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# Impact of farm ponds on the economy of beneficiary *vis a vis* non-beneficiary farmers for soybean in Amaravati District

**KV Wagh, SN Ingle, SS Thakare and SS Noroliye**

**Abstract**
Farm pond plays an important role in increasing agricultural production. This increase in production is due to availability of more water for irrigation on farms of beneficiary farmers. A farm pond is a large hole dug out in the earth, usually square or rectangular in shape, which harvests rainwater and stores it for future use. The main objective of present study was to assess the impact of farm ponds on productivity of various inputs used by the farmers. This study was undertaken in Morshi Tehsil of Amaravati District. The study was based on a sample of 50 beneficiary and 50 non-beneficiary farmers data pertaining the year 2022-23 were collected by survey method from the beneficiary and non-beneficiary farmers. The data were tabulated, compiled and analyses to accomplish the objective of study. Per hectare use of inputs were slightly higher on beneficiary farms than non-beneficiary farms. But, per hectare crop yield was much higher in beneficiary farms. This was obvious due to availability of farm ponds, which made water available for irrigation in farms of beneficiary farmers and thus, ultimately increasing the crop yield. In beneficiary farmers at overall level the output-input ratio at cost '$C_3$' was 1.46, while in case of non-beneficiary farmers it was 1.32. It shows that the beneficiary farmers were more profitable than non-beneficiary farmers.

**Keywords:** Amaravati, beneficiary, farm pond, input-output ratio, non-beneficiary, productivity

## Introduction
A farm pond is a large hole dug out in the earth, usually square or rectangular in shape, which harvest rainwater and stores it for future use. It has inlet to regulate inflow and an outlet to discharge excess water. The pond is surrounded by a small bund, which prevents erosion on the banks of pond. The size and depth depend on the amount of land available, the type of soil, the farmers water requirements, the cost of excavation, and the possible uses of the excavated earth. Water from the pond is conveyed to the fields manually, by pumping or by both methods. Farm pond size adopted by the farmers ranges 15×15×3 meter, 20×20×3 meter, 25×25×3 meter, and 30×30×3 meter according to size of land holding of a farmer. The excess rain water harvested in farm ponds play a vital role in stabilizing crop production through recycling during dry spell in *kharif* season and for protective irrigation in *rabi* season. Ponds can be filled by rainfall, as is common with farm and ranch ponds that are sited at a low point and serve to collect runoff from higher reaches in the watershed. Alternatively, farm ponds can be filled with well water from irrigation, which can then be recycled. The major works of Rain Water Harvesting Structure adopted in the watershed are check dams, farm ponds, nala bunds, contour bunds, vegetative covers etc. which play major role in managing and conserving the soil and water resources. However, farm pond is perceived as best rain water harvesting structure by large majority of farmers.

## Materials and Methods
The standard cost concepts i.e. Cost $A_1$, Cost $A_2$, Cost $B_1$, Cost $B_2$, Cost $C_1$, Cost $C_2$, and Cost $C_3$ were used in present analysis.

**Cost $A_1$:** All variable cost excluding family labour cost and including depreciation.
1) Value of Hired human labour (HL)
2) Value of hired and owned bullock labour (BL)
3) Value of hired and owned machine labour (ML)
4) Value of seeds
5) Value of insecticides and pesticides

6) Value of manure
7) Value of fertilizers
8) Irrigation charges
9) Depreciation on implements and farm building
10) Land revenue, cesses and other taxes
11) Interest on working capital
12) Miscellaneous expenses

**Cost $A_2$:** Cost $A_1$ + Rent paid for leased-in land.
**Cost $B_1$:** Cost $A_2$ + interest value of owned fixed capital assets (excluding land)
**Cost $B_2$:** Cost $B_1$ + rental value of owned land and rent paid for leased in land.
**Cost $C_1$:** Cost $B_1$ + imputed value of family labour.
**Cost $C_2$:** Cost $B_2$+ imputed value of family labour.
**Cost $C_3$:** Cost $C_2$ + 10 per cent of Cost $C_2$ on account of managerial functions performed by farmers.

