

Socio-economic profile of the dairy farmers: A study in rural urban interface of Bengaluru

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Suggestions:
-The manuscript should be prepared based on the author guidelines.
-The manuscript should be proofread by a native speaker

Abstract

Objectives: To study the socio economic condition of dairy and non-dairy farmers in rural-urban interface of Bengaluru.

Methodology: The study was conducted in rural area and surrounding of Bengaluru urban in India. Data of 240 dairy samples, 120 non-dairy samples were drawn from different layers of South and North transects during 2016-17. Thus, the total sample size was 360. By using descriptive ~~statistie~~statistical analysis was done. ~~study~~Study was conducted in ~~rural~~in rural-urban interface of Bengaluru also heighted the influence of ~~urbanization~~of urbanization was brought changes in ~~their herd~~their herd size and socio-economic condition of ~~the dairy~~the ~~farmers~~dairy farmers.

Findings: study reveals that most of the rural people occupation was dairying, younger generation (36-41 age) was more involved in more than others and their average operational holding (6.40) acre was less in dairy farmers as compare to non-dairy farmers. Education level was more in non-dairy farmers than the dairy farmers as dairy demands more labours. Dairy act as one of the instrument to alleviate the poverty generates the employment, income and provides the sustainable livelihood security for the dairy farmers. Therefore, it needs a paradigm shift in focusing more on marketing and production oriented dairy system for sustainable development and poverty alleviation oriented dairy system.

Key words: Dairy & Non-dairy farmers, Cropping pattern, Urbanization, Transect and livestock

Introduction

Agriculture is the crucial sector in Indian economy with contribution of 15.4% Gross Domestic Product (GDP), providing employment to nearly 2/3rd of the work force and agriculture is divided into several segments like, agriculture, horticulture, fisheries, animal husbandry also nearly 70% of rural population livelihood is depend on agriculture. Milk production increased from around 17-22 million tons in the 1960s to over 198.4 million tons in 2019-20. ~~and~~And per capita per day availability of milk from 200 grams (1996-97) to 406 grams/day (2019-20), which is more than the world average of 294 grams/day. Approximately 78 per cent of milk producers are marginal and small farmers and they together contribute around 68 per cent to total milk production. This is almost hold good in all the states. Dairying is very important in improving the socio-economic condition of the

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dairy farmers in reducing the poverty and unemployment and underemployment. It provides nutrition, draft animal power, organic manure, supplementary employment, cash income (Gautam R et al.).

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Agriculture sector is undergoing structural transformation, increase in income, rapid urbanization, growth in population, changing the consumer preference, increase in liberation and integration with global market are influencing the changing pattern of lifestyle of Indian population. Consumption habits have been diversified into high value commodity. Among all allied sector, livestock play an important role as they consuming huge crop residue and returning the valuable manure to soil productivity and crop growth. Livestock in general and dairying in particular is emerging as growth drivers of Indian agriculture sector. It also play an important role in empowering the women, it support the livelihood of the rural women, dairying engages in underutilize labour force and it can be subsidiary activity to farmers also generate the employment. The majority of rural population in the Karnataka state is engaged in livestock, dairying is constantly trying to increase milk production, processing and marketing of milk/milk products and developing infrastructure to promote the dairy industry within the state.

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Methodology

This study was conducted during 2016-2017 at University of Agriculture science Bengaluru. The blue contours indicate the Northern and Southern research transects the star mark indicates the reference point (Vidhana Soudha) in the city centre. The methodology adopted by project "Effects of urbanization on value chains and livelihoods of farmers and other stakeholders". Who considered the per cent of build-up area and distance from the city centre using GIS analysis of satellite images, and combining basic measures of building density and distance. The correlation of the two parameters and discontinuities in the frequency distribution of the combined index indicate highly dynamic stages of transformation, spatially clustered in the rural-urban interface (Ellen M Het al.).

