Socio-economic Characteristics of Rice Farmers in the Combined State of Andhra Pradesh

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Authors' contributions

This work was carried out by author AS under the guidance of authors NV and KS. All authors read and approved the final manuscript.

Original Research Article

ABSTRACT

Aims: The study was conducted in the combined state of Andhra Pradesh to investigate the socio-economic characteristics of rice farmers.
Study Design: Multistage stratified random sampling technique was adopted for the study.
Place and Duration of Study: The study was conducted in three regions of Andhra Pradesh viz., Telangana, Coastal Andhra and Rayalaseema regions during the agricultural year 2013-14.
Methodology: The sample consisted of three districts, one each from the three regions of the state, six mandals (two mandals from each district), eighteen villages (three villages from each mandal) and 360 rice farmers (twenty rice farmers from each village).
Results: The average age, education and experience of the sample farmers was 46.04, 7.54 and 22.16 years respectively. Majority of the farmers owned small (54.44%) and medium sized (41.11%), nuclear families (68.61%), had agriculture as their primary occupation (99.44%), cultivated rice on own lands (71.94%), with canal as the major source of irrigation (71.11%), owned buffaloes (40%), had contact with extension agencies (67.22%) and had access to institutional credit (81.11%). It was found that 60.28% and 64.17% of the sample farmers were not members of Rythu Mitra Groups (RMGs) and cooperative societies respectively. The cost of cultivation for rice farmers

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was US$1048.65 ha^{-1} whereas the net returns were only US$179.62 ha^{-1}.

Conclusion: Electronic media, mobiles and e-resources can be used to educate the farmers on improved technologies. Diversification in occupation within the farm families is to be encouraged by developing processing firms and creating non-farm jobs. Participation in farmers organization has to be encouraged. It is also essential to create awareness about the institutional sources of credit so that farmers may avail the credit from institutional sources.

1. INTRODUCTION

Rice is the most important and extensively grown food crop in the world. Because of its importance in providing national food security and generating employment and incomes for the low-income sectors of society, most Asian governments regard rice as a strategic commodity [1]. India was the largest exporter of rice (10.14 million tonnes) in 2013-14 followed by Thailand, Vietnam and U. S. A. Rice occupies about 23 per cent of the gross cropped area and 35 per cent of the total area under food grains in the country.

Andhra Pradesh is known as the rice bowl of India. Rice is of key importance to Andhra Pradesh's economy and its people. Rice is the major staple food grain crop in Andhra Pradesh. The state has significant strengths in rice production enjoying the right conditions for growing rice and is ranked third in the country in terms of rice with a cultivated area of 4.5 million hectares, production of 14.61 million tonnes and yield of 3.19 tonnes ha^{-1} in 2013-14. Rice is grown in 28 per cent of gross cropped area and 50 per cent of area under food crops round the year in all districts. Hence the present study was carried out in the state of Andhra Pradesh by selecting three highest rice producing districts one each from Telangana, Coastal Andhra and Rayalaseema regions of Andhra Pradesh.

Socio-economic analysis is basically required to have a clear-cut comprehensive idea about the composition of the respondents in the study area which will be useful to derive valid conclusions which may help the researcher to suggest better location-specific feasible solutions for the improvement of efficiency in the study area. Generally the socioeconomic analysis focuses on identifying the adaptive capacity of individuals or communities based on their internal characteristics such as age, education etc. A clear-cut comprehensive idea about the socio-economic composition of the respondents in the study area will be useful to derive valid conclusions which may help the policy makers to suggest better location-specific feasible solutions for improvement of rice cultivation.

The socio-economic characteristics of the sample rice farmers included age, educational profile, experience in rice cultivation, family size, type of the family, occupational structure, tenurial status, sources of irrigation, livestock ownership, contacts with extension agency, membership in Rythu Mithra Groups (RMGs), membership in cooperative society, and access to institutional credit.

