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### A comparative economic study on cultivation of summer crops grown in Khanakul–I block of Hooghly district in West Bengal

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#### Abstract

This study was conducted in Khanakul-I block in Hooghly district of West Bengal. The agricultural households in a village were completely enumerated in respect of area under different crops. Fifty agricultural households were randomly selected as sample households from 117 agricultural households by the technique of Simple Random Sampling Without Replacement (SRSWOR). Three summer crops like boro paddy, sesame and groundnut were taken in the purview of the study. Necessary primary data on various aspects of these crops were collected from sample agricultural households. The concept of cost C was used in cost of cultivation of these three crops. Values of main product and by-product were taken into account while estimating gross returns of these crops. Size class wise comparison among these three summer crops was attempted in respect of costs, gross returns and net returns. The reference period of the study pertained to 2015-16 agricultural year. The study revealed that sample farmers belonged to either marginal size class or small size class. Both the size classes of farms cultivated other crops like aman paddy, mustard, potato besides groundnut, sesame and boro paddy. Percentage of net sown area under groundnut was higher in marginal size class than in small size class of farms. A reverse picture was noted in the case of sesame and boro paddy. The results of the study also indicated cultivation of groundnut and boro paddy in leased-in land besides owned land. As a whole, net sown area under groundnut was 61.52 of the total net sown area. The corresponding figures for sesame and boro paddy were 9.69 per cent and 28.79 per cent respectively. Per hectare cost of cultivation of groundnut was slightly higher in small size class as compared to that in marginal size class of farms. Per hectare cost of cultivation of sesame was also recorded higher in small size class of farms. A negligible difference in per hectare cost of cultivation of boro paddy was found between two size classes of farms. Comparison among these crops indicated the highest per hectare cost of cultivation in groundnut. The lowest cost of cultivation was recorded for sesame in this study. As regards gross return relative positions of these three crops were same as those for per hectare cost of cultivation. Gross return per hectare of groundnut was 57.44 per cent higher than that of boro paddy and 136.16 per cent higher than that of sesame. Return cost ratio was highest for groundnut and it was lowest for boro paddy. Net return per hectare of groundnut exceeded boro paddy and sesame by amounts of Rs. 43393 and Rs. 44183 respectively. Due to risk situation arising from cyclone and undesirable sudden rainfall in summer season farmers followed diversified farming in this season.

**Keywords:** Summer crops, cost C, gross return, net return, return cost ratio

#### Introduction

Agriculture remains a cornerstone of the Indian economy, with a significant proportion of the population relying on farming for their livelihoods. In West Bengal, particularly in the Khanakul- I block of the Hooghly district, the cultivation of groundnut, sesame and boro paddy forms a major part of agricultural practices in summer season. Understanding the economics of these crops is essential for formulating policies that can improve the welfare of farmers, especially those with marginal and small landholdings. Previous studies highlighted the multifacet challenges and opportunities within the agricultural sector in India. For instance, Chand *et al.* (2011)<sup>[2]</sup> and Birthal *et al.* (2012)<sup>[1]</sup> emphasized the importance of technological

adoption and efficiency improvements to enhance productivity among smallholders. Similarly, Upadhaya *et al.* (2022)<sup>[10]</sup> underscored the critical role of crop diversification in improving income stability and resilience among farmers. Groundnut cultivation was studied for its economic viability and productivity potential. According to Patel *et al.* (2022)<sup>[8]</sup>, groundnut offered significant economic benefits due to its high demand and market value. However, studies by Katema *et al.* (2017)<sup>[5]</sup> indicated that labor costs and land tenure issues posed substantial challenges to profitability. Sesame, as explored by Myint *et al.* (2020)<sup>[6]</sup>, offered advantages in terms of low input requirements and drought resistance, making it suitable for small and marginal farmers. Nevertheless, market

fluctuations and price volatility remained critical concerns. Boro paddy, a staple food in West Bengal, was extensively analyzed for its intensive labor and water requirements. Studies by Chowdhury *et al.* (2020)<sup>[3]</sup> suggested that while boro paddy yielded high returns, it was also susceptible to environmental risks and high input costs. Recent literature also pointed to the growing importance of understanding land tenure dynamics. A study by Ghatak and Roy (2007)<sup>[4]</sup> highlighted that secure land tenure and access to land were crucial for improving agricultural productivity and economic stability for smallholders. Sarker *et al.* (2023)<sup>[9]</sup> examined the economic resilience of small farmers in West Bengal, suggesting that diversification and improved access to credit were vital for sustaining agricultural livelihoods.

