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RESOURCE USE EFFICIENCY AND RETURNS TO INVESTMENT IN RESEARCH OF PEARL MILLET IN RAJASTHAN

Seema Shaktawat[*], I.P. Singh[*], N.Nagaraj[**] and Shirish Sharma[*]

ABSTRACT

The present study was conducted in Jodhpur and Nagaur districts of Rajasthan under HOPE project funded by BMGF foundation. The average technical efficiency for rain-fed and irrigated farmers was 0.42 and 0.84 respectively. The results revealed that 78.38 percent rain-fed farms were operating at technical efficiency rating of ≤ 0.50 and 35.00 percent. Irrigated farms were found to operate at technical efficiency rating between 0.81 and 0.90. The returns to investment in research analysis revealed that NPV was estimated to be extent of ₹489.94 million. The internal rate of return to investment in research on pearl millet improvement was estimated to be 28 per cent. The B:C ratio was worked out to be 1.41 indicating that returns to investment in research on pearl millet improvement and release of HHB 67-Improved was highly profitable research investment contributing to the economic welfare to the society.

Key word: Technical efficiency, NPV, economic welfare and investment
JEL Classification: D24, D61

INTRODUCTION

Pearl millet is the most widely grown type of millet because of its tolerance to difficult growing conditions such as drought, low soil fertility and high temperature. It can be grown in areas where other cereal crops, such as maize (*Zea mays*) or wheat (*Triticum aestivum*), would not survive. Pearl millet is concentrated in the developing countries which accounts for over 95 per cent of the production and acreage. India continues to be the single largest producer of pearl millet in the world, although the area has been declining in the traditional growing states of Gujarat, Rajasthan and Haryana. Pearl millet is usually grown as a dry land dual purpose grain and fodder crop. Pearl millet grain is the staple diet for farm households in the world's poorest countries. In the Sahelian region of Africa and rural regions of

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northwestern India, pearl millet is an important cereal for consumption. Pearl millet stover is a valuable livestock feed in the growing regions in India and Africa. Pearl millet production in India was characterized by subsistence cultivation during 1970s with a small marketable surplus. But in recent years, it is being geared to a more market-oriented crop owing to the change in utilization from mainly food use to many other alternative uses such as animal feed, alcohol, processed food etc. The present study was an attempt to examine resource use efficiency and returns to investment in research of pearl millet in Rajasthan.

METHODOLOGY

HOPE Project (Harnessing Opportunities for Productivity Enhancement for Millets) was funded by ICRISAT, Hyderabad. The project clusters namely Kherapa in Jodhpur and Gotan in Nagaur were purposively selected as the HOPE project was running in these clusters. The project villages selected were Kherapa and Lavera Khurd in Kherapa cluster and Gotan and Talanpur in Gotan cluster.

Selection of Farmers

In to draw a representative sample the selection of farmers was done on the basis of different land size holdings using the standard classification criteria presented in Table 1. For the collection of the primary data, a sample of 120 farmers consisting 60 farmers each cultivating millet crop under rainfed and irrigated conditions were selected with probability proportion to number of farmers in each size group and detail is presented in Table 1.

Table 1: **Average size of land holding and area under pearl millet on different land size holdings**

(Ha)

Land size holding	Category of farmers	Number of the farmers	Average area under Pearl Millet
up to 2	Small	60	0.78
> 2 ≤ 4	Medium	39	1.13
> 4	Large	21	1.78
Total	**-**	**120**	**-**

Collection of data

The primary data were used for the present study. Information regarding cost of inputs and prices obtained for output, resource use pattern and research cost for developing varieties was collected to assess impact of pearl millet high yielding varieties. The data were obtained from All India Coordinated Pearl Millet Improvement Project (AICPMIP) based at Jodhpur. The HHB 67-Improved was

released in 2005. The research and adoption cost estimates were obtained from the pearl millet project.

Techniques of Analysis

To analyze resource use efficiency of pearl millet hybrids across different farm size groups in rain-fed and protective irrigation conditions, the Frontier Production Function was used. To analyze the ability of farmers to achieve the maximum realizable pearl millet output (efficiency) with current level of input use under the existing situation and given technologies, a careful examination of farm specific technical efficiency of the farmers is necessary. The technical efficiency evaluates the farm's ability to obtain the maximum possible output from a given set of resources, while allocative efficiency explores the needed adjustments in equating the marginal revenue with the marginal cost for maximizing the profitability. The Cobb-Douglas Production Function does not discriminate between technical and allocative efficiency. It ignores the problem of technical inefficiency by assuming that all the techniques of production are identical across farms and every producer is technically efficient which may not be true always.

Timmer (1971) modified the procedure in a number of ways and imposed a Cobb-Douglas type of specification on the frontier and evolved an output based measure of efficiency.

The function in log form is as under.

$$nY = A + \sum_{i=1}^{n} \beta i \ln xi + U$$

$$\ln Y = A + \sum_{i=1}^{n} \beta_i \ln x_i + U \quad ; \qquad U \leq 0 \quad \dots\dots\dots\dots\dots\dots (1)$$

The above model was estimated using corrected ordinary least squares (COLS) regression. As a first step, ordinary least square (OLS) was applied to the regression equation to yield best linear unbiased estimates of βi coefficient. The function estimated was in form of:

$$\text{Log } Y = \log a + \sum_{i=1}^{7} b_i \log x_i + e \dots\dots(2)$$

Where,

Y = Gross returns from pearl millet (₹ha^{-1})
a = Intercept
x_1 = Area under pearl millet (ha)

3

x_2 = Use of FYM (₹ha^{-1})

x_3 = Use of Seed (₹ha^{-1})

x_4 = Use of Urea (₹ha^{-1})

x_5 = Use of DAP (₹ha^{-1})

x_6 = Irrigation (₹ha^{-1})

X_7 = Use of Labour (₹ha^{-1})

b_i = Elasticity's of production (i = 1 to 7)

e   = Error term

Equation (2) was estimated in log form using ordinary least squares method. The Frontier Production Function was derived from the Cobb-Douglas type of production function fitted to the gross income from pearl millet cultivation. The technical efficiency was worked out using potential output that can be realized from a set of inputs. The potential output is given by

$$Y^* = Y + e_m \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (3)$$

Where,

Y^* = Potential gross returns that could be derived from Pearl millet cultivation

Y = Estimated gross returns from Pearl millet cultivation.

e_m = Highest positive error term.

The intercept estimate 'α' was then corrected by shifting the function until no residual is positive and one observation becomes zero. This was done by the adding the largest error term of the fitted model to the intercept. The new production function with a shift in the intercept in the frontier production function gives the maximum output obtainable for given level of input and it would be of the form.

$$\text{Ln } Y^* = A + \Sigma\beta_i \ln X_i + U; \qquad U \leq 0 \qquad \ldots\ldots\ldots\ldots\ldots. (4)$$

If the value of β_i is negative, then the geometric mean of ith input X_i is taken instead of β_i in X_i. The Frontier Production Functions were estimated separately for Rain-fed and irrigated farms.

Timmer's measure of technical efficiency

It is the ratio of actual output to the potential output on the production function given the level of input use on the ith farm.

Technical Efficiency of ith farm = Yi / Yi*

Where,

Yi-is actual gross returns from Pearl millet cultivation on i^{th} farm

Yi*-is the potential gross returns attainable from Pearl millet cultivation on i^{th} farm.

For the most efficient farmer $(Y=Y^*)$, the technical efficiency will be highest being equal to one. In frontier approach, a producer is said to be technically efficient if the observed output is maximum for the given level of input. Thus, the production frontier is defined as the locus of maximum possible output for each level of input used. A failure on part of firm to produce the frontier level of output at given input level is attributed to technical inefficiency.

Allocative efficiency

The allocative efficiency or price efficiency is an economic measure as against technical efficiency, which is a physical measure. A production activity is allocative efficient when the value of the marginal product (VMP) of a factor is equal to the marginal factor cost (MFC).

The Cobb-Douglas type production function was fitted for pearl millet crop and used to compute the allocative efficiencies. The first differential itself was the VMP of the factor as the dependent variable was the gross returns from pearl millet cultivation. Since all the independent variables in regression are the cost of inputs, the MFC of all factors was unity. Thus the allocative efficiency measures of all factors are given by the equation:

$$\text{Allocative efficeincy} = \frac{VMPx_i}{MFCx_i} \dots\dots\dots(5)$$

Where,

$$VMPx_i = \frac{\beta_i \overline{Y}_i}{\overline{x}_i} \dots\dots\dots(6)$$

VMP_i = Value marginal product of ith input

β_i = Regression co-efficient of ith input

$\overline{Y}_i$ = Geometric mean of gross returns from pearl millet.

$\overline{x}_i$ = Geometric mean of ith input

The value marginal product of the inputs was worked out by multiplying the respective input coefficient with the geometric mean level of output and divided by the geometric mean level of respective input………..(Equ. 6)

The allocative efficiency equal to unity represents the most efficient allocation or optimal allocation while less than or more than unity represents over or under use of the factor (sub-optimal use), respectively. The allocative efficiency of all the factors was computed at the geometric mean level of the inputs and the output for the rain-fed and irrigated farmers of Pearl millet crops and the same were compared.

Economic efficiency

Economic efficiency (EE) is the product of technical efficiency (TE) and allocative efficiency (AE)

EE = TE * AE   ………………… (7)

Returns to investment in research

To study economic impact of pearl millet HYVs, NPV, IRR and B: C ratio was worked out.

$$B{:}C\ ratio = \frac{\sum\limits_{i=1}^{n} \dfrac{Bn}{(1\ +\ i)^{n}}}{\sum\limits_{i=1}^{n} \dfrac{Cn}{(1\ +\ i)^{n}}}$$

Where,

BCR = Benefit Cost Ratio
i = Rate of interest used for discounting
Cn = Cost in nth the year
Bn = Benefit in the nth year
i = 1, 2, 3, 4…………….n

$$NPW = \sum\limits_{i=1}^{n} \frac{Bn - Cn}{(1+i)^{n}}$$

Where,

NPW = Net Present Worth
i = Rate of interest used for the discounting
Bn = Benefit in the nth year
Cn = Cost in the nth year
i = 1, 2, 3, 4…………….n

$$IRR = \sum\limits_{i=1}^{n} \frac{Bn}{(1+i)^{n}} - \sum\limits_{i=1}^{n} \frac{Cn}{(1+i)^{n}} = 0$$

Where,

i = Rate of interest used for discounting (which is also the IRR of the project of this equation is satisfied)
B_n = Benefit in the nth year
C_n = Cost in the nth year
i = 1, 2, 3, 4…………….n

RESULTS AND DISCUSSION

The results obtained from analysis of data are discussed under various sub-heads as follows:

Adoption Level of High Yielding Varieties of Pearl Millet

The perusal of Table 1 shows revealed that public hybrids dominated in rain-fed area (93.23 per cent) and private hybrids occupy most of irrigated area under pearl millet cultivation (70.37 per cent). However, public hybrids are also grown under irrigated conditions and cover 29.63 per cent of irrigated area.

Table 1: Percent area under pearl millet cultivation in HOPE Project clusters

Particulars	Rain-fed farms	Irrigated farms
Local varieties	06.79	-
Public Hybrids	93.21	29.63
Private Hybrids	-	70.37
Total	100.00	100.00

Resource Use Efficiency of Pearl Millet Hybrids

One of the major objectives of the study was to analyze resource use efficiency under rain-fed and irrigated conditions in pearl millet cultivation. The regression parameters of the estimated Cobb-Douglas production function are presented in the Table 2.

Table 2   Estimated production function for pearl millet cultivation in HOPE Project clusters

Particulars	Rain-fed farms	Irrigated farms
Constant	8.72*	5.83*
	(3.85)	(7.31)
Area under pearl millet	1.03*	0.38*
	(2.77)	(2.96)
FYM (₹)	-0.33	-0.04
	(-1.59)	(-0.60)
Seed (₹)	0.45*	0.25*
	(4.09)	(5.45)
Urea (₹)	-0.01	0.24**
	(-0.93)	(1.97)
DAP (₹)	.002	0.03
	(0.26)	(0.50)
Irrigation (₹)	-	0.08***
		(1.73)
Labour (₹)	-0.02	0.06
	(-0.09)	(0.83)
R^2	0.83	0.95
F-value	44.23	138.20

Figures in parentheses indicate t-stat value.
***, ** and * indicates significance at 10, 5 and 1 percent level.

The coefficients of multiple determinations (R^2) were 0.83 and 0.95 for estimated production function of rain-fed and irrigated farms (Table 2). The high and significant F-values indicated that Cobb-Douglas production function was adequate in explaining 83 per cent and 95 per cent of the variation in output under rain-fed and irrigated conditions. The constant returns to scale were noticed in both the conditions since sum of elasticities was nearly equal to one. The constant value under rain-fed

and irrigated conditions indicated that the pearl millet output was positive and significant. Under rain-fed conditions, the coefficients like area under pearl millet and seed were positive and significant. Under irrigated conditions area under pearl millet, seed, urea and irrigation were positive and significant statistically.

To analyze the scope for intensification of resources in both conditions, the marginal value products (MVP) of resources were compared with the respective marginal factor cost (MFC). The MVP and MFC ratios for different resources under rain-fed and irrigated conditions are furnished in Table 3. The MVP-MFC ratios for seed were more than one on the rainfed farms (2.08) and irrigated farms (1.48). The corresponding figures for MVP-MFC ratios for FYM, urea and labour under rain-fed conditions were came out to be 0.57, 0.99, and 0.98 respectively. In the case of irrigated pearl millet, urea, DAP, irrigation and labour ratios were greater than one as such the corresponding were estimated to be 1.45, 1.06, 1.11 and 1.08 respectively.

Table 3: **MVP and MFC ratios of resources rain-fed farmers in HOPE Project clusters**

Particulars	Rain-fed			Irrigated		
	MVP	MFC	Ratio	MVP	MFC	Ratio
FYM (₹)	0.57	1	0.57	0.93	1	0.93
Seed (₹)	2.08	1	2.08	1.48	1	1.48
Urea (₹)	0.99	1	0.99	1.45	1	1.45
DAP (₹)	1.00	1	1.00	1.06	1	1.06
Irrigation (₹)	-	1	-	1.11	1	1.11
Labour (₹)	0.98	1	0.98	1.08	1	1.08

The technical efficiency of rain-fed and irrigated farms was worked out by using Timmer Method. The distribution of sample farmers according to different technical efficiency ratings along with average technical efficiency for both farms is presented in Table 4.

Table 4: **Distribution of farmers according to technical efficiency in HOPE Project clusters**

Farm category	Percent technical efficiency rating						
	≤ 50	51-60	61-70	71-80	81-90	> 90	ATE
Rain-fed	47 (78.38)	6 (10.00)	5 (8.33)	2 (3.33)	-	-	0.42
Irrigated	-	-	2 (3.33)	21 (35.00)	21 (35.00)	16 (26.67)	0.84

Figures in parentheses indicate percent farmers
ATE: Average technical efficiency

The average technical efficiency for rain-fed and irrigated farmers was 0.42 and 0.84 respectively. It was found that 78.38 percent rain-fed farms were found to operate at technical efficiency rating ≤ 0.50 and 35.00 percent irrigated farmers were found to operate at technical efficiency rating between 0.81 and 0.90. The technical efficiency of more than 90 per cent was achieved by 26.67 per cent of farms under irrigated conditions. However, there was none in this category under rain-fed conditions. Only 3.33 per cent farms under rain-fed conditions achieved technical efficiency between 71-80 per cent.

The perusal of Table 5 shows technical, allocative and economic efficiency of pearl millet cultivation. The results revealed that an allocative efficiency of rain-fed farms (0.50) was greater than that of irrigated farms (0.40), and the economic efficiency was less in the case of rain-fed farms (0.21) as compared to irrigated farmers (0.34) indicating that irrigated farms were more efficient in terms of input use.

Table 5: Technical, allocative and economic efficiency of pearl millet cultivation in HOPE Project clusters

Particulars	Farm category	
	Rain-fed	Irrigated
Technical efficiency	0.42	0.84
Allocative efficiency	0.50	0.40
Economic efficiency	0.21	0.34

Returns to Investment in Research

The economic impact of pearl millet high yielding varieties from 1999-2011 in Rajasthan is presented in Table 6. These cost estimates were discounted at 5 per cent rate of discount. The analysis of NPV, IRR and B: C ratio revealed that NPV was highly positive to the extent of ₹ 489.94 where as discounted total cost was ₹ 1203.82 million indicating that returns to investment in research were highly beneficial. Internal rate of return to investment in research on pearl millet improvement was 28 per cent and B: C ratio was worked out to be 1.41 indicating that returns to investment in research on pearl millet improvement and release of HHB 67-Improved was highly useful research investment contributing economic welfare to the society.

Table 6: Economic impact of pearl millet HYVs from 1999 to 2011 in Rajasthan: Local V/s HHB 67- Improved

Particulars	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Total
Cost of cultivation of Local PM ($\bar{\mathrm{R}}$ ha^{-1}) (a)								3226	3396	3574	3763	3961	4169	-
Cost of HHB 67 - Improved ($\bar{\mathrm{R}}$ha^{-1}) (b)								4241	4464	4699	4947	5207	5481	-
Incremental Cost over Local ($\bar{\mathrm{R}}$ha^{-1}) (c=b-a)	0	0	0	0	0	0	0	1015	1069	1125	1184	1246	1312	-
Improved Public bred hybrid area (000' ha) (d)	0	0	0	0	0	0	0	41	187	300	214	208	731	-
Adoption cost ($\bar{\mathrm{R}}$ million)								41.62	199.83	337.46	253.39	259.25	959.07	2050..64
Discount factor @ 5 per cent (e)	0.95	0.91	0.86	0.82	0.78	0.75	0.71	0.68	0.64	0.61	0.58	0.56	0.53	-
Discounted adoption cost ($\bar{\mathrm{R}}$ million)								28.17	128.82	207.17	148.15	144.36	508.62	1165.29
Mean Yield of Improved public bred hybrids (kgha^{-1}) (f)	0	0	0	0	0	0	0	648	648	648	442	589	610	-
Mean yield of local (kgha^{-1}) (g)								450	450	450	223	375	411	-
Yield Diff due to HHB 67 over Local (kgha^{-1}) (h=f-g)								198	198	198	219	214	199	-
Price of Pearl millet (MSP) ($\bar{\mathrm{R}}$ tonne^{-1}) (i)	4150	4450	4850	4950	5050	5150	5250	5400	6200	8400	8600	8800	9800	-
Incremental return due to HHB 67 Improved ($\bar{\mathrm{R}}$ ha^{-1}) (j=i×h)								1069	1228	1663	1883	1883	1950	
Total gain due to HHB 67 Improved in Rajasthan ($\bar{\mathrm{R}}$ million)								43.84	229.56	498.96	403.05	391.71	1425.60	2992.71
Discounted Total gain due to HHB 67 Improved in Rajasthan ($\bar{\mathrm{R}}$ million)								29.67	147.98	306.32	235.65	218.12	756.02	1693.76
Incremental net return due to HHB 67 Imp ($\bar{\mathrm{R}}$ha^{-1}) (k=j-c)								54	159	538	699	637	638	-
Incremental net return in Rajasthan due to HHB 67 Imp ($\bar{\mathrm{R}}$ million) (l=k×d)	-	-	-	-	-	-	-	2.21	29.73	161.50	149.65	132.45	466.52	942.07
Total research cost (m)	53.94													-
Apportioned research cost (n=m×0.75)	40.46													-
Discounted research cost , $\bar{\mathrm{R}}$ million (o=n×e)	38.53	0	0	0	0	0	0	0	0	0	0	0	0	-
Discounted Total cost, $\bar{\mathrm{R}}$ million (Adoption +Research cost)	38.53	0	0	0	0	0	0	28.17	128.82	207.17	148.15	144.36	508.62	1203.82
Discounted net return in Rajasthan due to HHB 67-I ($\bar{\mathrm{R}}$ million) (l=k×d)	-38.53	0	0	0	0	0	0	1.50	19.16	99.15	87.50	73.76	247.41	489.94
NPV ($\bar{\mathrm{R}}$ million)	489.94													-
IRR	0.28													-
B:C	1.41							1.05	1.15	1.48	1.59	1.51	1.49	-

CONCLUSIONS

The study concluded that average technical efficiency for rain-fed and irrigated farmers was 0.42 and 0.84 respectively. About 78.38 percent rain-fed farmers were found to operate at technical efficiency rating ≤ 0.50 and 35.00 percent. Irrigated farmers were found to operate at technical efficiency rating between 0.81 and 0.90. The returns to investment in research analysis revealed that NPV was highly positive to the extent of ₹489.94millions. Internal rate of return to investment in research on pearl millet improvement was 28 per cent and B: C ratio was worked out to be 1.41 indicating that returns to investment in research on pearl millet improvement and release of HHB 67-Improved is highly useful research investment contributing to the economic welfare to the society.

REFERENCES

Aski, S.G., Gotyal, S.H., Patil, M.B., Hanumanaikar, R. H. 2010. A study on knowledge level and adoption behaviour of improved cultivation practices of pearl millet growers in Bijapur district of Karnataka. *Agriculture Update*. **5** (3/4): 403-405.

Carl, E. Pray and Nagarajan, L. 2009. Pearl Millet and Sorghum Improvement in India. IFPRI Discussion Paper 00919, *www.ifpri.org/millionsfed*.

Rahman, S. and Shankar, B. 2009. Profits, Supply and HYV Adoption in Bangladesh" *Journal of the Asia Pacific Economy*. **14** (1): 73- 89.

Timmer, C.P. 1971. Using a Probabilistic Frontier Function to Measure Technical Efficiency, *Journal of Political Economy*. **79**: 776-794.

A TEMPORAL ANALYSIS OF RESEARCH INVESTMENT AT PUNJAB AGRICULTURAL UNIVERSITY

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ABSTRACT

The present study was conducted to examine the research investment by PAU on crops and enterprises in Punjab. In order to achieve the stipulated objectives of the study the data on research investment was compiled from Budgets of Punjab Agricultural University for last 25 years 1985-86 to 2009-10. The results show that annual average research investment has increased over time. Whereas growth analysis indicated that growth rate dropped down to 1.74 per cent per annum in Period III (2003-04 to 2009-10). Thus, there is need to provide more resources to PAU to conduct research in various field of development. Further, it was observed that the share of non-plan agricultural schemes to research budget has increased whereas share of all the other schemes has shown decline during the study period and state government remained key sources of funding for the research work done at PAU. The ICAR ranked second, but it is losing its ground with passage of time. An analysis of research investment on different crops by Punjab Agricultural University indicated that research efforts remained confined to wheat and rice. In the case of enterprises it was observed that research investment by PAU skewed in the favour of mushroom.

INTRODUCTION

Agriculture is the prime sector of Punjab economy and is at the core of socio-economic development of the state. The Punjab agriculture, not withstanding its importance, suffers from various constraints such as small land holding (77 per cent area is below four ha), fragmentation of land holdings, low productivity and low investment (Golait and Lokare, 2008). Among others, declining research investment over time has emerged as a major binding constraint on the performance of agriculture and remains a cause of concern. Inadequacy of research investment has

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slowed the pace and pattern of technological change and the infrastructural development with adverse ramification on agricultural productivity. Moreover, in the era of globalization where agriculture is moving from subsistence to commercial one, the need for increasing research investment in agriculture is being felt as never before. Most importantly Public investments need to be stepped up in regions which although relatively backward but have a high potential for agricultural growth as productivity levels in the Green Revolution areas have already plateau (Nath,1998). Additional boost in agricultural production to the levels, needed to feed an expanded world population, will require sharply increased public investment in research and development and widespread adoption of new technologies, farming techniques and crop varieties. Noting that investment in research and development (R&D) is the most productive way to support agriculture, it has been argues that massive public and private investments in R&D are required if agriculture is to benefit from the use of new technologies and techniques. The need for substantially higher levels of investment in agriculture R&D will further increase due to climate change and intensifying water scarcity.