**Gross and net returns**

**Gross returns**

Gross return of the farmers under the present study was estimated from returns obtained from sale of main produce.

Gross returns = Value of main produce + Value of by produce

**Net returns**

Net returns were computed at different costs i.e. Cost $A_1$, Cost $A_2$, Cost $B_1$, Cost $B_2$, Cost $C_1$, Cost $C_2$, and Cost $C_3$ by deducting respective costs from the gross returns.
Net income at cost $A_1$ = Gross return – cost $A_1$
Net income at cost $A_2$ = Gross return – cost $A_2$
Net income at cost $B_1$ = Gross return – cost $B_1$
Net income at cost $B_2$ = Gross return – cost $B_2$
Net income at cost $C_1$ = Gross return – cost $C_1$
Net income at cost $C_2$ = Gross return – cost $C_2$
Net income at cost $C_3$ = Gross return – cost $C_3$

**Input-Output ratio**

It was calculated at cost $A_1$, Cost $A_2$, Cost $B_1$, Cost $B_2$, Cost $C_1$, Cost $C_2$, and Cost $C_3$ by dividing gross income by respective cost.

**Results and Discussion**

The findings of the present study as well as relevant discussion have been presented under following heads.

**Per hectare input utilization of Soybean**

The degree of management of the resources can be judged for the utilization of resources, the choice and the decision-making. Beside this, it also indicates the level of technology adopted by the farmers. The farmers required to spend on various inputs like seed, manure, fertilizer, human labour, bullock labour and machinery labour etc. Therefore, it is necessary to know the pattern of expenditure on various inputs on per hectare basis. Table 1 indicates that at overall level use of some input for soybean on beneficiary farms was slightly higher than non-beneficiary farms. It is observed from table 1 that at overall level human labour, seed, manure and fertilizers were used more in beneficiary farmers as compared to the non-beneficiary farmers. Machinery and family labour used more in non-beneficiary farmers.

**Table 1:** Input utilization pattern of beneficiary and non-beneficiary farmers of selected farm ponds in Soybean (Numbers/ha)

| Sr. No | Inputs | Unit | Size of groups | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Small | | Medium | | Large | | Overall | |
| | | | B | NB | B | NB | B | NB | B | NB |
| 1 | **Hired human labour** | | | | | | | | | |
| a | Male | Days | 23.31 | 15.13 | 20.54 | 18.79 | 22.86 | 16.65 | 22.35 | 16.68 |
| b | Female | | 28.35 | 22.08 | 24.48 | 25.07 | 24.91 | 23.37 | 26.16 | 23.37 |
| 2 | Bullock labour | Days | 4.50 | 3.97 | 5.60 | 8.07 | 9.40 | 7.73 | 5.74 | 5.77 |
| 3 | Machinery | Hrs. | 3.02 | 3.20 | 3.82 | 5.70 | 4.20 | 3.85 | 3.64 | 4.17 |
| 4 | Seed | Kg. | 66.90 | 58.90 | 72.00 | 67.00 | 117 | 75.00 | 85.71 | 66.71 |
| 5 | Manures | Qtl. | 4.27 | 3.07 | 5.60 | 3.70 | 8.70 | 6.61 | 6.02 | 4.64 |
| 6 | **Fertilizer** | | | | | | | | | |
| a | N | Kg. | 65.70 | 55.90 | 61.70 | 65.90 | 95.00 | 59.00 | 75.77 | 63.14 |
| b | P | Kg. | 119.00 | 110.00 | 113.00 | 116.00 | 195.00 | 121.00 | 111.00 | 114.00 |
| c | K | Kg. | 35.15 | 22.15 | 39.75 | 37.17 | 45.85 | 45.50 | 37.71 | 34.94 |
| 7 | **Family labour** | | | | | | | | | |
| a | Male | Days | 11.00 | 7.71 | 15.76 | 15.93 | 14.92 | 20.86 | 11.92 | 15.52 |
| b | Female | Days | 14.00 | 10.10 | 20.77 | 19.20 | 19.19 | 25.85 | 16.25 | 19.18 |

