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Research Article

# Comparative Economics and Evaluation of Constrains of Chickpea Production in Rajasthan with Reference to Gangour Variety

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## Abstract

The Comparative Economics of the chickpea production in Rajasthan with reference to the Gangour variety was evaluated in this study. The evaluation was based on a household survey of Bengal gram grower in 4 villages of Bikaner District of Rajasthan. The estimated cost of cultivation was ₹32068.10, Net Income ₹44599.90 in case of the Gangour variety while cost of cultivation ₹30535.43, Net Income ₹15494.07 was in case of local cultivar. The gross income from the Gangour variety was greater than local variety that is ₹76668 and ₹46029.50 per hectare, respectively because of higher yield and low cost of production of former as compared to latter one and their yield was of 17.70q and 10.65q, respectively and the cost of production was ₹1811.75and ₹2867.18 respectively. The Output- Input Ratio for the Gangour variety was 2.39 and for local variety was1.51. Cultivation of Gangour variety are profitable than local varieties. The survey revealed that improved chickpea variety showed distinctly superior performance over local cultivars but it also have some constrains viz., chickpea growers were not getting satisfactory price of their produce in both Gangour and local variety grower. The another problem faced by chickpea grower is, require more water with reference to Gangour and problem of labour with reference to local variety.

**Keywords:** Comparative Economics; Cost of Cultivation; Cost of Production; Net Income; Output-input Ratio; Constrains

## Introduction

Chickpea (*Cicerarietinum* L.), is also known as garbanzo bean or Bengal gram, is an old growing pulse and one of the seventh Neolithic founder crops in the Fertile Crescent of the Near East [1]. Globally, it is the third most important pulse crop in area and production, next to dry beans and field pea [2]. Chickpea is an important legume that plays prerequisite role in terms of food and nutritional security of people in the developing countries like India, contributing to protein intake, mainly for the vegetarian population. It is a good source of carbohydrates and protein, together constituting about 80% of the total dry seed mass in comparison to other pulses[3,4]. It is cholesterol free and is a good source of dietary fibers, vitamins and minerals [5]. It contains 23 percent protein, 64 percent carbohydrates, 47 percent starch, 5 percent fat, 6 percent crude fiber, 6 percent soluble sugar and 3 percent ash [6]. Being a leguminous crop it contributes in improving soil fertility by nitrogen fixation into the soil. This property has an added benefit to farmers by reducing external applications of nitrogenous fertilizers and in turn cuts cost of production and thus is environment friendly crop.

South and Southeast Asia contributes about 81 percent to the chickpea production in globe, with India as the principal chickpea producing nation (84% share in the region). The chickpea area

marginally expended from 6.4 million ha to 9.93 million ha during the period 2000-01 to 2013-14. However, the production expanded substantially from 5.47 to 9.53 million tonnes due to the rise in grain yields from 853 kg/ha to 960 kg/ha [7,8].

Inspite of large area and production there are many constraints of acreage, production and productivity in India as well as in Rajasthan. Area of pulses does not expand incredibly as compared to wheat and rice. It includes various constraints such as unavailability of high yielding seeds, insufficient knowledge of package and practice, less input use, insufficient irrigation facilities and it mostly depends on rains, insufficient fertilizers and minerals use. Usage of improved seeds is one of the important factors for accelerating productivity when compared with other yield attributing inputs. Its genetic potential for higher yield is still under estimation process as a result of strong and dominating effects of economy. The fact is that the ultimate aim of chickpea growers is to get higher remunerative income through use of superior varieties, disease and insect resistance and other characteristics [9].

So, there is need to develop a high yielding variety which can grow in rain fed condition and give more profitability to farmers.

ARS, Shree Ganganagar of SKRAU, Bikaner has developed the 'Gangour' variety of chickpea under AICRP (All India Coordinated Research Project) which is very popular in the chickpea growing area and gradually replacing all existing (Local/Traditional) varieties. Under the present circumstances, this study is aimed to address such issues.