Another major concern is that agriculture research system should made effort for the development of new varieties of all the crops, rather than remained confined to few crops only. Hence, the strengthening of agricultural research system is one of the main priorities, not only for wealth creation but also for its contribution to food security, poverty reduction, and environmental sustainability. But this calls for increased public investment in agricultural research. If the declining trend of public sector investment is not reversed then prospects of agricultural growth in the country are dim. Only step up in public investment can survive the Indian agriculture. Moreover, diminishing returns can be altered with investments, which may help technological developments, shifting the production function upward or bringing in higher efficiency in the use of variable inputs or combination of both (Singh and Sidhu, 2005).

Therefore, this study attempts to critically evaluate research investment by Punjab Agricultural University in Punjab agriculture. The Punjab Agricultural University helped in catapulting the country from food deficit to food sufficient single handedly by bringing substantial increase in the productivity and production of food grains. It has been responsible for the development, adaptation and adoption of agricultural technology for the state farmers' and has played a pivotal role in the agricultural and rural development of the state. moreover it is important to study the trend in research investment in Punjab agriculture because this state has reached a plateau in term of growth in agriculture and both capital and technologies have to play a more dynamic role in future growth of Punjab agriculture. The present study along with the discussion of the existing pattern of investment, present the pattern of investment at point of timed that was not covered by the previous studies.

The specific objectives of the study were:

    i.   to analyse the trend of research investment by Punjab Agricultural University and

    ii.   to analyse the trend in research investment on different crops and individual enterprise by Punjab Agricultural University.

METHODOLOGY

Data Sources

In order to achieve the stipulated objectives of the study the secondary data were used and compiled from publications of various departments of Punjab Agricultural University for the period 1985-86 to 2009-10. To study the objectives, data on crops like wheat, rice, maize, cotton, sugarcane, oilseeds and pulses was collected. For enterprises, mushroom and bee-keeping were considered because of non availability of data on other enterprises. Yearly data on funds sanctioned to Punjab Agricultural University for research work under various schemes was compiled from Budgets of Punjab Agricultural University (PAU) for last 25 years 1985-86 to 2009-10. Crop and enterprises wise research investment by Punjab Agricultural University was collected from Budget of Punjab Agricultural University and Department of Plant Breading, Genetics and Biotechnology, Department of Entomology and Department of Microbiology, Punjab Agricultural University, Ludhiana respectively. The series were obtained by adjusting current prices by whole sale price index of 21 agricultural commodities in the state to (1980-81) prices. In order to compute investment incurred on oilseeds, investment on groundnut, sunflower, rapeseed, mustard, was combined and investment on pulses includes investment on pulses like arhar, moong, chickpea, etc.

Optimum Sub-periods

For the purpose of growth analysis the entire study period 1985-86 to 2009-10 was divided into sub-periods by construction of strata by following cumulative cube root rule (Singh, 1975) to obtain approximately optimum strata boundaries.

Thus, the three sub periods considered were: Period I (1985-86 to 1992-93); Period II (1993-94 to 2002-03) and Period III (2003-04 to 2009-10). These three sub periods reflects distinct pattern in agriculture investment.

Growth Analysis

Compound growth rate: The growth rate in research investment was computed for the entire study period and three sub-periods separately using equation (1):

$$\log Y_t = \log \alpha + X \log \beta + u_t$$

………….(1)

where, Y_t = Investment on agriculture in the year t,

α = Constant-term,

β = Regression parameter,

u_t = Residual term, and

X = Relevant year.

Compound Growth Rate (CGR) = [Antilog (log β)-1]*100 …………… (2)

Significance of co-efficient was tested by t- Statistic and significance of the model was tested in term of goodness of fit.

RESULT AND DISCUSSION

The result obtained from the analysis data are discussed under different sub-heads as under:

Research Investment by Punjab Agricultural University (PAU)

The perusal of the Table 1 exhibits the research budget of PAU at current and 1980-81 prices during the study period. A close examination of data indicates rising trend in research investment by PAU at current prices with very little variations.

It was found that the research investment from ₹ 50.03 million during 1985-86 reaches to a peak level of ₹ 1585.09 million in 2009-10. The research investment by PAU at 1980-81 prices too shows a rising trend but at a very slow rate and reached ₹ 182.10 million in 2008-09 from ₹ 38.84 million during 1985-86 with ripples in between. Further the results indicate that share of research investment to total investment by PAU has increased with time. Thus, it could be concluded, both the share and investment of research by PAU has increased over time. The result presented in Table 1 revealed that annual average research investment by PAU at current prices was ₹542.61 million and ₹ 118.77 million at 1980-81 prices. During the study period research investment shows significant growth by 15.09 per cent per annum and 7.43 per cent per annum at current and 1980-81 prices respectively.

Growth Analysis of Research Budget of PAU during different Periods

The research investment by PAU for three periods is presented in Table 2. During Period I annual average research investment by PAU at current prices was ₹151.71 million, and at 1980-81 prices annual average research investment turned out to be ₹73.61 million. Annual average research investment at current prices during Period II and Period III was ₹429.90 million and ₹1071.49 million respectively. Similarly, annual average research investment at 1980-81 prices was ₹112.10 million and ₹178.95 million in Period-II and III respectively.

A look at the growth analysis from Table 2 reveals that research investment at current prices show highest significant growth at 21.43 per cent per annum in Period-I and thereafter show significant growth but at a declining rate at 130.00 per cent per annum and 8.97 per cent per annum for remaining two periods respectively.

Whereas, research investment at 1980-81 prices showed a significant growth in all the three periods 4.83 per cent per annum, 7.30 per cent per annum and 1.74 per cent per annum respectively. It is clear from above that, average annual research

investment by Punjab Agricultural University has increased over time, whereas, the growth analysis pointed out the fact that investment has declined Period III. Indicating, there is vital need to provide more resources to Punjab Agricultural University to conduct necessary research in the field of development.

Share of Different Schemes to Total Research Budget of PAU

Before examining the trend of research investment on various crops and enterprises, the share of different schemes to total research budget were analyzed. University received grants from various sources for its overall development. The grants allocated are used for development of infrastructure and for conducting research in many fields for development-the improved varieties and hybrids of field crops, fruits and vegetable, production and protection technologies and appropriate mechanization of farm operations. The perusal of Table 3 reveals that share of Non-Plan Agricultural Schemes show a rising trend and reach to 72.73 per cent of research budget in 2008-09 from 36.68 during 1985-86 with huge variations in between. In the case of Plan Agricultural Schemes its share show decline and reached to 11.54 in 1992-93 from 14.08 during 1985-86, then its share show some improvement and increased to 29.34 per cent in 1997-98. Thereafter its share dropped and it was just 1.83 percent in 2003-04.

The share of Non Plan Veterinary Schemes remain almost the same during study period where as share of Plan Vet Scheme has show significant decline with ripples in between. Share of ICAR Schemes has shown a decline but at a low rate. Its share dropped to 19.22 in 1994-95 from 27.23 during 1985-86, and then suddenly reach to 21.49 per cent in 1995- 96. In 2001-02 it share show a sharp increased to 29. 17 per cent, thereafter that its share starts moving down with fluctuation in between and reach to 16.49 per cent of research budget in 2008-09 which is a cause of concern. Share of centrally sponsored scheme remains almost stable but with sharp increased its share to 18.44 per cent of research budget in 2003-04. Initially the shares of others schemes such as miscellaneous sponsored Schemes, P.L 480 Schemes, Revolving Fund Schemes, and UGC Schemes remain stable, thereafter its share show downward movement with ripples in between and reach to 7.45 per cent in 2008-09.

From above discussion it was observed that, the share of non plan agricultural schemes to research budget has shown increased whereas share of all the other schemes has shown decline during the study period. Thus, it could be concluded that considerable share of research budget goes to old research projects, and very less to new projects. Further, state government remained key sources of funding for the research work done at PAU. ICAR ranked second, but it is losing its ground with passage of time. ICAR which is directly responsible for administering 45 research institutes in the field of agriculture, animal sciences, and fisheries etc is thinning its hands from providing funds for research work to PAU, which is a cause

of concern. Thus, the need of the hour is to raise more funds from ICAR schemes and undertake new research venues.

Crops and Enterprises-wise Research Investment by PAU

The perusal of Table 4 presents the crops wise break up of research investment of PAU in different years during period under study. In the case of wheat results clearly indicate that investment of wheat at current prices steadily increased from ₹1.79 million during 1985-86 to ₹8.52 million in 1991-92, but investment slide down to ₹ 5.27 million in 1992-93 and remain almost constant at this level for 4-5 years (Table 4). In 1998-99 there has been manifold increase in the investment on wheat and investment reached to ₹12.15 million. Thereafter, investment show rising trend and touched a shy high and reached to ₹26.55 million in 2004-05. But investment again dropped to ₹23.30 million in 2005-06. In 2006-07 investment on wheat showed some improvement and increased to ₹25.47 million and subsequently investment touched to ₹50.08 million.

Thus, there are, clear indications that investment on wheat by PAU increased over time with very few ripples in between. Similarly investment on wheat at 1980-81 prices shows a rising trend from ₹1.40 million during 1985-86 to ₹3.72 million in 1991-92. Investment at 1980-81 prices declined to ₹ 2.16 million in 1992-93 and continued till 1997-98. Later investment continued to rise and reached to ₹ 6.15 million in 2008-09 with ripples in between. In the case of rice results disclose that, research investment by PAU at current prices increased from ₹1.47 million during 1985-86 to ₹3.53 million in 1989-90. But investment moved down to ₹2.23 million in 1990-91 and remains almost stagnant at that level for 8-9 years. In 2001-02 investment reached a high level of ₹4.84 million (Table 4). After that investment shows cyclic fluctuations from period 2001-02 to 2006-07 and reached to ₹19.80 million in 2009-10 from ₹5.27 million during 2006-07. It is clear from Table 4 that there was increase in the research investment on rice by PAU at current prices.

Further the results indicate that at 1980-81 prices research investment on rice remained almost stable for first three years then dropped back to ₹0.94 million in 1989-89, thereafter show some improvement and touched to ₹2.07 million in 1989-90. Then continued to fall and ebbed to ₹0.47 million in 1998-99. Later on investment on rice starts rising and reached ₹2.48 million in 2008-09 with fluctuation in between. Thus, there is over time improvement in research investment on rice by PAU.

The research investment on maize at current prices shows a rising trend from 1985-86 to 1993-94 with ripples in between and reached at the level of ₹3.78 million in 1993-94 from ₹1.26 million during 1985-86 (Table 4). Rising tempo, however, could not be maintained after 1993-94 and investment on maize starts falling down wards and touched a low of ₹1.42 million in 1996-97. Research investment on maize

showed some improvement and increased to ₹1.68 million in 1997-98. The perusal of Table 4 indicated that from 1998-99 investment started picking up and touched a height of ₹10.14 million in 2004-05 from ₹4.72 million in 1998-99. But investment again decreased to ₹6.57 million in 2005-06 and after that research investment on maize did not show consistent trend. The research investment on maize at 1980-81 prices indicates that investment remained almost at same level for three years then dropped back to ₹0.73 million in 1988-89 but after that show some improvement and rises to ₹1.40 million in 1992-93. Subsequently there was downward movement and investment fell to ₹0.39 million in 1996-97. In 2004-05 investment reached ₹2.09 million and from then on, investment continued to fall.

The perusal of Table 5 indicates that in the case of sugarcane research investment by PAU at current prices shows a rising trend and reached at the level of ₹5.50 million in 1990-91 from ₹2.68 million during 1985-86. Thereafter investment showed falling trend, although slowly and with minute variations and ebbed to ₹0.77 million in 1995-96. An investment on sugarcane by PAU shows some improvement in 1996-97 and reached ₹1.16 million. After 1996-97 research investment shows increasing trend and reached to the level of ₹15.74 million in 2004-05, but in 2005-06 research investment again drop to ₹4.06 million. In 2006-07 investment increased to ₹14.79 million, which continued to rise till 2009-10 and stop at the level of ₹ 27.56 million whereas investment rise to ₹2.18 million in 1987-88 from ₹2.08 million during 1985-86 (at 1980-81 prices). In 1988-89 investment falls to ₹1.89 million but again rise to ₹3.02 million in 1989-90 in real terms. Later investment showed erratic trend and reached to ₹0.85 million in 2000-01. It showed rising trend which till 2004-05.

The results presented in Table 5 indicate that research investment on pulses at current prices indicates rising trend with fluctuations in between and reached to ` 4.18 million in 1995-96 from ₹1.95 million during 1985-86. Investment shows a sudden decline to ₹1.77 million in 1996-97, thereafter, shows some improvements and rise to ₹3.24 million in 1997-98 and similar trend was observed till 2005-06. In 2006-07 again there was a sudden drop in investment to ₹8.57 million but thereafter investment shows improvement and reached to ₹20.45 million in 2009-10. On the other hand research investment at 1980-81 prices show in consistent trend and reached to ₹2.48 million in 1989-90. Then showed downward movement with ripples in between and reached to ₹1.26 million in 1995-96. After that show rising trend and reached ₹3.43 million in 2005-06 but this rising trend could not be maintained and investment fall to ₹1.49 million in 2006-07 which further dropped to ₹1.47 million in 2007-08. In 2008-09 investment shows improvement and rise to ₹2.63 million.

Further, the results reveal that investment on oilseeds at current prices rises to ₹6.28 million in 1990-91 from ₹1.47 million during1985-86 and decline thereafter and touched a lowest level of ₹2.14 million in 1996-97. Then, research investment on oilseeds shows a rising trend and reaches to the peak level of ₹12.15 million in 2004-05 and thereafter investment continue to show rising movement but with huge fluctuations. On the other hand research investment at 1980-81 prices show rising trend and reached to ₹3.28 million in 1990-91 from ₹1.14 million in 1985-86. Thereafter show decline and dropped to ₹0.59 million in 1996-97. Then investment at 1980-81 prices continued to rise and reached ₹ 2.50 million in 2004-05 but in 2005-06 investment falls to ₹1.94 million and continued to decline. In 2008-09 investment was ₹1.75 million.

The results show that research investment on cotton by PAU at current prices showed an increasing trend till 1994-95 and investment reached to ₹5.59 million from ₹1.68 million during 1985-86 (Table 5). During the period 1995-96 to 2003-04 research investment becomes highly unstable and showed erratic trend and reach to ₹14.84 million in 2004-05, then a sudden decline in investment was observed to ₹8.99 million in 2005-06. But thereafter investment shows some improvement and rises to ₹11.70 million in 2007-08. Investment peaked to ₹32.50 million in 2008-09 which again drop down to ₹26.71 million in 2009-10. Whereas research investment at 1980-81 prices show rising trend and reached ₹2.08 million in 1990-91 from ₹1.30 million during 1985-86. Then start falling downward and ebbed to ₹0.67 million in 1996-97. Thereafter show improvement and touched ₹4.44 million in 2008-09.

Growth Analysis of Crop-wise Research Investment by PAU

The results of Table 4 and 5 indicate that investment on wheat took first place under research investment by PAU with average annual investment of ₹15.00 million at current prices and ₹3.17 million at 1980-81 prices. Investment on cotton took second place with average investment of ₹8.55 million and ₹1.99 million at current and 1980-81 prices respectively. Average annual research investment on sugarcane was ₹7.25 million at current prices and ₹1.71 million at 1980-81 prices, average annual investment on pulses was ₹6.70 million and ₹1.80 million, average annual investment on oilseeds was ₹6.05 million and ₹1.59 million at current and 1980-81 prices respectively. Average annual investment on rice and maize was ₹4.39 million and ₹4.97 million respectively at current prices and ₹0.98 million and ₹1.23 million respectively at 1980-81 prices. Looking at growth analysis of Table 4 and 5 collectively indicates that cotton growth significantly at the highest rate of 9.869 per cent per annum followed by pulses and rice (9.69 and 8.11 per cent per annum respectively). Whereas all the other crops show non-significant growth indicating that flow of funds on these crops remained almost constant.

Growth Analysis of Research Investment of PAU on Different Crops

The results reveal that investment on wheat remains dominant item of

investment of research investment by PAU with average annual investment of ₹4.20 million at current prices and ₹ 2.05 million at 1980-81 prices during Period I. Cotton took the second place with average annual investment of ₹3.73 million at current prices and ₹1.84 million at 1980-81 prices and third place was occupied by pulses with average annual investment of ₹3.50 million and ₹1.74 million at current and 1980-81 prices respectively. On oilseed average annual investment was ₹3.08 million at current prices and ₹1.56 million at 1980-81 prices, sugarcane average annual investment was ₹2.95 million and ₹1.68 million, Maize average annual investment was ₹2.30 million and ₹1.11 million at current and 1980-81 prices respectively. Average annual investment of Rice was ₹1.99 million at current prices and ₹1.07 million at 1980-81 prices (Table 6).

Growth analysis at current prices pointed out that investment on wheat show highest growth 14.04 per cent per annum followed by pulses 12.49 per cent per annum, oilseed 10.38 per cent per annum and rice 1.85 per cent per annum, whereas maize and cotton show non-significant growth. Investment on sugarcane declined significantly. Growth analysis at 1980-81 prices reveals that maize showed highest significant growth of 4.15 per cent per annum, followed by wheat 3.29 per cent per annum, cotton 2.11 per cent per annum, pulses 1.89 per cent per annum. Other crops show significant negative growth (Table 6).

It was noticed that with an average annual investment of ₹12.64 million at current prices and ₹3.02 million at 1980-81 prices wheat remained at the domain place during Period II. Cotton took the second place with average annual investment of ₹7.01 million and ₹1.68 million at current and 1980-81 prices respectively. Third place was taken by pulses followed by oilseed, maize, sugarcane, and Rice. Growth analysis at current prices indicates that the investment on sugarcane has shown highest significant growth rate of 40.74 per cent per annum, followed by maize (27.03 per cent per annum), wheat (22.29 per cent per annum), cotton (21.78 per cent per annum), pulses (21.42 per cent per annum), and rice (13.07 per cent per annum). But investment on oilseed was not statistically significant.

Growth analysis at 1980-81 prices indicates that the investment on sugarcane has shown highest significant growth rate of 34.65 per cent per annum, followed by oilseeds 23.37 per cent per annum, maize 20.58 per cent per annum, wheat 17.00 per cent per annum, cotton, pulses, and rice. Again wheat took first place under research investment by PAU on different crops with average annual investment of ₹33.13 million and ₹5.22 million at current and 1980-81 prices respectively during Period III, followed by sugarcane with average annual investment of ₹17.20 million at current prices and ₹2.82 million at 1980-81 prices. Cotton took the third place with average annual investment of ₹17.20 million and ₹2.66 million at current and 1980-81 prices respectively. Fourth position was taken by pulses with average annual investment of ₹11.77 million and ₹2.29 million at current and 1980-81 prices

respectively, followed by oilseed, rice, and maize. A look at growth analysis of investment at current prices shows that investment on pulses has shown highest significant growth rate of 17.79 per cent per annum, followed by Sugarcane (17.58 per cent per annum), Cotton (14.75 per cent per annum), and Wheat (14.01 per cent per annum), whereas rice and maize did not show significant growth.

On the other hand oilseeds show significant negative growth. Growth analysis of investment at 1980-81 prices shows that investment on rice has shown very high significant growth rate of 39.63 per cent per annum, followed by wheat 2.79 per cent per annum, cotton 2.15 per cent per annum, sugarcane 0.33 per cent per annum.

All remaining crops showed significant negative growth during this period. Thus, it can concluded that the large share of the research efforts remained confined to wheat and rice taken together in over enthusiasm of producing more and more grains to meet the growing demands for food in the country. At the national level every year larger and larger targets of food grain production were fixed for the Punjab state and all the resources of the state were directed to meet these targets without earning that what happens to other crops. This clearly show that the agricultural research system remained over- obsessed with the wheat and rice system and is not responding to changing conditions.

Enterprises-wise Research Investment by PAU

The perusal of the Table 7 represents enterprise wise research investment by PAU on bee- keeping and mushroom during period under study. The examination of research investment on mushroom at current prices indicates that investment with a start of ₹0.40 million during 1985-86 reached to ₹0.86 million in 1989-90. Investment shows a minor decrease and reached ₹0.85 million in 1990-91. After that the series shows rising trend, and reach to ₹2.87 million in 2000-01. In 2001-02 there was a sudden drop in investment by ₹2.18 million. Thereafter investment on mushroom increased to ₹4.29 million in 2009-10 with huge fluctuations in between. The results of Table 7 indicate that at 1980-81 prices investment on mushroom reached to ₹0.47 million in 1995-96 from ₹ 0.31 million during 1985-86 but in 1996-97 investment dropped to ₹0.37 million. From 1997-98 series show improvement and reached to ₹ 0.67 million in 2000-01. Thereafter series shows erratic trend. The results reveal that research investment at current prices on bee-keeping showed a rising trend from ₹0.21 million during 1985-86 to ₹0.54 million in 1993-94 with ripples in between, decline thereafter for three years and reached at ₹0.43 million in 1996-97. Research investment on bee- keeping was ₹ 1.31 million in 1998-99. But again investment showed a sudden decline to ₹0.97 million in 1999-00 (Table 7).

A close examination of series indicates that after 1999-00 research investment on bee- keeping shows inconsistent trend and reached to ₹2.82 million during 2009-10. Whereas investment increased from ₹0.17 million in 1985-86

continued to rise and reached ₹0.21 million in 1992-93 with ripples in between at 1980-81 prices. Then show downfall trend for four- five years and reached ₹0.12 million in 1996-97. Thereafter show rising trend with fluctuations here and there and reached to ₹0.33 million in 2008-09.

Growth Analysis of Enterprises-wise Research Investment by PAU

The perusal of the Table 7 indicates that research investment on mushroom remain dominant investment by PAU with average annual investment of ₹2.05 million at current prices and ₹0.51 million at 1980-81 prices. Average annual investment on bee-keeping was ₹1.13 million at current prices and ₹0.26 million at 1980-81 prices during the study period. A look at the growth analysis of Table 7 indicates that CGR of research investment on both the enterprises were not mathematically significant during entire period of study at current prices. Whereas at 1980-81 prices both bee-keeping and mushroom showed significant growth at 4.23 per cent per annum and at 2.17 per cent per annum respectively.

Growth Analysis of Enterprises-wise Research Investment by PAU

The results presented in the Table 8 indicate that investment on mushroom was dominating as compare to bee-keeping. Average annual investment on mushroom and bee-keeping was ₹0.84 million and ₹0.38 million respectively at current prices and the corresponding figures at 1980-81 prices turned out to be ₹0.41 million and ₹0.19 million respectively during Period I.

The results pertaining to the growth analysis presented in Table 8 indicated that CGR were non-significant at current prices. But at 1980-81 prices both mushroom and bee-keeping show significant growth at 3.92 per cent per annum and 0.79 per cent per annum respectively. The perusal of Table 8 revealed that an investment on mushroom again remained dominating. Average investment on Mushroom was ₹2.39 million and ₹0.58 million at current prices and at 1980-81 prices respectively and average investment on bee-keeping was ₹1.14 million at current prices and ₹0.27 million at and at 1980-81 prices during Period II. A look at growth analysis reveals ACGR of both the enterprise was statistically significantly, Bee- keeping (24.99 per cent) and Mushroom (11.88 per cent) at current prices and at 1980-81 prices Bee- keeping (19.59 per cent) and Mushroom (7.01 per cent).