### Methodology

The study was conducted in Hooghly district of West Bengal. For the purpose of the study one village was selected from Khanakul-I block which was selected purposively. All the cultivator households in the selected village were completely enumerated in respect of land

holding. Out of 117 cultivator households in the village 50 were selected as samples in the study by the technique of Simple Random Sampling without Replacement. The study was based on primary data. Data were collected by survey method from sample agricultural households of the study area with pretested schedule. Data were collected on area under different crops in different seasons. Among various crops grown by the farmers in the area under study in a year cultivation of summer crops like groundnut, sesame and boro paddy were taken in the purview of this study. Data were also collected on quantity of inputs used in various crops, input prices, value of output of all crops, etc. Comparison among these three crops was attempted based on cost and return analysis. Cost C of these three crops were estimated to work out net returns of the crops concerned in the study. Both values of main product and by product of these crops were taken into consideration while estimating gross return of these crops. Tabular method of analysis was extensively used in the study. This was a cross sectional study and the reference period of the study was 2015-16 agriculture year.

**Table 1:** Agricultural holdings (in hectare) of sample agricultural households in different size classes of farms

Size class (Col. 1)	No. of agricultural households (Col. 2)	Operational holding(ha)				Average size of operational holding (ha) (Col.7)
		Owned land (Col.3)	Leased -in land (Col.4)	Leased- out land (Col.5)	Total operated land (Col.6)	
Marginal (<1ha)	34 (68.00)	22.76 (53.29)	1.07 (4.49)	-	23.83 (53.94)	0.70
Small (1-2ha)	16 (32.00)	19.95 (46.71)	2.54 (12.48)	2.14 (12.02)	20.35 (46.06)	1.27
Semi- medium (2-4ha)	-	-	-	-	-	-
Medium (4-10ha)	-	-	-	-	-	-
Large (>10ha)	-	-	-	-	-	-
Combined	50 (100.00)	42.71 (100)	3.61 (8.17)	2.14 (5.28)	44.18 (100)	0.88

**N.B.:** i) Figure in parentheses in col.2, col.3 & col.6 indicate percentages to total (combined) land.

ii) Figure in parentheses in col.4 indicates percentages to total operated area in the respective size class.

iii) Figure in parentheses in col.5 indicates percentages to total owned land in the respective size class.

Land holdings of agricultural households in different size classes are presented in table - 1. Two size classes of agricultural households were found to exist in the area under study. The agricultural households either belonged to marginal or small size class. Both the marginal and small size classes of agricultural households were reported to have leased in land, i.e. they do their cultivation in owned land and leased -in land. A portion of owned land was also found to be leased-out by the agricultural households in small size class. It was noted that agricultural households in marginal size class accounted for 68 per cent of the total agricultural households. The corresponding figure for small size class of agricultural households was observed to be 32 per cent. Owned land of marginal and small size classes of farmers was noted to be 53.29 per cent 46.71 per cent respectively of

the total owned land. Leased-in lands in marginal and small size classes were observed to be 4.49 per cent and 12.48 per cent respectively of the total operated land. The marginal farmers were found to lease-out their land to the extent of 12.20 per cent. Operated lands in marginal and small size classes were noted to account for 53.94 per cent and 46.06 per cent respectively. Average size of operational holding in marginal size class was found to be 0.70 hectare. This was noted to be 1.27 hectare for small farmers. As a whole, leased-in land accounted for 8.17 per cent of the operated land. Agricultural land which was leased out by the farmers in the area under study was noted to be 5.28 per cent of the owned land. Average size of operational holding of the farmers was observed to be 0.88 hectare.