1.1 Review of Literature

[2] conducted a socio-economic analysis of rice farmers in Nigeria. The mean age of the farmers was found to be 48 years. The results further showed that 38.9% of rice farmers had primary education, 27.4% had secondary education, while 25.1% had no education. The average farm size cultivated was 1.72 ha. [3] studied the socioeconomic profiles of rural rice farmers in Swat, Pakistan. Rice farmers were found associated with agriculture sector. Major occupations were teaching, fishing and daily wage earners. Most of the rice farmers were found uneducated and tenants. Cattle, buffalo, cow and poultry were the major livestock. Similarly [4] studied the socioeconomic characteristics of the paddy farmers in Malaysia where the average age of farmers was 52.9 years. Most of the farmers had basic primary education (47.5%) followed by secondary education (42.9%). 29.3% of the families had three members, 52% had four to six members and 18.7% had more than six members in each family. Agriculture was the main occupation of 88.4% and supplementary occupation of 8.6% heads of household in farmers' community. The size of 17.2% of the farms was below 1 hectare, 59.1% was between 1–3 hectares, 12.1% was between 3–5 hectares and 11.6% was 5 hectares or above. [5] determined the socio-economic characteristics of rice farmers in Nigeria and found that 80% of the farmers were

within the age range of 30 years and 50 years. 75.0% were literate, 75.0% had household size of 1 to 10 people, 87.0% were small–scale farmers, 63.3% had between 6 to 15 years of farming experience and majority (73.3%) were members of Farmers' Association. [6] analysed the socio-economic factors in rice production in Sri Lanka. Mean age of the sample was 53.56 years. Farmers' level of education varied from no formal education up to Advanced Level education. Majority (64%) completed grade 10.

2. METHODOLOGY

2.1 Description of the Study Area

The Andhra Pradesh state, lying between 12°41' and 22°N latitude and 77° and 84°40'E longitude covers a geographical area of 274.40 lakh hectares. The state is bordered by Maharashtra, Chhattisgarh and Orissa in the north, the Bay of Bengal in the east, Tamil Nadu to the south and Karnataka to the west. Monsoon plays a major role in determining the climate of the state. The state receives maximum rainfall from Southwest monsoon during July to September. About one third of the total rainfall in Andhra Pradesh is brought by the Northeast monsoon during October and November. Summer lasts from March to June with temperatures ranging between 20°C and 41°C. The range of winter temperature is generally 12°C to 30°C. Andhra Pradesh is divided into three regions namely Telangana, Coastal Andhra and Rayalaseema which occupy 41.74, 33.75 and 24.51 per cent of the total area in the state respectively as shown in Fig. 1.

2.2 Sampling Design

Multistage stratified random sampling technique was adopted for selection of the sample districts as the first stage units, mandals as the second stage units, villages as the third stage units and farm holdings as the final and ultimate stage units where the farmers were selected randomly.

Fig. 1. Map of Andhra Pradesh showing Telangana, Coastal Andhra and Rayalaseema regions

Thus the sample consisted of three districts, six mandals (two mandals from each district), eighteen villages (three villages from each mandal) and 360 rice farmers (twenty from each village). The data of the selected rice farmers were obtained through personal interview method with the help of pre-tested comprehensive interview schedule for the agricultural year 2013-14 based on farmer's recall.

2.3 Tools of Analysis

Descriptive/tabular analysis involving the computation of means and percentages were employed to present the data regarding the socio-economic profile of the respondents Operational costs included the cost incurred on seed, fertilisers, manures, human labour, bullock labour, machine labour, plant protection chemicals and interest on working capital. Fixed costs included depreciation, land revenue, rental value of own and leased-in land. The summation of operational and fixed costs was the total cost of cultivation. Gross income was estimated as the sum of value of main product and by product whereas net income was obtained by deducting cost of cultivation from gross income.

