediments by more than 90 per cent respondents although, ranks provided to these problems varied considerably. The problem of distant market was pointed out by relatively lower percentage of surveyed farmers. Around 56 and 52 per cent respondents informed that environmental problems such as poor quality of ground

water and adverse climatic conditions are important problems in raising basmati crop. To sum up, the entire range of cited problems were perceived by most of the sampled farmers in cultivating basmati rice but the degree of severity pointed out by different categories of farmers was not similar and varied significantly.

The growth in agriculture depends on the way farmers react to various aspects related to farming. The farmers are the final decision makers concerning the allocation of land and other resources. Several measures of public policy directly and indirectly influence the farmer's decisions. Primarily, the pricing of farm products affects the farmer's decisions regarding allocation of land. Other factors such as suitability of soil, availability of inputs including human labour, government support in marketing also influence allocation of land to various crops. To make price policy an effective instrument for introducing desired changes in area allocation to different crops, knowledge of how farmers react to various aspects of production is essential.

7.3 Problems Faced by Wholesalers:

The details of major problems perceived by wholesalers in trading basmati rice are presented in Table 7.3. It may be observed that 90 per cent of surveyed wholesalers stated that erratic supply and production are problems faced by them while 60 per cent considered competition from other wholesalers as a problem. Besides, supply of poor quality grain, higher taxes and infrastructure related constraints also affect their business and therefore, they opined that these constraints should be removed for smooth functioning of the business related to basmati rice. In a nutshell, wholesalers faced most of the cited problems in low and medium range but none of the problems was rated severe by the sampled wholesalers.

7.4 Problems faced by Retailers:

The details of major problems perceived by the surveyed retailers of basmati rice are depicted in Table 7.4. It may be observed that government intervention in price and competition in price and competition from other retailers were pointed out as problems by retailers of basmati rice. They also experience the brunt of poor quality supply. Further, expansion of organized retail and competition from imports are perceived as serious problems. Around 10 per cent sampled retailers rated these

as high ranking problems. None of the cited problems was ranked severe by the respondents.

Table-7.3

Problems of Wholesalers of Basmati Rice in Haryana

Sl.No	Problem	Low	Medium	High	Severe	Total
1	Lower Supply	8	1	1	0	10
2	Poor quality supply	6	3	1	0	10
3	Lower price due to lower demand	9	1	0	0	10
4	Competition from other wholesalers	2	6	2	0	10
5	Competition from imports	9	1	0	0	10
6	Poor road network	5	5	0	0	10
7	Other infrastructure problems	7	2	1	0	10
8	Erratic supply/ production	0	9	1	0	10
9	High marketing charges/ taxes	5	3	2	0	10
10	Mixing of different varieties	10	0	0	0	10
Per cent of Wholesalers						
1	Lower Supply	80	10	10	0	100
2	Poor quality supply	60	30	10	0	100
3	Lower price due to lower demand	90	10	0	0	100
4	Competition from other wholesalers	20	60	20	0	100
5	Competition from imports	90	10	0	0	100
6	Poor road network	50	50	0	0	100
7	Other infrastructure problems	70	20	10	0	100
8	Erratic supply/ production	0	90	10	0	100
9	High marketing charges/ taxes	50	30	20	0	100
10	Mixing of different varieties	100	0	0	0	100

Sources: ibid

7.5 Problems Faced by Exporters:

During the survey, exporters of rice reported that higher taxes in importing countries along with absence of government support at domestic level are the major problems faced by them. They informed that shipments of the premium basmati quality aromatic rice have taken a hit in 2014-15. Basmati exports till September have dropped by approximately 20 per cent to 2.2 million tonnes compared with 2013-14. They suggested that the government should restore the interest sub-vention scheme discontinued in March, 2014 to support them. Some of them wanted to enhance the rate to 5 per cent from the earlier 3 per cent.

Table-7.4

Problems of Retailers of Basmati Rice in Haryana

Sl.No	Problem	Low	Medium	High	Severe	Total
1	Lower Supply	7	2	1	0	10
2	Poor quality supply	6	4	0	0	10
3	Non-remunerative price due to lower demand	9	1	0	0	10
4	Competition from other retailers	4	6	0	0	10
5	Competition from large organized retail chains	7	3	0	0	10
6	Competition from imports	6	3	1	0	10
7	Government intervention in price	2	7	1	0	10
8	Poor infrastructure	6	3	1	0	10
Per cent of Retailers						
1	Lower Supply	70	20	10	0	100
2	Poor quality supply	60	40	0	0	100
3	Non-remunerative price due to lower demand	90	10	0	0	100
4	Competition from other retailers	40	60	0	0	100
5	Competition from large organized retail chains	70	30	0	0	100
6	Competition from imports	60	30	10	0	100
7	Government intervention in price	20	70	10	0	100
8	Poor infrastructure	60	30	10	0	100