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Sampling frame consist of dairy farmers from the two transects, north and south Bengaluru representing three layers (rural, transition and urban). A sample size of 50 households of dairy farmers from transition and rural layer and 20 from urban was selected randomly from the two transects to constitute a total sample of 240 households. In addition, 20 non-dairy farmers from each layer from the transect we select. Thus, the total sample size was 360 and sample farmers were interviewed personally using a structured pre-tested schedule in Table 1.

The Northern and Southern transect were treated as separate populations when calculating the SSI (Survey Stratification Index) and allocating them to the six arbitrary strata for random sampling. In North transect 21 villages and in South transect 22 villages were selected as detailed in Table-2-4. The information elicited from the respondent farmers

pertained to age, education, cropping pattern, land holdings, socio-economic status. Tabular calculation was used to analyze the issues.

Result and discussion

Age-wise distribution of sample households

Table 2 reveals that age of dairy sample households in urban, transition and rural layers in North transect was 36 years, 39 years and 41 years, respectively. Whereas age of dairy sample households in South transect of urban, transition and rural layers was 36 years, 38 years and 41 years, respectively. Similarly, in the case of non-dairy sample households, the average age of farmers in urban, transition and rural in North transect were 35-years, 38-years and 42 years, respectively. The respective figures in South transect were 38-years, 39-years and 39 years. The dairy and non-dairy sample households were found to be relatively middle (39 years) age for all the households from all the layers in the overall study layer (Gautam R et al.). It is observed that 73.3-percent% of dairy farmers were middle aged and 15.0percent and 11.7-percent% were in each old and young age group. The age wise distribution pattern of sample households is presented in the same Ttable. The age of households in both dairy and non-dairy sample households was not varied, which indicated comparable decision-making capacity among both the category of farmers. The socio-economic profile of sample households is a pre-requisite to have a sound impact on the decision-making process and profitability of the dairy enterprise. Thus, it is quite pertinent to throw light on the basic socio-economic profile of the sample households before discussing the major findings of this study.

Average family size and its composition

Number of family members plays an important role in deciding the kind of enterprises to be undertaken and scope for diversifying the business activities. Table 3. Indicates the analysis of data, in dairy sample households, inter transect analysis revealed that the average family size observed to be more in the case of south transect (11.00). All the three layers in north transect having same family size (7.00). Similarly, in case of south transect, dairy sample households in rural layer (11.00) showed the highest family size followed by transition (8.00) and urban (7.00). Among the households, the relatively same number of female (3.00 and 3.00) was found in the transition layer and male members (3.00 and 3.00), while the number of children (3.00 and 2.00) were found to be the highest in rural layer in north and south transect, respectively. In the case of non-dairy sample households, the family size was again observed to be higher in case of south transect. In among three layers in north transect, family size was more in rural (9.00), followed by transition and urban (8.00), while in the case of south transect, rural layer (11.00) showed the higher family size followed by transition (9.00) and urban (8.00). The results implied that the average family size was bigger in dairy sample households than the non-dairy sample households. These findings are in line with results (Prajapati MC) observed that majority of the dairy

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farmers had medium (53.33%) size families (5-10 members) followed by 45.0 percent had small size (up to 5 members) and 1.67 per cent had large size (above 10 members) families

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Educational status of heads of the sample households

Education is one of the important factors which influence the managerial and technical ability of the rural households. Therefore, education status of the sample households has been analyzed and the results are furnished in Table 4.

In case of dairy sample households, relatively more number of households (45.0%, 24.0 % and 24.0%) had high school education in the case of urban, transition and rural of north transect, respectively. In south transect 55.0-per-cent, 24.0per-cent and 38.0-per-cent% were studied up to high school level in urban, transition and rural layers, respectively, followed by other class of education. However, still about twenty per cent of households in the south transect in all the three layers were illiterates. Whereas, in the case of non-dairy sample households, relatively higher proportion of the households possessed primary education (40%), high school education (25.0%) and high school (40.0%) education in the case of urban, transition and rural layers, respectively in north transect, while in south transect the higher proportion of households had high school education in the all the three layers. Overall all education level in non-dairy sample households revealed higher proportion of them had the high school education (33.0%), followed by primary (22.0%), PUC (13.0%), graduate (12.0%), postgraduates and diploma, while 16 per cent were illiterates.