## Material and Method

The study is based on primary data as well as on secondary data. The primary data was collected through well structured, pretested and comprehensive schedules from 120 chickpea growers in Rajasthan. Secondary data was collected from different government agencies like RSSOCA 1977nd area, production and yield was collected from different secondary sources like Rajasthan statistical abstract, therefore Rajasthan state purposively selected, due to higher production, Bikaner district of Rajasthan was selected. Then, two tehsils were selected on the basis of production. From each selected tehsil, two villages were chosen randomly. From each of the village, 15 farmers were interviewed who were growing the Gangour variety and other 15 who were growing local/traditional variety. Total of 120 farmers were interviewed for this study. Cost of cultivation was calculated by cost concept given by CACP (Commission on agriculture cost and price). The different income measurements were also used for estimating different income level. Garrett's ranking technique was used to identify the preferred traits and constraints in the production of chickpea varieties in study area. For the calculation the M.S. Excel was used.

## Results and Discussions

### Cost of cultivation of different variety of chickpea

It could be observed from table 1 that on Gangour variety and local variety of chickpea cultivation farmers incurred a total cost of ₹32068.10 and ₹30535.43, respectively. The cost of cultivation on the Gangour variety farms was higher than the cost incurred for the local variety farms due to higher cost incurred towards plant protection, seed and irrigation.

| Input | Gangour (₹/ha) | Local(₹/ha) |
|---|---|---|
| Machine labour | 1162.50 | 1137.50 |
| Hire labour | 750.00 | 697.50 |
| Imputed value of family labour | 3322.50 | 3450.00 |
| Value of seed | 5691.30 | 4915.60 |
| FYM | 870.00 | 865.25 |
| Fertilizers | 2371.90 | 1976.29 |
| Plant Protection Chemicals | 1831.88 | 1698.00 |
| Irrigation Charges | 3445.00 | 2710.00 |
| Depreciation | 6239.86 | 6416.49 |
| Land Revenue | 60.00 | 60.00 |
| Interest on working capital | 261.80 | 203.68 |
| Interest on Fixed capital | 286.87 | 295.99 |
| Rental Value of owned land | 6257.63 | 6109.13 |
| Total | 32068.10 | 30535.43 |

**Table 1:** Breakup of cost of cultivation of Chickpea.

Results showed that the Rental value of the land accounts higher cost in local variety compared to the Gangour. The depreciation is second most dominant cost. Value of seed is higher in case of the Gangour variety because of the seed of the Gangour variety is costly than that of local variety. The irrigation charge is higher in case of the Gangour variety because of it needed more water requirement. Fertilizer and plant protection chemical charges are also higher in case of the Gangour variety because it required more input than the local variety.

**Figure 1:** Different costs in production of chickpea with reference to Gangour variety (%).

**Figure 2:** Different costs in production of chickpea with reference to local variety (%).

Figure 1 and 2 shows the percentage contribution of different elements of cost of cultivation for both local or traditional variety and for the Gangour variety.

The cost concepts were measured. These costs included Cost $A_1$, Cost $A_2$, Cost $B_1$, Cost $B_2$, Cost $C_1$ and Cost $C_2$.The comparative estimates of different costs incurred in chickpea cultivation for two different varieties of farms i.e. Gangour and Local are explained in this section. The estimates of different costs incurred in chickpea cultivation for Gangour and Local variety are given in table 2.

| Cost | Gangour(₹/ha) | Local(₹/ha) |
|---|---|---|
| Cost $A_1$ | 22201.11 | 20206.06 |
| Cost $A_2$ | 22201.11 | 20206.06 |
| Cost $B_1$ | 22487.98 | 20502.05 |
| Cost $B_2$ | 28745.60 | 26611.18 |
| Cost $C_1$ | 25810.48 | 23952.05 |
| Cost $C_2$ | 32068.10 | 30535.43 |

**Table 2:** Cost of cultivation of chickpea on different cost concepts basis.

The table 2 reveals that Cost A1 was ₹22201.11 and ₹20206.06 for Gangour and local variety, respectively. Cost A1 and cost A2were the same because no chickpea growers had leased-in land. Cost B1 was worked out to be ₹22487.98 and ₹20502.05, respectively. The Cost B2was worked out to be ₹28745.60 and ₹26611.18, respectively. The Cost C1was worked out to be ₹25810.48 and ₹23952.05, respectively. The Cost C2was worked out to be ₹32068.10 and ₹30535.43 respectively. The cost of cultivation of Gangour variety was higher than cost of local variety.