Source: ibid

In 2013-14, India exported around 10.5 million tonnes of rice. As a result, India maintained its first position in the global market for the staple grain. Out of this, around 4 million tonnes was basmati rice with Iran being the biggest market. Thus, sizeable chunk of India's basmati rice output is exported. It is usually stored for one/two years, a process called ageing to improve the aroma. Exporters reported that they have high stocks of basmati rice due to lower demand in the world market. They are likely to suffer losses in the absence of government support and high interest on loans. Export margins are low due to higher cost of rice, interstate taxes, electricity cost and service taxes.

Table 7.5
Problems of Exporters of Basmati Rice in Haryana

Sl.No	Problem	Low	Medium	High	Severe	Total
1	Lower domestic production	4	2	1	0	7
2	Poor quality supply	0	4	2	1	7
3	Lower price due to lower world demand	3	2	2	0	7
4	Competition from wholesaler	2	2	2	1	7
5	Competition from other exporters	1	3	3	0	7
6	Poor road network	0	3	4	0	7
7	Poor port facilities	0	6	1	0	7
8	Other infrastructure problems	0	4	2	1	7
9	Lengthy government procedures	0	4	3	0	7
10	Export policy uncertainty	6	1	0	0	7
11	Erratic supply/ production	1	5	1	0	7
12	Lower domestic demand	1	5	1	0	7
13	Mixing of different varieties	6	1	0	0	7
14	Problem of chemical residue	2	5	0	0	7
15	High port charges/ taxes	1	0	5	1	7
Per cent of Exporters						
1	Lower domestic production	57.14	28.57	14.29	0	100
2	Poor quality supply	0	57.14	28.57	14.29	100
3	Lower price due to lower world demand	42.86	28.57	28.57	0	100
4	Competition from wholesaler	28.57	28.57	28.57	14.29	100
5	Competition from other exporters	14.29	42.86	42.86	0	100
6	Poor road network	0	42.86	57.14	0	100
7	Poor port facilities	0	85.71	14.29	0	100
8	Other infrastructure problems	0	57.14	28.57	14.29	100
9	Lengthy government procedures	0	57.14	42.86	0	100
10	Export policy uncertainty	85.71	14.29	0	0	100
11	Erratic supply/ production	14.29	71.43	14.29	0	100
12	Lower domestic demand	14.29	71.43	14.29	0	100
13	Mixing of different varieties	85.71	14.29	0	0	100
14	Problem of chemical residue	28.57	71.43	0	0	100
15	High port charges/ taxes	14.29	0	71.43	14.29	100

Sources: ibid

The major problems perceived by the surveyed exporters and their responses in terms of severity are presented in Table 7.5. The surveyed exporters revealed that high port charges and taxes were felt as high ranking and severe problems by 71.42 and 14.29 per cent respondents. Further, poor quality supply, competition from wholesalers and infrastructure problems were also cited as severe by 14.29 per cent of surveyed exporters. In addition, poor port facilities were considered as medium ranging problem by 85.71 per cent sampled exporters. Further, low domestic demand, erratic supply and problems of chemical residue were also experienced by 71.42 per cent of surveyed exporters. The exporters pointed during the course of survey that uncertainty of government policy on exports and international demand for basmati rice are severe problems which affect their business, income and profitability.

Chapter-8

Summary and Conclusions

This chapter aims to present main findings of the study and to draw policy implications in order to encourage farmers to adopt cultivation of basmati paddy in Haryana. Most of the earlier studies on basmati paddy/rice in India are limited, based on secondary data and do not provide farm size information. Literature based on in-depth village studies at the micro level is limited to some studies and therefore, there is an urgent need to conduct in-depth micro level studies. Such studies provide an important insight that cannot be derived from secondary data based studies due to availability of limited information. The present study is a departure from earlier literature in terms of its focus on issues related to basmati production and sale at the micro level and therefore, will be useful in framing future policy initiatives to promote production and export of this valuable commodity. Although, Haryana is the leading producer of basmati paddy in India, we have not come across any study which deals with production and marketing aspects of basmati paddy in the state. This study was planned to bridge this research gap. It is expected to benefit all stakeholders involved in the process of production and marketing of basmati paddy/rice from Haryana.