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The level of education moulds the farmer's response to adopt new technology in dairy farming and influence the decision making is about dairying. Enlightened farmers have a higher motivation to sell milk, to diversify farm business and to earn more income through a better management of inputs. These findings are in line with the results of the (Udaykumar MS et al.) in rural-urban interface of Bengaluru, where the percentage of literacy was more among non-dairy farmers who resides in urban than the rural and transition area.

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Cropping pattern of dairy sample households in both transects

The cropping pattern followed by dairy sample households in Table 5 indicated that ragi, maize, vegetables, others crops were cultivated by farmers. The ragi crop occupied the highest (46.36%-and 66.67%) area in both urban layers transect followed by forage crop. The cultivation of perennial crops like mango was noticed only in north transects. Cropping intensity in urban area was 136.04 and 100.00% -per-cent in the north and south transects. In transition layer, ragi occupied the highest area (36.51%) in North transect while in South transect others crops dominated (31.19%), others crop included maize, avare, tur, etc., During rabi season guava occupied the highest area of 15.87 in north transect and 13.76 percent-% area is occupied by maize and guava south transect, respectively. cropping intensity was 146.51 per cent and 137.97% -per-cent in North and South transect

respectively. In case of rural layer crops were grown during all the three seasons, In kharif season also area under ragi was the highest (20.41%and 26.26%) followed by others crops (9.36%and 26.47%) in North and South transects. During rabi season maize occupied the highest area (14.04%and 10.50%) in North and South transects other crops found only in North transect. During summer season vegetables were grown in north transect whereas maize was grown in south transect, Mulberry was cultivated in both transects. The cropping intensity observed was 188.03 per cent and 146.01 per cent in North and South transects respectively. These findings are comparable with similar findings reported by (Potdar VV et al.) as ragi is the traditional crop and it is eaten as main staple food might have grown by majority of therespondents.

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Cropping pattern of non-dairy sample households in both transect

The cropping pattern followed by non-dairy sample households in Table 6 indicated that ragi, maize, vegetables, mango, mulberry, guava, grass and others crops were cultivated by farmers. The ragi crop occupied the highest (27.59%) area followed by grapes (17.24%), paddy (10.34%) in urban North transect. Cropping intensity for annual and perennials was 100.00 per cent in north transect. In transition layer, ragi occupies the area 12.24and 30.12per cent in both thetransects, followed by others crops. During rabi season maize occupied the 9.18 and 20.08 per cent in north and south transect. Mulberry was the perennial crop grown by non-dairy sample households in both transect. Cropping intensity for annual and perennials was 224.45 per cent and 143.10 per cent in North and South transect respectively. In case of rural layer crops were grown during all the three seasons, In kharif season also layer under maize was the highest (13.48 % and 17.38 %) followed by other crops. During rabi season potato and maize and potato occupied. During summer season only vegetables were grown in North transect whereas baby corn maize was grown in South transect, Mulberry was cultivated in both transect as perennial crop overall cropping intensity observed was 236.31 and 232.61 per cent in north and south transect respectively. It's evident that there was high rate of diversification of crops among dairy sample households. These findings are comparable with similar findings reported by (Potdar VV et al.)

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Livestock possession of sample farmers

Livestock possession of the sample households was analysed and the results are presented in Table 7. This reflects the details of livestock possessed by the sample farmers. In the case of dairy sample households in rural layers, among the different livestock possession, the proportion of dairy cows (91.30%and 93.72%) was more followed by goats (4.89%and 4.35%) and sheep (1.91%and 1.93%) in north and south transects, respectively. In the transition layer, the proportion of dairy cows (94.27%and 93.59%) was more followed goat (3.82%and 3.21%) and sheep (1.91%and 3.21%) in both transects, respectively. Similarly, in urban layer also the proportion of dairy cows was the highest followed by goat and sheep.

