



Comparative Expenditure in Public and Private Dairy and Crop Sectors in Haryana

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ABSTRACT

At a time when food crop production reaching a plateau in terms of production and productivity, there is a need for diversification within and outside the crop production. Dairying offers itself as a prospective alternative for investment and diversification with immense commercial potential. Until and unless dairying promises better returns, the investment is not likely to flow to this sector. Both crop production and dairying are integral part of farming but with the availability of limited capital, the investment is attracted by those enterprises which give higher comparative returns. This study attempted to compare trends in Investments (public and private) in dairy and crop sector and the purpose was to figure out the emphasis given in making the Investment and the kind of correlation exist between these Investments in particular crop or dairy sector of Haryana. The time series data at state level (from 1996-97 to 2012-2013) was collected by categorizing key heads of expenditures in both the sectors. Study found that public expenditure in the dairy and crop sector has increased faster (CGR 8.77% & 5.03%) than the private capital expenditure (CGR 7.36% & 1.04%) in real value terms respectively. The correlation coefficient between total expenditures in dairy and crop sector was positive and higher, indicating strong complementarities and the correlation between two expenditures has increased over the time period. If the expenditure on dairy sector moves up, the expenditure on crop sector will also move up to take advantages of surpluses of both the sectors. The study suggested to the farmer that dairy is the better destination of his investment out of the opportunities available in the state.

KEY WORDS: Trend, Expenditure, Public, Private, Investment, Dairy, Crop

INTRODUCTION

Indian agriculture is a small holder production and huge portion of production is contributed by marginal and small landholdings of up to two hectares. Due to the smaller landholdings, crops alone cannot offer profitable employment and adequate food for the nation. Hence, there is a necessity for diversification within farming and with off farm engagement. In the current social, economic, political and technological scenario, farmers are to be self-assured of continuous flow of income, so that they find investment in farming as rewarding.

Traditionally, crop production has reported for over four-fifths of the agricultural production, but over the last two decades, a variation has been observed. The livestock share in total agricultural output has been risen rapidly and now it is accounted near about 30 per cent of the total agricultural output. Overall, the composition of agricultural output has gradually been shifting towards high-value crops and animal products, especially milk [1]. The income elastic nature and changing lifestyle of the urban population, has led to increase the demand for milk and milk products. In the times to come, as the demand pressure for milk and milk products would continue to re-enforce itself, production shortfalls and further surge in prices could make the consumers highly vulnerable, jeopardising their nutritional and food security. It is important to envision the shape that dairy sector would take in future to get the right perspective for policy preferences, investment and research.[2]

The increasing demand for convenient and hygienic food at both, domestic and global level, offer immense investment opportunities in the Indian dairy sector to make it price competitive and resource focused. The realization of the potential opportunities would be instrumental in enhancing livelihood security of the millions of dairy farmers in the country. In India, the livestock and agricultural production are inter-dependent and both are crucial for the livelihood security of the rural population. At a time when food crop production reaching a plateau in terms of production and productivity, there is a need to avoid mono-cropping and take up animal husbandry, dairy and other similar businesses as an alternative prospect. So, this study was intended to compare the trends in Investments (public and private) in dairy and crop sector and the purpose was to figure out the emphasis given in making the Investment and the kind of correlation exist between these Investments in particular crop or dairy sector of Haryana.[3]

DISCUSSION

Investment made in a sector both by the government (public) and the farmer (private) is one of the important determinants of its profitability. In this study, it has been tried to compare trends in Investments (public and private) in dairy and crop sector and the purpose was to figure out the emphasis given in making the Investment and the kind of correlation exist between these Investments in

particular crop or dairy sector. The expenditure in dairy sector in Haryana was comprised of both public expenditure and private capital expenditures. The heads included in public expenditures were extension and training, veterinary services and animal health, fodder and feed development, cattle and buffalo development and expenditure on dairy development. The items included in private capital expenditures were animal sheds/barn/ farm house and livestock used as fixed asset. To determine the periodic change, the expenditure series were further divided into three triennium averages ending TE 1998-99, TE 2005-06 and TE 2012-13.[4]

It was noted that overall in absolute terms there were increasing trends for total public expenditures (164.55 `/ha to 573.59 `/ha) in dairy sector over the three trienniums.