8.1 Objectives of the Study:

Food security, nutritional security, sustainability and profitability are the main focus of present and future agricultural development. The crop rotation of rice-wheat largely adopted in irrigated areas of Haryana has posed serious challenges in future for sustainability of agriculture in the state. Adoption of basmati in cropping systems could improve productivity and also the agro-eco-systems of the region. Further, irrigation requirements of the area could be reduced through adoption of basmati, thereby reducing pressure on depleting water table. In addition, basmati being a high value crop will help in reducing production risk in mono-cropping and will raise income of the farmers. This study aims to analyze issues related to basmati production, marketing and perceptions of stake holders such as producers, wholesalers, retailers and exporters of basmati rice in Haryana.

The specific objectives of the study are as under:

i) To analyse economics of major basmati varieties grown by the farmers in Haryana.

ii) To study the marketing pattern of basmati producers.
iii) To study divergence among producer price, wholesaler price, retailer price and exporter price of basmati rice.
iv) To analyse perceptions and problems of above stakeholders.

8.2 Research Methodology:

This study is conducted in the state of Haryana. It is based on published and un-published sources of secondary and primary data. The relevant information about the state and districts was obtained from various issues of the Statistical Abstract of Haryana, Government of Haryana, Panchkula. Further, district-wise data on area, production and yield of basmati were obtained from Statistics Department of Haryana. The data on exports of basmati rice were culled from the APEDA website. The Agri-net and FAO websites were also used to collect relevant information. The required preliminary information regarding the selection of blocks and villages was obtained from the district officials. The meetings with the Deputy Director of Agriculture of selected districts were useful and informative. The sampling design for primary survey for study was decided as per the study design provided by the coordinator.

The scope of the study is confined to basmati rice in Haryana. Three districts namely, Kaithal, Jind and Sonipat with highest share of area under basmati rice in Haryana were selected for in-depth study. The selection of respondents is based on multistage sampling design. At the first and second stages, basmati rice producing districts and blocks in these districts were selected. At the third stage, villages were selected on the same criterion. A questionnaire was canvassed to the farmers growing basmati rice. All farm size categories i.e. marginal, small, medium and large were covered in the sample. The number of farm households in each category was decided according to their proportion at the district level. The primary data pertaining to the year 2013-14 were collected from 150 farmers.

The popular basmati varieties grown in Haryana are Pusa Basmati-1121, Pusa Basmati-1509, Pusa Basmati-1, CSR-30, Pusa Basmati-1401, Super, etc. The total basmati area in Haryana was 741 thousand hectares in 2013-14. Out of which, more than 50 per cent of area was devoted to Pusa Basmati-1121. The next was Pusa Basmati-1509 covering more than 15 per cent of area. The remaining varieties covered rest of the area. Considering the importance of Pusa Basmati-1121 and

Pusa Basmati-1509, we have carried out in-depth analysis for these varieties. The reason for higher proportion of area under Pusa-1121 is better crop output and popularity in the export market. It has superior grain length and excellent elongation upon cooking and therefore, it has caught the fancy of the Iranian and other International markets.

In addition, ten wholesalers, ten retailers and seven exporters of basmati rice from the selected districts were surveyed to analyse prices and problems of stakeholders dealing with basmati rice.

8.3 Main Findings:

Now, we present main findings of the study

a) Macro level Findings:

Area, Production and Yield of Basmati Paddy in India:

India produces about 7-8 million tonnes of basmati rice or 12 million tonnes of paddy (at 66 per cent conversion ratio) primarily in three states namely, Haryana, Punjab and Uttar Pradesh. It is one of the major export items from India. Exports of basmati rice touched about 3 million tonnes, equivalent to Rs. 15336 crore during 2011-12. Pusa Basmati 1121/1509 which are hybrid varieties and yield higher than traditional basmati have become popular in Iran and other export markets of West Asia.

Traditionally, basmati rice is a crop of north-west Himalayas in India. This area is blessed with producing extra long slender aromatic grain that elongate at least twice of the original size with soft and fluffy texture upon cooking and has delicious taste. Also, known as king of rice, basmati uses less water and fertilizer, has high export potential and its straw is used for livestock feed, rather than burning in the field and creating atmospheric pollution.

Exports of Basmati Rice from India:

Rice is a major export commodity from India. The steady increase in production and growing demand for basmati in the world market has made India a leading exporter in the world. The quantum of basmati exports from India was around 267 thousand tonnes in 1991-92 which rose to 849 thousand tonnes in 2000-01 and increased phenomenally to a record scale of 3145 thousand tonnes in

2011-12. Similarly, the value too rose from around Rs. 499 crore in 1991-92 to Rs. 2155 crore in 2001-02 and further to Rs. 15335 crore in 2011-12 which turns out around 1080 percentage points increase in quantum and 2972 percentage points increase in value. The per unit price also followed the upward trend and rose from Rs. 1873 per qtl in 1991-92 to Rs. 2538 per qtl in 2000-01 and further escalated to Rs. 4876 per qtl in 2011-12.

