

Benefit-cost Analysis of Tenant Farmers: A Case Study of Sugarcane Cultivation

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Abstract

The present paper has been designed to study input-output ratio, cost and return pattern of sugarcane cultivation for the tenant as well as the owner farmers. The study has been based on the primary data collected from 60 farmers (40 tenant and 20 owner), spread over sub mountainous zone of Punjab pertaining to the year 2017-18. The study highlighted that the operational cost of sugarcane cultivation per hectare was found slightly lower (Rs.94621) in case of tenant farmers as against Rs.96144 for owner farmers. The returns over variable cost was found to be higher on tenant farms (Rs.200081/ha) as compared to owner farms (Rs.187784/ha). Total cost of cultivation (C_2) was also observed to be lower in case of tenant farmers (Rs.177578/ha) as compared to (Rs.186846/ha) on owner farmers, resulting into the higher profitability of tenant farmers (Rs.117124 / ha) in relation to (Rs. 97082/ ha) owner farmers. The benefit-cost ratio was recorded 1.66 in case of tenant farmers as compared to 1.52 in owner farmers. The study emphasizes to strengthen tenant farmers for optimum utilization of fallow land or farm resources.

Keywords: Tenant farmers, Cost of cultivation, Return structure

JEL Classification: Q15, R14, R52

Introduction

Land is one of the most important assets of a farmer, providing food for the family while surplus yield can be used to earn income. For those with no land or insufficient land for their needs, acquiring land through leasing goes a long way in determining their future security. For land owners, extra income can be acquired by leasing land to others in exchange for cash or a portion of the harvest. When drawing up lease, some

factors play a key role i.e. flexibility and financial implication of the length of lease, degree of freedom and control given to tenant farmers (Bansal 2018). Lease farming not only results in improved utilization of land and labour, but also provides income to both tenants and land owners. Leasing also helps to utilize the available land of landowners and surplus labour of the tenant households more efficiently, as many landowners would prefer to lease-out land under various socio-economic compulsions and tenants do prefer

to lease in land, to improve their socio-economic status.

In Punjab, nearly half (43.18%) of farmers were in medium farmers, followed by 25.93 per cent large and 21.56 per cent semi-medium farmers respectively (Anonymous 2017). The proportion of operational holding and area leased-in were comparatively higher in the marginal and small farmers while medium and semi-medium farmers had comparatively lower proportion of their total area under lease cultivation (Haque 2001). The marginal and small farmers accounted for about 34 per cent of the total operational holdings during 2010-2011 (Anonymous 2015). To increase the operational size of holding, small and marginal farmers cultivate land under different tenure systems.

Leasing of land had been in vogue since long but its magnitude varied over time. The changes in production and productivity pattern had affected the land lease pattern agreements. During the Green Revolution period Punjab experienced a technological change, which resulted in a vital change in productivity of resources. But over the past decade, Punjab is not considered prosperous as compared to other states due to downfall in its economy. This downfall occurs due to stagnant productivity, high cost of production, less per capita income and indebtedness (Bansal 2018). The main cause of agrarian crisis is small and marginal farmers who find it difficult to survive and pushed out from agriculture sector. This shows that there is a decline in the number of cultivators and shifting towards the non-farm activities (Singh *et al* 2009).

With the ever rising population and disguised unemployment in agriculture, the

land labour ratio is declining more rapidly than rise in land and labour productivity (Mani and Pandey 1997). In our country, the marginal holdings are increasing and the average size of holding is declining. However, this trend is reverse in Punjab. The number of marginal and small operational holdings was about five lakh during 1991, which declined to about 3.59 lakh during 2010-11 (Sharma *et al.* 2014). This shows that about 1.41 lakh marginal and small farmer have left farming. Out of these farmers 36 per cent sold their whole land, 12 per cent sold some part of their land and remaining 52 leased in/out their entire land (Singh 2017). They are forced to sell/lease out their land primarily due to an increase in the cost of production, declining water table, falling returns and increasing uncertainty on account of erratic weather condition. In such a situation, how the tenant farmers, especially, survive in farming and how they cope up in the present scenario of agricultural crisis in the state. Thus, it becomes necessary to examine the cost and return pattern of sugarcane crop in tenant and owner farmers and the various policy implications needed to strengthen the tenant farming in sub-mountainous zone of Punjab state.