Majority of farmers (98.88%) had dairy cows and proportion of sheep was very less (1.12 per cent) in north transect whereas south transect farmers had only dairy cows. The non-dairy sample households in rural layers did not ~~posses~~possess any dairy cows but had both goat (44.19% and 57.89%) and sheep (55.81% and 42.11%) in north and south transect, respectively. In transition layer, dairy cows accounted for 30.77%~~per cent~~in south transect, while goat (53.85% and 19.33%) and sheep (46.15% and 50%) found in both north and south transects, respectively. In urban layer only sheep was reared in north transect, while it was only goat in south transect. Thus, in the overall study layer, dairy cow constituted for the highest proportion of livestock than goat and sheep in the case of both the layers. Livestock formed a major source of income for the farmers in rural layers. Due to assured dairy cooperatives and through milk vendors marketing of milk produce. Payments to the farmers were made on weekly or fortnight.

Since livestock ensured the sustainable income and hence farmers gave importance to dairy activity in the study layer. Other livestock reared were goat and sheep, which were mainly confined to rural followed by transition and very less in urban. Ironically, the existence of milching cow found only in the transition layer of the south transects. The number of total livestock possessed by households increased with supply area moved from urban to transition and to rural area irrespective of whether in South-North or dairy of non-dairy category of households. These findings are in conformity with results of (Prajapati MC), where dairy farmers~~posses~~possess the more dairy animals.

Distribution of households based on land holdings

From table 8, it could be revealed that irrespective of the rural, transition and urban situations, the proportion of marginal farmers were comparatively more than medium and small farmers. There was difference between urban, ~~transition~~transitions and rural across the different type of farmers in both dairy and non-dairy sample households. In the case of dairy sample households, the proportion of landless farmers was more (85.42%) followed by marginal (9.17 %) and small (4.17%) and medium (1.25 %) category farmers. Whereas in the case of non-dairy sample households, proportion of marginal farmers was more (33.33%) followed by landless (27.50%) and small (24.17%) and medium (15%).

In the overall category of dairy and non-dairy sample households' landless farmers and marginal farmers dominated followed by small and medium farmers. Thus, marginal farmers category dominates in the total farming community. (Potdar VV et al.,) Reported that majority of farmers (92.30%) were holding small acres of rainfed land followed by medium and large landholding.

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Operational land holding

Operational Land Holdings include only those units which are used both in farm production as well as livestock and poultry products also pisciculture. So, land holding status of the sample households of the study area was analysed and the results are presented in the Table 9. In the case of dairy category sample farmers, the operational size of land holding was 6.40

acre in medium category farmer, 3.60 acre in case of small farmer 0.80 acre in the case of marginal farmers. Whereas in non-dairy sample households, operational size of land holding was 7.10 acre in medium category farmer followed by small 3.40 and marginal 0.80. The economic and social progress of the households depends upon the size of operational land holdings. Different research studies showed that herd size relates directly with the operational land holding apart from this landless people owning milch animals. These findings are comparable with similar findings reported by (Prasad N et al.), dairy farmers had large (above 6 acre) farm size followed by small (17.50%) farm size (2.1 to 4.0 acres) and 16.67% had marginal (up to 2.0 acres) and medium (4.1 to 6.0 acres) each as their land holding.