During Period III again research investment on Mushroom remained at the first position. Average annual investment on Mushroom was ₹3.36 million and on Bee- keeping were ₹2.21 million at current prices and ₹0.55 and ₹0.38 respectively at 1980-81 prices. Growth analysis shows that investment of Mushroom and Bee-keeping shows significant growth rate of 7.72 per cent per annum and 2.79 per cent per annum respectively at current prices but at 1980-81 prices both the enterprises showed a significant negative growth. From above discussion it could be concluded

that research investment by PAU skewed in favour of Mushroom. There is need to focus on need to increased in research investment on Bee-keeping as bee- pollination is key for flourishing plant life.

CONCLUSIONS

The study shows that annual average research investment by PAU has increased over time. Whereas growth analysis indicated that growth rate dropped down to 1.74 per cent per annum in Period III (2003-04 to 2009-10) from 7.30 per cent per annum during Period II (1993-94 to 2002-03). Thus, there is need to provide more resources to PAU to conduct research in various field of development. Further, it was observed that the share of non plan agricultural schemes to research budget has shown increased whereas share of all the other schemes has shown decline during the study period and State Government remained key sources of funding for the research work done at PAU. ICAR ranked second, but it is losing its ground with passage of time. Thus, the need of the hour is to raise more funds from ICAR schemes and undertake new research venues. Analysis of research investment on different crops by Punjab Agricultural University indicates that research efforts remained confined to Wheat and Rice taken together in over enthusiasm of producing more and more grains to meet the growing demands for food in the country and is not responding to changing conditions. In case of enterprises wise research investment, it was observed that research investment by PAU skewed in favor of mushroom and there is need to increased research investment in case of bee-keeping also.

LITERATURE CITED

Golait R and Lokare SM. 2008. Capital Adequacy in Indian Agriculture A Riposte. *Reserve Bank of India Occasional Papers,* **29**.

Nath V. 1998. Trend in Public Investment in Agriculture. *Research paper. ULR: www. Vikasnath.org.*

Singh J and Sidhu R S (2005) Changing Pattern of investments and its impact on growth in Punjab agriculture. *J Agric Dev & Policy* **17**: 17-34.

Singh R. 1975. On optimum stratification for proportional allocation. *Sankhya* © **37**: 109-15.

Table 1:   Punjab Agricultural University budget at current and 1980-81 prices during period 1985-86 to 2009-10

(₹ million)

Year	At current prices		1980-81 prices		Percentage of research budget to total budget
	Research budget	Total budget	Research budget	Total budget	
1985-86	50.03	181.36	38.84	140.81	2.76
1986-87	99.42	212.14	74.63	159.26	4.69
1987-88	121.19	246.96	80.05	163.12	4.91
1988-89	144.87	278.96	81.66	157.25	5.19
1989-90	153.17	321.78	89.79	188.62	4.76
1990-91	182.70	358.78	95.55	187.65	5.09
1991-92	218.46	419.37	95.32	182.97	5.21
1992-93	243.82	485.08	100.25	199.46	5.03
1993-94	257.20	504.51	95.60	187.52	5.10
1994-95	280.68	575.21	87.88	180.09	4.88
1995-96	295.43	663.30	89.17	200.21	4.45
1996-97	332.68	688.80	91.72	189.91	4.83
1997-98	468.42	892.10	128.65	245.02	5.25
1998-99	468.90	991.96	110.10	232.91	4.73
1999-00	509.34	1044.83	117.48	240.99	4.87
2000-01	595.23	1297.88	140.01	305.28	4.59
2001-02	661.24	1377.89	148.29	309.01	4.79
2002-03	766.56	1442.43	168.92	317.86	5.31
2003-04	799.29	1506.01	167.53	315.66	5.31
2004-05	859.28	1657.34	177.10	341.58	5.18
2005-06	974.12	1829.61	189.66	356.23	5.32
2006-07	1168.29	2046.60	203.25	356.05	5.71
2007-08	1086.47	1935.47	164.10	292.32	5.61
2008-09	1332.85	2275.54	182.11	310.91	5.85
2009-10	1585.09	2638.93	0.00	0.00	6.01
Average	542.61	-	118.77		
CGR (%)	15.09[**]	-	7.43[**]	-	-
	(1.53)		(1.45)		

Source: Budget of PAU for various years
Figure in parentheses are standard errors.
*** Significant at 5 per cent level.*
 NS: Non-significant.

Table 2: Growth rate of Punjab Agricultural University research budget

(₹ Million year[-1])

Periods	Research budget			
	At current prices		At 1980-81 prices	
	Average	CGR (%)	Average	CGR (%)
Period-I	151.71	21.43[*]	73.62	4.83[*]
(1985-86 to 1992-93)		(3.39)		(0.66)
Period-II	429.90	13.30[**]	112.10	7.30[**]
(1993-94 to 2002-03)	183.37[@]	(0.81)	52.27[@]	(1.17)
Period-III	1071.49	8.97[**]	178.95	1.74[*]
(2003-04 to 2009-10)	149.24[@]	(1.63)	59.63[@]	(1.51)

 Figure in parentheses are standard errors
 @ Per cent change over previous period
 ***, * Significant at 5 and 10 per cent level*
 NS: Non-significant

Table 3: Share of different schemes to total research budget of PAU

Years	Non plan agricultural scheme	Plan agricultural scheme	Non plan veterinary scheme	Plan veterinary scheme	ICAR scheme	Centrally sponsored scheme	Other schemes
1985-86	36.68	14.08	3.18	4.54	27.23	4.11	10.15
1986-87	33.80	13.92	3.26	4.67	25.18	7.08	12.05
1987-88	34.29	12.73	2.86	5.85	29.08	3.73	11.42
1988-89	34.84	10.65	7.82	4.67	25.73	5.03	11.23
1989-90	35.97	11.26	2.95	4.77	27.45	5.52	12.05
1990-91	40.71	11.78	4.06	4.35	26.24	2.18	10.65
1991-92	39.11	16.41	3.81	3.78	26.63	0.65	9.58
1992-93	38.25	11.54	3.80	7.89	23.85	1.55	13.09
1993-94	33.63	18.08	2.48	8.03	25.16	0.99	11.60
1994-95	35.11	20.15	3.04	9.30	19.22	1.21	11.93
1995-96	37.19	19.78	2.62	6.42	21.49	1.11	11.35
1996-97	38.95	18.05	2.51	6.79	17.88	2.00	13.79
1997-98	28.43	29.34	1.95	12.45	16.77	1.41	9.63
1998-99	30.61	11.06	29.02	6.06	14.28	1.20	7.73
1999-00	43.98	10.93	3.90	7.79	22.02	1.48	9.86
2000-01	47.86	7.58	3.36	5.09	25.05	1.94	9.08
2001-02	43.24	7.21	3.92	4.35	29.17	2.85	9.23
2002-03	50.61	2.29	7.04	0.52	27.02	2.01	10.47
2003-04	46.25	1.83	5.30	0.83	19.36	18.44	7.96
2004-05	55.74	2.00	6.67	0.91	20.57	1.93	12.16
2005-06	63.38	3.68	6.39	0.42	17.32	6.66	2.12
2006-07	58.54	7.18	5.46	0.68	17.25	2.24	8.62
2007-08	66.74	0	2.420	1.40	19.84	1.92	7.67
2008-09	72.73	0	0	0	16.49	3.31	7.45

Table 4: Crops wise break up of research investment by PAU

(₹ Million)

Year	Wheat		Rice		Maize	
	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices
1985-86	1.80	1.40	1.47	1.14	1.26	0.98
1986-87	2.22	1.67	1.53	1.15	1.35	1.01
1987-88	3.03	2.00	1.72	1.14	1.48	0.98
1988-89	2.88	1.62	1.67	0.94	1.29	0.73
1989-90	3.45	2.02	3.53	2.07	1.64	0.96
1990-91	4.55	2.38	2.23	1.17	2.39	1.25
1991-92	8.52	3.72	2.24	0.98	3.15	1.37
1992-93	5.27	2.16	2.30	0.94	3.41	1.40
1993-94	5.18	1.93	1.73	0.64	3.78	1.41
1994-95	5.15	1.61	1.52	0.48	3.27	1.02
1995-96	7.80	2.36	1.98	0.60	3.34	1.01
1996-97	5.09	1.40	1.58	0.44	1.42	0.39
1997-98	5.60	1.54	1.63	0.45	1.68	0.46
1998-99	12.15	2.85	1.99	0.47	4.72	1.11
1999-00	12.53	2.89	1.97	0.45	4.92	1.14
2000-01	18.58	4.37	4.05	0.95	6.41	1.51
2001-02	19.28	4.32	4.84	1.08	7.95	1.78
2002-03	20.08	4.42	2.64	0.58	8.81	1.94
2003-04	24.43	5.12	3.41	0.71	9.38	1.97
2004-05	26.55	5.47	1.80	0.37	10.14	2.09
2005-06	23.30	4.54	5.46	1.06	6.57	1.28
2006-07	25.47	4.43	5.27	0.92	8.46	1.47
2007-08	37.05	5.60	15.97	2.41	8.43	1.27
2008-09	45.01	6.15	18.13	2.48	6.66	0.91
2009-10	50.07	0.00	19.80	0.00	12.55	0.00
Mean value	15.00	3.16	4.38	0.98	4.97	1.23
CGR (%)	13.90 [NS]	6.03*	8.11**	-.15**	9.597 [NS]	1.99**
	(0.77)	(0.89)	(1.65)	(1.61)	(1.06)	(1.17)

Source: Budget of PAU
Figure in parentheses are standard errors
***, * Significant at 5 and 10 per cent level*
NS: Non significant

Table 5:   Crop wise break up of research investment by PAU

(₹ Million)

Year	Sugarcane		Pulses		Oilseed		Cotton	
	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices
1985-86	2.68	2.08	1.95	1.51	1.47	1.14	1.68	1.30
1986-87	2.90	2.18	1.22	0.91	1.91	1.43	2.45	1.84
1987-88	3.30	2.18	2.74	1.81	1.82	1.20	2.58	1.70
1988-89	3.36	1.89	3.02	1.70	2.23	1.26	2.95	1.66
1989-90	5.16	3.02	4.22	2.48	3.50	2.05	4.17	2.44
1990-91	5.50	2.88	4.54	2.37	6.28	3.28	3.97	2.08
1991-92	2.69	1.17	3.87	1.69	3.65	1.59	4.29	1.87
1992-93	1.27	0.52	4.54	1.87	3.10	1.27	4.86	2.00
1993-94	1.38	0.51	4.98	1.85	3.64	1.35	4.79	1.78
1994-95	1.27	0.40	3.89	1.22	3.21	1.01	5.59	1.75
1995-96	0.77	0.23	4.18	1.26	2.25	0.68	5.15	1.56
1996-97	1.16	0.32	1.77	0.49	2.14	0.59	2.44	0.67
1997-98	1.89	0.52	3.24	0.89	2.46	0.68	3.14	0.86
1998-99	2.15	0.50	7.26	1.70	5.21	1.22	7.54	1.77
1999-00	2.29	0.53	7.36	1.70	5.97	1.38	5.12	1.18
2000-01	3.18	0.75	8.41	1.98	8.02	1.89	9.20	2.16
2001-02	3.76	0.84	8.82	1.98	7.74	1.74	8.61	1.93
2002-03	16.02	3.53	9.09	2.00	11.24	2.48	14.86	3.27
2003-04	18.90	3.96	11.05	2.32	11.34	2.38	13.61	2.85
2004-05	15.74	3.24	11.53	2.38	12.12	2.50	14.84	3.06
2005-06	4.06	0.79	17.60	3.43	9.94	1.94	8.99	1.75
2006-07	14.79	2.57	8.57	1.49	10.08	1.75	12.03	2.09
2007-08	19.59	2.96	9.73	1.47	10.41	1.57	11.70	1.77
2008-09	24.76	3.38	19.27	2.63	12.82	1.75	32.50	4.44
2009-10	27.56		20.45		8.61		26.71	
Mean value	6.70	1.71	7.25	1.80	6.05	1.59	8.55	1.99
CGR (%)	7.75 NS (1.51)	1.58** (1.20)	9.69** (2.49)	1.51** (2.73)	8.67 NS (1.09)	1.69** (1.25)	9.86* (1.05)	1.99** (1.15)

Source: Budget of PAU
Figure in parentheses are standard errors
**, * Significant at 5 and 10 per cent level
NS: Non significant

Table 6: Growth rate of crop wise research investment by PAU

(₹ Million year^{-1})

Particular	Wheat	Rice	Maize	Sugarcane	Pulses	Oilseed	Cotton
1985-86 to 1994-95							
Mean value (Current prices)	42.03 (14.04**)	19.94 (1.85**)	23.02 (14.99NS)	29.51 (-9.92**)	34.97 (12.49**)	30.79 (10.38**)	37.32 (12.74NS)
Mean value (1980-81 prices)	20.50 (3.29**)	10.65 (-7.76**)	11.11 (4.15**)	16.84 (-18.41**)	17.41 (1.89**)	15.58 (-0.03**)	18.42 (2.11**)
1995-96 to 2002-03							
Mean value (Current prices)	126.38 (22.29**)	25.85 (13.07**)	48.70 (27.03**)	39.03 (40.74**)	62.67 (21.47**)	56.28 (56.28**)	70.07 (21.78**)
Mean value (1980-81 prices)	30.19 (17.00NS)	6.28 (8.18**)	11.67 (20.58**)	9.03 (34.65**)	15.00 (16.21**)	13.30 (23.37*)	16.76 (16.51**)
Per cent change over previous period at current prices	200.69	29.64	111.55	32.26	79.21	82.79	87.75
Per cent change over previous period at 1980-81 prices	47.27	-41.03	5.04	-46.38	-13.84	-14.63	-9.01
2003-04 to 2009-10							
Mean value (Current prices)	331.25 (14.01**)	98.33 (53.58NS)	88.83 (1.02 NS)	172.00 (17.58**)	117.65 (17.79**)	107.61 (-2.35**)	171.95 (14.75**)
Mean value (1980-81 prices)	52.17 (2.79**)	13.25 (39.63**)	14.98 (-3.80**)	28.18 (0.33**)	22.85 (-4.55**)	19.81 (-8.25**)	26.60 (2.15**)
Per cent change over previous period at current prices	162.10	280.38	82.40	340.68	87.73	91.20	145.39
Per cent change over previous period at 1980-81 prices	72.80	100.98	28.36	212.07	52.33	48.94	58.71

Figure in parentheses are CGR (%)
**, * Significant at 5 and 10 per cent level
NS: Non significant

Table 7: Enterprise-wise break up of Research investment by PAU

(₹ Million)

Year	Mushroom		Bee-Keeping	
	At current prices	At 1980-81 prices	At current prices	At 1980-81 prices
1985-86	0.40	0.31	0.21	0.17
1986-87	0.44	0.33	0.24	0.18
1987-88	0.57	0.37	0.29	0.19
1988-89	0.68	0.38	0.28	0.16
1989-90	0.86	0.50	0.34	0.20
1990-91	0.85	0.44	0.42	0.22
1991-92	0.97	0.42	0.43	0.19
1992-93	1.09	0.45	0.51	0.21
1993-94	1.27	0.47	0.54	0.20
1994-95	1.33	0.42	0.50	0.16
1995-96	1.54	0.47	0.47	0.14
1996-97	1.35	0.37	0.43	0.12
1997-98	2.22	0.61	0.72	0.20
1998-99	2.58	0.61	1.32	0.31
1999-00	2.67	0.62	0.97	0.22
2000-01	2.87	0.67	1.11	0.26
2001-02	2.18	0.49	2.27	0.51
2002-03	3.74	0.82	1.80	0.40
2003-04	3.04	0.64	2.09	0.44
2004-05	3.83	0.79	2.26	0.47
2005-06	1.15	0.22	2.34	0.46
2006-07	4.20	0.73	1.72	0.30
2007-08	3.13	0.47	1.82	0.27
2008-09	3.91	0.53	2.42	0.33
2009-10	4.29	0.00	2.82	0.00
Mean value	2.05	0.51	1.13	0.26
CGR (%)	9.53 [NS]	2.17**	11.77 [NS]	4.23**
	(0.93)	(0.84)	(0.75)	(0.89)

Source: Budget of PAU.
Figure in parentheses are standard errors
*** Significant at 5 percent level*
NS: Non significant

Table 8: Growth rate of enterprise-wise research investment by PAU

(₹ Million year^{-1})

Period	Variables	Mushroom	Bee-Keeping
1985-86 to 1992-93	Mean value	0.84	0.38
	(Current prices)	(14.75[NS])	(12.28[NS])
	Mean value	0.41	0.19
	(1980-81 prices)	(3.92**)	(0.79**)
1993-94 to 2002-03	Mean value	2.39	1.14
	(Current prices)	(11.85**)	(24.99**)
	Mean value	0.58	0.27
	(1980-81 prices)	(3.24**)	(4.54**)
	Per cent change over previous period (At current prices)	62.23	210.86
	Per cent change over previous period (At 1980-81 prices)	42.05	43.85
2003-04 to 2009-10	Mean value	3.36	2.21
	(Current prices)	(0.77**)	(0.27**)
	Mean value	0.55	0.38
	(1980-81 prices)	(-3.45**)	(-9.33**)
	Per cent change over previous period (At current prices)	40.58	40.15
	Per cent change over previous period (At 1980-81 prices)	-6.02	28.36

Figure in parentheses are CGR (%)
*** Significant at 5 per cent level*
NS: Non significant

PREFERENCE AND SATISFACTION TOWARDS MOBILE SERVICE PROVIDERS: A COMPARATIVE STUDY OF RURAL AND URBAN CONSUMERS

Gagandeep Banga, Babita Kumar and Money Dhingra[*]

ABSTRACT

The present study was undertaken to understand and compare the preference and satisfaction of rural and urban consumers towards mobile service providers. The study was conducted by selecting company outlets of five mobile service providers, one each of Airtel, Idea, Reliance, Vodafone and BSNL, from both urban and rural areas of Ludhiana district on convenience basis. Further 20 customers from each company outlet were selected on random basis. Thus, 100 each urban and rural customers, were selected for the study. The primary data were collected with the help of structured and non-disguised schedule. The results showed that both rural and urban respondents consider economical calling, network coverage, customer service, as the most important factors influencing their choice of mobile service providers. Urban respondents also consider roaming services as one of the factors influencing their choice of mobile service providers. It was also found that 69 and 56 percent of rural and urban respondents would recommend others to subscribe to their mobile service provider.

INTRODUCTION

The world is on the threshold of a new industrial revolution which promises to have an impact on a wide variety of aspects of life at global level. Telecommunication sector is at the epicenter of this revolution. Telecommunication is critical not only for the development of the information technology industry but also has widespread ramifications for the entire economy of the country. The telecom industry has the potential to transform a nation's fate. Telecommunication is universally recognized as one of the prime movers of modern economy; hence, it is of vital importance for a developing country like India. The availability of adequate infrastructure facilities is critical for acceleration of the economic development of country. The Government of India recognizes that the provision of a world-class

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telecommunication and information infrastructure is the key to rapid economic and social development of the country. Some mobile service providers dominating the industry are Bharti Airtel, Vodafone, Idea, Reliance, BSNL and many others. The telecom industry is entering both urban and rural areas. For every company, in order to increase its customer base is very important as well as difficult. To increase its customer base they have to provide better services to customers and satisfy their needs. The urban and rural consumers have different choices based upon their needs (Dhingra, 2012).

The rural market of India is large and scattered, which consists of over 0.60 million villages spread over 3.2 million square kilometers. The Indian rural market has immense potential, which needs to be tapped. About 750 million Indians live in rural areas but a vast section of the rural sector is still cut off from the benefits of telecom services. The potential of the rural markets evolves primarily due to the colossal size of varied demands of rural masses (Anand, 2007).

The urban consumers can choose mobile network operator according to their requirements as they are aware and educated whereas rural consumers are less aware of network operators and their various service plans. Therefore, rural consumers are influenced by many other factors like low calling rates; value added services, roaming services and recommendations from family/friends while selecting their mobile network operator (Dhingra, 2012). It is very difficult for the cellular service providers to predict and understand user's behavior, so the service sector should concentrate on understanding the reasons behind their behavior (Revathy and Padmavathy, 2005). Lee and Murphy (2005) investigated the determinants that caused mobile phone customers to transit from being loyal to switching and found that the transition from loyalty to switching may be due to changes in the underlying determinants as well as new determinants. Oyeniyi *et al.* (2008) examined the relationship between customer service and customer retention in telecommunication industry in Nigeria and found that if retentions was not managed, customer's loyalty may be lost. Sridhar (2010) found the attitude of the respondents using cell phone was not influenced by either education or occupation and income. Service quality, product quality, availability and promotional offer play a main role during the time to purchase telecommunication service provider (Jain and Hundal, 2006).

The rural market behaves quite differently from its urban counterpart. The mobile phone service provides need to study the rural market and buying behavior of rural consumers deeply to penetrate this market. A proper understanding of customer's preference helps the marketer to direct marketing efforts in right direction with respect to product, price, promotion and distribution strategies. Therefore, the present investigation was carried out with the objective to study and compare the preference and satisfaction of rural and urban consumers towards mobile service providers in Punjab.

METHODOLOGY

An exploratory research design was formulated which guided the collection and analysis of data. The population for study consisted of all the rural and urban consumers of Punjab. For the study, company outlets one each of five mobile service providers, namely Airtel, Idea, Reliance, Vodafone and BSNL, were selected from both urban and rural areas. At next stage 20 customers from each company outlet were selected on random basis. On the whole 100 each urban and rural customers formed the sample for the study. A structured, non-disguised schedule was formulated and survey was carried out for collection of primary data. Data were collected relating to various parameters of preference and satisfaction like preference of prepaid or postpaid connection, economical calling rates, network coverage, customer service value added services, billing integrity, etc. with respect to mobile service providers. The data, collected from the respondents, was tabulated and analyzed using suitable statistical tools like percentage, mean scores, ranking, correlation and two mean Z-tests. Mean score was calculated for the questions asked on a 5-point Likert Scale. Similarly, Spearman's Correlation Coefficient was computed to examine the relationship between responses from rural and urban respondents.

RESULTS AND DISCUSSION

This section includes the discussion and results obtained from the analysis of the primary data collected from the rural and urban respondents in order to understand their preference and satisfaction towards mobile service providers.

Demographic Profile of the Respondents

To gain a better understanding of the consumers' preference and satisfaction towards mobile service providers in rural and urban areas, demographic characteristics of the respondents were analyzed and presented in Table 1. The results show that 82 percent of rural respondents were male while 18 percent were female. It was seen that, 48 and 18 percent were in the age group of 20-29, 30-39 years and >49 years respectively. It was also seen that 50, 26 and 14 percent of rural respondents were graduates, higher secondary education level and post graduates. Similarly, 22, 16, 14 and 14 percent were in service, businessman, housewives and students respectively. The results also showed that, 56, 20, 14 and 10 percent of respondents had family income ₹25000-₹ 50000, ₹<25000, ₹ 50,000-₹100000 and > ₹100,000 per annum respectively.

In urban area, 70 percent of respondents were male while 30 percent were female. It was seen that 48, 22 and 14 percent were in the age group of 20-29, 30-39 and 40-49 years respectively. The results further revealed that 42, 36, 12 and 10 percent of respondents were post graduates, graduates, higher secondary and others

respectively. Further, 38, 30, 16, 12, and 10 percent of respondents were students, businessman, service, professionals, and house wives respectively. The results also showed that 32, 26, 22 and 20 percent of respondents had family income ₹25,000-₹50,000, ₹50,000-₹1, 00,000, >₹1, 00,000 and <₹25,000 per annum respectively. Overall, 76 percent of respondents were males, 48 percent were in 20-29 years age group, 43 percent were graduates, 23 percent were in business and 44 percent were having family income ₹25,000-₹ 50,000 per month.