The triennium averages percentage share of dairy sector's public expenditures under various heads displayed that veterinary services and animal health exhibited exceptionally increasing trend of expenditure, rest all other heads such as extension and training, fodder and feed development, cattle and buffalo development, expenditure on dairy development has exhibited decreased proportion of expenditure to total public expenditure. It was noted that, in absolute terms cattle and buffalo development has exhibited an increasing trend from 89.40 (`/ha) to 146.51 (`/ha) over the time period.

Table 1: Component wise public expenditure in dairy sector at constant prices (base year: 2004) (per hectare)

Particulars	TE 1998-99	TE 2005-06	TE 2012-13	Growth rate 1998-99 to 2012-13 (%)
Extension and Training	0.88 (0.54)	0.14 (0.07)	0.11 (0.02)	-14.81
Veterinary Services and Animal Health	55.35 (33.64)	135.15 (70.14)	413.19 (72.04)	16.20
Fodder and Feed Development	11.09 (6.74)	5.55 (2.88)	9.45 (1.65)	-2.22
Cattle and Buffalo Development	89.40 (54.33)	44.89 (23.29)	146.51 (25.54)	3.00
Expenditure on Dairy Development	7.82 (4.75)	6.96 (3.61)	4.33 (0.75)	-3.89
Total	164.55 (100.00)	192.69 (100.00)	573.59 (100.00)	8.77

It is noted that overall, in absolute terms there was increasing trend for total private capital expenditure in dairy sector over the three triennium periods (90.82 `/ha to 226.99 `/ha). Similar increasing trend of expenditure was observed for livestock used as fixed assets (69.81 `/ha to 226.33 `/ha). Whereas there was decreasing trend of expenditure for animal sheds/barn/farm houses (21.01 `/ha to 0.66 `/ha) over the three triennium periods. [5]

Table 2: Component wise private capital expenditure in Dairy sector at constant prices (base year: 2004) (per hectare)

Particulars	TE 1998-99	TE 2005-06	TE 2012-13	Growth rate 1998-99 to 2012-13 (%)
Animal sheds/Barn/ farm house	21.01 (23.14)	6.26 (3.90)	0.66 (0.29)	-22.44
Livestock used as fixed asset	69.81 (76.86)	154.02 (96.10)	226.33 (99.71)	9.29
Total	90.82 (100.00)	160.28 (100.00)	226.99 (100.00)	7.36

The triennium percentage share of dairy sector private expenditure displayed similar trends as per absolute values and indicates that maximum focus of expenditure has been paid to livestock used as fixed asset as the expenditure grew from 76.86 per cent to 99.71 per cent in first and last trienniums, respectively.

Public expenditure in dairy sector has played a vital role in promoting growth of dairy and dairy product output because it includes expenditures directed to heads such as extension and training, veterinary services and animal health, fodder and feed development, cattle and buffalo development and expenditure on dairy development. Compound annual growth rate for expenditure in public, private capital and total expenditure in dairy sector over the three time-periods TP-I (1996-97 to 2003-04), TP-II (2005-06 to 2012-13) and Overall (1996-97 to 2012-13) along with their correlation coefficient are shown. The growth rate trend of public, private capital and total expenditure was observed as 8.77 per cent, 7.36 per cent and 8.32 per cent, respectively over the time period (1996-1997 to 2012-13). The growth pattern over two sub time-period TP-I (1996-97 to 2003-04) and TP-II (2005-06 to 2012-13), depicted the positive and increasing trend of public (11.95% to 21.61%) and total expenditure (9.85% to 13.73%) in dairy sector.[6]

Table 3: Trend of public & private capital expenditure in dairy sector at constant prices (base year: 2004) (per hectare)

Time period	Public expenditure	Private capital expenditure	Total expenditure
TE 1998-99	164.55 (64.43)	90.87 (35.57)	255.37 (100.00)
TE 2005-06	192.69 (54.59)	160.28 (45.41)	352.97 (100.00)
TE 2012-13	573.59 (71.65)	226.99 (28.35)	800.58 (100.00)
Compound growth rate (CGR) and correlation coefficient			
TP-I (1996-97 to 2003-04)			
CGR (%)	11.95	6.38	9.85
Correlation coefficient	0.7596		
TP-II (2005-06 to 2012-13)			
CGR (%)	21.61	3.50	13.73
Correlation coefficient	0.9682		
Overall (1996-97 to 2012-13)			
CGR (%)	8.77	7.36	8.32
Correlation coefficient	0.7997		