Data Sources and Methodology

The primary data at farmers' field were collected from sub-mountainous zone of Punjab through multistage random sampling technique. At the first stage, one district was selected randomly from the respective zone. At the second stage, two blocks from each of the selected district was taken randomly. At the third stage, two clusters (2-4 villages) from each block were randomly chosen. At the final stage, 10 tenant farmers were randomly chosen from each cluster and making 40 in all for the ultimate survey. The

operational definition of tenant farmers refers to, those farmers whose leased-in land was more than that of his owned land. To make the comparative study with owner land holdings, 5 owner farmers from each village representing the similar agro-socio economic background/ characteristics were taken as a control group (20 in all). Thus the study has been based on the total sample of 60 farmers (40 tenant farmers + 20 owner farmers). Further, tenant farmers were divided into two groups i.e. low intensity tenant (whose leased-in land was (50-75%) of the operational holding) and high intensity tenant (whose leased-in land was (≥ 75) % of the operational holding).

Description statistics such as averages, percentages were used. Student- t test was used to examine the significant difference in input utilization and productivity level between tenant and owner farmers. The cost of cultivation is the total expenses incurred in obtaining the produce. It includes both variable costs (hired human labour, family human labour, hired machine labour, owned machine labour, seeds, fertilizers, insecticides, pesticides, irrigation, interest on working capital) and fixed cost (land rent, land revenue, depreciation of fixed farm assets, interest on fixed capital). The gross income of crops has been estimated by multiplying the production of main product with their respective post harvest period prices. The return over variable cost has been calculated by deducting total variable cost from the gross income and net income by deducting total cost from the gross income.

Results and Discussion

The results have been discussed under sub-heads i.e. cost of cultivation based on components of sugarcane crop in tenant and

owner farmers and benefit-cost ratio of tenant farmers as well as owner farmers in sub-mountainous zone of Punjab state

Cost of cultivation based on components of sugarcane crop in tenant and owner farmers

The components of cost given under the study of cost of cultivation of sugarcane crop by tenant and owner farmer have been rearranged so as to throw light on the variable cost and fixed cost.

Variable cost

The difference in various variable/ operational cost components among tenant as well owner farmers revealed that seedling cost was observed more Rs.32159 in low intensity tenant farmers, followed by Rs. 31930 in tenant farmers and Rs.31700 in high intensity tenant farmers. The average expenditure on chemical fertilizers found to be more in case of owner farmers i.e. Rs. 6581, followed by Rs.6024 in high intensity tenant farmers and Rs.5888 in tenant farmers. Among the total cost on fertilizers, the higher expenditure was found in DAP, followed by urea and other micro nutrients (MoP, zinc sulphate, iron etc) in tenant as well as owner farmers. The expenditure on Dap found to be Rs.4273 in owner farmer and Rs.3196 among tenant farmers. The cost of crop protection has shown slight difference i.e. Rs.5206 in tenant farmers and Rs.5005 in owner farmers. In cultivation of any crop, human labour plays an important role for cultivating that crop. The cost of human labour in study of sugarcane crop contributes nearly 44 per cent of operational cost. The cost of human labour was found Rs.40817 in tenant and Rs.42799 in owner farmers. In case of group wise scenario of tenant farmers, the cost of human