**Table 1:** Area of land (ha) under different crops in two size classes of farms

Size class	No. of farmers	Groundnut			Potato			Mustard	Sesame	Aman Paddy	Boro Paddy			Gross cropped area	Cropping intensity
		Owned land	Leased inland	Total	Owned land	Leased -In land	Total				Owned land	Leased -In land	Total		
Marginl (<1ha)	34	15.80	0.40	16.20 (22.66)	21.02	0.27	21.29 (29.78)	2.54 (3.55)	1.07 (1.50)	23.83 (33.33)	6.16	0.40	6.56 (9.18)	71.49 (100.00)	300.00
Small (1-2ha)	16	10.04	0.94	10.98 (17.99)	17.14	0.80	17.94 (29.38)	2.41 (3.95)	3.21 (5.26)	20.35 (33.33)	5.36	0.80	6.16 (10.09)	61.05 (100.00)	300.00
Combined	50	25.84	1.34	27.18 (20.51)	38.16	1.07	39.23 (29.60)	4.95 (3.73)	4.28 (3.23)	44.18 (33.33)	11.52	1.20	12.72 (9.60)	132.54 (100.00)	300.00 (100.00)

**N.B.:** Figures in parentheses indicates percentage area of different crops to gross cropped area in each of the size classes.

Area under different crops in two size classes of farms is displayed in table -2. It was found that six crops such as groundnut, potato, mustard, sesame, aman paddy, and boro paddy were grown in both the size classes of farms. Area under aman paddy was noted to account for 33.33 per cent in both the size classes and this was the highest per cent of the gross cropped area in the respective size class. Next to this crop, a large area was found to be allocated to potato. Area under this crop accounted for 29.78% and 29.39% respectively in marginal & small size classes. Also there was no wide difference between these two size classes in respect of allocation of land to mustard and boro paddy. Area under groundnut was noted to be slightly higher in marginal size class than in small size class. But in case of sesame percentage of gross cropped area was observed to be higher in small size class than in marginal size class. As a whole, the crops covering subsequently the higher percentage area were mustard, boro paddy, groundnut, potato and aman paddy. A lowest percentage area was found to be allocated to sesame. It may be mentioned that groundnut, sesame and boro paddy are contemporary crops which are grown in summer season. As these crops are grown in the area under study in the same season these may

be alternative crop enterprises to the farmers in one hand and on the other hand these crops may be undertaken for diversification of farming in summer season.

**Table 2:** Percentage allocation of net sown area in two size classes of farms

Size class	Percentage of net sown area			
	Groundnut	Sesame	Boro paddy	Net sown area(ha)
Marginal	67.98	4.49	27.53	23.83 (100.00)
Small	53.96	15.77	30.27	20.35 (100.00)
Combined	61.52	9.69	28.79	44.18 (100.00)

**N.B.:** It was noted that a sizable net sown area was allocated to groundnut in summer seasons

A comparison was attempted among groundnut, sesame and boro paddy in respect of net sown area (operated area). It was noted that a sizable net sown area was covered by groundnut in summer seasons. Among these three crops the highest per cent of net sown area (NSA) was noted to be allocated to groundnut in both the size classes of farms. As a whole, groundnut, sesame and boro paddy accounted for 61.52 per cent, 9.69 per cent and 28.79 per cent respectively of total NSA.