It can be inferred that private capital expenditure in dairy sector, has increased in real terms (90.87 `/ha to 226.99 `/ha) but due to bigger growth in public expenditure the proportionate ratio of private capital expenditure has declined over two sub time periods from 6.38 per cent to 3.50 per cent per annum. As per the correlation analysis it was found that correlation coefficient between public expenditure and private capital expenditure was 0.7997 for overall time period (1996-97 to 2012-13). Correlation between public and private capital expenditure was observed significantly high in TP-II (2005-06 to 2012-13) as 0.9682 showing high complementarity relation between public expenditure and private capital expenditure in dairy sector. [7]

Further it can be easily observed that the private capital expenditure series in dairy sector in real values has been lower than the public expenditure except for year 2005-06 where it has partially offset the decline in public expenditure trend. The results of public and private capital expenditure in dairy sector can be summarised that the public expenditure in the sector has increased faster (CGR 8.77%) than the private capital expenditure (CGR 7.36%) in real value terms. Nevertheless, the amount of public expenditure per hectare on dairy sector has been higher than the private capital expenditure which has make up only during the year 2005-06. The growth in public expenditure has mainly taken place on veterinary services and animal health component. Its share in total expenditure has more than doubled during 1996-97 to 2012-13. In private capital expenditure, the growth in expenditure on livestock as fixed assets was positive as 9.29 per cent per annum, while it was negative (-22.44%) for animal shed/ farm houses. [6,7]

The expenditure in crop sector in Haryana was comprised of both public and private capital expenditures. The heads included in public expenditure were research and education, extension and farmers training, soil & water conservation, food storage warehousing and total irrigation. The items included in private capital expenditure were well and other irrigation sources, agricultural machinery, transport equipment and others furniture's and fixtures. It was noted that overall in absolute terms there was increasing trend for total public expenditure in crop sector over three triennium periods (1235.78 `/ha to 2458.10 `/ha). The triennium percentage share of public expenditure under various heads illustrated that soil and water conservation (7.93% to 3.03%) and total irrigation (73.26% to 62.19%) has exhibited decreasing trend while other heads such as research and education (12.74% to 15.83%), extension and farmers training (5.51% to 18.02%) and food storage warehousing (0.56% to 0.92%) has exhibited increased proportion of expenditure to total public expenditure.

Table 4: Component wise public expenditure in crop sector at constant prices (base year: 2004) (per hectare)

Particulars	TE 1998-99	TE 2005-06	TE 2012-13	Growth rate 1998-99 to 2012-13 (%)
Research and Education	157.49 (12.74)	247.71 (15.70)	389.19 (15.83)	6.68
Extension and Farmers Training	68.09 (5.51)	127.90 (8.11)	442.98 (18.02)	13.41
Soil & water conservation	98.01 (7.93)	85.24 (5.40)	74.56 (3.03)	-2.80
Food storage warehousing	6.92 (0.56)	13.51 (0.86)	22.57 (0.92)	31.16
Total Major and Medium Irrigation	905.28 (73.26)	1103.60 (69.94)	1528.80 (62.19)	4.05
Total	1235.78	1577.96	2458.1	5.03

It was noted in absolute terms total irrigation has exhibited an increasing trend from 905.28 (`/ha) to 1528.80 (`/ha) over the time period. This has happened as proportionate share of other heads in total public expenditure has increased and hence in-spite of having actual increasing trend of expenditure, total irrigation has exhibited reduced proportionate share over the time. It was a keen area of concern that expenditure in soil and water conservation displayed decreasing trend, this can be a major threat for sustainable farming system in Haryana.

It was quite noted that overall, in absolute terms there was increasing trend for total private capital expenditure in crop sector over initial two trienniums 365.07 `/ha to 490.06 `/ha). Similar increasing trend of expenditure was observed for all individual item expenditures such as well and other irrigation sources (145.00 `/ha to 179.81 `/ha), agricultural machinery (213.13 `/ha to 271.08 `/ha), transport equipment (6.81 `/ha to 39.08 `/ha) except furniture's and fixtures, (0.33 `/ha to 0.10 `/ha). Whereas in last two triennium there was decreasing trend of expenditure for individual items and total private capital expenditure except for transport equipment which has exhibited increasing trend (39.08 `/ha to 111.33 `/ha).[8]