Cost of production = (Cost of cultivation − Value of by product)/ Yield

3. RESULTS AND DISCUSSION

3.1 Age of the Sample Farmers

The age structure of a population and their affiliation to organizations at micro level plays crucial role in bargaining for better price and negotiating agricultural price policy at national level. Age has a bearing on the farmers' risk taking attitude and innovativeness in adopting new technologies. The analysis revealed that 66.11% of the farmers were middle aged (Table 1). The average age of the sample farmers was 46.04 years.

3.2 Educational Profile

Educational profile of the farmers decides the relative exposure of the farmer to latest technologies. Farmers need a basic level of education to understand and read relevant news, rules and notices which can affect productivity significantly [7]. The average years of schooling for sample farmers were 7.54 years. Out of the total sample farmers 41.39% of the farmers had higher secondary education, 29.44% had only primary school education, 19.44% were illiterates and 9.72% were graduates as depicted in Table 1.

3.3 Experience in Rice Cultivation

The number of years a farmer has spent in the farming business may give an indication of the practical knowledge he has acquired on how he can overcome certain inherent farm production and adoption problems. In order to have efficiency in crop management it is essential that farmers have experience in raising a particular crop [5].

Majority (35%) of the sample farmers had 11 to 20 years of experience followed by those with 21 to 30 years (31.94%). The percentage of farmers cultivating rice for less than 10 years and greater than 30 years was 18.61% and 14.44% respectively (Table 1). The average level of experience of sample rice farmers was found to be 22.16 years.

3.4 Family Size and Type of Family of the Sample Farmers

Participation in farm activities and related decision making depends on family size. Family size also has a great role to play in provision of family labour in agricultural sector. It was observed that 54.44% of farmers owned small families followed by medium sized (41.11%) and large families (4.44%). Thus majority (95.55%) of the farmers owned small and medium sized families as seen from the results in Table 1.

A study of the type of family indicated that percentage of farmers belonging to nuclear families (68.61%) was more than double to those living in joint families (31.39%). Nuclear families can play a vital role in the decision making process and adoption of new technology.

3.5 Occupational Structure of Sample Farmers

Agriculture was the primary occupation of 99.44% of the sample farmers (Table 1). Thus the economy of the study area was found to be predominantly agriculture-based. Secondary occupations were taken up by 10% of the sample farmers which included local businesses such as aqua-culture, owning a school, operating a water

plant, ration shop in village, rice business, carpentry, tailoring, providing bullocks for hire and providing sprayers for hire as well as working as an agricultural labourer or hamali.

3.6 Average Farm Size

Rice cultivators were stratified into five groups based on the size of operational holding viz., marginal (<1 ha), small (1-1.99 ha), semi-medium (2-3.99 ha), medium (4-9.99 ha) and large (>10 ha). The average farm size for marginal, small, semi-medium, medium and large farmers was found to be 0.60 ha, 1.41 ha, 2.73 ha, 5.70 ha and 12.01 ha respectively as shown in Table 1.

3.7 Livestock Ownership

Livestock is very important asset among rural farming communities. It is used as a store of wealth, provides traction power, improves soil fertility through its manure and provides even income and food security when sold and or eaten on the farm. Livestock are also kept as a source of investment, insurance against disaster and also for cultural purposes [8]. Livestock production is also an instrument to socio-economic change to improved income and quality of life [9]. Animal husbandry also provides a good source of dietary needs of farmers' family.

Table 1. Age, education, experience, family size, type of family, occupational structure, average farm size and livestock ownership of sample rice farmers