We have also tried to examine the intra-year variability in quantity, value and per unit price of basmati rice exported from India. We have estimated coefficient of variation in these parameters during 2012-13, 2013-14 and 2014-15. The analysis of monthly quantity, value and per qtl price of exports of basmati and non-basmati rice suggests that around 30 per cent of quantity of basmati rice was exported in January, February and March during 2012-13. The months of September and October were found relatively lean months. However, pattern of exports of basmati rice during 2013-14 deviated and the highest quantity was exported in the month of April followed by June. Next year, around 33 per cent of basmati rice was exported in February and March. The per qtl price of basmati rice in import market has increased by 26.25 per cent between 2012-13 and 2014-15. We have observed variations in price per qtl across the months in the year. The coefficient of variation was found highest for value in 2012-13 and 2013-14 and for quantity in 2014-15.

The exports of basmati rice from India increased several folds during the past two decades. India exports basmati rice to a large number of countries but major importers are a few countries. Saudi Arab and Iran with more than 50 per cent share in export are major buyers of Indian basmati rice. Other important importers are United Arab Emirates, Iraq, Kuwait, Yemen Republic, Qutar, United Kingdom, USA and Jordan. Omen, Netherlands, Australia and Mauritius also import Indian basmati in small quantities. It may be noted that share of Saudi Arab and Iran in total exports increased continuously. It was largely due to popularity of Pusa Basmati 1121 in these countries. All these countries together imported around 90 per cent quantity of Indian basmati rice in 2012-13, 2013-14 and 2014-15.

We have found intra year variability in quantity, value and per qtl price of basmati rice across the months in 2012-13, 2013-14 and 2014-15. The coefficient of

variation was estimated higher for quantity and value in comparison to price during all these years.

b) Socio-Economic Characteristics of Sampled Districts and Households

Sampled Districts:

At the outset, we provide basic information about the important indicators of the selected districts for the survey from the state of Haryana.

i) The total population of Sonipat, Jind and Kaithal districts was14.50, 9.42 and 10.74 lakh respectively during 2011. Surprisingly, around 78 per cent of population in Jind and Kaithal is rural based. Education, although a catalytic factor in development has exhibited poor performance in Jind and Kaithal districts. The share of agricultural workers in total workers in selected districts was between 47 and 64 per cent. The share of non-agricultural workers in Sonipat was around 53 per cent. It appeared that growing work opportunities in these districts could not benefit rural population. The composition of workers in farm and non-farm sectors was markedly different across the selected districts for field survey. Sonipat has shown around 53 per cent workers engaged in the non-farm sector. On the contrary, Jind has exhibited.36 per cent of the work force involved in this sector. Thus, Sonipat is much ahead of other selected districts in rural non-farm employment.

(ii) A comparison of important indicators of agricultural development reveals wide disparities across the selected districts. The agricultural economy of all these districts is food grains based with an area allocation of 88-89 per cent of GCA under these crops except for Jind where around 76 per cent of GCA was devoted to these crops. Cotton is grown on more than 10 per cent of GCA in Jind district. The irrigation status, yield rates of important crops, input uses were analyzed to gauge the disparities in agricultural development. Out of the selected districts, Kaithal appeared to be ahead in productivity of paddy and cotton in comparison to other selected districts.

(iii) The infrastructural development of selected districts was distinctively different. Sonipat is one of the important industrial and commercial centre near

the capital city of Delhi, therefore, it is found rich in infrastructure such as roads.

Sampled Households:

For an understanding of basmati production and marketing, we have looked into main indicators related to population, land resources and crop pattern of the sampled households.

Demographic Characteristics:

The average size of the family of selected farm households was 8 persons at the aggregate level. Farm size and average size of family were not related. The large farmers indicated an average size of family around 9 persons against 6 persons by small households. It could be due to prevalence of joint family system. The literacy rate of the head of households was not found to be impressive however, head of small farm households indicated higher level of literacy.

Land Resources:

The nature of land ownership influences crop pattern, adoption of technology and innovation. At the aggregate level, land owned by selected farmers was 483 hectares. The practice of leasing-in land was prevalent but a small share of land was leased out. The net operated area per household was 4.99 hectares. A positive relationship emerged between land operated and farm size. Thus, large farmers operated 7.6 hectares against 1.39 by small farmers. Tubewells are the major source of irrigation. Some farmers combined tubewells and canal for watering their fields. The sources such as tanks are non-existent.