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Occupational details

The households depend not only on the particular activity to sustain their livelihood instead they undertake numerous activities to reduce the incidence of poverty, to have resilience against risk and enhance their income. The result on distribution of sample household-based occupation pattern is depicted in Table 10. It could be observed that majority (85%) of the sample household has dairy farming as the main occupation, while agriculture was main occupation for rest (15%) of the households. Among the dairy sample households, 95% of urban, 90% and 84% of urban, transition and rural households had dairy as main occupation and remaining 5 per cent, 10 per cent and 16 per cent had agriculture as main occupation in North transect. While in South transect the dairy sample households, 90%, 92% and 70% of urban, transition and rural households had dairy as main occupation and remaining had agriculture as main occupation. Among the non-dairy sample households urban 35% households had agriculture as main occupations that too only exist in North transect, while Casual labours constitute by 65 and ten per cent and business occupation constitute 90% only exist in South transect. In transition as well as rural layer, all households possess agriculture as main occupation in both the transects. Sample respondent were mainly depending on dairy, agriculture and others activity, this indicates their livelihood depends on the above mention occupation urbanization attracts the dairy activity farmers switching over from traditional activity to commercial activity. These findings are comparable with similar findings reported by (Singh AK et al.).

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Conclusion

The dairy farmers were found to be relatively younger, size of the family was more but education level was more in non-dairy farmers. In the case of dairy sample respondents, the proportion of landless farmers was more, this shows that dairy is an important source is livelihood security for the most of the farmers, it reduces the dependency also empowers the individual. Hence policies oriented towards promotion of dairy enterprise in rural urban interface for sustainable livelihood security needs to be further strengthen to harness the full potential of dairying especially by rearing crossbreed cows. Smallholder dairy farms needs to be more encouraged with low interest loans for sustaining dairying.

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Table 1: Village stratification and sampling frame for the study

| Stratum | SSI Boundaries | North transect | | South transect | |
|-----------|----------------|----------------------|-------------------|----------------------|-------------------|
| | | Villages per Stratum | | Villages per Stratum | |
| | | Total | Randomly Selected | Total | Randomly Selected |
| 1 (Urban) | <0.167 | 5 | 2 | 14 | 3 |
| 2 | 0.333 | 9 | 2 | 10 | 2 |
| 3 | 0.5 | 9 | 3 | 13 | 4 |

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|--------------|--------|-----------|-----------|-----------|-----------|
| 4 | 0.667 | 18 | 5 | 26 | 5 |
| 5 | 0.833 | 30 | 4 | 23 | 6 |
| 6 (rural) | >0.833 | 22 | 5 | 12 | 2 |
| Total | | 93 | 21 | 98 | 22 |

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Table 2: Age wise distribution of sample respondents in study area

Note: Figures in parentheses indicates the percentage to the column respective total

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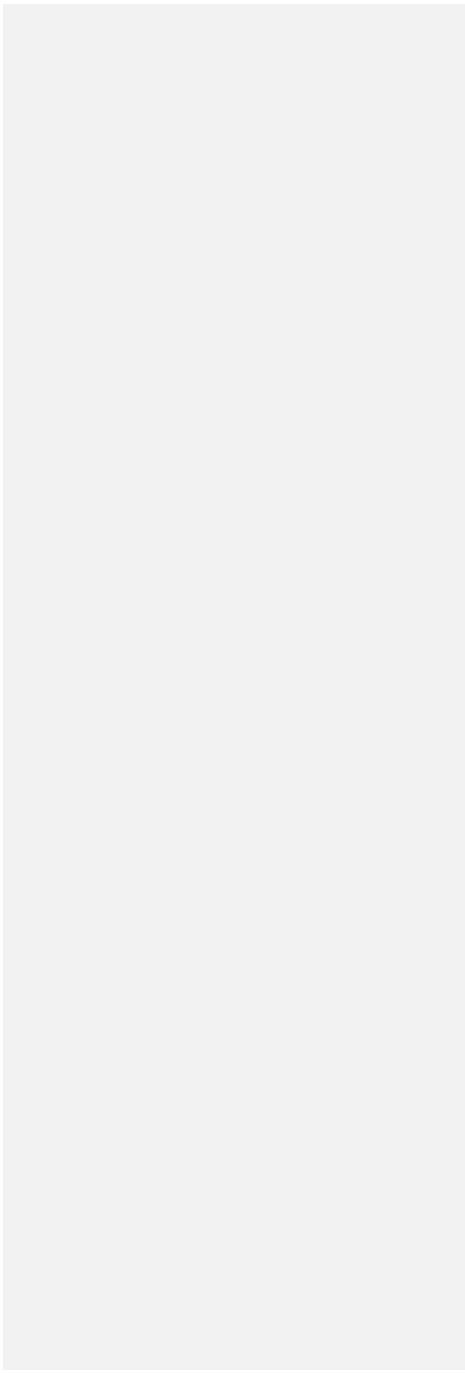