## Profitability of the Gangour variety cultivation

### Productivity of chickpea

The productivity of chickpea and gross returns on sample farms are given in table 3. The table reveals that yield of Gangour and local variety is 17.70 and 10.65q/ha, respectively. The yield was higher on Gangour variety grower than the local variety grower. Similar result was found by Selvaraj., *et al.* [10] in his study.

| Category | Yield (q/ha) | | Price ₹/q | | Income (₹/ha) | | Gross income (₹/ha) |
|---|---|---|---|---|---|---|---|
| | Main product | By product | Main product | By product | Main product | By product | |
| Gangour | 17.70 | 26.33 | 4030.00 | 198.25 | 71455.00 | 5213.00 | 76668.00 |
| Local | 10.65 | 15.00 | 4035.00 | 196.25 | 43087.50 | 2942.00 | 46029.50 |

**Table 3:** Gross income from of chickpea cultivation.

Table 3 shows that the yield of Gangour variety is greater than local variety that is 17.70q and 10.65q, respectively. Similar result was found by Aggarwal., *et al.* [11] and Shiyani., *et al.* [12] in his study. The gross income from Gangour variety is greater than local variety that is ₹76668 and ₹46029.50 per hectare, respectively. Gross income from Gangour variety is higher because of its higher yield. Similar result was found by Singh, A. in his study. Additional income from Gangour variety is ₹30638.50/ha. Similar result was found by Tripathi and Das [13] in his study.

## Income measures

This includes farm business income, which indicates returns over variable cost. The family labour income, which is residual of gross income over cost $B_2$, explains the returns to family labour and has lot of relevance under Indian conditions. A comparison of incomes estimated for two different varieties of sample farms of chickpea growers is shown in table 4.

| Particulars | Gangour (₹/ha) | Local (₹/ha) |
|---|---|---|
| Gross income | 76668.00 | 46029.50 |
| Farm business income | 54466.89 | 25823.44 |
| Net income | 44599.90 | 15494.07 |
| Family labour income | 47922.40 | 19418.32 |
| Output-Input Ratio | 2.39 | 1.51 |

**Table 4:** Returns from cultivation of Chickpea on sample farms.

It is evident from the table 4 that gross income from the Gangour variety is more than Local variety. Gross income from the Gangour variety is ₹76668.00 per hectare and from local variety is ₹46029.50 per hectare which is very low as compared to Gangour variety. The farm business income from Gangour variety grower and local variety is ₹54466.89 and ₹25823.44, respectively. The higher farm business income from Gangour variety is because of its higher yield. Per hectare net income from Gangour variety grower and local variety is ₹50857.52 and ₹15494.07, respectively. Net income from Gangour variety is more than local variety because of its higher yield. Output- Input Ratio from the cultivation of Gangour variety and local variety is 2.39 and 1.51, respectively. Output- Input ratio is high in case of Gangour variety which mean that per rupee output from the Gangour is higher than the local variety.

## Cost of production

The costs of production per quintal on different cost concept basis for Gangour and local variety are given in table 5.

| Particular | Gangour | Local |
|---|---|---|
| Cost (₹/ha) | 32068.10 | 30535.43 |
| Production (q/ha) | 17.70 | 10.65 |
| Cost of Production (₹/q) | 1811.75 | 2867.18 |

**Table 5:** Cost of Production of chickpea different on the basis of cost concepts.

It is evident from the table 5 that the cost of production for the Gangour variety is less than the cost of production of local variety that is ₹1811.75 and ₹2867.18 per quintal, respectively. The cost of production is lower in case of Gangour variety because of its higher yield. It indicates the superiority of Gangour variety over local variety. The similar results were found by Shiyani., *et al.* [14] and Deb., *et al.* [15] in their study.