Crop Pattern:

The crop pattern on the sampled farms indicated that wheat and paddy are the dominant crops which occupied around 80 per cent of GCA. Paddy is the main crop grown by the farmers in kharif season occupying 40 per cent of GCA. The commercial crop of cotton was allotted 3 per cent of GCA. The most important coarse cereal crop of bajra received only 0.13 per cent of GCA and maize was grown on 0.71 per cent of GCA. The farm size variations were common in allocation of area to different crops grown by the farmers.

Basmati paddy was grown on around 549 hectares by the sampled farmers. The largest proportion of basmati paddy was devoted to Pusa Basmati 1121. Each surveyed farmer had sown this variety due to better yield and demand in the export market. A much lower share of total basmati paddy (6.63 per cent) was allotted to Pusa Basmati 1509. A summary of results on proportion of total basmati area allocated to Basmati 1121 + 1509 reveals that it was the maximum in case of marginal farmers. Other categories also devoted more than 80 per cent of basmati area to these varieties.

c) Production and Disposal:

An analysis of production, retention and disposal of Pusa Basmati 1121 and Pusa Basmati 1509 grown by the farm households during the reference year revealed that production of Basmati 1121 was around 113 qtls per farm during 2013-14. Farm size variations were found wide. The sampled households retained a part of production i.e. 1.97 qtls for domestic consumption. In retention, self consumption dominated whereas other requirements were found marginal. The quantity of Basmati 1121 sold was around 16529 qtls whereas, a smaller quantity of 1532 qtls of Basmati 1509 was disposed during the reference year. Since large farm category produced higher quantity than other categories, they also dominated in sales. The price of Basmati 1121 realized by the farmers was Rs. 3607 per qtl while Rs.3364 per qtl were received for Basmati 1509. The produce of basmati was sold primarily to commission agents followed by village traders.

d) Economics of Basmati Paddy Cultivation:

We have analyzed cost of cultivation and economics of production of Basmati 1121 and Basmati 1509 grown by the sampled farmers during kharif season of 2013-14 in Haryana. In addition, we have examined value of marketed surplus of these varieties.

Cost of Cultivation:

The sampled farmers incurred cost on human labour, seed, irrigation, fertilizer and manure and pesticides used by them in cultivation of basmati paddy in kharif season. They also incurred expenditure on storage, transportation and marketing. The per hectare cost of cultivating Basmati 1121 was Rs. 39850 on sampled farms

and the maximum proportion of cost was incurred on human labour followed by chemical fertilizer and pesticides. Findings show that per hectare cost of cultivating Basmati 1509 on sampled farms was Rs. 35447 during 2013-14. The human labour and fertilizer were found the major components of cost. Thus, human labour, machine labour, fertilizer and plant protection were the major items in cost composition in cultivation of study crops.

To sum up, cost of cultivation varies from one crop to another. Farm size variations are common. Among the included crops, cost of cultivation was found higher in production of Basmati 1121 due to relatively higher expenditure on human labour, fertilizer and machine labour.

e) Returns from Cultivation of Basmati 1121 and Basmati 1509:

The per hectare yield of Basmati 1121 on sampled farms was 40.32qtls. Farm size and productivity were found related. Thus, productivity on marginal farms was higher than large farms. After deducting the cost from gross returns, producers earned a profitability of Rs. 1,09,903 per hectare during 2013-14. As expected, marketed surplus in terms of value was much higher in case of large farmers in comparison to other categories. The net returns per qtl from Basmati 1121 were Rs. 2700 and these were found highest on marginal farms.

The results of economics of Basmati 1509 revealed that per hectare input cost of cultivation was Rs. 30787 on sampled farms during the reference year. The major cost items were human labour followed by fertilizer and machinery. Other costs such as storage, transportation, marketing cess, etc were estimated Rs. 4491 per hectare. Thus, total cost of basmati 1509 cultivation was Rs. 35278 per hectare on sampled farms. In particular, marginal farmers incurred higher cost in comparison to other categories. The net returns per hectare after deducting the cost from gross returns were computed Rs. 113569 during 2013-14. The net returns per qtl were estimated Rs. 2617. Like basmati 1121, marketed surplus was recorded higher on large farms in comparison to other categories.