**Table 3:** Costs of cultivation of Groundnut in two size classes of farms (Rupees)

Size class	Seeds	Irrigation	PPC	Human labour	Machine labour	Interest on working capital	Land revenue	Depreciation cost	Miscellaneous	Imputed interest on Fixed capital (excluding land)	Rental value of owned land	Rent paid for leased-in land	Total cost
Marginal (<1ha)	196425 (12125)	121500 (7500)	26017 (1606)	577579 (35653)	49199 (3037)	43174 (2665)	766 (48)	8975 (554)	20509 (1266)	9953 (614)	415992 (26328)	15802 (39506)	1485891 (91722)
Small (1-2ha)	145397 (13242)	82350 (7500)	17864 (1627)	414099 (37714)	32797 (2987)	31968 (2911)	458 (46)	10167 (926)	13582 (1237)	12134 (1105)	264001 (26295)	37071 (39437)	1061888 (96711)
Combined	341822 (12576)	203850 (7500)	43881 (1615)	991678 (36486)	81996 (3017)	75142 (2765)	1224 (47)	19142 (704)	34091 (1254)	22087 (813)	679993 (26316)	52873 (39457)	2547779 (93737)

**N.B.:** Figures in parentheses indicate per ha cost of various items

PPC – Plant protection chemical.

Costs of cultivation of groundnut in two size classes are displayed in table – 4. Various items of costs were taken in to account. Among various items of costs per hectare rent paid for leased-in land was found to be highest in both the size classes. These were noted to be Rs.39506 per hectare and Rs. 39437 respectively in marginal and small size classes of farms. Next to this item of cost, human labour cost per hectare was found to be higher than any other items of cost in both the size classes. The other items of cost in descending order of sequence were rental value of owned land, cost of seeds, cost of irrigation, charges for machineries and implements, cost of plant protection

chemicals, miscellaneous expenses, imputed interest on fixed capital, depreciation cost and land revenue. These items of costs were found to range from Rs. 48 per ha to Rs. 26328 per ha in marginal size class. In small size class these items of costs ranged from Rs.926 to Rs. 26295 per hectare. It was found that there was no wide difference between two size classes in respect of each individual item of costs. This crop was grown after potato in which huge quantity of manures and fertilizers was reported to be applied. Cost of cultivation of groundnut was observed to be Rs. 91722 per ha in marginal size class. This was noted to be Rs. 96711 per ha in small size class. As a whole, the relative positions

of different items of costs on per hectare basis were same as those in marginal and small size classes. As a whole cost of

cultivation of this crop was estimated to be Rs. 93737 per ha.

**Table 4:** Costs of cultivation of sesame in two size classes of farms (Rupees)

Size class	Seeds	Manure & fertilizer	Irrigation	PPC	Human labour	Machine labour	Interest on working capital	Land revenue	Depreciation cost	Misc.	Imputed interest on fixed capital (excluding land)	Rental value of owned land	Total Cost
Marginal (<1ha)	400 (374)	737 (689)	8025 (7500)	1700 (1589)	18286 (17090)	2582 (2413)	1269 (1186)	52 (48)	593 (554)	654 (612)	657 (614)	11038 (10316)	45993 (42984)
Small (1-2ha)	1200 (374)	2770 (863)	24075 (7500)	5200 (1620)	61709 (19224)	9600 (2991)	4511 (1405)	147 (46)	2972 (926)	2298 (716)	3547 (1105)	36655 (11419)	154684 (48188)
Combined	1600 (374)	3507 (819)	32100 (7500)	6900 (1612)	79995 (18691)	12182 (2846)	5780 (1350)	199 (46)	3565 (833)	2952 (690)	4204 (982)	47693 (11143)	200677 (46887)

**N.B.:** Figures in parentheses indicate per ha cost of various items.

PPC – Plant protection chemical.

Costs of cultivation of sesame in two size classes of farms are presented in table 5. Among different items of costs, cost of seeds, manures and fertilizers, human labour, rental value of owned land, irrigation charges, charges for machineries and implements, cost of plant protection chemicals, interest on working capital were found to be recorded in both the size classes of farms. These items of costs were noted to range from Rs.374 to Rs. 17090 per ha

in marginal size class. In small size class these items of costs were noted to vary from Rs.374 to Rs. 19224 per hectare. However, cost of cultivation of sesame was estimated to be Rs. 42984 per ha in marginal size class. In small size class this was estimated to be Rs. 48188 per hectare. As whole, cost of cultivation of this crop was estimated to be Rs. 46887 per hectare.