**Per hectare cost of cultivation of Soybean for beneficiary farmers:** The share of each item to the total cost i.e. cost '$C_3$' total economic costs for soybean cultivation. The cost has determined on the basis of standard cost concept i.e. cost '$A_1$', cost '$A_2$', cost '$B_1$', cost '$B_2$', cost '$C_1$', cost '$C_2$', cost '$C_3$' the different cost concepts have different utilities in research. Table No.2 revealed that, per hectare cost of cultivation of soybean crop for the sample as a whole of beneficiary farmers worked out to Rs. 70103.00. The per ha. overall cost '$A_1$' and cost '$A_2$' was Rs. 39417.00 and Rs. 39417.00 respectively which was 56.22 per cent and 56.22 per cent of total cost i.e. cost '$C_3$'. The per ha. Overall cost $B_1$ and cost $B_2$ was Rs. 40832.00 and Rs. 57658.00 respectively which was 58.24 per cent and 82.24 per cent of total cost i.e. cost $C_3$. The per ha. Overall cost $C_1$ and cost $C_2$ was Rs. 46905.00 and Rs. 66730.00 respectively which was 66.90 per cent and 90.92 per cent of total cost $C_3$.

The per ha. cost of cultivation in large size group of farmers i.e. cost '$A_1$' and cost '$B_1$' was Rs.43633.00 and Rs.44812.00 which was 55.37 per cent and 56.86 per cent of total cost i.e. cost '$C_3$'. The per ha. cost of cultivation in medium size group of farmers i.e. cost '$A_1$' and cost '$B_1$' was Rs.36380.00 and Rs.37821.00 which was 55.08 per cent and 57.26 per cent of total cost i.e. cost '$C_3$'. The per ha. cost of cultivation in small size group of farmers i.e. cost '$A_1$' and cost '$B_1$' was Rs.37579.00 and Rs.42985.00 which was 53.84 per cent and 61.59 per cent of total cost i.e. cost '$C_3$'

**Table 2:** Per hectare cost of cultivation of Soybean of beneficiary and Non-beneficiary farmers of selected farm pond (Rs./ha)