Table 5: Component wise private capital expenditure in crop sector at constant prices (base year: 2004) (per Hectare)

Particulars	TE 1998-99	TE 2005-06	TE 2012-13	Growth rate 1998-99 to 2012-13 (%)
Well and other Irrigation sources	145.00 (39.72)	179.81 (36.69)	129.67 (30.14)	-1.08
Agricultural Machinery	213.13 (58.38)	271.08 (55.31)	189.22 (43.98)	-1.18
Transport equipment	6.81 (1.86)	39.08 (7.97)	111.33 (25.87)	29.91
Others Furniture's and fixtures	0.13 (0.03)	0.10 (0.02)	0.07 (0.02)	-4.48
Total	365.07 (100)	490.06 (100)	430.28 (100)	1.04

The triennium percentage share of private capital expenditure for crop sector under various heads displayed continuous decreasing trend at individual item level and total expenditure, except for transport equipment where it has achieved an accelerated trend of 1.86 per cent, 7.97 per cent and further 25.87 per cent per annum, respectively over the three triennium averages.

Public expenditure in crop sector has played a vital role in promoting growth of agricultural output because it includes expenditures directed to heads such as research and development, education and training, agricultural infrastructure and irrigation. Compound annual growth rate for expenditure in public, private capital and total expenditure in crop sector over the three time-periods TP-I (1996-97 to 2003-04), TP-II (2005-06 to 2012-13) and Overall (1996-97 to 2012-13) along with their correlation coefficient are shown. The growth rate trend of public, private capital and total expenditure was observed as 5.03 per cent, 1.04 per cent and 4.26 per cent, respectively during overall time period (1996-97 to 2012-13). The growth pattern over two sub-time periods i.e. TP-I (1996-97 to 2003-04) and TP-II (2005-06 to 2012-13), depicted the positive and increasing trend of public expenditure (5.26 % to 6.98%), while decreasing trend is observed in case of private capital expenditure (5.47% to -2.24%). Whereas growth rate trend of total expenditure in crop sector was observed as positive but decreased marginally (5.31 % to 5.21 %).

Table 6: Trend of public & private capital expenditure in crop sector as ratio of net sown area at constant prices (2004 base year) (per hectare)

Time period	Public expenditure	Private capital expenditure	Total expenditure
TE 1998-99	1235.78 (77.20)	365.07 (22.80)	1600.85 (100.00)
TE 2005-06	1577.96 (76.30)	490.06 (23.70)	2068.02 (100.00)
TE 2012-13	2458.10 (85.10)	430.28 (14.90)	2888.38 (100.00)
Compound growth rate (CGR) and correlation coefficient			
TP-I (1996-97 to 2003-04)			
CGR (%)	5.26	5.47	5.31
Correlation coefficient	0.9246		
TP-II (2005-06 to 2012-13)			
CGR (%)	6.98	-2.24	5.21
Correlation coefficient	-0.9141		
Overall (1996-97 to 2012-13)			
CGR (%)	5.03	1.04	4.26
Correlation coefficient	0.3042		

RESULTS

A further look into the public expenditure series in real values initially displayed decreasing trend only up to year 1998-99, but thereafter started rising and got accelerated up to year 2002-03, however for subsequent three years (2003-04 to 2005-06) the expenditure fell down which again picked up and got accelerated from 2006-07 onwards. [8,9]

As per the correlation analysis it was found that correlation coefficient between public expenditure and private capital expenditure in crop sector was found to be less as 0.3042 for overall time period (1996-97 to 2012-13). The main reason of lesser correlation during overall period was found to be negative correlation coefficient in TP-II (2005-06 to 2012-13) as -0.9141. Whereas there was a significantly high complementarily relation between public expenditure and private capital expenditure observed in initial time period TP-I (1996-97 to 2003-04) as 0.9246.

Further it can be easily observed that the private capital expenditure series in crop sector in real values has been lower than the public expenditure throughout the period.