**Table 5:** Costs of cultivation of Boro paddy in two size classes of farms (Rupees)

Size class	Seeds	Manure & fertilizer	Irrigation	PPC	Human labour	Machine labour	Interest on working capital	Land revenue	Depreciation cost	Misc.	Imputed interest on fixed capital (excluding land)	Rental value of owned land	Rent paid for leased-in land	Total Cost
Marginal (<1ha)	22875 (3487)	36546 (5571)	66938 (10204)	26063 (3973)	209100 (31875)	20937 (3192)	12760 (1945)	318 (48)	3634 (554)	6586 (1004)	4031 (614)	103580 (16815)	10093 (25233)	523461 (79796)
Small (1-2ha)	19989 (3245)	37083 (6020)	60337 (9795)	23999 (3896)	188496 (30600)	18520 (3006)	12055 (1957)	281 (46)	5704 (926)	5920 (961)	6807 (1105)	89013 (16607)	19934 (24918)	488138 (79243)
Combined	42864 (3370)	73629 (5788)	127275 (10006)	50062 (3936)	397596 (31258)	39457 (3102)	24815 (1951)	599 (47)	9338 (734)	12506 (983)	10838 (852)	192593 (16718)	30027 (25023)	1011599 (79528)

**N.B.:** Figures in parentheses indicate per ha cost of various items.

PPC – Plant protection chemical

Cost of boro paddy in two size classes of farms are furnished in table 6. Boro paddy was reportedly grown in owned land and leased-in land by the farmers in both the size classes. Among various items of cost, cost of human labour was found to be highest in both the size classes of farms. In marginal and small size classes these costs were noted to be Rs.31875 and Rs. 30600 per hectare respectively. The other notable items of costs in descending order of sequence were rent paid for leased-in land, rental value of owned land, irrigation charges, cost of manures and fertilizers, cost of plant protection chemicals, cost of seeds, charges for machineries and implement, interest on working capital.

These items of costs ranged from Rs. 1945 per ha to Rs. 25233 per ha in marginal size class. In small size class these

items of costs were found to vary from Rs. 1957 per ha to Rs. 21410 per hectare. The other items of costs were noted to be low and each of these was estimated to be below Rs.1000 per hectare in both the size classes. Among the notable items of costs almost all the items of costs per ha were found to be slightly higher in marginal size class than those in small size class of farms. However, cost of cultivation per hectare of boro paddy was estimated to be Rs. 79796 per ha in marginal size class. In small size class this was Rs. 79243 per hectare. As a whole, the positions of different items of costs in respect of their amounts per hectare were found to be same as those in two size classes of farms. As a whole, cost of cultivation of this crop was estimated to be Rs. 79528 per hectare.

**Table 6:** Gross returns (GR) of groundnut, sesame and boro paddy (Rupees)

Size class	Groundnut			Sesame			Boro paddy			Per hectare GR of Ground nut higher than		Return cost ratio		
	Main Product	By - Product	Total	Main Product	By - Product	Total	Main Product	By - Product	Total	Boro Paddy (%)	Sesame (%)	Groundnut	Sesame	Boro paddy
Marginal (<1ha)	2547013 (157223)	12150 (750)	2559163 (157973)	64623 (60395)	1605 (1500)	66228 (61895)	639712 (97517)	22140 (3375)	661852 (100892)	56.57	155.23	1.72	1.43	1.26
Small (1-2ha)	1724058 (157018)	8235 (750)	1732293 (157768)	215105 (67011)	4815 (1500)	219920 (68511)	593023 (96270)	20790 (3375)	613813 (99645)	58.33	130.28	1.63	1.42	1.25
Combined	4271070 (157140)	20385 (750)	4291455 (157890)	279728 (65357)	6420 (1500)	286148 (66857)	1232735 (96913)	42930 (3375)	1275665 (100288)	57.44	136.16	1.68	1.42	1.26