After combining the results for cost of cultivation and net returns from Basmati 1121 and 1509, it was found that sampled producers earned a profit of Rs. 109276 per hectare and Rs. 2693 per qtl during 2013-14. The share of marginal, small, medium and large categories of farmers in marketed surplus of basmati paddy was positively related to farm size.

f) Marketing of Basmati Rice:

Most of the sampled basmati paddy growers disposed their produce in the village market and through commission agents. Some of them combined both the channels. The proportion of farmers selling produce of Basmati 1121 through these channels was 39 and 65 per cent respectively. The sampled farmers sold 110 qtls of Basmati 1121 and 63.85 qtls of Basmati 1509 per farm during 2013-14. They received a price of Rs. 3607 and Rs. 3554 per qtl at the overall level. We could not ascertain any relationship between the price realized and farm size. Basmati 1121 sold through village market and commission agents was 8537 qtls and 7992 qtls, which turns out as 51 and 49 per cent respectively. Among different categories, marginal farmers sold 27 qtls in the village market and 205 qtls through commission agents. They realized a price of Rs. 3181 and Rs. 3909 per qtl respectively. The large proportion of Basmati 1121 produce was sold immediately after the harvest in November, 2013. The produce stocked for future sale was disposed in December 2013, January 2014 and February 2014. The producers realized highest price of Basmati 1121 in January 2014 in the village market and through commission agents in December 2013

In case of Basmati 1509, farmers preferred commission agents but also sold some quantity in the village market. It is unexpected that they received higher price in sale through commission agents. Like Basmati 1121, most of the marketed surplus was sold in the harvesting month of November 2013. A small quantity of produce was retained by some farmers for future sale and it was sold in the month of December 2013 and January 2014. The price realized was the maximum through disposal in the month of December 2013.

The intermediaries play an important role in functioning of supply chain of food commodities. We had examined sources of their supply for basmati rice. The wholesalers sourced their supply from millers while retailers purchased their stock from wholesalers. The exporters purchased paddy through commission agents in the regulated market. They have milling facility in their premises and therefore, they process paddy in their own units.

g) Price Pattern of Basmati Rice:

Price of agricultural commodities has multiple implications for all stakeholders. Prices help in balancing demand and supply, allocation of scarce resources and in regulating the movement of agricultural items across the regions. We had worked out price spread i.e. share of consumer's rupee received by the producers for study crops. In addition, purchase and sale prices of Basmati 1121 and Basmati 1509 and margins of stakeholders such as wholesalers, retailers and exporters are analysed for a period from October 2013 to March 2014.

Findings show that producers of Basmati 1121 and Basmati 1509 received 66.41 and 63.62 per cent of the consumer's rupee. The balance was reaped by intermediaries in the supply chain.

The wholesalers sold an average quantity of 13.72 and 5.25 qtls of Basmati 1121 and Basmati 1509 during the reference period. The total quantity disposed was 18.97 qtls per month. They earned a margin of 4.34 per cent. The retailers sold 1.19 qtls and 0.59 qtl of Basmati 1121 and 1509. They sold an average quantity of 1.78 quintals per month. The maximum sale occurred in the festival months of October and November, 2013. The percentage mark up of retailers was 6.81 per cent after combining Basmati 1121 and Basmati 1509 during the reference period.

The primary survey of exporters revealed that they exported an average quantity of 6990 qtls of Basmati 1121 and 1551 qtls of Basmati 1509 during the reference period of Oct 2013 to March 2014. Evidently, quantum of exports of Basmati 1121 was around four times as compared to Basmati 1509. It was largely due to international demand for this variety in countries like Iran. In December 2013, quantum of exports of above mentioned varieties was higher in comparison to other months under consideration. The per qtl price realized from exports of Basmati 1121 was Rs. 8127 while it was Rs. 7424 for Basmati 1509. The percentage mark up of exporters was 11.43 per cent and 10.50 per cent respectively for these varieties of basmati rice. At the overall level, this margin was 11 per cent during the study period. To conclude, the exporters earned higher margins in comparison to domestic intermediaries including wholesalers and retailers.

h) Perceptions of Stakeholders:

We had gauged the perceptions of stakeholders involved in the process of production to exports of basmati rice through perceived problems by them. The stakeholders included producers, wholesalers, retailers and exporters.

Agriculture is a risky business because it deals with uncertain factors such as weather and market conditions. During the course of survey, we had asked farmers about reasons for growing basmati paddy. They rated profitability followed by suitability of land as primary factors governing their decisions for allocation of land to basmati paddy. They reported that they face umpteen problems during cultivation of basmati paddy such as lower and unstable yield, shortage of human labour and other inputs. They also stated that instability in price, lack of remunerative price and non-existence of minimum support price are serious constraints in their efforts. The problems are further aggravated by environmental problems such as poor quality of ground water and adverse climatic conditions. The wholesalers of basmati 1121 and basmati 1509 perceived the problems such as lower price due to lower domestic demand, competition from imports, supply of poor quality grain, mixing of varieties and infrastructural problems.