Table 1: Demographic profile of the rural and urban respondents

			(Percent)
Parameters	**Rural**	**Urban**	**Overall**
Age (Years)			
<20	04	12	08
20-29	48	48	48
30-39	18	22	20
40-49	12	14	13
>49	18	04	11
Occupation			
Business	16	30	23
Professional	0	12	06
Service	22	16	19
Home maker	14	10	12
Student	14	38	21
Others	34	04	19
Parameters			
Educational Qualification			
Up to Higher Secondary	26	12	19
Graduation	50	36	43
Post-Graduation	14	42	28
Others (Illiterate, Doctoral)	10	10	10
Family Income (₹annum^{-1})			
<25000	20	20	20
25000-50000	56	32	44
50000-100000	14	26	20
>100000	10	22	16
Gender			
Male	82	70	76
Female	18	30	24

Figures indicate percentage
*Illiterate, doctorate and middle level education qualification

Type of Billing Plan

The results show that 48 and 54 percent from rural and urban consumers were pre-paid users and 42 and 34 percent from rural and urban were post-paid users

respectively. On the other hand 10 and 12 percent from rural and urban consumers found to have both connections.

Table 2: **Distribution of respondents on basis of type of billing plan**

Parameter	Respondents (Percent)		
	Rural	**Urban**	**Overall**
Prepaid	48	54	51
Postpaid	42	34	38
Both	10	12	11
Total	**100**	**100**	**100**

Figures in parentheses indicate percentage

Reasons for Preference of Pre-paid Connection

The perusal of Table 3 shows that the most important reason for preference of pre-paid connection by rural respondents was availability of full talk time recharges (58.60 percent), followed by availability of SMS packages, availability of other facilities, internet packages and tariff plans. Whereas, urban respondents reported that the most important reason for their preference of pre-paid connection was availability of full talk time recharges (75.75 percent), followed by internet packages, availability of SMS packages, tariff plans, and availability of other facilities. It was reported by 67.74 percent of respondents that the most important reason for their preference of pre-paid connection was availability of full talk time recharges. This was followed by availability of SMS packages, internet packages, tariff plans and other facilities.

Table 3: **Distribution of respondents according to reasons for preference of pre-paid connection**

Reasons	Respondents (Percent)		
	Rural	**Urban**	**Total**
Full talk time recharges	58.60	75.75	67.74
SMS Packages	44.80	54.54	50.00
Internet Packages	31.07	57.57	45.16
Tariff Plans	13.70	33.33	24.19
Other facilities	37.90	15.15	25.80
Total sample (No.)	58	66	124

Figures in parentheses indicate percentage

Reasons for Preference of Post-paid Connection

The perusal of Table 4 shows that 84.61 percent of rural respondents reported that the most important reason for their preference of post-paid connection was unlimited calling facility, followed by availability of other facilities, and closed user group facility. Similarly, 91.30 percent of urban respondents said that the most

important reason for their preference of post-paid connection was unlimited calling facility, followed by closed user group facility and availability of other facilities.

Overall, 87.75 percent of respondents said that the most important reason for their preference of post-paid connection was unlimited calling facility, followed by availability of other facilities and closed user group facility.

Table 4: **Distribution of respondents according to reasons for preference of post-paid connection**

Reasons	Respondents (Percent)		
	Rural	**Urban**	**Total**
Unlimited calling Facility	84.61	91.30	87.75
Closed user group Facility	30.76	47.82	28.57
Others	42.30	30.43	36.73
Total sample (No.)	52	46	98

Figures in parentheses indicate percentage.

Activities Preferred by the Respondents

The respondents were asked to rate the activities preferred by them on a scale from 1 to 5, where 5 stand for most preferred and 1 stands for least preferred. The results presented in Table 5 show that, there was a divergent view of rural and urban respondents for all activities except talking time, SMS messaging and MMS facilities. This show that the all the sample customers preferred to avail the more talking time and SMS facilities both in the case of rural and urban areas.

Table 5: Preference of various activities among rural and urban respondents

Particulars	Mean Score			Z-Value
	Rural	**Urban**	**Total**	
Talking time	4.64	4.61	4.62	0.30[NS]
SMS Messaging	3.20	4.11	3.65	1.68[NS]
Reviewing bank account information	2.10	2.47	2.28	2.05[**]
MMS	1.69	1.91	1.80	1.46[NS]
Gaming	1.79	2.29	2.04	3.33[**]
Social networking	2.73	3.48	3.10	4.16[**]
Video conferencing	1.51	2.51	2.01	6.67[**]
Shopping	1.55	2.51	2.03	5.64[**]
Accessing maps and directions	1.44	2.22	1.83	6.00[**]
Accessing local information	1.66	1.78	1.72	2.80[**]
Reading news	1.69	2.62	2.15	5.80[**]
e-mail	1.84	3.61	2.72	11.0[**]
You tube	1.78	2.84	2.31	5.57[**]
Search music, video and pictures	2.12	3.57	2.84	6.90[**]
Others	1.54	2.25	1.89	5.07[**]

*** Significant at 5 percent level.**
NS: Non-significant

Factors Influencing Choice of Mobile Service Provider

The results presented in Table 6 revealed that rural respondents consider economical calling (mean score 4.62), network coverage, customer service and billing integrity as the most important factors influencing their choice of mobile service providers. Factors like company image, advertisement, value added services, attitude of sales person and roaming services were the least important factors influencing their decision. On the other hand, the urban respondents consider economical calling, network coverage, customer service and roaming services as the most important factors influencing their choice of mobile service providers. Factors like company image, advertisement, value added services, attitude of sales person and billing integrity were the least important ones.

The results also show that for the factors brand image, advertisement, value for money, roaming services, recommendation from family/friends and low priced GPRS facility the difference between the means of two samples belonging rural and urban area was significant statistically.

Table 6: **Factors affecting choice of mobile service provider by rural and urban respondents**

Factors	Mean Score			Z-value
	Rural	**Urban**	**Combined**	
Economical calling	4.62	4.47	4.54	1.61^{NS}
Network Coverage	4.62	4.54	4.58	1.01^{NS}
Customer Service	4.01	4.10	4.05	0.84^{NS}
Company/ Brand Image	3.46	3.03	3.24	3.20^{**}
Advertisement	3.41	2.95	3.16	3.04^{**}
Value Added Services	3.21	3.37	3.29	1.02^{NS}
Value For Money	3.08	3.77	3.42	4.85^{**}
Good Attitude of Salesperson	3.39	3.27	3.33	0.59^{NS}
Roaming Services	3.34	3.69	3.51	2.20^{**}
Billing Integrity	3.70	3.49	3.59	1.40^{NS}
Recommendations From Family/Friend	2.66	3.37	3.01	4.30^{**}
Low priced GPRS facility	3.32	3.65	3.48	2.07^{**}

***Significant at 5 percent level*
NS: Non-significant

Satisfaction of Respondents towards Services of Mobile Service Provider

The perusal of Table 7 depicts the satisfaction of rural and urban respondents towards various services provided by their service provider. The rural consumers have higher satisfaction for factors like price, performance, schemes, modes of payments and outgoing call charges.

Table 7: **Satisfaction of rural and urban respondents with regard to mobile service providers**

Factor	Mean Score			Z-value
	Rural	**Urban**	**Overall**	
Price	2.39	2.49	2.44	1.23[NS]
Performance	2.30	2.50	2.40	2.40[**]
Capacity	1.82	2.31	2.06	6.04[**]
After sales service	1.98	2.41	2.19	5.65[**]
Easy process	1.99	2.26	2.12	4.21[**]
Schemes	2.09	2.53	2.31	5.64[**]
Various facilities	1.95	2.14	2.04	2.26[**]
Periodical offers	1.91	2.47	2.19	7.08[**]
Modes of payment	2.03	1.97	2.00	0.73[NS]
Outgoing call charges	2.01	1.85	1.93	1.83[NS]

***Significant at 5 percent level, NS: Non Significant*

On the other hand they were having lower satisfaction from services like capacity, after sales service and periodical offers. On the other hand, urban consumers have higher satisfaction for factors like price, performance, schemes, capacity, after sales service, periodical offers and have less satisfaction from services like modes of payments, outgoing call charges.

Problems Faced by the Respondents

The respondents were questioned whether they faced any problem with the service provider. It was found that 58 and 48 percent of rural and urban respondents have faced a problem with the service provider. Overall 53 percent of respondents faced problems with their service providers on one accent or another.

Type of problem faced by the respondents

The respondents were further enquired about what type of problem they faced. The perusal of Table 8 shows that 34.4 percent of rural respondents faced problem of coverage, followed by busy network, clarity of voice and other service problem.

Table 8: Problems faced by the respondents from mobile service providers

Problem	Respondents (Percent)		
	Rural	**Urban**	**Total**
Coverage	34.4	25.0	30.1
Service	13.7	35.4	23.5
Clarity	20.6	37.5	28.3
Network Busy	31.0	27.0	29.2
Others (internet speed, 3G, etc.)	17.2	16.6	16.9
Total sample (No.)	58	48	106

Figures in parentheses indicate percentage

On the other hand 37.5 percent urban consumers faced problems on account of clarity, followed by service, network busy, coverage and other problems. Overall, 30.1 percent of respondents faced problem of coverage, followed by network busy, clarity, service and other problems.

Respondents' continuity with service provider

The respondents were questioned whether they will continue with present service provider or will switch over to other service provider. The perusal of Table 9 showed that 70 and 53 percent of rural and urban respondents respectively will continue with their present service provider while 30 and 47 percent will change in near future. This shows that respondents have very little brand loyalty as far as mobile service provider was concerned and were ready to shift as soon as the other person gives a better package. Thus, it is a highly dynamic and changing market.

Table 9: Distribution of respondents on basis of their continuity with service provider

Particulars	Respondents (Percent)		
	Rural	**Urban**	**Total**
Continue with present service provider	70	53	61.5
Switch over to other service provider	30	47	38.5
Total	**100**	**100**	**100**

Figures in parentheses indicate percentage

Reasons for Shifting to Other Mobile Service Provider

The perusal of Table 10 shows that the respondents wanted to shift to other mobile service provider due to high calling rates, poor network, unattractive packages, poor customer service and poor internet accessibility.

Table 10: Reasons for shifting to other mobile service provider by rural and urban respondents

Statement	R_1 (Rural)	R_2 (Urban)	$D = R_1 - R_2$	D_2
High calling rates	01	01	00	00
Poor Network	02	04	-02	04
Billing Problems	04	06	-02	04
Poor Customer Service	07	05	02	04
Lack of Value Added Services	06	07	-01	01
Poor Internet accessibility	05	03	02	04
Unattractive packages	03	02	01	01
Rank Correlation Coefficient	-	-	-	0.68
Calculated t-value	-	-	-	0.5[NS]

NS: Non Significant

The rank correlation coefficient was estimated to be 0.68. This shows that correlation exists between the reasons of shifting for the respondents from rural and urban population. Also, Student's t-test was applied to test the significance of

correlation coefficient between reasons of shifting for rural and urban respondents which was non- significant statistically.

Present Mobile Service Provider Recommended to Others

It was found that the number of respondents who will recommend their present mobile service provider to others. It revealed that 69 percent of rural respondents and 56 percent of urban respondents would recommend others to subscribe to their mobile service provider. Overall, 62.5 percent of respondents would recommend others to subscribe to their mobile service provider while 37.5 percent would not recommend others for the same.

CONCLUSIONS

The study revealed that majority of the respondents want economical call charges, excellent customer service, comprehensive network coverage and fast internet service from their mobile service providers. The results showed that for the factors brand image, advertisement, value for money, roaming services, recommendation from family/friends and low priced GPRS facility, there was a significant difference between the means of two samples pertaining to the rural urban areas. It was also found that customers were ready to shift to other service provider if they were not satisfied with the present service provider. The reasons for shifting to other mobile service providers were high calling rates, poor network, unattractive packages and poor internet accessibility. Also, a majority of the respondents said that they would recommend their present service provider to others.

REFERENCES

Anand. A. 2007. India mobilizes for a rural revolution. Retrieved on September 16, 2011 culled from *http://globaltechforum.eiu.com.*

Anonymous. 2008. Urban Definition. Retrieved on March 15, 2012 from *http://dictionaryreference.com*

Dhingra, M. 2012. *A study of preference and satisfaction towards mobile service providers among rural and urban consumers*, M.B.A. Thesis, Punjab Agricultural University, Ludhiana, India.

Jain, A. and Hundal, B.S. 2006. Factors influencing the adoption of cell phone services in rural areas. *ICFAI Journal of Management Research.* **3**:14-26.

Lee, R. and Murphy, J. 2005. From loyalty to switching: Exploring the determinations in the transition. *Paper presented at the Australia and New Zealand Marketing Academy Conference,* Perth, Australia.

Oyeniyi, A., Omotayo, O. and Joachim, A. 2008. Customer service in the retention of mobile phone users in Nigeria. *African Journal of Business Management* **2**: 26-31.

Revathy, S. and Padmavathy, S. 2005. Preference in cellular service providers in the post liberalization era. *Indian Journal of Marketing.* **35**: 54-64.

Sridhar, V. 2010. Mobiles for delivery of public services. Culled from *http://sites.google.com.*

ATTITUDINAL STUDY OF PORTRAYAL OF WOMEN IN PRINT ADVERTISEMENTS

B.S. Hundal and Sukhmani[*]

ABSTRACT

The worth of a civilization can be judged by the place given to women in the society. One of several factors that justify the greatness of India's ancient culture is the honorable place granted to women. It has been seen that advertisers use different tactics to attract viewer attention such as roles stereotyping, using modern portrayal or positioning women as objects to grab attention of viewers. The results of Factor Analysis for attitude towards portrayal of women in advertisements revealed the extraction of twelve factors which suggested that respondents preferred positive role portrayal and condemned lack of ethics in advertising, nudity in advertising and use of objectification of women. The respondents also opined that bold women portrayal is only selling mantras without bearing any direct relevance to the ad/ product advertised.

INTRODUCTION

Advertising has evolved into a powerful marketing tool over the last century. Advertising is one of the promotional tools used in marketing endeavors, as one means of communication between the seller (advertiser) and the buyer (consumer or organization). The portrayal of women in advertising is an effective tool used by advertisers to attract viewer attention. Indian advertisers portray women often as housewives, featured as sex objects and dependent on men. They are still not seen as individuals in their own right. Many of the studies have shown that advertisements depict women in stereotypical ways. Women's place is at home, women are dependent on men, they do not make important and independent decisions, women are shown in few occupational roles. This type of portrayal of women in advertising is detrimental to society because it creates, or perpetuates, misconceptions about

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women. These stereotypes serve as poor role model and inhibit sympathetic understanding of individual differences. And such type or portrayal of women encourages people to think and speak of women in terms of their narrowly defined roles in society.

A study conducted by Kang (1997) in which used Goffman's (1979) five coding categories and added two new categories body display (degree of nudity, body-revealing clothes) and independence/self-assertiveness (women's overall image in terms of independence and self-assurance) in order to examine any changes in the way women have been portrayed in magazine advertising since the late 1970s. It was concluded that even though some advertisers had begun to feature more powerful and independent women, "only superficial cultural alterations were transferred to advertisements, while the underlying ideological foundation remains untouched". Bhullar (2000) indicated that the respondents do not equally like all roles in which women are portrayed in ads, rather liking for some roles is much higher than for other roles.

The ads showing woman in the role of mother and that showing woman in the role of working woman were liked the most. The subtle stereotyping is more insidious as it is relatively more invisible but nonetheless demeaning and patronizing (Dagar, 2004). Rachoza (2003) compared ads of 1950's and 2000's and found that stereotypes from the past have vanished, only to have new ones take their place, while other stereotypes have not changed at all. In the 1950's advertisements displayed women as innocent, weak, and quiet individuals. Lindner (2004) took a longitudinal approach to analyze the portrayal of women in a general interest magazine and a women's fashion magazine from 1955 to 2002, the results of this study showed that stereotypical images of women are found quite frequently. Zarchikoff (www.*kafka.uvic.ca)* compiled results of various studies on women's place in adverting which revealed that the portrayal of women in advertising was negatively influencing the view men have of women in our society and how women view themselves. In the past woman were usually depicted in household settings or tending motherly duties.

In the backdrop of this the present study was undertaken to understand the attitude of the viewers towards various portrayal of women used in print advertisements.

METHODOLOGY

The present study was conducted in Amritsar, Jalandhar and Ludhiana districts of Punjab. These districts were selected purposively. The rationale behind the selection of these districts was to get integrated view of the Malwa, Doaba and Majha regions of Punjab as sample districts were having different socio-economic characteristics. A sample of 100 respondents each was randomly selected from the

sample districts. The total sample consisted of 300 respondents. The views of the selected respondents were recorded pertaining to the portrayal of woman in print ads and were asked to specify their level of agreement on a 5 point Likert Scale from Strongly Agree to Strongly Disagree. (Strongly Agree = 5 and Strongly Disagree = 1) on 32 statements to adjudge agreement versus disagreement with various women portrayal in print ads. A list of the statements is presented in Table 1. The study was mainly based on primary data collected by personally interviewing 300 respondents with the help at a pre-tested, semi-disguised, structured schedule.

Factor Analysis

Factor analysis has been employed in this study to analyze the factors important to the respondents regarding the attitude towards portrayal of women in ads. In order to serve this purpose, the information collected through 32 statements relating to portrayal of women in ads has been condensed into important dimensions, with the help of factor analysis. Since the objective of this research was to summarize the variables, 'R' factor analysis was applied.   In order to extract the factors 'Principal Component Analysis' method was used. Loadings under the analysis were rotated to make them more interpretable by making the loadings for each factor either large or small, not in between. For rotation, Varimax Method was employed.

Statistical Packages Used

SPSS version 16 was used for all statistical analysis. In order to investigate about the attitude of respondents towards different portrayal of women the responses were analyzed using Weighted Average Scores (WAS) and t- test was applied to find out if any significant differences exist between female and male respondents.

For 300 respondents, overall Weighted Average Score was applied over 32 statements to understand the overall attitude of respondents towards different portrayal of women. The respondents have shown a pro-statement attitude towards the different role portrayal as the Weighted Average Score for the statements S3, S4, S5, S6, S7, S12, S13, S16, S18, S20, S21, S22, S23, S24, S25, S26, S27, S28, S30, S31 and S32 is 4 or rounding off to 4. And for the remaining statements, which are S1, S2, S8, S9, S10, S11, S14, S15, S17, S19, S29, respondents have neutral attitude towards the different women role portrayal. As the Weighted Average Score for the above mentioned statements are 3 or rounding off to 3. Similarly, to understand the attitude of female and male respondents each toward different portrayal of women, weighted average score was calculated over 32 statements. For female respondents a majority of them indicated a disagreement with the portrayal of women for all the statements ranging from 1 to 32. As the weighted average score is 1 or rounding off to 1.

RESULTS AND DISCUSSION

The results presented in Table 2 revealed that in the case of the male respondents majority of them gave pro-statement agreement attitude towards the different portrayal of women as for the statements S1, S2, S3, S4, S5, S6, S7, S12, S13, S16, S18, S20, S21, S22, S23, S24, S25, S26, S27, S28, S30, S31 and S32, the Weighted Average Score is rounding off to 4. For the remaining statements S8, S9, S10, S11, S14, S15, S17, S19 and S29, the respondents are neutral as their Weighted Average Scores are rounding off to 3.

The t-values show that female and male respondents differ statistically with respect to their attitude towards the different portrayal of women for majority of the statements. The statements on which the female and male respondents differ are S1, S2, S3, S5, S6, S7, S12, S13, S15, S17, S19, S20, S24, S25, S26, S27 and S28. The remaining 15 statements showed that the female and male respondents have same opinions towards the different portrayal of women.

FACTOR ANALYSIS FOR ATTITUDE TOWARDS WOMEN PORTRAYAL

The results of factor analysis for the overall sample are presented in this section. In all 12 factors were extracted from a series of 32 statements to uncover the underlying dimensions considered important for portrayal of women in advertising factors. The various factors are discussed in Table 3.

Factor Labelling

Favourable attitude towards positive role portrayal of women

The first factor extracted is *Favourable attitude towards positive role portrayal of women* which explains 7.003 percent of total variance. The factor is composed of 5 statements. The statements suggest that respondents strongly favour projection of women as equals of men (S28) and ads where women are treated merely as an object to sell must be abandoned (S27). In addition to this, a need has been projected for women to come up boldly against their degrading presentation (S26) or the government must encourage media to refrain from projecting women as inferior beings (S7). Overall factor structure depicts that respondents prefer positive role portrayal of women and oppose strongly unequal or derogatory presentation of women in ads.

Objectification of women

Objectification of women is the second factor that loads on to explain 5.668 percent of total variance. The factor structure suggests that respondents agree to sexual objectification of women as depicted in statements S29 (women are treated as mere sex objects), S1 (Sale of a product is directly related to bold portrayal of women), S15 (Sex sells pretty more than anything). The two statements S18 and S17 suggest that women are depicted in ads only as attention seeking objects.

Bold portrays-Only a selling mantra

The statements loading on to this factor suggest that women are given bold portrayal in ads to attract attention, boost brand image or ultimately sell. This is depicted in statements like bold ads attract attention (S16), use of women celebrity helps in promoting the brand image (S13) and sex sells pretty more than anything (S15). This factor accounts for 5.586 percent of total variance.

Neutral attitude towards women portrayal

The four statements that load on to this factor, which explains 5.555 percent of total variance suggest that respondents are neutral to the presence/ absence of women in ads. More so, they opine that negative and degrading images of women in media communication must be changed. To accomplish this, there must either be self-regulatory mechanism in media or the government should encourage media to refrain from gender biased programming. These opinions have been depicted through statements S4, S5, S7 and S6.

Low impact of objectification as a selling tactics

Low impact of objectification as a selling tactics is the fifth factor that loads on to explain 5.493 percent of total variance. The statements included in the factor suggest that respondents strongly opine that quality is incomparable with whatever way the women may be projected (S11). In addition to this, they also agree to the statements that women portrayal in the ad overcomes the image of the brand (S12) or that women are needed in the ad, no matter relevant or irrelevant (S17) and that women look best as decorative pieces (S19). This suggests that though respondents get swayed away by portrayal of charming women, yet alongside they rationally confirm that quality of a product cannot be confirmed through these portrayals.

Women portrayal as a part of advertising tactics

This factor explains 5.348 percent of total variance. The factor suggests that women are portrayed in ads to draw attention of prospective buyers (S36) and greater attention is sought from public if women are portrayed in a sensuous manner (S23). The respondents, on one side, agree to the statement that purchase behaviour is also affected by ads portraying charming women (S32). On the other hand, the respondents opine that people prefer only those ads which have relevance (S30). The responses suggest that seemingly people's purchase behaviour for certain product categories is affected by portrayal of charming but the ads individually are preferred if they are relevant.

Skeptic attitude towards advertising

The statements that load on to this factor suggest that viewers are aware of the fact that ads seek to mislead them. This is depicted from the agreement to the statement 'Consumes are insensitive to women projection in ads' (S10) or some models use their physical charm only to earn more money through ads (and not endorse any product / brand) (S24). The respondents also voice the need for media to

refrain from projecting women as strong beings (macho women) (S9), which is far from being true. There is also a need to avoid gender stereotyping (S8), which is unreal in the present times. Together these statements account for 5.094 percent of total variance.