| Sr. No. | Input | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | NB | B | NB | B | NB | B | NB |
| 1 | **Hired human labour** | | | | | | | | |
| | Male | 4662 (6.77) | 3025 (5.07) | 4108 (6.13) | 3758 (6.52) | 4573 (5.69) | 3329 (6.23) | 4469 (6.23) | 3336 (5.83) |
| | Female | 4253 (6.18) | 3312 (5.55) | 3672 (5.48) | 3763 (6.53) | 3737 (4.65) | 3505 (6.56) | 3924 (5.47) | 3505 (6.13) |
| 2 | Bullock Pair | 3150 (4.57) | 2642 (4.43) | 4310 (6.43) | 4038 (7.00) | 4879 (6.07) | 4111 (7.70) | 4017 (5.60) | 2443 (4.27) |
| 3 | Machinery | 1510 (2.19) | 1598 (2.68) | 2643 (3.94) | 2900 (5.03) | 2842 (3.53) | 1617 (3.02) | 2249 (3.13) | 1994 (3.48) |
| 4 | Seed | 7360 (10.69) | 7300 (12.24) | 7220 (10.78) | 7426 (12.89) | 7336 (9.13) | 7269 (13.61) | 7306 (10.19) | 7328 (12.82) |
| 5 | Manure | 3004 (4.36) | 2158 (3.61) | 3999 (5.97) | 2617 (4.54) | 6103 (7.59) | 5325 (9.97) | 4222 (5.88) | 3246 (5.68) |
| 6 | **Fertilizers** | | | | | | | | |
| | N | 350 (0.50) | 365 (0.61) | 350 (0.52) | 362 (0.62) | 400 (0.49) | 358 (0.60) | 360 (0.50) | 361 (0.63) |
| | P | 2010 (2.90) | 1746 (2.92) | 2147 (3.20) | 2113 (3.66) | 2591 (3.22) | 2298 (4.30) | 2220 (3.09) | 2058 (3.60) |
| | K | 398 (0.57) | 355 (0.59) | 405 (0.60) | 389 (0.64) | 463 (0.57) | 406 (0.76) | 421 (0.58) | 386 (0.67) |
| 7 | Irrigation | 716 (1.04) | 958 (1.60) | 507 (0.75) | 1247 (2.16) | 382 (0.47) | 178 (0.33) | 309 (0.43) | 225 (0.39) |
| 8 | Plant protection | 3125 (4.54) | 2304 (3.86) | 2484 (3.71) | 2384 (4.13) | 2253 (2.80) | 1796 (3.36) | 2621 (3.65) | 2058 (3.60) |
| 9 | Incidental charges | 533 (1.08) | 470 (0.78) | 561 (0.83) | 374 (0.64) | 573 (0.71) | 425 (0.79) | 553 (0.77) | 427 (0.74) |
| 10 | Repairing charges | 517 (0.77) | 481 (0.80) | 523 (0.78) | 309 (0.53) | 541 (0.67) | 211 (0.39) | 526 (0.73) | 349 (0.61) |
| 11 | Threshing | 3679 (5.34) | 2233 (3.74) | 3263 (4.87) | 1711 (2.97) | 3740 (4.65) | 2240 (4.19) | 3573 (4.98) | 2176 (3.80) |
| 12 | Int. on working capital @6% per annum | 2291 (3.33) | 1673 (2.80) | 2177 (3.25) | 1774 (3.07) | 2547 (3.17) | 1707 (3.19) | 2334 (3.25) | 1713 (2.99) |
| 13 | Depreciation | 1121 (1.62) | 1048 (1.75) | 1281 (1.91) | 1237 (2.14) | 1412 (1.75) | 1123 (2.10) | 1256 (1.75) | 1127 (1.97) |
| 14 | Land revenue | 198 (0.28) | 171 (0.28) | 214 (0.31) | 156 (0.27) | 253 (0.31) | 379 (0.70) | 219 (0.30) | 193 (0.33) |
| 15 | COST A1 | 37579 (53.84) | 29491 (49.96) | 36380 (55.08) | 30783 (54.01) | 43633 (55.37) | 29078 (55.71) | 39417 (56.22) | 29755 (52.79) |
| 16 | Rental value of leased in land | - | - | - | - | - | - | - | - |
| 17 | COST A2 | 37579 (53.84) | 29491 (49.96) | 36380 (55.08) | 30783 (54.01) | 43633 (55.37) | 29078 (55.71) | 39417 (56.22) | 29755 (52.79) |
| 18 | Int. on fixed capital @10% per annum | 1606 (2.33) | 1839 (3.08) | 1440 (2.15) | 1664 (2.88) | 1179 (1.46) | 1066 (1.99) | 1428 (1.99) | 1554 (2.71) |
| 19 | COST B1 | 42985 (61.59) | 31331 (53.08) | 37821 (57.26) | 32447 (56.93) | 44812 (56.86) | 30144 (57.75) | 40832 (58.24) | 31310 (55.54) |
| 20 | Rental value of land | 15962 (23.20) | 11556 (19.38) | 15940 (23.81) | 13086 (22.71) | 18860 (23.48) | 12189 (22.83) | 16825 (23.46) | 12205 (21.35) |
| 21 | COST B2 | 58947 (84.46) | 50998 (86.40) | 53762 (81.39) | 45534 (79.89) | 63673 (80.80) | 39022 (74.76) | 57658 (82.24) | 45766 (81.19) |
| 22 | **Family Human Labour** | | | | | | | | |
| | Male | 2458 (3.57) | 1141 (1.91) | 3153 (4.71) | 3186 (5.53) | 4184 (5.20) | 4457 (8.34) | 3184 (4.44) | 2749 (4.81) |
| | Female | 2037 (2.96) | 1515 (2.54) | 3129 (4.67) | 3090 (5.36) | 3779 (4.70) | 3970 (7.44) | 2887 (4.02) | 2724 (4.76) |
| 23 | COST C1 | 47480 (68.03) | 33988 (57.58) | 44104 (66.77) | 38725 (67.94) | 52776 (66.97) | 38572 (73.89) | 46905 (66.90) | 36784 (65.26) |
| 24 | COST C2 | 63443 (90.90) | 53655 (90.90) | 60045 (90.91) | 51811 (90.90) | 71637 (90.90) | 47450 (90.90) | 66730 (90.92) | 51240 (90.90) |
| 25 | 10% Of Cost C2 | 6344 (9.08) | 5365 (9.09) | 6004 (9.08) | 5181 (9.08) | 7163 (9.08) | 4745 (9.09) | 6673 (9.08) | 5124 (9.09) |
| 26 | COST C3 | 69787 (100) | 59021 (100) | 66049 (100) | 56992 (100) | 78801 (100) | 52195 (100) | 70103 (100) | 56364 (100) |
| | Gross income | 96965 | 70368 | 96931 | 79456 | 95601 | 74693 | 96445 | 74392 |
| | B:C Ratio | 1.44 | 1.20 | 1.46 | 1.36 | 1.45 | 1.44 | 1.46 | 1.32 |