The retailers of basmati rice reported problems such as non-remunerative price, competition from large organized retail chains, lower supply of the grain in the market when demand in the international market is higher than the available supply.

8.4 Policy Implications:

Basmati rice is a great strength of India since its quality in terms of grain length and aroma can hardly match any other variety of rice in the world. There has been commendable increase in the production of basmati in the country due to area expansion and yield enhancement. The steady increase in production and growing demand in world market has made India a leading exporter of basmati rice in the world. This has benefited all stakeholders including farmers. However, a huge potential still remains to be realized. Haryana is the leading producer of basmati rice in India. The production can be further improved through pragmatic policy initiatives. The following policy measures are recommended for achieving this objective.

1. Yield enhancement of basmati paddy through research on improved varieties and their transfer at the farm level.
2. In addition to technology generation for improved yield of basmati paddy, timely delivery of required inputs at reasonable price to the farmers should be prioritized.
3. Pesticide residues in the produce of basmati rice create serious problem in matching international standards of food safety. Therefore, extension department should organize regularly awareness camps for the producers in order to promote balance use of fertilizer and pesticides.
4. Provision of necessary physical (storage, credit, etc) and marketing infrastructure.
5. Streamlining the administrative procedures for export of basmati rice.

Bibliography:

1. Acharya, S.S.; Ramesh Chand; P.S. Birthal; Shiv Kumar and D.S. Negi. (2012). Market Integration and Price Transmission in India: A Case of Rice and Wheat with Special Reference to the World Food Crisis of 2007/08, www.fao.org, Rome, Italy.
2. Ali, Mubarik (1995). Institutional and Socioeconomic Constraints on the Second-Generation Green Revolution: A Case Study of Basmati Rice Production in Pakistan's Punjab. *Economic Development and Cultural Change,* 43(4):835-861p.
3. Ali, Mubarik and John C. Flinn. (1989). Profit Efficiency among Basmati Rice Producers in Pakistan Punjab. *American Journal of Agricultural Economics,* 71(2):303-310p.
4. Aslam. (1979). Rice Policy of the European Community and Prospects of Rice Export from Pakistan. *Pakistan Economic and Social Review,* 17(1/2):50-65p.
5. Brar, A.S; S.S. Mahal; G.S. Buttar and J.S. Deol. (2011). Water Productivity, Economics and Energetic of Basmati Rice (Oryza Sativa) Wheat (Triticum Aestivum) Under Different Methods of Crop Establishment. *Indian Journal of Agronomy,* 56(4):317-320p.
6. Chaudhry, M. Ghaffar; and Nighat Naheed Kayani. (1991). Implicit Taxation of Pakistan's Agriculture: An Analysis of the Commodity and Input Prices. *The Pakistan Development Review,* 30(3):225-242p.
7. David, C. Cristina and Jikun Huang. (1996). Political Economy of Rice Price Protection in Asia. *Economic Development and Cultural Change,* 44(3):463-483p.
8. Dorosh, Paul A. (2008). Regional Trade and Food Price Stabilization in South Asia: Policy Responses to the 2007-08 World Price Shocks. *The Pakistan Development Review,* 47(4):803-813p.
9. Dwivedi, Sudhakar; M.C. Dwivedi; and Tarunvir Singh. (2011). An Economic Analysis of Basmati Rice Production in Jammu district of Jammu and Kashmir. *Journal of Research, SKUAST-J,* 10(1):93-99p.
10. Farooq, Umar; Trevor Young; Noel Russell and Muhammad Iqbal. (2001). The Supply Response of Basmati Rice Growers in Punjab, Pakistan: Price and Non-Price Determinants. *Journal of International Development,* 13(2):227-237p.
11. Ghani, Abdul; Jeffrey C. Metzel and B. Lynn Salinger. (1993). Diversification within Rice: Production Opportunities and Export Prospects of Specialty Rice in Bangladesh. *The Bangladesh Development Studies,* 21(3):111-123p.
12. Grover, D.K. (2012). Basmati Rice Cultivation for Resource Conservation and use Efficiency in Context of Sustainable Agriculture in Punjab, *Indian Journal of Economic Development,* 8(2):11-26p.
13. Iqbal, Nuzhat. (1993). Economic Analysis of the Effects of Rice Price Distortions in Pakistan: 1975-90. *The Pakistan Development Review* 32(4):859-872p.
14. Khatkar, R.K.; J.C. Karwasra; V.K. Singh and Jitender Kumar Bhatiya. (2014). Market Co-Integration, Price Discovery and Causation of Basmati Paddy in Haryana. *Indian Journal Economic Development,* 10(1a):38-44p.