Table 3: Family composition of the sample respondents in study area

| Sl. No . | Particulars | Dairy sample respondents | | | | | | Poole d (n=240) | Non- Dairy sample respondents | | | | | | Poole d (n=120) |
|----------|-------------|--------------------------|--------------------------|---------------------|-----------------------|--------------------------|-----------------|-----------------------|-------------------------------|--------------------------|---------------------|----------------------|--------------------------|---------------------|-----------------------|
| | | North transect(n=120) | | | South transect(n=120) | | | | North transect(n=60) | | | South transect(n=60) | | | |
| | | Urba n (n=20) | Transitio n (n=50) | Rura l (n=50) | Urba n (n=20) | Transitio n (n=50) | Rural (n=50) | | Urba n (n=20) | Transitio n (n=20) | Rura l (n=20) | Urba n (n=20) | Transitio n (n=20) | Rura l (n=20) | |
| 1 | Female | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 4.00 | 6.00 | 3.00 | 3.00 | 3.00 | 4.00 | 4.00 | 4.00 | 4.00 |
| 2 | Male | 2.00 | 2.00 | 2.00 | 3.00 | 3.00 | 4.00 | 5.00 | 3.00 | 3.00 | 3.00 | 3.00 | 3.00 | 4.00 | 3.00 |
| 3 | Children | 2.00 | 2.00 | 2.00 | 1.00 | 2.00 | 3.00 | 4.00 | 2.00 | 2.00 | 3.00 | 1.00 | 2.00 | 3.00 | 2.00 |
| | Total | 7.00 | 7.00 | 7.00 | 7.00 | 8.00 | 11.00 | 15.00 | 8.00 | 8.00 | 9.00 | 8.00 | 9.00 | 11.00 | 9.00 |

Table 4: Education wise distribution of sample respondents in study area

| Sl. No. | Particulars | Dairy sample respondents | | | | | | Poole d (n=240) | Non- Dairy sample respondents | | | | | | Poole d (n=120) |
|---------|-------------|--------------------------|--------------------------|---------------------|----------------------|--------------------------|---------------------|-----------------------|-------------------------------|--------------------------|---------------------|---------------------|--------------------------|---------------------|-----------------------|
| | | Northtransect (n=120) | | | Southtransect(n=120) | | | | Northtransect(n=60) | | | Southtransect(n=60) | | | |
| | | Urban (n=20) | Transitio n (n=50) | Rura l (n=50) | Urban (n=20) | Transitio n (n=50) | Rura l (n=50) | | Urban (n=20) | Transitio n (n=20) | Rura l (n=20) | Urban (n=20) | Transitio n (n=20) | Rura l (n=20) | |
| a. | Illiterates | 7 (35) | 6 (12) | 11 (22) | 4 (20) | 10 (20) | 12 (24) | 50 (20) | 3 (15) | 5 (25) | 3 (15) | 4 (20) | 2 (5) | 2 (10) | 19 (16) |
| b. | primary | 2 (10) | 10 (20) | 10 (20) | 3 (15) | 9 (18) | 8 (16) | 42 (18) | 8 (40) | 1 (5) | 4 (20) | 5 (25) | 6 (30) | 3 (15) | 27 (22) |
| c. | High school | 9 (45) | 12 (24) | 12 (24) | 11 (55) | 12 (24) | 20 (38) | 76 (32) | 3 (15) | 5 (25) | 8 (40) | 8 (40) | 6 (30) | 9 (45) | 39 (33) |
| d | PUC | 1 (5) | 6 (12) | 9 (18) | 1 (7) | 8 (16) | 7 (14) | 32 (13) | 1 (5) | 2 (10) | 5 (25) | 1 (5) | 3 (15) | 4 (20) | 16 (13) |
| E | Diploma | - | 2 (4) | 1 (2) | 1 (5) | 3 (6) | 1 (2) | 8 (3) | - | - | - | - | 1 (5) | - | 1 (1) |
| f | Graduate | 1 (5) | 8 (11) | 6 (12) | - | 5 (10) | 2 (4) | 22 (9) | 5 (25) | 6 (30) | - | 1 (5) | 2 (5) | 1 (5) | 15 (12) |