Table 1: Cost of cultivation of sugarcane crop of sampled farmers in study area, 2017-18 (Rupees per hectare)

| Particulars | Tenant Farmers | | | Owner Farmers (N=20) |
|--|---------------------------------|----------------------------------|-----------------|-------------------------|
| | Group I (n ₁ =12) | Group II (n ₂ =28) | Total (N=40) | |
| Variable cost components | | | | |
| Seed | 32159 | 31700 | 31930 | 31240 |
| Fertilizers | 5751 | 6024 | 5888 | 6581 |
| Plant Protection | 5329 | 5082 | 5206 | 5005 |
| Human Hours | 40508 | 41126 | 40817 | 42799 |
| Tractor Use | 5940.35 | 5700 | 5820 | 5610 |
| Irrigation charges@ | 3427 | 3242 | 3335 | 3255 |
| Interest on working capital# | 1630 | 1625 | 1627 | 1654 |
| Total variable cost | 94744 | 94498 | 94621 | 96144 |
| Fixed cost components | | | | |
| Weighted average of rental value for crop period | 81510 | 80275 | 80893 | 83274 |
| Depreciation | 980 | 558 | 769 | 2334 |
| Interest on Fixed Capital | 1523 | 1067 | 1295 | 5093 |
| Total fixed cost | 84014 | 81901 | 82957 | 90702 |

Note: #calculated at the rate of 7 per cent per annum for half of the crop period

@ represents wear and tear of irrigation equipment and cost of diesel consumption

labour was recorded more i.e. Rs.41126 in high intensity tenant farmers as compared to Rs.40508 in low intensity tenant farmers. However, the cost of tractor usage was observed high Rs.6078 in owner farmers as compared to Rs.5820 in tenant farmers and Rs.5700 in group II tenant farmers. Further, it was found that the share of interest on working capital in operational cost remained same i.e. 1.7 per cent among sampled farmers of study area. But the variable cost was found slightly more i.e. Rs.96144 in owner farmers as compared to Rs.94621 in tenant farmers. Thus it was concluded that respective share of different cost components i.e. seed, fertilizers, plant protection, human labor and tractor use and operational cost itself did not show any significant difference in both owner and

tenant farmer (Prakash *et al*, 2013).

Fixed cost

It had the highest impact in increasing the total cost among tenant farmers as well as owner farmers. The per hectare fixed cost in cultivating of sugarcane crop was found to be more i.e. Rs.90702 in owner farmer, followed by Rs.84014 in group I tenant farmers and Rs.82957 in group II tenant farmers. The underlying reason for this variation in rent paid for leased-in land by different size groups of tenant can be attributed to the proportion of rental land in total area. On the other hand, it was found that expenditure on depreciation and interest on fixed capital was comparatively higher in case of owner farmer than that of tenant farmer. It was concluded

that average farm machinery (tractor, trolley, leveler, Rotavator etc) was comparatively higher in land lord farmers as compared to tenant farmers (Tilekar 2000).

Benefit-cost ratio of tenant farmers as well as owner farmers

Cost structure

The analysis of Table 2 revealed that the contribution of cost components in total cost was relatively lower in case of tenant farmers as compared to owner farmers. The total cost of cultivation of sugarcane crop was recorded slightly more in owner farmers as compared to tenant farmers. It might be due to including both the imputed value of owned land and rental value of leased-in land.

Returns structure

The study highlighted that the gross returns of sugarcane cultivation on per hectare was found slightly higher (Rs.294702) in case of tenant farmers as against Rs.283928 for owner farmers. It implied that tenant farmer tried to earn maximum profit from leased-in land by taking particular crop in particular season during a short period of time (Birari *et al.* 2000). The returns over variable cost was found to be higher on tenant farms (Rs.200081/ha) as compared to owner farms (Rs.187784/ha). Net returns (return over total cost) was also observed to be higher in case of tenant farmers (Rs.117124/ha) as compared to (Rs. 97082/ha) on owner farmers, resulting into the higher profitability of (39.74%) tenant farmers in relation to (34.19%) owner farmers. Thus it was concluded that tenant farmers had achieved highest level of land productivity in term of monetary value as compared to owner farmer (Malla *et al.* 2007).

Benefit-cost analysis

The analysis revealed that by investing one unit on cultivating sugarcane crop, how much return the tenant and owner farmer get from it. The benefit-cost ratio (Gross returns/ Total variable cost) was found slightly higher in tenant farmers as compared to owner farmers. While the ratio (Gross returns/ Total cost) was also observed to be higher in case of tenant farmers (1.66) as compared to (1.52) on owner farmers, resulting that tenant farmers were more efficient in inputs use for cultivation as compared to owner farmers (Ebong *et al.* 2011).