**N.B.:** Figures in parentheses indicate per hectare gross return.

Gross returns accrued from different crops grown by two size classes of farms are presented in table 7. It was found that the farmers also earned returns from by-products from all the crops. Among three crops the highest gross return per hectare was noted to be accrued from groundnut in both the size classes. The other crops generating gross return per hectare in descending order were boro paddy and sesame. This order of relative positions of these crops in respect of gross return was noted to be same in both the size classes. In marginal size class gross return per hectare was found to range from Rs. 157973 to Rs. 61895. The gross return per hectare in small size class was observed to range from Rs. 157768 to Rs. 68511. It was also observed that gross returns per hectare generated from groundnut and boro paddy were slightly higher in marginal size class than in small size class. In case of sesame gross returns per hectare were observed to be higher in small size class than in marginal size class. As a whole, relative positions of these crops remained same as those in marginal and small size classes of farms. Now gross returns of competing crops like groundnut, boro paddy and sesame could be compared in the study. It was clear from the above discussion that among these three crops gross return per hectare was highest in groundnut. A lowest gross return per hectare was noted to be accrued

from sesame. Sequence of these three crops in respect of per hectare gross return was found to be same as that in respect of per hectare cost (table 4, 5 and 6). Extent of largeness of gross return in groundnut in comparison with two other competing crops could also be visualized in terms of percentage from the table (7)

It was noted that gross return per hectare in groundnut was higher by 56.57 per cent over the same in boro paddy in marginal size class. Gross return per hectare in groundnut was found to be 155.23 per cent higher than that in sesame in the same size class. In small size class the corresponding figures for groundnut were noted to be 58.33 per cent and 130.28 per cent higher than those in boro paddy and sesame respectively. As a whole, 57.44 per cent higher gross return was earned in groundnut than in boro paddy per hectare. This was found to be 136.16 per cent higher than that in sesame.

It was evident that return cost ratio was highest in groundnut and it was found to be lowest in boro paddy in both the size classes. In each of the competing crops return cost ratio was noted to be higher in marginal size class than in small size class. As a whole, return cost ratios in groundnut, boro paddy and sesame were 1.68, 1.26, and 1.42 respectively.

**Table 7:** Net return (NR) of three crops (rupees)

Size class	Groundnut	Sesame	Boro paddy	Per hectare NR of Ground nut higher than	
				boro paddy	sesame
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Marginal	1073272 (66251)	20235 (18911)	138391 (21096)	45154 (214.04)	47340 (250.33)
Small	670405 (61057)	65236 (20323)	125675 (20402)	40655 (199.26)	40734 (200.43)
Combined	1743677 (64153)	85471 (19970)	264066 (20760)	43393 (209.02)	44183 (221.24)

**N. B:** i) Figure in parentheses under columns 2, 3 and 4 indicate per ha net return.

ii) Figure in parentheses under columns 5 and 6 indicate extent of largeness of per hectare net return in groundnut as compared to boro paddy and sesame in terms of percentage.

Net return of various crops grown in two size classes is presented in table 8. It was observed that net returns per hectare in groundnut and boro paddy were found to be higher in marginal size class than in small size class of farms. But net return in sesame was found to be higher in small size class than in marginal size class of farms. It might be mentioned that cost per ha in groundnut was higher in small size class than in marginal size class (table 4). But gross return per hectare was negligibly higher in marginal size class than small size class. Due to both the effects of higher gross return and lower cost, higher net return per ha in groundnut was earned by the farmers in marginal size

class. In case of boro paddy higher effect of gross return as compared to cost effect resulted in higher net return in marginal size class of farms as compared to small size class. But in case of sesame both gross return and cost per hectare were (table7) higher in small size class than in marginal size class of farms. Due to larger effect of gross return as compared to cost effect in this crop higher net return was earned in small size class of farms as compared to marginal size class. As a whole, net returns per hectare in groundnut, boro paddy and sesame were Rs.64153, Rs.20760 and Rs. 19970 respectively. Extents of largeness of net return in groundnut in comparison with its two contemporary crops

are also furnished in the table. It was noted that net return per ha in groundnut was higher than boro paddy to the extent of Rs.45154, Rs. 40655 in marginal and small size classes respectively. In comparison with sesame net return per ha in ground nut was higher to the extent of Rs. 47340. Rs. 40734 in marginal and small size classes respectively. As a whole, net returns per hectare in groundnut were noted to be higher to the extent of Rs. 43393 and Rs. 44183 in comparison with Boro paddy and sesame respectively. Patel (2022)<sup>[8]</sup> and Naidu (2023)<sup>[7]</sup> also founded that groundnut cultivation yielded the highest net return, thereby establishing it as a prominent oilseed crop.