(Figure in parentheses indicates the percentages to total cost '$C_3$')

**Per hectare cost of cultivation of soybean for non-beneficiary farmers**

In case of non-beneficiary farms total cost i.e. cost $C_3$ of small, medium, large and overall were Rs.59021.00, Rs.56992.00, Rs.52195.00 and Rs.56364.00, respectively. The share of cost '$A_1$' to total cost was in case of small, medium, large and overall were 49.96 per cent, 54.01 per cent, 55.71 per cent and 52.79 per cent, respectively also share of cost '$B_1$' and cost $B_2$ to total cost $C_3$ of small, medium, large and overall were 53.08 per cent and 86.40 per cent, 56.93 per cent and 79.89 per cent, 57.75 per cent and 74.76 per cent, 55.54 per cent and 81.19 per cent. In non-beneficiary group costs were lower as compared to beneficiary farmers as there was low level of input used.

**Per hectare cost and returns of Soybean for beneficiary and non-beneficiary farmers**

It is revealed from the Table 3 that, in case of beneficiary overall level average gross return worked out to Rs.96445.00. The net return obtain at various costs were Rs.62867.00 at cost '$A_1$', Rs.62867.00 at cost '$A_2$', Rs.61439.00 at cost '$B_1$', Rs.44613.00 at cost '$B_2$', Rs.55366 at cost '$C_1$', Rs.38541 at cost '$C_2$', Rs.32168 at cost '$C_3$'. The highest input-output ratio at cost '$C_3$' was recorded in medium size group i.e.1.46 and lowest input-output ratio at cost '$C_3$' was recorded in small size group i.e.1.44. At overall level the input-output ratio at cost '$C_3$' was 1.46. and large size group input-output ratio was 1.45 respectively. In case of non-beneficiary farmers at overall level input output ratio was 1.32 and for small, medium and large farmers it was 1.20, 1.36 and 1.44

respectively. It's shown that the beneficiary farmers were more profitable than non-beneficiary farmers the impact of gross returns was observed in case of beneficiary farmers due to construction of farm ponds in their field