Conclusion and Policy Implications

The empirical finding on cost of cultivation, returns structure among owner and tenant farmer has thrown some light on the type of adjustment required in the existing form of leasing characteristics for optimal utilization of available resources. Furthermore, it was observed that tenant farmers were more efficient as compared to owner farmers in order to increase the returns, profit maximization and cost minimization for growing sugarcane crop in the study area. It might be due to less investment made by tenant farmers on purchasing expensive farm machinery for cultivation of land. The study also revealed that the tenant farmers preferred to hire machinery from cooperative society instead of buying and cultivating lands themselves instead of hiring labour to lower the total cost. In order to encourage the tenant farming various policy implications are recommended from the study i.e. The Punjab land leasing and tenancy bill 2019, if applied effectively at ground level, will not only help to increase the income and productivity of tenant farmers' land significantly, it will also

Table 2. Per hectare cost and returns from sugarcane crop in study area, 2017-18

| Particulars | Tenant Farmers | | | Owner Farmers (N=20) |
|--------------------------------|---------------------------------|----------------------------------|-----------------|-------------------------|
| | Group I (n ₁ =12) | Group II (n ₂ =28) | Total (N=40) | |
| Cost structure | | | | |
| Total variable cost(Rs/ha) | 94744 | 94498 | 94621 | 96144 |
| Difference | | | | -1523 |
| TVC % of TC | 53 | 53.57 | 53.28 | 51.46 |
| Total fixed cost (Rs/ha) | 84014 | 81901 | 82957 | 90702 |
| Difference | | | | -7745*** |
| TFC % of TC | 47 | 46.43 | 46.72 | 48.54 |
| Total cost (TVC+TFC) (Rs/ha) | 178758 | 176399 | 177578 | 186846 |
| Difference | | | | -9268*** |
| Returns structure | | | | |
| Yield | | | | |
| Main product (Q/ha) | 926.25 | 876.85 | 901.55 | 866.26 |
| By product (Q/ha) | 179.07 | 179.07 | 179.07 | 181.01 |
| Gross Returns | | | | |
| Main product(Rs/ha) | 287138 | 271824 | 279481 | 268541 |
| By product (Rs/ha) | 15221 | 15221 | 15221 | 15386 |
| Total (Rs/ha) | 302359 | 287045 | 294702 | 283928 |
| Difference | | | | 10774** |
| Returns over cost | | | | |
| ROVC (Rs/ha) | 207615 | 192547 | 200081 | 187784 |
| Difference | | | | 12297** |
| ROVC % of Gross returns | 68.67 | 67.08 | 67.89 | 66.14 |
| Net returns(Rs/ha) | 123601 | 110646 | 117124 | 97082 |
| Difference | | | | 20042** |
| Net returns % of Gross returns | 40.88 | 38.55 | 39.74 | 34.19 |
| Benefit-cost analysis | | | | |
| Total variable cost | 3.19 | 3.04 | 3.11 | 2.95 |
| Total cost | 1.69 | 1.63 | 1.66 | 1.52 |

Notes: ***, **, * represents significance upto 1, 5 and 10 per cent levels, respectively,

Difference represents difference between tenant farmers from owner farmers,

ROVC: Returns over variable cost, TC: Total Cost, TVC: Total variable cost, TFC: Total fixed cost

help overall agricultural growth while helping the government double farmers' income. The operational cost was reported less in tenant farmers which clearly depicted that tenant

farmer efficiently used the inputs and even the net returns were also comparatively higher in case of tenant farmers who show the quote of "money saved is money earned". The

study revealed that tenant farmers were more efficient than owner farmers. The profitability was observed comparatively higher in tenant farmers. Thus, the government may ensure an adequate size of holding i.e. operational land holding should be distributed uniformly among all farm groups on account of providing sustainable income and livelihood to all farmers.

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