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|---|---------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| g | Post Graduate | - | 6 (12) | 1 (2) | - | 3 (60) | 1 (2) | 11 (5) | - | 1 (5) | - | 1 (5) | - | 1 (5) | 3 (3) |
| | Total | 20 (100) | 50 (100) | 50 (100) | 20 (100) | 50 (100) | 50 (100) | 240 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 120 (100) |

Note: Figures in parenthesis is the percentage to the column total

Table 5: Cropping pattern of the dairy sample respondents in different transect of study area _____ (Acres)

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| Sl. No. | Particulars | North transect (n=14) | | South transect (n=21) | |
|---------|-------------------------------|-----------------------|----------|-----------------------|----------|
| | | Area | % to GCA | Area | % to GCA |
| A | Urban | | | | |
| | Kharif and Perennials | | | | |
| 1 | Ragi | 0.70 | 46.36 | 0.50 | 66.67 |
| 2 | Forage | 0.21 | 13.91 | 0.25 | 33.33 |
| 3 | Mango | 0.20 | 13.25 | | |
| | Gross cropped area | 1.51 | 100.00 | 0.75 | 100.00 |
| | Net Cropped area | 1.11 | | 0.75 | |
| | Cropping intensity (%) | 136.04 | | 100.00 | |
| B. | Transition | | | | |
| | Kharif | | | | |
| 1 | Ragi | 1.15 | 36.51 | 1.50 | 27.52 |
| 2 | Others | 0.50 | 15.87 | 1.70 | 31.19 |
| | Rabi | | | | |
| 3 | Maize | 0.30 | 9.52 | 0.75 | 13.76 |
| 4 | Others | 0.25 | 7.94 | 0.30 | 5.50 |
| 5 | Guava | 0.50 | 15.87 | 0.75 | 13.76 |
| | Gross cropped area | 3.15 | 100.00 | 5.45 | 100.00 |
| | Net Cropped area | 2.15 | | 3.95 | |
| | Cropping intensity (%) | 146.51 | | 137.97 | |
| C. | Rural | | | | |
| | Kharif | | | | |
| 1 | Ragi | 1.09 | 20.41 | 1.25 | 26.26 |
| 2 | Others | 0.50 | 9.36 | 1.26 | 26.47 |
| | Rabi | | | | |
| 1 | Maize | 0.75 | 14.04 | 0.50 | 10.50 |
| 2 | Others | 0.80 | 14.98 | | |
| | Summer | | | | |
| 1 | Vegetables | 0.50 | 9.36 | | |
| 2 | Maize | | | 0.50 | 10.50 |
| | Perennials | | | | |
| 1 | Mulberry/silk | 1.25 | 23.41 | 0.75 | 15.76 |

| | | | | | |
|--|-------------------------------|---------------|--------|---------------|--------|
| | Gross cropped area | 5.34 | 100.00 | 4.76 | 100.00 |
| | Net Cropped area | 2.84 | | 3.26 | |
| | Cropping intensity (%) | 188.03 | | 146.01 | |