Lack of ethics in women portrayal

The statements included in the factor suggest that media lacks ethics in portraying women in advertisements. The factor accounts for 4.654 percent of total variance. The statements suggest that ads seek more attention from viewers when women are portrayed in a sensuous manner (S23), women models did not mind nudity for fame (S22) and there is a need for women to come up openly and boldly against their degrading presentation (S26). Clearly, there is a consensus amongst respondents as regards lack of ethics in portraying women in ads.

Irrelevance of nudity in women portrayal in Ads

Irrelevance of Nudity in Women Portrayal in Ads' is the ninth factor that explains 4.612 percent of total variance. The factor structure suggests that there is no substitute to the image of a brand which it carries (S14) while women models use their physical charm to earn more money (S24) or for fame (S22).

Negative attitude towards sex stereotyping

The tenth factor such as negative attitude towards sex stereotyping accounts for 4.573 percent of total variance. The statements included in the factor like people prefer only those ads that have relevance (S30) and one would be better off without purchasing the product if portrayal of women is not respectable (S2) and women are depicted as weaker sex (S8). This suggests that the respondents hold a negative view of sex stereotyping in ads so much so that they would even forego buying the products that present women as weak individuals.

Interest in modern role portrayal of women

The factor includes two statements to bring froth that men have more interest in women ads (S21) and the preferred portrayal for women are ones of working roles (S20). Together these statements account for 4.440 percent of total variance.

Attention seeking sensuous portrayal

Attention seeking sensuous portrayal is the last factor that explains 4.067 percent of total variance. Only two statements get loaded to this factor. The respondents show agreement to the statement that women ads seek more attention if women are portrayed in a sensuous manner (S23). At the same time such attention seeking sensuous portrayal were condemned by agreement to the statement that it is better to project women only for product meant for women and not of men which do not bear any direct relevance to women.

CONCLUSIONS

The results of Factor Analysis for attitude towards portrayal of women in advertisements revealed the extraction of twelve factors which suggested that respondents prefer positive role portrayal for women as given out in Factor 1, Factor 10 and Factor 11. Along with this, it is seen that respondents condemn lack of ethics in Advertising (Factor 8), Nudity in advertising (Factor 9), and use of objectification of Women (Factor 2 and Factor 5). The respondents also opine that bold women portrayal is only selling mantras (Factors 3, 6 & 7) without bearing any direct relevance to the ad/ product advertised. Thus, it can be concluded that positive role portrayal was preferred by the viewers where as the bold portrayal was considered to be merely a selling mantra.

REFERENCES

Bhullar, P. 2000. *Portrayal of women in advertising.* An unpublished doctoral dissertation submitted to GNDU, Amritsar.

Dagar, R. 2004. Gender and media: Indian perspective. SAFMA Regional Workshop, Kathmandu, Nepal, June 24-27.

Goffman, E. 1979. *Gender advertisements.* Colophon Publication, New York

Kang, M. 1997. Manicuring race, gender, and class: Service interactions in New York city Korean Nail Salons. *Race, Gender, and Class*. **4** (3):143-164.

Rachoza, J. 2003. The Power of the gaze: the stereotypical image of women in advertisements. Retrieved from www.jessicara.com/portfoliofilesgaze.pdf

Zarchikoff, R. Looking through the years at women's place in advertising. Culled from http://kafka.uvic.ca

Table 1:   A list of statements for portrayal of women in adertisement

Sr. No.	Statements for portrayal of women in Ads
S1	Sale of a product is directly related to bold portrayal of women
S2	I would be better off without purchasing the product if portrayal of women is not respectable
S3	It is better to project women only for the products meant for women & not of men (e.g. shaving advertisement)
S4	I would buy the product irrespective of the presence or absence of women in adv.
S5	Continued negative and degrading images of women in media communications must be changed
S6	There is need of self-regulatory mechanisms in media to eliminate gender biased programming
S7	The govt. needs to encourage media to refrain from projecting women as inferior beings
S8	Women are depicted as 'weaker sex' in combined Male-Female adv.
S9	Media to refrain from projection of women as very strong beings
S10	Consumer is insensitive to the women projection in adv.
S11	Quality is incomparable with whatever way the women may be projected
S12	Women portrayal in the ad overcomes the image of the brand
S13	Use of women celebrity helps in promoting the brand image
S14	There is no substitute to the image of a brand which it carries
S15	Sex sells-pretty more than anything
S16	Bold Ads-Attract Attention
S17	Woman-A need in ad, no matter relevant or irrelevant
S18	Media gains more TRP with women projection
S19	Women look best as decorative pieces
S20	Women should be portrayed in working roles
S21	Men watch more of women ads
S22	Some women model don't mind nudity for fame even in ads
S23	Women ads seek more attention if portrayed in sensuous manner
S24	Some women models use their physical charm to earn more money through ads
S25	Media needs to be more sensitized towards ethics
S26	Women need to come up openly & boldly against their degrading presentation
S27	The ads where women are treated merely as an object to sell need to be abandoned
S28	Women should be projected in ads as equals of men
S29	Women are treated as mere sex objects
S30	People prefer only those ads which have relevance
S31	Women adv. are successful in terms of drawing attention of the prospective buyers & general public
S32	The purchase behaviour is directly affected by ads portraying the charming women

Table 2: **Attitude towards different portrayal of women**

Sr. No	Overall WAS	WAS (Female)	SD	WAS (Male)	SD	t- value
S1	3.3467	1.23	0.10	3.70	1.21	-5.00**
S2	3.4500	1.06	0.09	3.65	0.91	-3.57**
S3	3.9367	1.07	0.09	3.71	1.18	3.43**
S4	3.7367	1.10	0.09	3.63	1.22	1.54 NS
S5	4.1367	0.74	0.06	3.85	1.06	5.34**
S6	3.9233	0.78	0.06	3.75	0.94	3.55**
S7	4.0600	0.85	0.07	3.78	1.05	5.08**
S8	3.2200	1.26	0.10	3.35	1.11	-1.85 NS
S9	3.2700	1.04	0.08	3.36	1.11	-1.45 NS
S10	3.3100	1.05	0.09	3.40	1.14	-1.42 NS
S11	3.4300	1.13	0.09	3.48	1.08	-0.78 NS
S12	3.6167	1.12	0.09	3.82	1.18	-3.06**
S13	4.0667	0.87	0.07	3.95	0.88	2.25**
S14	3.3133	1.01	0.08	3.35	1.06	-0.67 NS
S15	3.1733	1.29	0.11	3.49	1.13	-4.57**
S16	3.6267	1.22	0.10	3.58	1.14	0.68 NS
S17	2.9733	1.23	0.10	3.26	1.22	-4.05**
S18	3.7567	0.96	0.08	3.69	0.94	1.28 NS
S19	2.9633	1.30	0.11	3.40	1.23	-5.99**
S20	3.7633	0.95	0.08	3.54	1.04	3.89**
S21	3.9967	0.95	0.08	3.90	0.95	1.76 NS
S22	3.8833	1.08	0.09	3.84	0.96	0.73 NS
S23	3.7500	0.90	0.07	3.71	1.03	0.66 NS
S24	4.0833	0.78	0.06	3.90	0.97	3.61**
S25	3.9967	0.80	0.06	3.77	0.89	4.71**
S26	4.0067	0.91	0.07	3.75	0.96	4.82**
S27	3.8800	0.95	0.08	3.65	0.91	4.35**
S28	4.0633	0.77	0.06	3.83	1.08	4.25**
S29	3.4900	1.31	0.11	3.49	0.99	-0.05 NS
S30	3.6833	1.09	0.09	3.71	0.96	-0.39 NS
S31	3.7833	0.87	0.07	3.74	0.88	0.86 NS
S32	3.6200	1.03	0.08	3.55	1.00	1.14 NS

*** Significant at 5 percent level*
NS: Non-significant

Table 3: Factor Analysis for attitude towards portrayal of women in advertisements

Factor No.	Name of Dimension	Label	*Statements*	Factor Loading
F1	Favourable attitude towards Positive Role Portrayal for Women	S28	Women should be projected in ads as equals of men	0.696
		S26	Women need to come up openly & boldly against their degrading presentation	0.632
		S27	The ads where women are treated merely as an object to sell need to be abandoned	0.629
		S24	Some women models use their physical charm to earn more money through ads	0.330
		S7	The govt. needs to encourage media to refrain from projecting women as inferior beings	0.318
F2	Objectification of Women	S29	Women are treated as mere sex objects	0.692
		S1	Sale of a product is directly related to bold portrayal of women	0.616
		S18	Media gains more TRP with women projection	0.505
		S17	Woman – A need in ad, no matter relevant or irrelevant	0.421
		S15	Sex sells – pretty more than anything	0.384
F3	Bold Portrayal seem to be selling mantras	S16	Bold Ads – Attract Attention	0.768
		S13	Use of women celebrity helps in promoting the brand image	0.628
		S15	Sex sells – pretty more than anything	0.593
F4	Neutral attitude towards women portrayal	S4	I would buy the product irrespective of the presence or absence of women in adv.	0.744
		S5	Continued negative and degrading images of women in media communications must be changed	0.544
		S7	The govt. needs to encourage media to refrain from projecting women as inferior beings	0.528
		S6	There is need of self-regulatory mechanisms in media to eliminate gender-biased programming	0.469
F5	Low Impact of Objectification Selling tactics	S11	Quality is incomparable with whatever way the women may be projected	0.699
		S12	Women portrayal in the ad overcomes the image of the brand	0.674
		S17	Woman – A need in ad, no matter relevant or irrelevant	0.457
		S19	Women look best as decorative pieces	0.385
F6	Women Portrayal as a part of Advertising Tactics	S31	Women adv. Are successful in terms of drawing attention of the prospective buyers & general public	0.730
		S32	The purchase behaviour is directly affected by ads portraying the charming women	0.661
		S23	Women ads seek more attention if portrayed in sensuous manner	0.411
		S30	People prefer only those ads which have relevance	0.369

F7	Skeptic attitude towards Advertising	S9	Media to refrain from projection of women as very strong beings	0.761
		S10	Consumer is insensitive to the women projection in adv.	0.614
		S8	Women are depicted as 'weaker sex' in combined Male-Female adv.	0.456
		S24	Some women models use their physical charm to earn more money through ads	-0.335
F8	Lack of Ethics in Women portrayal	S25	Media needs to be more sensitized towards ethics	0.728
		S22	Some women model don't mind nudity for fame even in ads	0.541
		S23	Women ads seek more attention if portrayed in sensuous manner	0.389
		S26	Women need to come up openly & boldly against their degrading presentation	0.334
F9	Irrelevance of nudity in women portrayal in ads	S14	There is no substitute to the image of a brand which it carries	0.742
		S6	There is need of self-regulatory mechanisms in media to eliminate gender-biased programming	0.348
		S17	Woman – A need in ad, no matter relevant or irrelevant	0.339
		S24	Some women models use their physical charm to earn more money through ads	0.329
		S22	Some women model don't mind nudity for fame even in ads	0.308
F10	Negative Attitude towards Sex Stereotyping	S2	I would be better off without purchasing the product if portrayal of women is not respectable	0.771
		S30	People prefer only those ads which have relevance	0.623
		S8	Women are depicted as 'weaker sex' in combined Male-Female adv.	0.466
F11	Interest in Modern Roles of Women	S20	Women should be portrayed in working roles	0.781
		S21	Men watch more of women ads	0.634
F12	Attention seeking sensuous portrayal	S3	It is better to project women only for the products meant for women & not of men (e.g. shaving adv.)	0.823
		S23	Women ads seek more attention if portrayed in sensuous manner	0.428

PRODUCTION AND MARKETABLE SURPLUS OF SUMMER VEGETABLES IN PUNJAB

Mini Goyal and Amandeep Singh[*]

ABSTRACT

The present study was undertaken to examine the extent of area, production, marketable surplus of summer vegetables in Punjab. The results revealed that all the important summer vegetables were grown in Punjab. The major summer vegetables were found to be onion to which the highest area was allocated by the sample vegetables farmers. It was found that a negligible quantity of summer vegetables was retained for home consumption. Similarly, vegetables crops were not raised for seed production as such lions' share of the production was spared for the market.

INTRODUCTION

In modern times every agricultural commodity is produced for sale in the market to earn income in cash and thereby to buy and meet other cash requirements. The larger the quantity actually marketed, greater the cash income to the farmer. But the entire quantity produced is not available for sale because some part of it is retained for home consumption, feed and seed purposes, payment in kind, gifts to friends and relatives, etc. (Singh, 1990) and moreover out of it some quantities are lost due to spoilage. In the case of non-food crops like cotton, sugarcane, oil seeds, etc. which are used as raw material in agro-based industry, almost whole of the produce is available for sale except small quantities kept for seed and therefore, marketable surplus is nearly hundred per cent (www.indiaagronet.com). Such crops are called as cash crops or commercial crops. On the other hand, food grains, and other food crops like fruits and vegetables which earlier were considered as food crops only are now being considered as commercial crops also since the marketable surplus of such crops is 85-95 percent of the production in the present market economy (Sharma, 2000).

Marketable surplus is significant as it indicates the degree of commercialization of agriculture (Prasad, 1989). For an underdeveloped economy like ours it is more important for three reasons. Firstly, it contributes to capital

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formation in non agricultural sector. Secondly, it accelerates capital formation to agricultural sector also by fetching it the requisites of agricultural production. And thirdly, it improves the standard of living in agricultural sector by making available to it the industrial consumer goods (Upender, 1990).

The review of studies conducted earlier revealed that the extent of marketable surplus in agriculture differs from region to region, crop to crop, period to period and moreover from country to country (Newman, 1977). Within the same year and region it may vary from holding to holding (Chattopadhyay and Sen, 1988). The quantity of marketable surplus in addition to price is also determined by some non-price factors (Upender, 1990) such as cropped area (Amruta *et al*., 2011) production (Sharma, 1968), size of the holdings (Dwivedi and Jha, 2011), total income, wealth, debt and obligations on the farmer, family size, etc. Most of the studies done earlier were confined to study the marketable surplus and its relationship with production, income farm size, etc. (Government of India 2002; Nadkarni 1980 and Chauhan and Chhabra, 2005) in general and about the marketable surplus of food grains in India.

The food bowl of the country, the state of Punjab produces vegetables also. The wave of diversification of agriculture towards high value crops like vegetables has helped the farmers to augment their income and bail out from vicious circle of poverty. Punjab shares 2.29 percent of total area under vegetables in the country and contributes 2.63 percent of the total vegetables produced in the country. The state produced 3522.5 thousand tonnes of veggies in 2009-10 (Anonymous, 2010). Almost all the important vegetables found in Northern India are grown in the state during winter and summer season. But the daily requirement of vegetables is about 300 against availability of 145 grams per capita per day only. Under this background, it was important to analyze marketable surplus of vegetables in Punjab. Hence, the present study was conducted with the objectives:

  i.   to estimate production and marketable surplus of summer vegetables Punjab; and
  ii.   to analyse inter-regional and size-wise variations in marketable surplus of summer vegetables farmers in Punjab.

METHODOLOGY

The present study was conducted in Punjab. A multi- stage random sampling technique was employed to draw a representative sample. All the districts in the state were classified into three regions on the basis of area under vegetable cultivation using Cumulative Cube Root Frequency Method (Singh and Mangat, 1996). The Regions I, II and III represented the districts with highest, intermediate and lowest area under vegetables respectively in year 2010-11. The Region-I included Pathankot, Kapurthala, Amritsar, Hoshiarpur and Jalandhar districts. The Region-II included Fatehgarh Sahib, Moga, Bathinda, Tarantaran, Nawan Shehar and Ludhiana

districts while the districts of Mukatsar, Faridkot, Mansa, Barnala, Ropar, Gurdaspur, Ferozepur, Mohali and Sangrur came under Region- III. In the first stage sampling unit, three districts, Jalandhar, Ludhiana and Sangrur were randomly selected from their respective regions. In the second stage, one subdivision from each district was selected at random. A random sample of 25 vegetable growers was taken from each sub-division making a total sample size of 75 vegetable growers in the third stage. The selected vegetable growers were categorized into marginal ($\leq$1 ha), small ($\geq$ 1 and $\leq$ 2 ha), medium ($\geq$2 and $\leq$ 5 ha) and large ($\geq$5 ha) using national farm size classification. The primary data related to the area, production, consumption of summer vegetables were collected from sample growers with the help of specially designed and pre-tested schedule through personal interview method. The data so collected were tabulated and analyzed using descriptive and statistical tools. In order to estimate marketable surplus on different categories of farms for summer vegetables following formula was used:

MS=TP-TR
Where
MS=Marketable Surplus
TP=Total Production
TR=Total Quantity Retained (Home consumption, Payment in kind, seed, exchange etc.)

RESULTS AND DISCUSSION

The results obtained from the analysis of data are discussed as under:

Area under summer vegetables

The results revealed that during summer season, marginal farmers were using highest of area (31.03 percent) of their total area for onion cultivation followed by okra (27.59 per cent) and bottle gourd (22.41 percent) in Jalandhar district. None of the marginal farmer was found to be growing bitter gourd in Jalandhar district. Small farmers allocated (28.57 per cent) of area for bottle gourd followed by onion (27.73 percent). The medium farmers have allocated 39.40 per cent of their area to onion cultivation following by bottle gourd (18.63 per cent) and okra (16.92 per cent). The large farmers have sown onion on 36.73 per cent of area which was followed by bottle gourd, brinjal, okra and bitter gourd with the respective figures came out to be 19.77, 17.42, 8.21 and 7.87 percent respectively.

In Ludhiana district, during summer season marginal farmers have allocated 33.33 per cent of area to onion cultivation followed by brinjal (22.22 per cent). The small vegetable growers have allocated 32, 24.60 and 16.67 percent of area to onion, bottle gourd and brinjal cultivation respectively. The medium and large

farmers have grown onion on 40.34 and 45.32 percent of the land respectively. While it was19 percent for bottle gourd. Onion was main crop which occupied highest of area (42.19 percent) at the overall level in Ludhiana district.

Table 1: Size wise distribution of Area under summer vegetables on selected farms in Punjab

(Percent)

District	Vegetable	Marginal	Small	Medium	Large	Overall
Jalandhar	Bottle Gourd	22.41	28.57	18.63	19.77	19.99
	Brinjal	18.97	15.13	15.85	17.42	16.77
	Bitter Gourd	0.00	13.45	9.21	7.87	8.49
	Okra	27.59	15.13	16.92	8.21	12.12
	Onion	31.03	27.73	39.40	46.73	42.62
	Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		(0.58)	**(2.20)**	**(4.67)**	**(5.97)**	**(3.79)**
Ludhiana	Bottle Gourd	17.46	24.60	19.12	19.33	14.54
	Brinjal	22.22	16.67	14.50	18.70	17.02
	Bitter Gourd	9.52	14.29	9.87	8.24	9.30
	Okra	17.46	12.70	16.18	8.40	11.95
	Onion	33.34	31.75	40.34	45.32	42.19
	Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		(0.63)	**(1.26)**	**(4.76)**	**(6.31)**	**(3.89)**
Sangrur	Bottle Gourd	11.48	24.30	21.13	17.95	19.21
	Brinjal	18.03	16.82	15.72	16.22	16.18
	Bitter Gourd	14.75	13.08	10.82	9.07	10.09
	Okra	16.39	14.02	17.78	8.30	11.82
	Onion	39.34	31.78	34.54	48.46	42.70
	Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		(0.61)	**(1.07)**	**(3.88)**	**(5.18)**	**(3.16)**
Overall	Bottle Gourd	17.03	25.76	10.45	19.06	19.60
	Brinjal	19.78	16.23	15.27	17.48	16.69
	Bitter Gourd	8.24	13.60	9.88	8.77	9.25
	Okra	20.33	13.93	16.83	8.30	11.97
	Onion	34.62	30.48	38.58	46.79	42.49
	Total	**100.00**	**100.00**	**100.00**	**100.00**	**100.00**
		(0.60)	**(1.17)**	**(4.47)**	**(5.80)**	**(3.60)**

Figures in parentheses are the total area (acres) allocated to vegetables by respective category of the sample farmers

Similarly, onion was the major summer vegetable. In the case of marginal, small, medium and large vegetable growers area allocated to onion was 39.34, 31.78, 34.54 and 48.46 percent respectively. Bottle gourd was the next most popular summer vegetable among the vegetable farmers. It was found 24.30, 21.13 and 18 percent for small, medium and large except the marginal ones who chose to grow brinjal. Okra was grown on 16.39, 14, 18 and 8.30 percent of the area by the marginal small, medium and large vegetable farmers respectively. Bitter gourd was the least important summer vegetable in the district as only 10 percent of the operational area was put under the crop.

It was found from the study that most of the operational area (42 percent) was allocated to onion while nearly one fifth of that was allocated to bottle gourd followed by brinjal (16.69 percent), okra (11.97 percent) and bitter gourd (9.25 percent) in Punjab.

Production and Marketable Surplus

Bottle gourd

The perusal of Table 2 shows that production of bottle gourd was 104.41 quintals per farm and its marketable surplus was 99.47 percent at the overall level.

Table 2: Size wise distribution of production and marketable surplus of Bottle Gourd of selected vegetable growers in Punjab

(Percent)

District	Particulars	Marginal	Small	Medium	Large	Overall
Jalandhar	Production (qfarm^{-1})	19.47	50.50	128.93	174.43	112.11
	Total quantity Retained	1.59	0.97	0.47	0.44	0.53
	Marketable Surplus	98.41	99.03	99.53	99.56	99.47
Ludhiana	Production (qfarm^{-1})	16.37	46.01	134.33	179.69	112.31
	Total quantity Retained	1.65	0.83	0.42	0.40	0.47
	Marketable Surplus	98.35	99.17	99.58	99.60	99.53
Sangrur	Production (qfarm^{-1})	10.38	38.32	120.49	136.19	88.80
	Total quantity Retained	2.79	0.83	0.49	0.50	0.61
	Marketable Surplus	97.21	99.17	99.51	99.50	99.39
Overall	Production (qfarm^{-1})	15.41	44.53	128.58	162.81	104.41
	Total quantity Retained	1.88	1.01	0.46	0.44	0.53
	Marketable Surplus	98.12	98.99	99.54	99.56	99.47

The production of bottle gourd was found to be 15.41, 44.53, 128.58 and 162.81 quintals per farm on marginal, small, medium and large farmers respectively. The marketable surplus was estimated to be 98.12, 98.99, 99.54 and 99.56 percent for marginal, small, medium and large farm categories respectively. The marketable surplus of bottle gourd for marginal, small, medium and large farmer was estimated to be 98.41, 99.03, 99.53 and 99.56 percent in Jalandhar district respectively. In Sangrur district, marketable surplus of bottle gourd for marginal, small, medium and large farms was 97.21, 98.77, 99.51 and 99.50 percent respectively. It can be concluded from the above discussion that marketable surplus of bottle gourd was slightly higher (99.53 percent) in Ludhiana district than Jalandhar (99.47 percent) and Sangrur districts (99.39 percent).

Brinjal

It can be seen from Table 3 that overall production of brinjal in the state was 56.26 quintals per farm and 1.32 percent was kept for home consumption. The marketable surplus was estimated to be 55.52 quintals per farm which came out to be 98.68 percent of the total produce.