The results of public and private capital expenditures in crop sector can be summarized that, like dairy sector, the public expenditure in the crop sector has, also, increased at a significantly high rate (CGR 5.03%) than the private capital expenditure (CGR 1.04%) in real value terms. The highest growth in public expenditure was recorded in storage warehouses (31.16%) and the extension & farmer services (13.41%) reflecting upon government's increased emphasis on reducing post-harvest losses and technology transfer. The share of extension and farmer training in total expenditure has been tripled (5.51% to 18.02%) during 1996-97 to 2012-13. The amount of private capital expenditure in crops which was moving in close proximity with amount of public expenditure per hectare, registered as decline after 2005-06 which clearly a sequel of agrarian distress. The private capital expenditure in crop sector reduced at the rate of -2.24 per cent per annum during TP-II (time period 2005-06 to 2012-13). Among components of private capital expenditure, the highest growth in expenditure was on transport equipment's (29.91 per cent per annum) while it was negative for rest of the components. The percentage share of all components of private capital expenditure has gradually reduced except of transport equipment's. In crop sector, though a strong complementary

relationship was observed in public and private capital expenditures in TP-I (1996-97 to 2003-04) with highly positive correlation coefficient of value 0.9246 but it weakened over the time period in TP-II (-0.9141) resulting in lesser correlation coefficient (0.3042) for overall time period (1996-97 to 2012-13). Unlike private capital expenditure, there has been lot of fluctuation in the amount of public expenditure in the sector. However, the decline in public expenditure during initial three years was offset by continuous growth in the private capital expenditure. [9]

CONCLUSION

The public expenditure in the dairy sector has increased faster (CGR 8.77%) than the private capital expenditure (CGR 7.36%) in real value terms. The growth in public expenditure has mainly taken place on veterinary services and animal health component. Its share in total expenditure has more than doubled during 1996-97 to 2012-13. In private capital expenditure, the expenditure on livestock as fixed assets has increased while it has decreased on animal shed/ farm houses. This reflects clearly on substantial increase in value of dairy animals in Haryana in the first decade during last ten years.

In dairy sector, a complementary relationship has been observed in public and private capital expenditure with positive correlation coefficient of value 0.7997. Unlike private capital expenditure, there have been lots of fluctuations in the amount of public expenditure in the sector. However, the decline in public expenditure was offset to some extent by continuous growth in the private capital expenditure.

Like dairy sector, the public expenditure in the crop sector has, also, increased at a significantly high rate (CGR 5.03%) than the private capital expenditure (CGR 1.04%) in real value terms. The highest growth in public expenditure was recorded in storage warehouses (31.16%) and the extension & farmer services (13.41%) reflecting upon government's increased emphasis on reducing post-harvest losses and technology transfer. The share of extension and farmer training in total expenditure has been tripled (5.51% to 18.02%) during 1996-97 to 2012-13.

Among components of private capital expenditure in crops, the highest growth on transport equipment's (29.91 per cent per annum) while it was negative for rest of the components.

The amount of private capital expenditure in crops which was moving in close proximity with amount of public expenditure per hectare, registered as decline

after 2005-06 which clearly a sequel of agrarian distress. Though there was positive correlation between public and private expenditure in crops but it has weakened over time.

The expenditure in dairy sector grew at the rate of 8.32 per cent per annum while it was 4.26 per cent per annum in crop sector. Dividing the total time into two periods i.e. TP-I (1996-97 to 2003-04) and TP-II (2005-06 to 2012-13), the growth rate in total expenditure for dairy sector increased in the later period (TP-II) while it decreased for crops which shows that to realize the future demand for milk and livestock products. From the study, it was well noted that public expenditure was mainly focused on one individual head i.e., veterinary services and animal health and it is recommended that other heads such as investment in extension and training also needs to be emphasised so that farmers embrace the new technology development and goal of overall sustainable dairy development is achieved. The total expenditure (both public and private) per hectare of crop and dairy has increased overtime but the rate of growth was faster in dairy sector as compare to crop sector. The shift in proportionate allocation of expenditure between dairy and crop sector is one of the key indicators of shift in emphasis and it was observed that the percentage share of dairy in the combined expenditure has continuously increased over time. The correlation coefficient between total expenditures in dairy and crop sector was positive and higher, indicating strong complementarities. The correlation between two expenditures has increased over the time period. If the expenditure on dairy sector moves up, the expenditure on crop sector will also move up to take advantages of surpluses of both the sectors. The study suggested to the farmer that dairy is the better destination of his investment out of the opportunities available in the state.[9]

The findings of the study will be useful for policy makers and the planners in determining future shift in investments within agriculture and finding out the priority areas for making infra-structural development

in order to harness the opportunities at farming in Haryana through supportive investments.

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