**Table 3:** Per hectare cost and returns on soybean beneficiary and Non-beneficiary farmers of selected farm ponds

| Sr. No. | Input | Small | | Medium | | Large | | Overall | |
|---|---|---|---|---|---|---|---|---|---|
| | | B | NB | B | NB | B | NB | B | NB |
| 1 | **Yield (qtl)** | | | | | | | | |
| | Main Produce (qtl) | 21.13 | 15.94 | 22.26 | 17.99 | 24.36 | 17.07 | 23.44 | 16.89 |
| | By Produce | 7.31 | 5.13 | 4.81 | 6.93 | 5.2 | 4.32 | 5.94 | 5.83 |
| 2 | Gross returns (Rs.) | 96965 | 70368 | 96931 | 79456 | 95601 | 74693 | 96445 | 74392 |
| | Value of main produce | 95137 | 68531 | 95722 | 77376 | 94041 | 73397 | 94959 | 72644 |
| | Value of by produce | 1828 | 1125 | 1208 | 1732 | 1560 | 1199 | 1486 | 1479 |
| 3 | **Costs (Rs.)** | | | | | | | | |
| | COST $A_1$ | 37579 | 29491 | 36380 | 30783 | 43633 | 29078 | 39404 | 29755 |
| | COST $A_2$ | 37579 | 29491 | 36380 | 30783 | 43633 | 29078 | 39404 | 29755 |
| | COST $B_1$ | 42985 | 31331 | 37821 | 32447 | 44812 | 30144 | 40832 | 31310 |
| | COST $B_2$ | 58947 | 50998 | 53762 | 45534 | 63673 | 39022 | 57658 | 45757 |
| | COST $C_1$ | 47480 | 34773 | 44104 | 38725 | 52776 | 38572 | 46905 | 36784 |
| | COST $C_2$ | 63443 | 53655 | 60045 | 51811 | 71637 | 47450 | 63730 | 51240 |
| | COST $C_3$ | 69787 | 59021 | 66049 | 56992 | 78801 | 52195 | 70103 | 56364 |
| 4 | **Net Return** | | | | | | | | |
| | COST $A_1$ | 59386 | 40876 | 60550 | 48673 | 71054 | 45615 | 62867 | 44637 |
| | COST $A_2$ | 59386 | 40876 | 60550 | 48673 | 71054 | 45615 | 62867 | 44637 |
| | COST $B_1$ | 53980 | 39037 | 59109 | 47008 | 69875 | 44549 | 61439 | 43082 |
| | COST $B_2$ | 38018 | 19370 | 43168 | 33922 | 51014 | 35671 | 44613 | 28635 |
| | COST $C_1$ | 49484 | 35595 | 52826 | 40731 | 61911 | 36121 | 55366 | 37607 |
| | COST $C_2$ | 33522 | 16713 | 36885 | 27645 | 43050 | 27243 | 38541 | 23152 |
| | COST $C_3$ | 27177 | 11347 | 30881 | 22464 | 35887 | 22498 | 32168 | 18027 |
| 5 | **Input-Output ratio** | | | | | | | | |
| | COST $A_1$ | 2.59 | 2.44 | 2.68 | 2.53 | 2.66 | 2.58 | 2.62 | 2.51 |
| | COST $A_2$ | 2.59 | 2.44 | 2.68 | 2.53 | 2.66 | 2.58 | 2.62 | 2.51 |
| | COST $B_1$ | 2.42 | 2.28 | 2.57 | 2.40 | 2.58 | 2.49 | 2.52 | 2.38 |
| | COST $B_2$ | 1.71 | 1.39 | 1.79 | 1.71 | 1.80 | 1.93 | 1.77 | 1.65 |
| | COST $C_1$ | 2.18 | 2.11 | 2.20 | 2.00 | 2.19 | 1.95 | 2.20 | 2.03 |
| | COST $C_2$ | 1.58 | 1.32 | 1.60 | 1.50 | 1.60 | 1.59 | 1.60 | 1.46 |
| | COST $C_3$ | 1.44 | 1.20 | 1.46 | 1.36 | 1.45 | 1.44 | 1.46 | 1.32 |