15. Kurosaki, Takashi. (1996). Government Interventions, Market Integration, and Price Risk in Pakistan's Punjab. *The Pakistan Development Review,* 35(2):129-144p.
16. Kumar, Parmod; R.K. Sharma. (2003). Spatial Price Integration And Pricing Efficiency At The Farm Level: A Study of Paddy in Haryana. *Indian Journal of Agricultural Economics*, 58(2):201-217p
17. Mallik, Jayanta Kumar. (2005). India's Exports: Policy Defeating Exchange Rate Arithmetic. *Economic and Political Weekly*, 40(52):5486-5496p.
18. Mukesh; Ishwar Singh; R.K. Pannu; Dasharath Prasad and Asha Ram. (2013). Effects of Different Transplanting Dates on Yield and Quality of Basmati Rice (Oryza Sativa) Varieties. *Indian Journal of Agronomy*, 58(2): 256-258p.
19. Mulik, Kranti and John M Crespi. (2011). Geographical Indications and the Trade Related Intellectual Property Rights Agreement (TRIPS): A Case Study of Basmati Rice Exports. *Journal of Agricultural & Food Industrial Organization,* 9(4):1-26p.
20. Nagaraju, J.; M. Kathirvel; R. Ramesh Kumar; E.A. Siddiq and Seyed E. Hasnain. (2002). Genetic Analysis of Traditional and Evolved Basmati and Non-Basmati Rice Varieties by Using Fluorescence-Based ISSR-PCR and SSR Markers. *The National Academy of Sciences of the United States of America,* 99(9):5836-5841p.
21. Reddy, A. R and C. Sen. (2004). Technical Inefficiency in Rice Production and its Relationship with Farm-Specific Socio-Economic Characteristics. *Indian Journal of Agricultural Economics,* 59(2):259-267p.
22. Samal, P; A.K. Mishra. (2003). GATT Commitments and Rice Exports: Issues for the Indian Rice Sector. *Indian Journal of Agricultural Economics,* 58(3):400-401p.
23. Sekhar, C. S. C. (2008). World Rice Crisis: Issues and Options. *Economic and Political Weekly,* 43(26/27):13-17p.
24. Sekhar, C S C. (2003). Agricultural Trade Liberalisation-Likely Implications for Rice Sector in India. *Indian Journal of Agricultural Economics,* 58(1):42-63p.
25. Sharma; Anil and Parmod Kumar. (2001). An Analysis of the Price Behavior of Selected Commodities. *planningcommission.gov.in*, GoI.
26. Sidhu, J.S.; Jasdev Singh and Raj Kumar. (2014). Role of Market Intelligence in Agriculture: A Success Story of Basmati Cultivation in Punjab. *Indian Journal of Economic Development,* 10(1a): 26-31p.
27. Zulfiqar, Muhammad; Dilawar Khan; Anwar F Chishti; Munir Khan; Wasiullah; Ajmal Waheed; Muhammad Zakir and Robina Karim. (2009). Trade Liberalisation Could Improve Producers Profitability in Agriculture: A Case of Basmati, Rice. *The Pakistan Development Review,* 48(4):771-782p.

Annex-1

FARM SIZE	No.of Farm Households
MARGINAL	14
SMALL	25
MEDIUM	29
LARGE	82
TOTAL	150

Action taken on Comments

Comments on Report "Relationship between Wholesale Prices, Retail Prices and Export Prices of Basmati rice in Haryana"

We are thankful to Dr. C.S.C. Sekher, Associate Professor, IEG for useful comments on the above submitted draft report.

General comment:

This is a well-written report with a good overview chapter and literature review. Tabulation is mostly as per the format suggested by the coordinating centre. The action taken on comments is as under:

Chapter 3

i) Please provide a table on the number of households in each size-category
----------table incorporated as Annex-1

ii) Matching of total area irrigated and un-irrigated to total area under all crops in case of sampled farmers.
----------These would not match since first is NAS and second is GCA.

iii) Table 3.9 is a repetition of Table 3.8 and may be removed.
----------Table 3.9 is deleted.

Chapter 4

i) Number of households in tables 4.1, 4.2 and 4.3.
----------Provided.

ii) "Machinery hired / owned charges" include imputed value of owned machinery
----------Checked and found correct.

Chapter 5

i) Sum of households marketing through village market and commission
----------yes, several farmers are marketing their Basmati produce through both the Channels

Chapter 6

i) Price patterns over time using secondary data,
---------Secondary date for the state of Haryana are not available.

Chapter 7

i)and ii) Matching of distribution to 100.

----------These are multiple responses and therefore, would not be 100.