Table 3: Size wise distribution of production and marketable surplus of Brinjal of selected vegetable growers in Punjab

(Percent)

Particulars	Particular	Marginal	Small	Medium	Large	Overall
Jalandhar	Production (qfarm[-1])	9.88	16.07	65.59	91.95	56.26
	Total quantity Retained	3.44	2.55	1.33	1.09	1.32
	Marketable Surplus	96.56	97.45	98.67	98.91	98.68
Ludhiana	Production (qfarm[-1])	12.44	18.57	60.57	103.36	58.16
	Total quantity Retained	3.30	2.91	1.52	1.04	1.39
	Marketable surplus	96.70	99.17	99.58	99.60	99.53
Sangrur	Production (qfarm[-1])	9.59	15.66	52.96	72.77	44.20
	Total quantity Retained	3.96	3.13	1.53	1.35	1.64
	Marketable surplus	96.04	96.87	98.47	98.65	98.36
Overall	Production (qfarm[-1])	10.63	16.70	60.07	88.82	52.87
	Total quantity Retained	3.54	2.88	1.11	1.14	1.43
	Marketable surplus	96.46	97.12	98.89	98.86	98.57

The marketable surplus for marginal, small, medium and large farm categories was estimated to be 96.46, 97.12, 98.89 and 98.86 percent respectively in Punjab. The marketable surplus of brinjal for marginal, small, medium and large farmers was 99.56, 97.45, 98.67 and 98.91 percent in Jalandhar district respectively. The corresponding figures were found to be 96.70, 99.17, 99.58 and 99.60 percent respectively in Ludhiana district. Similarly, marketable surplus was 96.04, 96.87, 98.47 and 98.65 percent for marginal, small, medium and large farmers in Sangrur district respectively. The results indicated that the marketable surplus of brinjal was higher (99.53 percent) in Ludhiana district as compared to Jalandhar (98.68 percent) and Sangrur districts (98.36 percent).The marketable surplus of brinjals in the case of medium farmers was slightly higher as compared to marginal and small farmers, the reason being more home consumption (Joshi, 2011) of the vegetable due to large size of the family (5-8 members) as it was 50 percent and 60 percent in the case of the marginal and small farmers respectively.

Bitter gourd

The perusal of Table 4 shows that at the overall level the production of bitter gourd was 21.90 quintals per farm in Punjab and after retaining 2 percent of it for home consumption and other purposes. The marketable surplus estimated to be 98 percent at the overall level. The marketable surplus was 96.57 percent for marginal, 96.73 percent for small, 98.22 percent for medium and 98.15 percent for large farms. None of the selected marginal farmers was growing bitter gourd in Jalandhar district whereas the marketable surplus of bitter gourd for small, medium and large farmers was 95.50, 97.27 and 97.35 percent respectively.

In Sangrur district, marketable surplus of bitter gourd for marginal, small, medium and large farmer was 96.45, 96.82, 98.64 and 98.52 percent respectively. This shows that the marketable surplus of bitter gourd was higher in Ludhiana district (98.49 percent) as compared to Jalandhar (97.13 percent) and Sangrur district (98.28 percent).

Table 4: Size wise distribution of production and marketable surplus of Bitter Gourd of selected vegetable growers in Punjab

(Percent)

District	Particular	Marginal	Small	Medium	Large	Overall
Jalandhar	Production (qfarm^{-1})	-	1068	28.54	30.92	21.26
	Total quantity Retained	-	4.50	2.73	2.65	2.87
	Marketable Surplus	-	95.50	97.27	97.35	97.13
Ludhiana	Production (qfarm^{-1})	-	10.20	27.76	30.10	20.45
	Total quantity Retained	3.24	2.26	1.33	1.41	1.51
	Marketable surplus	96.76	97.74	98.67	98.59	98.49
Sangrur	Production (qfarm^{-1})	4.01	11.97	30.93	34.00	23.81
	Total quantity Retained	3.55	3.18	1.36	1.48	1.72
	Marketable surplus	96.45	96.82	98.64	98.52	98.28
Overall	Production (qfarm^{-1})	3.31	10.50	29.09	31.69	21.90
	Total quantity Retained	3.43	3.27	1.78	1.85	2.01
	Marketable surplus	96.57	96.73	98.22	98.15	97.99

Okra

The results presented in Table 5 revealed that the marketable surplus of okra for medium size vegetable farm was highest (98.92 percent) in Punjab. The marketable surplus for marginal, small, medium, and large farmers was estimated to be 96.36, 96.48, 98.64 and 98.12 percent in Jalandhar district respectively. In Ludhiana district, marketable surplus of okra was 96.41, 96.84, 98.9 and 98.17 percent for the above said farm categories respectively. The respective figures for Sangrur district came out to be 97.68, 97.27, 99.16 and 98.27 percent for marginal, small, medium and large farmers. The study revealed that marketable surplus of okra was higher in Sangrur (98.55 percent) as compared to Ludhiana (98.41 per cent) and Jalandhar (98.14 percent) districts.

Table 5: Size wise distribution of production and marketable surplus of Okra of selected vegetable growers in Punjab

(Percent)

District	Particular	Marginal	Small	Medium	Large	Overall
Jalandhar	Production (qfarm^{-1})	7.97	8.81	38.25	23.39	22.17
	Total quantity Retained	3.64	3.52	1.36	1.88	1.86
	Marketable surplus	96.36	96.48	98.64	98.12	98.14
Ludhiana	Production (qfarm^{-1})	5.30	7.60	36.37	25.07	22.03
	Total quantity Retained	3.59	3.16	1.07	1.83	1.59
	Marketable surplus	96.41	96.84	98.93	98.17	98.41
Sangrur	Production (qfarm^{-1})	4.74	6.98	32.04	19.71	17.22
	Total quantity Retained	2.32	2.72	0.84	1.73	1.45
	Marketable surplus	97.68	97.28	99.16	98.27	98.55
Overall	Production (qfarm^{-1})	6.00	7.75	35.76	22.63	20.47
	Total quantity Retained	3.28	3.14	1.08	1.82	1.53
	Marketable surplus	96.72	96.86	98.92	98.18	98.37

Onion

It can be seen from Table 6 that the overall production of onion was 182.88 quintals per farm in the state while the total quantity retained for its home

consumption, payment in kind made to the hired farm labour or for making seed was 0.62 quintals per farm and the marketable surplus came out to be 182.26 quintals per farm. The marketable surplus was found to be increasing with increase in size of the land holding.

Table 6: Size wise distribution of production and marketable surplus of Onion of selected vegetable growers in Punjab

(Percent)

District	Particular	Marginal	Small	Medium	Large	Overall
Jalandhar	Production (qfarm^{-1})	22.08	40.34	24.17	338.68	196.29
	Total quantity Retained	1.40	1.21	0.30	0.21	0.30
	Marketable Surplus	98.60	98.79	99.70	99.79	99.70
Ludhiana	Production (qfarm^{-1})	20.97	25.80	225.18	341.44	189.83
	Total quantity Retained	1.76	1.86	0.27	0.20	0.30
	Marketable Surplus	98.24	98.14	99.73	99.80	99.70
Sangrur	Production (qfarm^{-1})	29.46	41.61	162.31	302.40	162.52
	Total quantity Retained	1.49	1.39	0.44	0.28	0.42
	Marketable Surplus	98.51	98.61	99.56	99.72	99.58
Overall	Production (qfarm^{-1})	24.17	36.27	206.88	326.97	182.88
	Total quantity Retained	1.54	1.44	0.32	0.23	0.34
	Marketable Surplus	98.46	98.56	99.68	99.77	99.66

The marketable surplus of onion for marginal, small, medium and large farms was 98.60, 98.79, 99.70 and 99.79 percent in Jalandhar district respectively. The marketable surplus for marginal, small, medium and large farmer was came out to be 98.24, 98.14, 99.73 and 99.80 percent respectively in Ludhiana district. The respective figures for Sangrur district came out to be 98.51, 98.61, 99.56 and 99.78 percent for above said vegetable growers respectively.

CONCLUSIONS

The study highlighted that among the summer vegetables in Punjab most of the area allocated to vegetables was under onion cultivation while nearly one fifth was allocated to bottle gourd followed by brinjal, okra and bitter gourd. The marketable surplus of bottle gourd was slightly higher in Ludhiana as compared to Jalandhar and Sangrur. The marketable surplus of brinjals in the case of medium farmers was slightly higher as compared to marginal and small farmers, due to higher home consumption of the vegetable being large size of the family in the case of the marginal and small farmers. There was a positive relationship between marketable surplus and the size of the farm in the case of onion. It was found that in all the three sample districts representing the three regions of vegetable cultivation in the state, a negligible quantity of summer vegetables was retained for home consumption, seed making or other purposes and a very large proportion of the produce was spared for the market.

REFERENCES

Amruta, B.Y. Zala, C. and Darji, Y. B. 2011. Analysis of Marketable and Marketed Surplus of Red Gram in Vadodra District of Gujarat. *Lagume Research-an International Journal.* **34** (4):267-272.

Anonymous. 2010. *Agricultural Statistics at a Glance*, Directorate of Economics and statistics, Ministry of Agriculture, Government of India, New Delhi.

Bhullar, P. 2000. *Portrayal of women in advertising.* An unpublished doctoral dissertation submitted to GNDU, Amritsar.

Chattopadhyay and Sen (1988) Marketable Surplus and Size- classes of Holdings. *Economic and Political Weekly.* **23** (52/53):151-156.

Chauhan, S. K. and Chhabra, A. 2005. Marketable Surplus and Price Spread of Maize in Hamirpur District of Himachal Pradesh. *Agricultural Economic Research Review*. **18:** 29-49.

Dwivedi, S. and Jha, A. K. 2011. A Study of Marketed and Marketable Surplus of Rice in Bihar-a Micro lavel Approach. *Economic Affairs*. **56** (1): 25-28.

Government of India (2002) *Marketable Surplus and Post Harvest Losses in Ragi in India A Report* Directorate of Marketing and Inspection, Ministry of Agriculture, Nagpur culled from www.indiaagronet.com.

Joshi, G. 2011. An Analysis of Marketed Surplus and Price Spread of Brinjal in Western Uttar Pradesh. *Asian Journal of Management Research*. **2** (1): 484.

Nadkarni, M. V. 1980. Marketable Surplus and Market Dependence- A Millet Region of Maharashtra. *Economic and Political Weekly.* **15** (13):15-24.

Newman, M. D. 1977. *Determinants of Marketed Surplus in Rural Households: Toward an Applied Research Agenda from an African Policy Perspective–A Plan Paper*. (Unpublished) Michigan State University.

Prasad, J. 1989. *Marketable Surplus and Market Performance*. Mittal Publications, Pp 44-107, New Delhi.

Sharma, P. 1968 Subsistence Crops: Consumption and Marketable Surplu*s. Economic and Political Weekly.* **3** (49):1879-1881.

Sharma, R. K. 2000. Production and Marketed Surplus of Major Rabi Vegetables on Commercial Farms of Lower Brahmaputra Valley of Assam. *Journal of Agricultural Marketing* **43** (2):16-19.

Singh, D. V. 1990. *Production and Marketing of off Season Vegetables.* Mittal Publications, pp 134, New Delhi.

Upender, M. 1990. Marketable *and Marked Surplus in Agriculture-A Stidy at Farm Land*. Mittal Publications, Pp 9-23, New Delhi.

GROWTH AND PERFORMANCE OF SERVICES SECTOR OF INDIA

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ABSTRACT

The present paper provides a brief overview of performance, prospects and problems encountered by the services sector in India's economy. The service sector has emerged as the largest and fastest-growing sector in the Indian economy in the last two decades, providing nearly 60 per cent of output and, larger share of employment. Its growth has in fact been higher than the growth in agriculture and manufacturing sector. Along with this, worldwide there has been a marked shift of FDI away from manufacturing sector towards services sector. A number of sector specific measures have been taken up by the government of India to promote IT and ITES and other sectors like telecom, organized retail, hospitality, entertainment and financial services sectors. The typical pattern of growth seen in recent decades is that there is a significant transfer of economic activity from agriculture to industry in the early phases of rapid growth. The services sector is largely responsible for the Indian growth miracle.

INTRODUCTION

The services sector has become important for many economies in the world and India is not an exception. While for the medium and long term, it is important to accelerate the growth of industrial sector particularly manufacturing sector to catch up with the growth of services sector and maintain a decent and stable growth of agricultural sector, which is still subject to the vagaries of nature, in the short and even medium term, the sure bet for higher growth of the Indian economy lies in further accelerating the growth of the services sector. Indian economy stands today as one of the most influential and attractive economy. The liberalization moves taken by the Indian Government in 1990s has given a boost to the Indian economy and put her on the fast track of economic growth. With the beginning of the new millennium, India was considered as an emerging super power. In 2009, Indian GDP based on purchasing power parity stood at US $ 3.5 trillion making it the fourth largest

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economy. The agricultural sector which was the back bone of Indian economy post-independence took a back seat in 21st century and contributed only 17.5 percent to the GDP. India's growth rate has been an average of 7 percent since 1997 and has maintained a growth rate above five percent even in times of global recession.

The Information Technology and IT outsourcing services has been the biggest contributor to India's economic growth. India's per capital income is not too attractive and stands at US $ 4542. India currently accounts for 1.5 percent of the total Indian trade as per WTO. Services experience an accelerated growth only after a certain level of development in agriculture and then in industry. In this regard, the Indian experience is somewhat different. Even today India cannot be considered as an industrially developed economy as the contribution of services sector is more than industrial sector.

Services Sector Contribution to the Indian Economy

By services sector we mean the tertiary sector, which is the largest of the three constituent sectors in terms of contribution to Gross Domestic Product (GDP) in India. The service sector comprises trade, hotels and restaurants, transport, storage, communication, financing, insurance, real estate and business services, community services (public administration and defence) and other services. This sector provides services of final consumption nature as well as intermediate nature, the latter accounting for a major share. The substantial parts of services such as transport and communications are in the form of intermediate inputs for production of other goods and services.

The emergence of India as one of the fastest growing economies in the world in the 1990s can be attributed, to the rapid growth of its service sector. The growth of output in the service sector in the 1990s has been much higher than the growth of output in agriculture or industry. However, this growth in the service sector has not been uniform. In order to arrive at some policy direction it is necessary to examine the performance of services sector and analyze the economy's potentials and constraints in these services. Most of the developing countries witness a lower growth rate in the service sector as compared to the manufacturing sector. Higher growth rate in the service sector is, therefore, a unique feature witnessed by India. The Services Sector contributes the most to the Indian GDP. The Services sector in India has the biggest share in the country's GDP as it accounted for around 55 percent in 2010. The contribution of the Services Sector in India GDP has increased a lot in the last few years. The Services Sector contributed only 15 percent to the Indian GDP in 1950. This shows that the Services Sector in India accounts for over half of the country's GDP. The contribution of the Services Sector has increased rapidly in the India's GDP as many foreign consumers have shown interest in the country's service exports. This is due to the fact that India has a large pool of highly skilled, low cost,

and educated workers in the country. This has made sure that the services that are available in the country are of the best quality.

Table 1: Share of different services categories in GDP at factor cost (current prices)

(Percent)

Sr. No.	Services sector components	2006-07	2007-08	2008-09	2009-10 (PE)	2010-11 (QE)	2011-12 (AE)
1	**Trade hotels and restaurants**	**17.1**	**17.1**	**16.9**	**16.6**	**16.9**	**25.2**
1.1	Trade	15.4	15.4	15.3	15.1	15.4	
1.2	Hotels and restaurants	1.7	1.7	1.5	1.4	1.5	
2	**Transport storage and communication**	**8.2**	**8.0**	**7.8**	**7.8**	**7.7**	
2.1	Railways	0.9	1.0	0.9	1.0	0.8	
2.2	Transport by other means	5.7	5.6	5.5	5.3	5.4	
2.3	Storage	0.1	0.1	0.1	0.1	0.1	
2.4	Communication	1.5	1.4	1.4	1.5	1.4	
3	**Financing, insurance, real estate & business services**	**14.8**	**15.1**	**15.9**	**15.8**	**16.4**	**16.9**
3.1	Banking and insurance	5.5	5.5	5.6	5.4	5.8	
3.2	Real estate, ownership of dwellings & business services	9.3	9.6	10.3	10.4	10.6	
4	**Community social and personal services**	**12.8**	**12.5**	**13.3**	**14.5**	**14.3**	**14.2**
4.1	Public administration and defense	5.2	5.1	5.8	6.7	6.3	
4.2	Other services	7.6	7.4	7.5	7.9	7.9	
4.3	Construction	8.2	8.5	8.5	8.2	8.2	8.1
5.	**Total services (excluding construction)**	**52.9**	**52.7**	**53.9**	**54.7**	**55.1**	**56.3**
6.	**Total services (including construction)**	**61.0**	**61.2**	**62.4**	**63.0**	**63.3**	**64.4**

Source: Central Statistical Office (CSO) Data 2012
PE: Provisional estimates, QE: Quick estimates and

The foreign companies have started outsourcing their work to India especially in the area of business services which includes business process outsourcing and information technology services. This has given a major boost to the Services Sector in India, and further helped in increasing its overall contribution in total GDP. The broad categorization of services sector has been presented in Table 1. The share of services in India's GDP at factor cost (at current prices) increased from 33.5 per cent in 1950-1 to 55.1 per cent in 2010-11. If construction is also included, the service sector's share increases to 63.3 per cent in 2010-11. With a 16.9 per cent share, trade, hotels, and restaurants as a group is the largest contributor to GDP among the various services'

sub sectors, followed by financing, insurance, real estate, and business services with a 16.4 per cent share. The community, social, and personal services with a share of 14.3 per cent is in third place. Thus, it seems that the services sector growth was much above overall GDP growth of the economy.

Performance of Services Sector in India

The emergence of India as one of the fastest growing economies in the world can be attributed to the rapid growth of its services sector, which has emerged as the largest contributor to the GDP with more than 50 per cent share. The contribution of services sector in India in different dimensions like sectoral contribution in GDP, flow of foreign Direct Investment (FDI) and employment generation can be discussed as under.

Sectoral Composition of GDP Growth

The analysis of the sectoral composition of GDP and employment for the period 1950-2000 brings out the fact that there has been tertiarization of the structure of production and employment in India. During the process of growth over the years 1950-51 to 1999-2000, the Indian economy has experienced a change in production structure in the form of shifting away from agriculture towards industry and tertiary sector. The service sector output increased at a rate of 6.63 percent per annum in the period 1980-81 to 1989-90 (pre-reform period) compared with 7.71 percent per annum in the period 1990-91 to 1999-2000 (post- reform period).The tertiary sector emerged as the major sector of the economy both in terms of growth rates as well as contributor to GDP in 1990s. The agriculture and manufacturing sectors have experienced phases of deceleration, stagnation and growth, the tertiary sector has shown a uniform growth trend during the period 1950-51 to 1999-2000 (Joshi, 2008). The perusal of Table 2 shows the Changes in Sectoral Distribution of Domestic Product in India. The share of agricultural sector in GDP has declined from 53.1 percent in the 1950's to 29.6 percent in 1990's.The share of industry and services increased from 16.6 percent to 27.7 percent and 30.3 percent to 42.7 percent respectively during the same period. according to advanced estimates of Economic Survey, 2011-12 the share of primary secondary and tertiary sectors will be approximately 13.9, 27.0 and 59.0 percent respectively in sectoral composition of GDP. During the 1950's it was the primary sector which was the dominant sector of the economy and the largest contributor in GDP.

Table 2: Changes in Sectoral Composition of GDP

Sectors	1950-51	1970-71	1990-91	2000-01	2011-12[AE]
Primary Sector	53.1	42.3	29.6	22.3	13.9
Secondary Sector	16.6	24.0	27.7	27.3	27.1
Tertiary Sector	30.3	33.8	42.7	50.4	59.0

Source: Calculated from CSO data.
AE: Advanced Estimates.

Employment Scenario

Although the primary sector (agriculture mainly) is the dominant employer followed by the services sector, the share of services has been increasing over the years while that of primary sector has been decreasing. The perusal of Table 3 shows employment share by different major sectors in India.

Table 3: Employment Share of Major Sectors

Sector	Sectoral Share in Employment		
	1999-2000	**2004-05**	**2009-10**
Primary Sector	60.32	56.30	51.30
Secondary Sector	16.24	18.78	22.02
Tertiary Sector	23.43	24.92	26.67
Total	100	100	100

Source: Calculated from CSO data.

The total employment in primary sector in 1999-2000 was 60.32percent followed by second highest employment providing sector as such tertiary sector with percentage share 23.43 and 16.24 percent by secondary sector. In 2004-05 share of employment by primary sector has declined to 56.30, while there has been marginal increase in the employment by tertiary sector i.e. 24.92 percent and share of secondary sector was 18.78 percent. Further share of employment in agriculture in 2009-10 has further declined to 51.30 percent, while other two sectors have witnessed increase in share of employment with the contribution of 22.02 percent by secondary sector and 26.67percent by tertiary sector. So it's clear that percentage of employed people in primary sector is continuously decreasing while that of tertiary sector and secondary sector is increasing. Now tertiary sector is the major sector which is contributing highest in GDP (Total services excluding construction) 56.3 percent and is the second largest employment providing sector in India (Table 1).

FDI and Indian Service Sector

FDI plays a major role in the dynamic growth of the services sector but there are issues involved in the classification of various activities under the services sector which creates difficulty in the measurement of FDI inflows into this sector. The combined FDI share of financial and non-financial services, computer hardware and software, telecommunications, and housing and real estate can be taken as a rough estimate of FDI share of services, though it could include some non-service elements as well. In 2000, share of FDI in services to total FDI inflows in India was just 1.8% and afterwards it grew steadily to reach a record all-time high of 34.7% during 2006 but declined afterwards. Of the cumulative FDI in services during 2000-2010, financial services accounted for bulk of the inflows with the inclusion of the construction sector (6.5 per cent), the share of services in FDI inflows increases to 48.4 per cent.

Table 4:   Services attracting highest foreign direct investment

(₹ **Crore**)

Rank	Sectors	2009-10	2010-11	2011-12	Cumulative inflows (2000-2011)	Percentage in total (US $ terms)
1	Services Sector (Financial And Non-Financial)	19945 (4176)	15053 (3296)	21431 (4575)	142539 (31710)	20.1
2	Telecommunication (Radio Paging, Cellular Mobile, Basic Telephone Services)	12270 (2539)	7542 (1665)	8969 (1989)	57035 (12544)	7.9
3	Computer Software And Hardware	4127 (872)	3551 (780)	2626 (564)	48940 (10973)	6.9
4	Housing And Real Estates	14027 (2935)	5600 (1227)	2544 (551)	48819 (10933)	6.9
5	Construction Activities (Including Roads and Highways)	4979 (2852)	7635 (1103)	7635 (1602)	46216 (10239)	6.5

Source: Department of Industrial Policy & Promotion data
Note: Figures in parentheses are US$ million.

The perusal of Table 4 shows services attracting highest FDI since 2009-10. In 2009-10 services sector contributed ₹ 19945 crores which has increased up to ₹ 21431 crores in 2011-12. Similarly there has been increase in the share of construction activities as FDI in this sector in 2009-10 was ₹ 4979 crores while this has increased to ₹ 7635 crores in 2011-12.Other notable feature regarding FDI trends shows decline in share of telecommunication sector, hardware and software and housing and real estate sector, in which share of FDI has declined in 2011-12 as compared to 2009-10. Services sector which includes financial and non financial sector as well has attracted maximum FDI and its percentage was highest in total FDI share that is 20.1 followed by 7.9 by telecommunication and 6.9 percent by computer software and hardware, housing and real estate and 6.5 percent by construction activities.

IT and ITES Sector

One of the major drivers of service sector growth in the post globalization era in India is the IT and ITES sector. According to the NASCOM, the IT and BPO industries can become major growth engines for India. India's IT and BPO industries could account for 10-12 percent of India's GDP by 2015 (NASSCOM, 2005). Overall growth performance by IT and ITES sector is shown with the help of Table 5.