## Constraints in chickpea production in Rajasthan

This section presents the constraints faced by the farmers in chickpea production by using the Garrett's ranking technique both with reference to Gangour and local variety.

| Constraints | Percentage of Garret value | Ranking |
|---|---|---|
| Lack of knowledge about diseases insect and pest of crop | 27.85 | 8 |
| Lack of knowledge insecticide pesticide and its doses | 28.50 | 7 |
| Desired fertilizer not available | 39.12 | 6 |
| Water supply not available when needed | 55.03 | 4 |
| Inadequate water supply | 58.09 | 3 |
| Problem about human labour During harvesting | 71.49 | 2 |
| Not getting the satisfactory price | 76.50 | 1 |
| Lack of marketing Facilities | 45.36 | 5 |

**Table 6:** Constraints in chickpea production with reference to local variety.

Table 6 showed constraints in production of chickpea with reference to Gangour variety. The results revealed that about 76.5 percent farmers faced the problem of not getting satisfactory price of their produce because they are getting fewer prices as compared to MSP. About 71.49 percent farmers faced the problem about human labour during the harvesting because the labour are not available at the time of harvesting which delay the sowing of the next crop. Inadequate water supply when needed was another major problem because the light is not available always during the irrigation. Lack of marketing facility was on fifth rank which also a major constraints faced by the farmers because market is not available near their village, so extra transportation charge were given by them.

Table 7 shows constraints in production of chickpea Gangour variety. The results revealed that about 78.8 percent farmers faced the problem of not getting satisfactory price of their produce same as faced by the local variety growing farmers because they are getting less price as compared to MSP. About 69.8 percent farmers faced the problem of requiring more water than the local variety because water requirement of Gangour variety is higher than the local variety. Problem of human labour during the harvesting was another major problem faced by the farmers because the labour are not available at the time of harvesting which delay the sowing of the next crop. More severity to pest and disease attack was also a major problem faced by the farmer because the intensity of wilt disease is higher in case of the gangour variety. Inadequate water supply when needed was on fifth rank because the light is not always available during the irrigation.

| Constraints | Percentage of Garret value | Ranking |
|---|---|---|
| Lack of knowledge about diseases insect and pest of crop | 12.43 | 10 |
| Lack of knowledge about insecticide/pesticide and its doses | 56.37 | 6 |
| Desired fertilizer not available | 19.70 | 9 |
| Water supply not available when needed | 58.43 | 5 |
| Inadequate water supply | 52.05 | 7 |
| Problem about human labour During harvesting | 61.40 | 3 |
| Not getting the satisfactory price | 78.80 | 1 |
| Lack of marketing facilities | 36.00 | 8 |
| More severe to disease pest attack | 59.51 | 4 |
| Water requirement is more than early variety | 69.80 | 2 |

**Table 7:** Constraints in chickpea production with reference to Gangour variety.

The Gangour variety growers faced more constraints than local variety grower because local variety growers had no knowledge about the Gangour variety. The same result was found by Thombre A. P., *et al.* [16], Kumar, P., *et al.* [17], and Sharma., *et al.* [18] in their study [19].

## Conclusion

The Comparative Economics of chickpea production in Rajasthan with reference to Gangour variety was evaluated in this study. We found that the Gangour variety has more cost of cultivation than local varieties due to high value of seed. But Gangour variety has low cost of production than local variety. The study also shows that the productivity, input output ratio and net income of Gangour variety higher than the local varieties. But it has its own constrains also. Growers of both cultivars don't fetch satisfactory prices whereas gangour require more irrigation whereas local cultivars need more labour. But in overall comparison, cultivation of gangour is more economical and profitable as compare to local cultivars.

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