Variable	Category	Frequency	Percentage
Age	Young (<30)	15	4.17
	Middle (30-50)	238	66.11
	Old (>50)	107	29.72
Education	Illiterate	70	19.44
	Below SSC	106	29.44
	SSC to Intermediate	149	41.39
	Graduate & above	35	9.72
Experience in rice cultivation	Up to 10	67	18.61
	11 to 20	126	35.00
	21 to 30	115	31.94
	> 30	52	14.44
Family size	Small (1-4)	196	54.44
	Medium (5-7)	148	41.11
	Large (>8)	16	4.44
Type of family	Nuclear	247	68.61
	Joint	113	31.39
Primary occupation	Agriculture	358	99.44
	Others	2	0.56
Farmers having secondary occupation	Yes	36	10.00
	No	324	90.00
Livestock ownership	Cow	53	14.72
	Buffalo	144	40.00
	Bullock pair	16	4.44
	Calves	77	21.39
	Poultry	14	3.89
	Goats	9	2.50
	Fish	17	4.72
Average farm size (Hectares)	Marginal	72	0.60 ha
	Small	72	1.41 ha
	Semi-Medium	72	2.73 ha
	Medium	72	5.70 ha
	Large	72	12.01 ha

Cow, buffalo, bullocks, goats, poultry and fish were the major livestock owned by farmers in the study area. On an average a farmer had one to three cows or buffaloes from which he would be able to sell milk and also satisfy his family needs. The sale of milk would also give him an additional income. Bullock pairs were owned by 4.44% of the farmers while 4.72% of the farmers owned fish tanks. Goats were owned by 2.5% of the farmers. Calves were reported for 21.39% of the farmers indicating continuity in the livestock production through the birth of progeny (Table 1).

3.8 Tenurial Status

Participation in land markets is a common phenomenon in Andhra Pradesh characterized either by leasing in or leasing out the cultivable land. In case of tenants the insecurity and financial stringency are the major restraining factors that inhibit more productive enterprising activities such as land improvement and other investment strategies as well as improvement in managerial capabilities. Tenants generally operate on small land holdings and thus experience economic pressure in payment of rent, meeting production expenses and saving something for the families' survival [10].

It was noticed that 71.94% of the farmers cultivated rice on own farms, 16.94% cultivated rice on both own and leased-in farms while 11.11% were tenant farmers as seen from Table 2.

3.9 Source of Irrigation for Rice Crop

According to Table 2 the major source of irrigation of rice crop for sample farmers was found to be canals (71.11%) followed by combination of canal and bore well (12.22%), bore well (11.94%), dug well (2.78%) and tanks (1.94%). It is evident that in all the three regions of the study area rice is predominantly cultivated under canals followed by bore wells. This may be due to the fact that the study area was close to the canal irrigation systems. These results are in line with the results of [11] who indicated that there has been a decline in the tank irrigation and a steep rise in bore well irrigation particularly after the 1980s with the arrival of submersible pump sets and completion of rural electrification in the State.

3.10 Contact with Extension Agency

A good agricultural extension system was required to enhance the efficiency of farmers [12]. Extension serves as a key linkage in the process of transferring technology from lab to land. For improving productivity the contacts between farmers and extension network is crucial.

Table 2. Tenurial status, source of irrigation, contacts with extension agency, membership in Rythu Mitra Groups, membership of cooperative society and access to institutional credit of sample rice farmers

Variable	Category	Frequency	Percentage
Tenurial status	Own	259	71.94
	Own+Tenant	61	16.94
	Tenant	40	11.11
Source of irrigation	Canal	256	71.11
	Bore well	43	11.94
	Dug well	10	2.78
	Tank	7	1.94
	Canal + Bore well	44	12.22
Contact with extension agency	Maintain contact	242	67.22
	Do not maintain contact	118	32.78
Membership in Rythu Mitra groups	Member	143	39.72
	Not a member	217	60.28
Member of cooperative society	Member	129	35.83
	Not a member	231	64.17
Access to formal credit	Yes	292	81.11
	No	68	18.89

The proportion of the farmers with extension contact was found to be 67.22% but 32.78% of the farmers were not maintaining any contact (Table 2). Thus, there is still need to create awareness about the benefits of having contacts with extension agency to those who were not having any contact.

3.11 Membership in Rythu Mitra Groups (RMGs)

The development of any district can be judged by its people's participation in various political and social organizations such as rythu mitra groups. About 2.38 lakh Rythu Mitra Groups were formed in the state of Andhra Pradesh to work on Self Help Group (SHG) lines to enable farmers to obtain finance from banks and to serve as a conduit for technology transfer and facilitate access to market information.