**Table 4:** Impact of farm ponds on farmers income of soybean production

| Sr. No. | Input | Small | Medium | Large | Overall |
|---|---|---|---|---|---|
| 1 | **Yield** | | | | |
| | Main Produce | 24.56 | 19.18 | 29.92 | 27.94 |
| | By Produce | 29.82 | 44.07 | 16.92 | 1.85 |
| 2 | Gross return (Rs) | 27.42 | 18.02 | 21.87 | 22.86 |
| | Value of main produce | 27.96 | 19.16 | 21.95 | 23.49 |
| | Value of by produce | 38.45 | 43.37 | 23.14 | 0.47 |
| 3 | **Costs (Rs)** | | | | |
| | COST $A_1$ | 21.52 | 15.38 | 33.35 | 24.48 |
| | COST $A_2$ | 21.52 | 15.38 | 33.35 | 24.48 |
| | COST $B_1$ | 27.11 | 14.20 | 32.73 | 23.31 |
| | COST $B_2$ | 13.48 | 15.30 | 38.71 | 20.64 |
| | COST $C_1$ | 26.76 | 12.19 | 26.91 | 21.57 |
| | COST $C_2$ | 15.42 | 13.71 | 33.76 | 19.59 |
| | COST $C_3$ | 15.42 | 13.71 | 33.76 | 19.59 |
| 4 | **Net Return** | | | | |
| | COST $A_1$ | 31.16 | 19.61 | 35.80 | 28.99 |
| | COST $A_2$ | 31.16 | 19.61 | 35.80 | 28.99 |
| | COST $B_1$ | 27.68 | 20.47 | 36.24 | 29.87 |
| | COST $B_2$ | 49.05 | 21.41 | 30.07 | 35.81 |
| | COST $C_1$ | 28.06 | 22.89 | 41.65 | 32.07 |
| | COST $C_2$ | 50.14 | 25.05 | 36.71 | 39.92 |
| | COST $C_3$ | 58.24 | 27.25 | 37.30 | 43.95 |

At overall level the change in yield obtained from farmers was 27.94 per cent. The yield obtained from small beneficiary group of farmers was 21.13 qtl. Per ha. and non-beneficiary group of farmers was 15.94 qtl. Per ha. The per cent change in the yield of small group of farmers was 24.56 per cent. The yield obtained from medium beneficiary group of farmers was 22.26 qtl. Per ha. and non-beneficiary group of farmers was 17.99 qtl. Per ha. The change in yield of medium group of farmers was 19.18 per cent. The yield obtained from large beneficiary group of farmers was 24.36 qtl. Per ha. and non-beneficiary group of farmers was 17.07 qtl. Per ha. The change in yield of large group of farmers was 29.92 per cent. The yield obtained from beneficiary group of farmers was more than the non-beneficiary group of farmers. This impact may be due to the availability of water present in the farm pond which was constructed in beneficiary group of farmers

## Conclusion

It can be concluded that in case of small, medium, large and at overall level higher per hectare input used more in beneficiary farmers than non-beneficiary farmers. The beneficiary farmer per hectare cost of cultivation of soybean for the sample as an overall was Rs.70103.00 i.e. cost '$C_3$'. In case of non-beneficiary farmer per hectare cost of cultivation for soybean crop for the sample as an overall was Rs.56364.00 i.e. cost '$C_3$'. There was more per hectare cost of cultivation in case of beneficiary farmers than non-beneficiary farmers. The per hectare cost and returns from soybean in case of beneficiary at overall level average gross returns worked out to the net returns obtained from soybean crop by beneficiary farmer are greater than non-beneficiary farmer. Input-output ratio was

also greater than non-beneficiary that means the beneficiary farmers was more profitable as compared to non-beneficiary farmers.

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