### Conclusion

Resource allocation by the farmers differs across these crops, i.e. groundnut, sesame and boro paddy grown in summer season. But no wide difference is there between marginal and small size classes of farms in respect of resource allocation. Farmers in both the size classes of farms belonging to a small geographical area follow more or less same package of practices. Groundnut and sesame are grown mainly for market. A negligible portion of output of these two crops is retained for annual home consumption. But a reverse scenario is there in the case of boro paddy. The cultivation of summer crops is highly affected by adverse weather condition. At the time of maturity and harvesting of boro paddy sometimes crop loss occurs to some extent due to cyclone in the area under study. Same phenomenon takes place due to undesirable rainfall during growth and harvesting of groundnut and sesame. To minimize risk farmers with low fund capacity particularly in the marginal and small size classes go for diversified farming.

### References

1. BIRTHAL PS, JOSHI PK, ROY D, AMIT T. Diversification in Indian agriculture toward high-value crops: The role of small farmers. *Can J Agric Econ.* 2012;46(1):61-91.
2. CHAND R, LAKSHMI PRASANNA PA, SINGH A. Farm size and productivity: Understanding the strengths of smallholders and improving their livelihoods. *Econ Polit Wkly.* 2011;46(26-27):5-11.
3. CHOWDHURY N, DAS A, MUKHERJEE M, SWAIN S, JOARDAR M, DE A, *et al.* Monsoonal paddy cultivation with phase-wise arsenic distribution in exposed and control sites of West Bengal, alongside its assimilation in rice grain. *J Hazard Mater.* 2020;400:123206. Available from: <https://doi.org/10.1016/j.jhazmat.2020.123206>
4. GHATAK M, ROY S. Land reform and agricultural productivity in India: a review of the evidence. *Oxf Rev Econ Policy.* 2007;23(2):251-269.
5. KATEMA T, MWAKIWA E, HANYANI-MLAMBO B, GOMERA M, CHAMBOKO T. An analysis of the profitability of groundnut production by small-holder farmers in Chegutu District, Zimbabwe. *J Econ Sustain Dev.* 2017;8:167-175.
6. MYINT D, GILANI S, KAWASE M, WATANABE K. Sustainable sesame (*Sesamum indicum* L.) production through improved technology: An overview of production, challenges, and opportunities in Myanmar. *Sustainability;* c2020. Available from: <https://doi.org/10.3390/su12093515>
7. NAIDU K, CHANDRA R. Estimation of costs and returns of groundnut in Vizianagaram districts of Andhra Pradesh, India. *J Exp Agric Int;* c2023. Available from: <https://doi.org/10.9734/jeai/2023/v45i102194>
8. PATEL P, CHANDRAKAR M. Cost and return analysis of groundnut (*Arachis hypogaea*) cultivation in Raigarh District of Chhattisgarh. *Agric Sci Dig;* c2022. Available from: <https://doi.org/10.18805/ag.d-5580>
9. SARKER MNI, RAIHAN ML, CHUMKY T, RAHMAN MH, ALAM GM, SIANIPAR CP. Adaptation strategies for Asian farmers against climate change. *SDGs Asia Pac Reg'* c2023. p. 1-30.
10. UPADHAYA B, KISHOR K, KUMAR V, KUMAR N, KUMAR S, YADAV V, *et al.* Diversification of rice-based cropping system for improving system productivity and soil health in Eastern Gangetic Plains of India. *Agronomy;* c2022. Available from: <https://doi.org/10.3390/agronomy12102393>