From the Table 2 it can be inferred that majority (60.28%) of the farmers were not members of Rythu Mitra Groups. Farmers reported that even though RMGs operated well initially after formation, most of RMGs later became non-functional.

3.12 Membership in Cooperative Society

Participation means empowering farmers and giving them responsibility so that they feel that they own the society which helps in ensuring that the schemes are compatible with the local environment and do not have conflicts with the target group [13]. Cooperative societies function in most efficient manner by providing adequate, cheap and timely inputs and credit to agriculture and allied sector. They spread to the remote areas of the districts in order to serve the needy farmers. Membership of a cooperative society might provide easy access to farm inputs and credit for the farmers. However, only one-third (35.83%) of the total sample farmers were found to be members of cooperative society while majority (64.17%) did not report membership in any of the societies as seen in Table 2.

3.13 Access to Institutional Credit

Access to institutional credit is identified as one of the key factors in improving rice production. Availability and access to adequate, timely and low cost credit from institutional sources is of great importance especially to small and marginal farmers. Easy access to financial services at affordable cost positively affects the productivity, asset formation, income and food security of the farmers. Credit access is important because of its ability to create access to other production factors [14]. The results in Table 2 revealed that majority (81.11%) of the sample farmers had access to institutional credit.

3.14 Economic Characteristics of Sample Rice Farmers

The cost of cultivation for the sample rice farmers was US$1048.65 ha^{-1} of which the share of variable and fixed costs was in the order of 79.03 per cent and 20.97 per cent respectively. The gross returns were US$1228.27 ha^{-1} and net returns were US$179.62 ha^{-1}. The unit cost of production was calculated to be US$16.29 per quintal (Table 3).

Table 3. Economic characteristics of sample rice farmers

Parameters	Value (US$ ha^{-1})
Operational costs	828.78
Fixed costs	219.87
Total costs	1048.65
Gross income	1228.27
Net income	179.62
Cost of production	16.29

4. CONCLUSION

The average age of the sample farmers was 46.04 years indicating that majority of the farmers in the study area were middle aged, agile and were actively taking part in paddy cultivation. About 80% of the farmers were educated and thus electronic media, mobiles and e-resources can be used to educate them on improved technologies.

Majority (95.55%) of the farmers were found to own small and medium sized families which might serve as an insurance against shortfall in supply of farm labour and revealing the general inclination among the sample farmers towards having nuclear family. The results showed the general inclination among the sample farmers towards having nuclear family where decision making would be quick and easier compared to joint family. These results also reflected the disintegration of typical Indian joint family system over a period of time.

Diversification in occupation within the farm families is to be encouraged by developing

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processing firms and creating non-farm jobs. Majority of the farmers cultivated rice on own lands which may be advantageous because owner farmers have the freedom for large capital investments in equipment and input.

The major source of irrigation of rice crop was found to be canals followed by combination of canal and bore well, bore well, dug well and tank which may be due to the fact that the study area was close to the canal irrigation systems. Cow, buffalo, bullocks, goats, poultry and fish were the major livestock owned by farmers in the study area.

Most of the farmers were found to have contact with extension agencies which is crucial for improving productivity. Participation in farmers organization has to be encouraged by focusing on the formation of Rythu Mitra Groups and considering these organizations as a contact point for extension services.

Farmers in the study area have access to institutional credit and hence they will be able to use better inputs and achieve high production of rice. However, it is also essential to create awareness about the institutional sources of credit so that farmers may avail the credit from institutional sources and avoid non-institutional sources which charge exorbitant rates of interest.

The cost of cultivation for rice farmers was US$1048.65 ha^{-1} whereas the net returns were only US$179.62 ha^{-1}. Hence steps should be taken to guide farmers to minimize the costs incurred in rice farming.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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