The total revenue by IT and BPO services in 2007-08 was 52.1 US$ billions which has increased to US$87.6 billion in 2011-12. Exports sector contributed 40.4 US$ billions in 2007-08 which has increased up to US$68.7 billion in 2011-12, domestic growth has also increased from US$11.7 billion to 19 US$ billions. So

growth rate during 2011-12 by IT and BPO, exports and Domestic sector was 14.8, 16.4 and 9.7 percent respectively. India's offshore IT and BPO industries hold the potential to create over 9 million jobs by 2010, 2.3 million direct jobs and 6.5 million induced jobs. there is a huge potential for growth in the services sector because of increase in disposable income, increasing urbanization, growing middle class, a population "bulge" in the working age groups providing 'demographic window of opportunity,' and emergence of a wide array of unconventional /new services like IT, ITES, new financial services like ATMs, credit cards and tourism services, etc.

Table: 5   Overall Growth Performance of IT And ITES Sector

			(US$ billions)
Year	Total IT BPO Services Revenue	Exports	Domestic
2007-08	52.1	40.4	11.7
2008-09	59.9	47.1	12.8
2009-10	64.0	49.7	14.3
2010-11	76.3	59.0	17.3
2011-12	87.6	68.7	19
Growth Rate 2011-12	14.8	16.4	9.7
CAGR (percent) 11th Five Year Plan	13.9	14.2	12.8

Source: IT Industry Fact Sheet by NASSCOM.

The results presented in Table 5 show that the overall growth trends in the services sector. It was found that the total IT BPO Services Revenue was US $52.1 billion in year 2007-08 which has increased up to US$ 87.6 billion in 2011-12. The compound annual growth rate during 11th Five Year Plan has been estimated to be 13.9 percent per annum. Same was the case regarding exports as it was US$ 40.4 billion during 2007-08 which has increased to US $ 68.7 billion in 2011-12 with the CARG 14.2 percent.

Policy Measures for the Development of the Services Sector

Several measures have been undertaken by the government to develop services sector, especially through deregulation of some sub-sectors of services sector. Foreign direct investment (FDI) varying in between 26 per cent and 100 percent in information technology (IT) sector in business process outsourcing, e-commerce activities, infrastructure, etc. have been permitted. There are several other promotional measures taken by the government to sustain the growth of the services sector. For example, having realized that in knowledge- intensive world driven by IT, integration with global economy cannot take place without making quality telecom services accessible at affordable prices, a large number of steps like launching of National Telecom Policy 1994, New Telecom Policy 1999, Broad Band Policy 2004 etc. were undertaken. In addition to this, a number of promotional measures have

been taken up in IT and Information Technology Enabled Services (ITES) segment, trade, tourism, banking and insurance and real estate sectors. India has emerged as a top destination for off shoring as per Global Services Location Index 2007. There is a lot of scope for future expansion as only 10 percent of the potentially addressable global IT/ ITES market has been realized. The remaining 90 percent (worth $300 billion) remains to be tapped as per An Approach to the 11th Five Year Plan.

Problems/Challenges Ahead

Though the growth of service sector in India is in line with the global trends, there are two unique characteristics of India's service sector growth. First, the entire decline in the share of agriculture sector in GDP has declined from 32 percent in 1990 to 22 percent in 2003, has been picked up by the service sector while manufacturing sector's share has remained more or less the same. In general, such a trend is mainly experienced by high-income countries and not by developing countries. And second, in spite of the rising share of services in GDP and trade, there has not been a corresponding rise in the share of services in total employment. This jobless growth of India's service sector, with no corresponding growth in the share of manufacturing sector, has raised doubts about its sustainability in the long run (World Investment Report 2004).

Further, it is found that growth pattern in the service sector has not been uniform across all services in India. Some services have grown fast in terms of their share in GDP and also in terms of their share in trade and FDI. But there are some services, which have grown fast but have not been able to improve their share in international transactions while there are some services that have in fact witnessed a negative growth and also a low share in international transactions. One of the probable reasons for this lopsided growth in services is the fact that reforms in India at the sect oral level have evolved in an ad-hoc way rather than as part of a coherent overall strategy. Though there exists an overall industrial policy and agricultural policy in India, there is no integrated service policy.

Consequently, the pace of reforms and their impact lacks uniformity across sectors. Moreover, most of the services have for a long time been in the public domain and they suffer from both external constraints in terms of high barriers to trade, as well as domestic constraints in terms of being highly regulated services with state monopolies. These services consequently suffer from inefficiencies and low growth. The sustainability of impressive growth of Indian economy has been questioned in the wake of some challenges in the form of lack of social infrastructure, physical infrastructure; IT infrastructure, agricultural and industrial sector reforms, rupee appreciation and U.S. sub-prime crisis, etc.

Besides, challenges in the field of IT and ITES like rising labour costs, rapid growth in demand for talented manpower/quality staff, high attrition rate, outsourcing backlash etc. are some other limiting factors. The growth of IT and ITES is having

social, economic, health, ethical and environmental implications also .Further, delay in the promotion of good environment and governance will enable the economy to catch up with the global giants in terms of world –wide presence and scale. It is also important to point out here that the measurement of output, productivity, non-availability of data or availability of data after a time lag are other problems confronted with in case of services. The problem gets further compounded because of the entry of new species of services like IT, ITES etc. and lack of development of concepts on the one hand and non-inclusion of unpaid households on the other. Further, quality of each unit of the same service varies from the other. Therefore, it is too difficult to achieve the same level of output in terms of quality.

CONCLUSIONS

The above discussion showed that the service sector has emerged as the largest and fastest-growing sector in the Indian economy in the last two decades, providing more than 60 per cent of output and, an even larger share of employment. Its growth has in fact been higher than the growth in agriculture and manufacturing sector. The growth in services has also been accompanied by the rising share of services in world transactions. Along with this, worldwide there has been a marked shift of FDI away from manufacturing sector towards services sector the present paper provides a brief overview of performance, prospects and problems encountered by the services sector in India's economy. It is heartening to note that India is called the 'services hub' of the world. Telecom and ITES-BPO revolution have already hit the shores of India. A number of sector specific measures have been taken up by the government of India to promote IT and ITES and other sectors like telecom, organized retail, hospitality, entertainment and financial services sectors. We found that the higher growth in services sector has added a dimension of stability to India's growth process. Unlike other commodity-producing sectors, which have either seen a stagnant growth or decline in employment, we found that the services sector has generated some employment opportunities. No doubt there has been increase in the GDP contribution but increase in employment has not increased in comparison with that. There are other problems as well as discussed earlier like lack of performance by few sectors, trained and skilled manpower and other hurdles. Various measures has been taken by govt. of India to improve the performance of services sector like deregulation of some sub –sectors, FDI promotion, like launching of National Telecom Policy 1994, New Telecom Policy 1999, Broad Band Policy 2004 etc. but still there is a need to look upon the problems and prospects and policy formulations to accelerate the growth performance of services sector in India.

REFERENCES

Anonymous. 2002. *India Development Report.* Government of India, New Delhi.

Anonymous. 2006-07. *Economic Survey.* Government of India, New Delhi.

Anonymous 2010-11. Economic Survey-2010-11. Government of India, New Delhi.

Anonymous 2011-12. Economic Survey-2010-11. Government of India, New Delhi..

Anonymous. 2012. *India Budget 2012*. Government of India, New Delhi.

Bhagwati, J. 1993. *India in Transition: Freeing the Economy.* Clarendon Press, Oxford.

Bhowmik, R. 2003. *Service Intensity in Indian Economy ,1968-69 –1993-94, Economic System Research,* Journal of the International Input-Output Association, Vol.15, No.4, pp.427-437.

Dasgupta, S., Singh, A. 2005. *Will Services be the New Engine of Economic Growth in India?"*Centre for Business Research, University of Cambridge Working Paper No. 310

Datta, M. 2001. *The Significance and Growth of the Tertiary Sector*, Delhi: Northern Book Centre.

Goldar, B. and Mitra, A. 2008. *Productivity Increase and Changing Sectoral Composition: Contribution to Economic Growth in India.* In Proc. V.K.R.V. Rao Centenary Conference on National Income and Other Macro-Economic Aggregates in a Growing Economy being organized by the Delhi School of Economics and the Institute of economic growth, Delhi

Jalan, B. 1992. *Balance of Payments: 1956 to 1991 in the Indian Economy: Problems and Prospects.* IPenguin Books India (P) Ltd., New Delhi.

Joshi, Seema. 2008. *Growth And Structure Of Tertiary Sector In Developing Economies"* Academic Foundation.

Pulin, B.N., Bishwanath, G. and Agrawal, P. 2010. *India's Economy and Growth-Essays in Honour of V.K.R.V.Rao.* Sage Publication India Ltd, New Delhi.

INDIAN AGRICULTURAL COMMODITY FUTURES MARKETS: AN OVERVIEW

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ABSTRACT

Futures market provides a convenient mechanism through which a farmer, who is uncertain about the price of his produce, can cover his risk by selling a futures contract before the harvest day. To improve the performance of futures market in India awareness at various levels i.e. Government, media, influential thinkers, corporate, farmers, traders etc. is to be created on war footing. Clearly, people need to understand that futures trading are not responsible for higher prices. The absence of link between spot and futures market is creating inefficiencies. There is a strong need to develop the spot market and related at with the futures market. There is need to build infrastructure and improve delivery system. More deliveries have to take place to make the market more efficient, get in more value chain participants and make the market more credible. To reach at grassroots level, there is an urgent need to spread members in important production centers. Education and training programmes for the various participants is must, particularly the farmers. In order to maximize the benefits to the farmers, awareness about negotiability of warehouse receipt (WR) should be created among the farming community. Warehouse Accreditation Agency should be promoted on a priority basis so that the confidence of bankers could be earned and farmers reap the benefits of good prices.

INTRODUCTION

India being an agrarian economy, instability in commodity prices has always remained a major concern for the producers as well as the consumers. Market based risk management tools for commodities have assumed special significance in the liberalization era (Sahadevan, 2002). Future markets serve as a risk shifting function used to lock in prices instead of relying on uncertain price developments (Rajpuria, 2002). An efficient futures market provides a mechanism for managing risk associated with the uncertainty of future events. Commodity futures market is an important constituent of the financial markets of any country. It is the market where a

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wide range of products, namely precious metals, crude oil, energy and soft commodities like palm oil, coffee, etc. are traded. Commodity futures market plays an important role in price discovery, the information which helps the producer to plan their activities on production, processing, storage, and marketing of commodities (Elumalai *et al*., 2009). Price discovery is more efficient in futures market than spot market (Brockman and Tse, 1995 and Yang and Leatham, 1999). Future trading infuse efficiency in functioning of commodity market (Tomek, 1980 and Karnade, 2006). Over the time, in the face of greater price exposure and thereby the urgent need for price risk management, importance of commodity futures trading and other tools for the transfer of risk is increasingly being realized (Kotak, 2002).It is important to develop a vibrant, active, and liquid commodity market. This would help investor to hedge their commodity risk, take speculative position and exploit arbitrage opportunities in the market. The gradual evolution of Commodity Futures Markets in India has been of great significance for our country's economic prosperity. UNCTAD and World Bank Joint Mission Report (1996) highlighted the role of futures markets as market based instruments for managing risks. Yet, it is well known that even in developed countries, not all the commodities are traded on futures markets. Indeed, only a minority of contracts floated by commodity exchanges succeeds in attracting trading volumes to be liquid (Brorsen and Fofana, 2001 and Thompson *et al*., 1996). As Nair (2004) pointed out that, government laws and various taxes hinder the movement of commodities. Furthermore, the absence of certified warehouses has meant that exchanges have promoted cash settlement rather than physical delivery. Thomas (2003) in a similar critique draws attention to the prevalence of bilateral deals, the lack of price transparency and the absence of certified warehouses.

The commodity future trading requires the presence of a well-developed support infrastructure in the country in the form of modern weighing, grading, and standardization and storage facilities at the mandis chain of road/rail and electronically linked modern warehouses, affordable and reliable grading, standardization and quality certification facilities and e-linked rural knowledge centers (Elumalai *et al*., 2009). The support infrastructure helps in increasing the linkages between physical and futures markets, efficient price discovery and increased involvement of a larger number of commodity players including farmers (Jairath, 2009). The investment required to bring India's agri-marketing infrastructure at par with the developed countries would be huge and cannot borne by the government or private players alone. This calls for separate initiative drive for promotion of support infrastructure on massive scale.

In the recent years, growth in commodity derivatives exchanges in Asia has been remarkable. The Chinese commodities futures markets have been growing incredibly fast, India is also not far behind in this race, with improvement in

technological infrastructure leading to more transparency in the business environment, the commodity trading business in the country is gaining popularity among the investors, traders, business fraternity and farmers. Though, the government has facilitated the trading friendly legal and regulatory environment, still a lot to be done so that the country can become the home of the largest derivatives markets in Asia-Pacific region.

History of Commodity Futures Market in India

The history of futures trading in commodities in India dates back to the later part of 19th Century when the first commodity exchange, The Bombay Cotton Trade Association Limited was set up for organizing futures trading. The Bombay Cotton Trade Association Limited., set up in 1875, was the first organized futures market. Bombay Cotton Exchange Limited was established in 1893 following the widespread discontent amongst leading cotton mill owners and merchants over functioning of the Bombay Cotton Trade Association. The Futures trading in oilseeds started in 1900 with the establishment of the *Gujarati Vyapari Mandali*, which carried on futures trading in groundnut, castor seed and cotton. Futures' trading in wheat was existent at several places in Punjab and Uttar Pradesh. But the most notable futures exchange for wheat was chamber of commerce at Hapur set up in 1913. Futures trading in bullion began in Mumbai in 1920.The Calcutta Hessian Exchange Limited was established in 1919 for futures trading in raw jute and jute goods. But organized futures trading in raw jute began only in 1927 with the establishment of East Indian Jute Association Limited. These two associations amalgamated in 1945 to form the East India Jute and Hessian Limited to conduct organized trading in both raw and jute goods. However, many feared that derivatives fuelled unnecessary speculation and were detrimental to the healthy functioning of the market for the underlying commodities. As a result, after independence, commodity option trading and cash settlement of commodity future were banned in 1952. A further blow come in 1960's when following several years of several droughts has forced many farmers to default on forward contact and even caused some suicides, forward trading was banned in many commodities considered primary or essential. In late 1960s, the Government of India suspended forward trading in several commodities like jute, edible oil seeds, cotton, etc. due to fears of increase in commodity prices. However, the government offered to buy agricultural products at Minimum Support Price (MSP) to ensure that the farmers are benefited. The Government also managed storage, transportation, and distribution of agriculture goods. These measures weakened the agricultural commodity markets in India. Through a notification issued on 27 June 1969, by exercising the powers conferred upon the Central Government by the Securities Contracts Regulation Act, 1956 forward trade was prohibited in a large number of commodities, leaving only seven commodities open for forward trade. Consequently, the commodities derivatives market dismantled and remained dormant. This scenario continued for

about four decades although the Dantawala Committee (1966) and Khusro Committee (1980) had recommended steps to revive futures trading in more agriculture commodities. In 1994, the Kabra Committee was set up which open futures trading in 17 commodities excluding wheat, pulses, non- basmati rice, tea, coffee, sugar, vanaspati oil, etc. The year 2003 is a watershed in the history of commodity futures market. The last group of 54 prohibited commodities was opened up for forward trading, along with establishment and recognition of three new national exchanges with on-line trading and professional management. Not only was prohibition on forward trading completely withdrawn, including in sensitive commodities such as wheat, rice, sugar and pulses which earlier committees had reservations about, the new exchanges brought capital, technology and innovation to the market. For a commodity to be suitable for futures trading, it must possess the following characteristics:

1. The commodity should have a suitable demand and supply conditions i.e. volume and marketable surplus should be large.
2. Prices should be volatile to necessitate hedging through futures trading.
3. The commodity should be free from substantial control from government regulations (or other bodies) imposing restrictions on supply, distribution and prices of commodity.
4. The commodity should be homogeneous or, alternately it must be possible to specify a standard grade and to measure deviations from that grade. This condition is necessary for the future exchange to deal in standardized contract
5. The commodity should be storable. In the absence of this condition, arbitrage would not be possible and there would be no relationship between spot and futures markets.

Structure of Commodity Futures Market in India

After the Indian economy embarked upon the process of liberalization and globalization in 1990, the Government had set up a committee in 1993 to examine the role of futures trading. It recommended strengthening of the Forward Markets Commission and certain amendments to Forward Contracts (Regulation) Act, 1952 (Anonymous, 1952) particularly allowing options trading in goods and registration of brokers with Forward Markets Commission. To make up the loss of growth and development during the four decades of restrictive government policies, Forward Market Commission (FMC) and the Government encouraged setting up of commodity exchanges using the most modern system and practices in the world. Some of the main regulatory measures imposed by the FMC include daily mark to market system of margins, creation of trade guarantee fund, back office computerization for the existing single commodity exchanges, online trading for the new exchanges, demutualization for the new exchanges and one third representation of independent Directors of the Boards of existing exchanges, etc. Responding

positively to the favorable policy changes the government has been set up a number of nation-wide Multi-Commodity Exchanges (NMCE) since 2002, using modern practices such as electronic trading and clearing. Multi-commodity Exchange of India Limited (MCX) is an independent and de-mutualised multi-commodity exchange which has permanent recognition from Government of India for facilitating online trading, clearing and settlement operations for commodity futures markets across the country. National Commodity and Derivatives Exchange Limited (NCDEX) is also a nation level, technology driven de-mutualised online commodity exchange with an independent Board of Directors and professionals not having any vested interest in commodity markets. It is committed to provide a world class commodity exchange platform for market participant to trade in a wide spectrum of commodity derivatives driven by best global professionalism and transparency. The NCDEX is regulated by Forward Market Commission in respect of futures trading in commodities. To keep pace with the globalization, India needs to develop its financial sector along with physical trade through the introduction of derivative market (Ramakrishna and Jayasheela, 2009).

Current Status of Commodity Futures Market in India

Future contracts are available for major agricultural commodities, metals and energy. Currently, 113 commodities are notified for future trading of which 50 are actively traded in 5 national and 16 commodity specific exchanges. Agricultural commodities, bullion, energy and base metal products account for a large share of the commodities traded in the commodity futures market. Commodity-wise value of trading since 2004-05 presented in Table1 shows that agricultural commodities led the initial spurt and constituted the largest proportion of the trade till 2005-06(55 percent). However this place was taken over by bullion and metals in 2006-07 and agricultural commodities accounted for only 12 percent share in the total value of trade in 2011-12. During the same year, in value terms bullion and other metals accounted for the maximum share of traded value among the commodity groups (72 percent) followed by energy (16 percent).

The volume of trade in the commodities markets has increased exponentially since 2004-05 to reach 181.22 lakh crores in 2011-12. Almost 95 percent of this is now accounted for by the two national commodity derivative exchanges namely MCX (83 percent) and NCDEX (12 percent). There are more than 3000 members registered with the exchanges. More than 20,000 terminals spread over more than 800 towns/cities of the country provide access to the trading platforms. Gold silver and petroleum crude recorded the highest turnover in MCX, while in NCDEX, soya oil, guar seed and soya bean was dominant; in NMCE, pepper, rubber and raw jute were the most actively traded commodities. There has been a very significant decline in volume of futures trade in agriculture commodities during the year 2007-08 by 29 percent. The overwhelming bulk of this decline is accounted for by Chana, Maize,

Mentha Oil, Guar seed, Potato, Guar Gum, Chillies and Cardamom. Trade in these eight commodities, which accounted for 58 percent of total futures trade in agricultural commodities in 2006-07, declined by over 68 percent during 2007-08 as compared to previous year. Four commodities (wheat, rice, urad and tur) were de-listed for futures trading towards the end of financial 2006-07. This de-listing has been held responsible in many circles for the recent general downturn in futures trading in agricultural commodities. Further, in the early 2008-09 four more commodities were de-listed (Refined Soy Oil, Chana, Rubber and Potato). This de-listing has created a significant drop in the trading volumes of agri-commodities.

The composition of value and volume of agricultural commodities have been examined in the Table 2. The perusal of the Table 2 shows that there has been a very considerable increase (282 %) in the volume of futures trade in agricultural commodities during Period II. The trade in eight commodities, chana, wheat, maize, guarseed, guargum, potato, cardamom, and pepper which account for about 38 per cent of total futures trade in agricultural commodities in Period I, which increased to over 85 per cent during Period II. The percentage increase in these eight commodities exceeded the increase of futures trading volumes in all agricultural commodities taken together.

The perusal of the Table 3 shows the share of major agricultural commodities traded in futures market. During 2004-05 and 2005-06, agricultural commodities accounted for the largest volume of futures trade with 68.20 and 55.30 per cent, respectively.In recent years, bullion metals have become dominant commodities. Among agricultural commodities, share of guar seed was highest (33.2%) followed by soy oil, chana, pepper and mustard seed. In year 2007-08 share of soy oil was highest (25.7%) where as share of wheat, urad, tur, rice was nil because their futures trading was banned in 2007-08.

Turnover on Commodity Futures Trading at different Exchanges

Turnover on commodities traded at different exchanges is presented in Table 4. The results indicate that turnover of different commodities Exchanges has increased over time. But in the case of NCDEX, its turnover has declined in years 2007 and 2008. NCDEX mainly trade in agro products and by 2007-08 many agricultural commodities were banned from futures trading resulting in decline in its volume.

The commodities which were traded in the commodity futures market during 2007 include a variety of agricultural commodities, spices, metals, bullion and crude oil. The total value of trade in commodity futures market rose from ₹ 3484485 crores in 2006 to ₹ 3654487 crores in 2007, notwithstanding the suspension of trading of wheat, rice, urad and tur. The MCX continued to be the largest commodity futures exchange during 2007. In 2008 several new commodities were permitted for trading, such as aviation turbine fuel, carbon credit, carbon financial instrument, red areca nut, coriander seeds, garlic, steel long (ingots/billets) and thermal coal. The total

value of trading rose from ₹ 3654487 crores in 2007 to ₹ 5033884 crores during 2008 (Table 4).

Volume of Agricultural Commodities Traded at NCDEX

An examination of Table 5 shows the volume of essential commodities traded at NCDEX. The results revealed that the volume of maize traded at NCDEX almost remained the same. In 2009, there has been sharp decline in volume of maize due to ban in future trading in essential agriculture by government. The results presented in Table 5 indicate that in NCDEX wheat has been traded in year 2004 and 2005 only. Thereafter it has not been traded because the government banned its trading. Significant increase in trading volume of guar has been witnessed as its share to total agricultural commodity futures trading has increased. The perusal of Table 6 shows that trade volume of potato has increased from year 2006-2007. But in 2008 potato future trading was banned, this resulted in decline in its volume in 2008. The volume of urad traded at NCDEX has increased over time, but in 2007-08 futures trading in urad was banned, thereafter it has not been traded at NCDEX.

The descriptive statistics of spot and futures prices of agricultural commodities have been illustrated in Table 6. The results show that futures in potato were relatively more unstable than their spot prices but in wheat, chana, urad and soya oil spot prices were more unstable than futures. The variation in the spot and futures prices as measured by coefficient of variation was found to be higher in the case of urad, chana and wheat. The recent decision of the government for discontinuance of futures trading in pulses and wheat could be largely attributed to the highest degree of instability in the prices of these commodities.

Participation of Farmers in Futures Markets

Large farmers can directly participate in futures, whereas other can participate by pooling of produce and participation by an external agency and participation by farmers themselves after pooling of produce through aggregator

Benefits of commodity futures market to farmers

There exists huge opportunity for farmers to take benefit of futures trading. The Guru Committee (2001) emphasized the role of futures trading for price risk management and marketing of agricultural produce. Farmers can derive benefit from futures markets (i) by participating directly or indirectly in the market to hedge their price risks and (ii) to take benefit of prices discovered on the platform of commodity exchanges by taking rational and well informed cropping marketing decisions. Expected future prices of commodities known in advance enable the farmer to plan his crop and sales. Based on hedged positions farmers can get easy financing from the banks. Since commodity contract are standardized it become essential for producers to ensure the quality of product. The futures exchanges have developed their own warehouses; cold stores, etc. thereby stimulate infrastructure development.

But farmers complained about poor accessibility of commodity exchanges at grass root levels. Majority of the farmers feels that commodity exchanges are confined to either close to mega markets or markets serving urban consumers (Rajput *et al*., 2009). Direct participation of farmers is also very low as markets are complex and there was an inadequate infrastructure. More than 81 percent of farmers are small and marginal. Market surplus is small with varying quality. Thus with varying qualities they cannot enter the futures market which imposes stringent quality norms. A vast majority of the farmers do not have proper storage capacity to store produce in expectation of high price in futures. The commodity futures markets also suffer from problems of lack of price transparency. There is no common interface or communications infrastructure using which prices from one market become accessible at another.

Suggestions to Improve Futures Markets

To improve the performance of futures market in India, there is a need to create awareness at levels such as government, media, corporate, farmers, traders etc. on war footing. The absence of link between spot and futures market is creating inefficiencies. There is a strong need to develop the spot market and related at with the futures market. There is need to build infrastructure and improve delivery system. More deliveries have to take place to make the market more efficient, get in more value chain participants and make the market more credible. To reach at grassroots level, there is an urgent need to spread members in important production centers. Education and training programmes for the various participants is must, particularly the farmers. In order to maximize the benefits to the farmers, awareness about negotiability of warehouse receipt (WR) should be created among the farming community. Warehouse Accreditation Agency should be promoted on a priority basis so that the confidence of bankers could be earned and farmers reap the benefits of good prices.

REFERENCES

Anonymous. 2001. Guru Committee on the Expert Committee on Strengthening and Developing Agricultural Marketing, India

Anonymous. 2004-2009. *Economic Survey* 2004-2009, Government of India, New Delhi.

Anonymous. 2008. Report of the Expert committee to Study the impact of futures trading on agricultural commodity prices, Ministry of Consumer Affairs, Food and Public Distribution, Government of India, New Delhi.

Elumalai K, Rangasamy, N. and Sharma, R.K. 2009. Price discovery in India's Agricultural Commodity Futures Markets. *Indian Journal of Agricultural Economics* **64** (3): 315-323.

Jian, Y. and David J. L. 1999. Price Discovery in Wheat futures markets" Indian *Journal of Agricultural and Applied Economics*. **31** (2): 359-370

Jairath, M.S. 2009. Constraints, opportunities and options to improve Indian agricultural commodity futures market. *Indian Journal of Agricultural Economics* 64 (3): 357-

371

Kalyan, R. 2002. Future Trading: locking in profitable prices. *Economic and Political Weekly.* **37** (20):1883- 1885.

Karnade, K. 2006. *A study of castor seed futures market in India.* Ph.D. Thesis (Unpublished) Indira Gandhi Institute of Development Research, Mumbai.

Kotak, S. 2002. Theme presentation in International Conference on commodities futures and derivatives trading: India's opportunities in the emerging global context held at Mumbai on October 30-31.

Nair, C.K.G. 2001. Commodity futures markets in India: Ready for takeoff? NSE News, July.

Paul, B. and Tse Y. 1995. Information shares in Canadian agricultural cash and future markets. *Applied Economic Letters.* **2**: 335-338

Rajput, M.M. Chaudhary, R. and Ashthana A. 2009. Globalization of Indian commodity futures market: Some perceptions from International acquaintance. *Indian Journal of Agricultural Economics.* **64** (3): 395-396.

Ramakrishana, R. and Jayasheela. 2009. Impact of futures Trading on spot market and price discovery of futures market . *Indian Journal of Agricultural Economics.* **64** (3): 372-384.

Rao, D.T. 2009. Commodity Futures Market in India: Its impact on production and prices. *Indian Journal of Agricultural Economics.* **64** (3): 333-356

Sahadevan, K.G. 2002. *Price discovery, return and market conditions: Evidence from commodity futures markets.* Indian Institute of Management, Prabandh Nagar, Off Sitapur Road, Lucknow, Uttar Pradesh

Singh, A., Shailja, S. and Madan, M. 2009. Critical assessment of problems and constraints on Indian Agriculture Commodity Futures . *Indian Journal of Agricultural Economics.* **64** (3): 393.

Thomas, S. 2003. Agricultural Commodities Market in India: Policy issue for growth (Mimeo.) Indira Gandhi Institute of Development Research, Mumbai.

Thomson, S., Gracia, P. and Wildman, L.D. 1996. The demise of the high fructose corn syrup futures contract: A case study. *The Journal of Furures Markets.* **16** (6): 697-724.

Tomek, W.G. 1980. Price behaviour on a declining terminal market. *American Journal of Agricultural Economics* **62**: 434-445.

UNCTAD and World Bank Joint Mission Report. 1996. India: Managing price risk in India's liberalized agriculture: Can futures market help?

Wade, B.B. and Fofana, N'zue F. 2001. Success and failure of agricultural future contracts. *Journal of Agri-business.* **19** (20): 129-145

Table 1: Commodity Group-wise Value of Trade

(₹ Lakh crores)

Commodity Groups	2004-05	2005-06	2006-07	2007-08	2009-10	2010-11	2011-12
Agricultural commodities	3.90 (68.2)	11.92 (55.3)	13.17 (35.81)	9.41 (23)	12.18 (16)	14.56 (12)	21.96 (12)
Bullions and other metals	1.80 (31.5)	7.79 (36.2)	21.29 (57.88)	26.24 (65)	49.65 (64)	81.81 (69)	130.78 (72)
Energy	0.02 (0.3)	1.82 (8.4)	2.31 (6.28)	5.00 (12)	15.78 (20)	23.10 (19)	28.51 (16)
Others	0.00 (-)	0.02 (0.1)	0.01 (0.03)	0.00 (-)	0.00 (-)	0.00 (-)	0.00 (-)
Total	**5.72 (100.00)**	**21.55 (100.00)**	**36.78 (100.00)**	**40.65 (100)**	**77.64 (100)**	**119.48 (100)**	**181.22 (100)**

Figures in parentheses shows percentage of total
Data Source: Various reports of Forward Market Commission

Table 2: Commodity group-wise volume and value of agricultural commodities futures trading in India

Name of commodity	Volume (lakh MT)			Value (₹ Crores)		
	Period-I	Period-II	Percentage change	Period-I	Period-II	Percentage change
Chana/Gram	36.21 (3.96)	554.46 (15.88)	1431.24	5595.38 (2.89)	140694.13 (14.63)	2414.47
Urd	21.74 (2.38)	54.88 (1.57)	152.41	3425.83 (1.77)	17848.71 (1.86)	421.00
Tur	0.12 (0.01)	17.97 (0.541)	14467.91	20.16 (0.01)	3565.76 (0.37)	17587.29
Wheat	12.48 (1.36)	78.41 (2.25)	528.27	959.77 (0.50)	7398.19 (0.77)	670.83)
Rice	1.60 (0.17)	0.79 (0.02)	-50.83	210.86 (0.11)	152.01 (0.02)	-27.91
Maize	0.68 (0.07)	36.00 (1.03)	5219.92	36.56 (0.02)	2812.39 (0.29)	7591.84
Soy oil	151.86 (16.60)	327.35 (9.38)	115.56	62359.12 (32.23)	160786.91 (16.72)	157.84
Mentha oil	-	3.96 (0.11)	0.00	0.00 (0.00)	23379.79 (2.43)	0.00
Guar seed	267.05 (29.19)	955.34 (27.37)	257.74	43249.40 (22.385)	184188.57 (19.15)	325.88
Guar gum	9.61 (1.05)	14.82 (0.42)	54.19	4470.72 (2.31)	7119.71 (0.74)	59.25
Potato	-	122.75 (3.52)	-	-	7235.17 (0.75)	-
Chillies	-	33.84 (0.97)	-	-	17693.72 (1.84)	-
Cumin seed	-	0.89 (0.03)	2451.56	-	57797.67 (6.01)	0.00
Cardamom	0.04 (0.00)	0.89 (0.03)	2451.56	148.24 (0.08)	4454.63 (0.46)	2904.95
Pepper	4.86 (0.53)	56.59 (1.62)	1064.41	3635.11 (1.88)	74930.76 (7.79)	1961.31
Rubber	2.21 (0.24)	5.07 (0.15)	129.95	1261.31 (0.65)	4758.47 (0.49)	277.26
Other agric. commodities	405.10 (44.28)	1174.87 (33.66)	190.02	67107.28 (34.68)	247087.29 (25.69)	268.20
Total	**914.83 (100.00)**	**3490.76 (100.00)**	**281.57**	**193481.64 (100.00)**	**961903.89 (100.00)**	**397.16**

Source: Jairath, 2009
Figures in parentheses indicate percentage to total value.
Period- I: 2002-03 to2004-05
Period- II: 2006-07 to 2008-09

Table 3: Agricultural Commodities wise share in total value of Agricultural Futures Trading

Commodity	2004-05	2005-06	2006-07	2007-08
Soy Oil	26.0	9.2	13.4	25.7
Guar Seed	33.2	27.7	24.7	13.1
Pepper	2.1	0.7	6.9	11.2
Chana/Gram	4.3	19.7	23.3	9.9
Mustard Seed	5.0	1.4	1.7	9.4
Jeera Seed	0.8	1.0	5.1	7.7
Soy Seed	2.5	1.2	2.0	6.5
Turmeric	0.3	0.3	1.1	3.0
Sugar	2.0	2.2	1.0	2.6
Castor Seed	3.7	1.0	1.1	2.1
Chillies	0.0	0.6	2.9	1.3
Mentha Oil	0.0	3.5	4.0	1.1
Kapas	8.5	2.6	0.6	1.0
Gur	2.0	1.4	0.8	0.7
Potato	0.0	0.0	1.1	0.6
Rubber	0.7	0.4	0.6	0.5
Guar Gum	3.4	3.1	1.0	0.5
Cardamom	0.1	0.0	0.6	0.4
Maize	0.0	0.1	0.4	0.2
Raw Jute	1.0	0.5	0.1	0.2
Wheat	0.7	1.3	1.7	0.0
Urad	2.6	16.5	4.1	0.0
Tur	0.0	3.5	0.8	0.0
Rice	0.1	0.1	0.0	0.0
Share of agricultural Commodities in total value of futures trade (%)	**68.2**	**55.3**	**35.8**	**23.2**

Source: Government of India (2008)

Table 4: Turnover on Commodity Futures trading at different Exchanges

(₹ Crores)

Exchanges	Financial year		Calendar year			
	2003-04	2004-05	2005	2006	2007	2008
MCX	2,456	1,65,147	6,33,324	20,25,663	27,30,415	42,84,653
NCDEX	1,490	2,66,338	8,83,209	12,43,327	7,74,965	6,28,074
NMCE	23,842	13,988	12,107	1,11,462	25,056	37,272
OTHERS	53,014	1,26,286	1,08,705	1,04,033	1,24,051	83,885
All exchanges	**1,29,364**	**5,71,759**	**16,37,345**	**34,84,485**	**36,54,487**	**50,33,884**

Source: Ministry of Consumer Affairs

Table 5: Volume of essential commodities traded at NCDEX

Volume (₹ in lakhs)

Years	Maize	Wheat	Guar	Potato	Urad
2004	-	165421	8052645	-	331101
2005	-	473701	32015433	-	11062921
2006	402970	-	28228674	32637	10214515
2007	241599	-	12066908	198526	-
2008	236723	-	11167117	49022	-
2009	49264	-	19912417	-	-

Source: www.NCDEX.com

Table 6: Variation in spot and futures prices

Commodity	Coefficient of variation (%)	
	Spot market	Futures market
Wheat	10.86	9.54
Chana	13.54	13.33
Urad	30.24	27.90
Soya oil	6.02	5.35
Potato	6.67	7.66

Source: Singh *et al*., 2009

A STUDY OF BRAND AWARENESS REGARDING CONSUMER DURABLES IN RURAL HARYANA

Anju Duhan, R.S.Pannu, Rajiv Goyal and Pankaj Jain[*]

ABSTRACT

Today's business environment is through-out competitive. Rural market is a world opportunity. There are so many products being launched every day in the market. So, it is difficult for a consumer or for marketers to differentiate the products. Brand name is the best way to solve this problem for both the consumer and the marketer. Brand gives an identity to a particular product. A good brand takes consumers from brand awareness to brand loyalty. It differentiates a product from the crowd. Brand name is the most important factor that effects the purchase decisions of almost all the consumers. The main purpose of the present investigation was to trace about the brand awareness among rural consumers. A survey was done to know the effects of brand name on rural consumer's purchase decision regarding the durables like television, refrigerator and washing machine. The survey has found that there were many issues faced by rural people when they decide about brand of a particular product to use. The results show that brand awareness is increasing day by day among rural population due to effect of information technology.

Key words: Brand awareness, brand loyalty and rural market
JEL Classification: M00, L68

INTRODUCTION

Before the liberalization of the Indian economy, only a few companies like Kelvinator, Godrej, Alwyn and Voltas were the major players in the consumer durables market, accounting for no less than 90 per cent of the market. After the liberalization, foreign players like LG, Sony, Samsung, Whirlpool etc, came into the picture. India is predominantly rural in spite of the extensive industrial development after our independence. Gone are the days when rural consumers went to a nearby city to buy, "branded products and services." There were days when big companies flocked to rural markets to establish their brand. Today, rural markets are critical for

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every marketer be it for a branded shampoo or an automobile. Seeing the vast potential of 75 per cent Indians living in rural areas, they started focusing on these unexplored, high potential areas (Monga, 2004). The rural marketing scenario is changing fast in all respects that is the market share of the products, the composition of durables and non-durables, brand loyalty, price are changing fast. The emerging scenario of rural marketing in India is highlighted in the surveys of NCAER, ORG, MARG and other organizations. As the consumers are getting informative, the business is becoming competitive day-by-day. The urban consumer durable market for television is growing annually by 7-10 per cent whereas the rural market is zooming ahead at around 25 per cent annually. Rural market has distinguished characteristics, accounts for 40 per cent of Indian economy. Rural India has huge, heterogeneous and growing consumer market, which contributes more than 50 per cent to India's total consumer market size (Cardozo, 1965). The refrigerator market has been growing at a rate of about 15 per cent per year, while the consumer durables industry as a whole has grown at almost 8 per cent. The size of the refrigerator market is estimated to be 3.5- 4 million units approximately, valued at Rs 50 billion. The domestic penetration rate of refrigerators is about 9 per cent. The penetration of refrigerators is considerably higher in urban areas, which account for 75 per cent of the demand, with rural areas constituting the other 25 per cent (NCAER, 2005). The urban consumer durable market for products including TV is growing annually by 7 to 10 per cent whereas rural market is zooming ahead at around 25 per cent annually. The number of TV in homes in India grew from 120 million in 2007 to 148 million in 2011. Washing machine is a relative new entrant to the white goods basket in India. Increasing consumer awareness and preference for new model have added to the demand. There has been a visible shift in the people's preference for brands. Rural consumers are not looking for cheap goods but they want value for money, and if a brand fits into this category they are ready to pay for it.

METHODOLGY

The present study was exploratory in nature mainly depend upon primary sources of information. It was not feasible to study the entire Hisar district. As such two villages each were randomly selected from the hinterlands (within 10 km) and beyond hinterlands (beyond 10 km) of the Hisar city. At next stage 25 respondents each who were having either one of the durable such as TV, Refrigerator, etc. were selected randomly from each sample village. The total sample comprised of 100 respondents. The data were obtained through a well-structured schedule and all the households were contacted personally for collection of data. The data were collected pertaining to various demographic characteristics, buying behaviour, inspiration

sources, brand awareness, etc. The data were analysed and compared by using simple descriptive statistics.

RESULTS AND DISCUSSION

The results obtained from the analysis of data are discussed under different sub-heads as under:

Demographic Characteristics

It was found that a significant number of consumers were found possessing either one of these durables. The perusal of Table 1 revealed that 47 percent of respondents were in the age group of 20-30 years. The next major respondent group (31 %) was in the age group of 31-40 years which was followed by age group of 41-50 and above 50 years of age with 15 and 7 percent of the respondents respectively. This data revealed that the young generation participated readily in the survey with higher cooperation as compared to their elder generation.

Table 1:   General characteristics of the sample respondents

Particulars	Percent (N=100)	Particulars	Percent (N=100)
Age group		**Occupation**	
20-30	47	Agriculture	40
31-40	31	Agri-business	3
41-50	15	Service	26
50 and above	7	Any other[*]	31
Income level (` per annum)		**Education**	
Up to 50000	29	Illiterate	7
50001-100000	63	Up to matric	39
100001-150000	6	Up to Graduation	39
150000 and above	2	PG and others	15

Source: Primary data
*Artisans, grocers, green grocers, etc.

The perusal of Table 1 showed that the highest proportion of the respondents (63%) were having annual income in the range of ₹50001- ₹100000 per annum (Table 1). It was noticed that 29 percent of the respondents were in the income level of ₹50000 per annum. The results further revealed that six and two percent of the respondents were having annual income to the tune of ₹100000 to ₹150000 and above ₹150000 respectively. The results clearly revealed that rural consumers managed to possess the electronic durables irrespective of their incomes.

The results presented in Table 1 revealed that as per the expectations, agriculture came out to be a major occupation of the rural respondents covering 40

percent of the respondents. The occupation as agribusiness and service class constituted 3 and 26 percent of the respondents respectively. It was noticed that as many as 31 percent of the respondents were in other occupations such as artisans, grocers, green grocers, etc.

As far as the literacy level of the respondents was examined, the highest 39 percent each of the respondents having education up to matric and up to graduation level respectively. The proportion of the respondents possessing PG and others academic qualification (Diploma, etc.) was 15 percent (Table 1). However, seven percent of the respondents were found to be illiterate. The findings clearly revealed that literacy level has no relationship with possession of durable in rural Haryana.

Buying Behaviour

After examining the various demographic characteristics of the respondents, their behavior was examined in respect of their buying behaviour as far as durables were concerned. The perusal of Table 2 revealed that LG was the most admired brand TV brand of the 20 percent of the respondents followed by Texla (12 percent) and Onida (11 percent) respectively.

Table 2: Pattern of ownership of different brand of durables by the sample respondents in rural Haryana

(Percent)

Name of the brand	Television	Refrigerator	Washing Machine
Onida	11	2	-
BPL	8	2	1
Samsung	2	1	5
LG	20	10	7
Whirlpool	-	15	2
Godrej	-	19	1
Haier	1	2	-
Videocon	6	7	1
Texla	12	-	-
Philips	1	-	-
Sansui	3	-	-
Akai	2	-	-
Sony	3	-	-
Any other	10	7	2
Don't Know	6	-	-
Not Applicable	15	35	81
Total	100	100	100

Source: Primary data

It was noticed that 8 and 6 percent of the respondents were having BPL and Videocon brand televisions respectively. Similarly, 3 percent each of the respondents found to have television of Sansui and Sony brands. It was noticed that 2 percent

each were having Samsung and Akai while one percent each of the respondents were having Haier and Phillips brands television also. Apart from these brands, 10 percent of the respondents also owned television of non-descript brands. It was interesting to note that 6 percent of respondents were not aware about the brand of the Television they possessed and 15 percent of the respondents did not own television at all.

In the case of other two durables namely refrigerator and washing machine, the largest percentage of the respondents did not have these durables. The perusal of Table 2 revealed that 35 percent of the respondents did not have refrigerator. Among those respondents who were having this refrigerator the top three admired brand were found to be Godrej, Whirlpool and LG. The corresponding figures for above said brands of the refrigerator were found to be 19, 15 and 10 percent respectively. The percent of respondents who possessed Videocon brand refrigerator was found to be 7percent. The figures for Onida, BPL and Haier were estimated to be 2 percent each. The results revealed that Samsung brand refrigerator was possessed by one percent of sample respondents.

The rural market of washing machine seems still in the struggling phase as revealed by the analysis of the data. The highest percentage of the respondents (81 percent) did not own a washing machine at all. For those who owned a washing machine, LG brand was most preferred by 7 percent of the sample respondents which was followed by Samsung (5 percent), Whirlpool (2 percent), BPL (1 percent), Godrej (1 percent) and Videocon (one percent). It was noticed that two percent of the respondents also owned washing machines of non-descript brands.

Factors Influencing Buying Behaviour

The results presented in Table 3 revealed that the factor which influenced for purchase decision of rural respondents was Brand name as it influenced the buying behaviour of the 28 percent of the sample respondents. It was noticed that 16 percent of the respondents have taken into account all the factors such as brand, price, dealer social circle and design while buying the durables.

Table 3: Inspiration sources of respondents in rural Haryana

Inspiration Source	Respondent Frequency (percent)
Brand Name	28
Price	14
Dealer Social Circle	2
Design	3
All of these	16
Brand Name & Dealer Social Circle	9
Brand, Design & Dealer Social circle	11
Brand name & Price	15
Any other	2

Source: Primary data

The next highly rated inspiration source was found to be brand name plus price which has determined behaviour of the 15 percent of the sample respondents while buying various durables. This was followed by price (14 percent), brand-dealer-design (11 percent), brand name and dealer social circle (9 percent), design (3 percent), dealer social circle (2 percent) and any other (2 percent).

Brand awareness among respondents

The results presented in Table 4 revealed that one percent each of the respondents was having the awareness about the brands of durables such as Onida, Samsung and Hitachi. It was noticed that 2 percent of the sample respondent were having the LG brand durables in rural Haryana. Only 7 percent respondents were having knowledge of all of these brands. It was interesting to note that 87 percent of respondents are well aware about two or more of these brands.

Table 4: Brand awareness among the respondents in rural Haryana

Brand Name	Frequency (percent)
Onida	1
Samsung	1
LG	2
Hitachi	1
Any other	1
All of these	7
2 or more of these	87

Source: Primary data

This clearly showed that although the selected respondents do have good awareness about the various brands of durables still they take into account other factor while buying different durable besides brand of the product.

CONCLUSIONS

The rural market constitutes a very large proportion of Indian market. Rural market seems very promising to various national and international companies. In present study, survey of different villages helped to study the rural consumer behavior. Study was carried out for three durables i.e. Television, Refrigerator and washing machine. It was concluded from the study that a significant number of consumers were found possessing these durables. A few respondents were price conscious and some respondents believe in quality brand products. They prefer quality over price. It was inferred that highly influencing factor for purchase decision of rural respondents was brand name. It is also found that there was a great brand loyalty towards LG products among the rural consumers in comparison to other brands especially in the case of television. Most of the rural consumers

purchase the product while keeping in mind the brand name, after the brand name, price was one major of inspiration factors determining buying behaviour of the sample respondents in rural Haryana. It was noticed that although the respondents were aware about two or more national and international brands of durables yet their buying behaviour was influenced by other factors too.

REFERENCES

Cardozo, R.N.1965. An Experimental study of customer effort, Expectation and Satisfaction. *Journal of Marketing Research* **2**: 244-249.

Loudon, D.L. and Della, B. and Albert, J. 1993. *Consumer behaviour-Concepts and Application*, 4th edition. McGraw-Hill, London.

Monga, P. 2004. Rural marketing strategies need to be customized. Culled from www.financialexpress.com.

NCAER, Report, 2005.

http://www.indiabiznews.com

http://www.icmrindia.org

http;//www.marketingprofs.com

http://www.wikipedia.com

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