Table 6: Cropping pattern of the non-dairy samples in different transect of study area (Acres)

| Sl. | Particular | North transect (n=47) | | South transect (n=40) | |
|------|-------------------------------|-----------------------|----------|-----------------------|----------|
| N o. | | Area | % to GCA | Area | % to GCA |
| A | Urban | | | | |
| | Kharif and Perennials | | | | |
| 1 | Paddy | 0.3 | 10.34 | | |
| 2 | Ragi | 0.8 | 27.59 | - | |
| 3 | Grapes | 0.5 | 17.24 | - | |
| 4 | Others | 0.3 | 10.34 | - | |
| | Gross cropped area | 2.9 | 100.00 | | |
| | Net Cropped area | 1.6 | | | |
| | Cropping intensity (%) | 181.25 | | | |
| B. | Transition | | | | |
| | Kharif | | | | |
| 1 | Ragi | 1 | 12.24 | 1.5 | 30.12 |
| 2 | Others | 1.25 | 15.30 | 0.75 | 15.06 |
| | Rabi | | | | |
| | Maize | 0.75 | 9.18 | 1 | 20.08 |
| 2 | Total | 0.75 | 9.18 | 1 | 20.08 |
| 1 | Mulbery | 1.39 | 17.01 | 1.23 | 24.70 |
| 2 | Others | 0.25 | 3.06 | 0.5 | 10.04 |
| | Gross cropped area | 8.17 | 100.00 | 4.98 | 100.00 |
| | Net Cropped area | 3.64 | | 3.48 | |
| | Cropping intensity (%) | 224.45 | | 143.10 | |
| C. | Rural | | | | |

Formatted Table

| | | | | | |
|---|-------------------------------|--------|--------|--------|--------|
| | Kharif | | | | |
| 1 | Maize | 1 | 13.48 | 1.5 | 17.38 |
| 2 | Others | 1 | 13.48 | 0.75 | 8.69 |
| | Rabi | | | | |
| 1 | Potato | 0.5 | 6.74 | - | |
| 2 | Maize | 0.5 | 6.74 | 1 | 11.59 |
| | Summer and Perennial | | | | |
| 1 | Cabbage | 0.5 | 6.74 | - | |
| 2 | Maize (baby corn) | - | | 1 | 11.59 |
| 1 | Mulberry/silk | 1.14 | 15.36 | 1.46 | 16.92 |
| 2 | Others | 0.5 | 6.74 | - | |
| | Gross cropped area | 7.42 | 100.00 | 8.63 | 100.00 |
| | Net Cropped area | 3.14 | | 3.71 | |
| | Cropping intensity (%) | 236.31 | | 232.61 | |

Table 7: Livestock possession of sample farmers in study area

(Numbers)

| Sl. No. | Particular | Dairy sample respondents | | | | | | Pooled (n=240) | Non- Dairy sample respondents | | | | | | Pooled (n=120) |
|---------|---------------|--------------------------|-------------------|--------------|-----------------------|-------------------|--------------|----------------|-------------------------------|-------------------|--------------|----------------------|-------------------|--------------|----------------|
| | | North transect(n=120) | | | South transect(n=120) | | | | North transect(n=60) | | | South transect(n=60) | | | |
| | | Urban (n=20) | Transition (n=50) | Rural (n=50) | Urban (n=20) | Transition (n=50) | Rural (n=50) | | Urban (n=20) | Transition (n=20) | Rural (n=20) | Urban (n=20) | Transition (n=20) | Rural (n=20) | |
| 1 | Milching Cows | 88 (98.88) | 247 (94.27) | 336 (91.30) | 56 (100) | 146 (93.59) | 194 (93.72) | 1067 (93.76) | - | - | - | - | 8 (30.77) | - | 8 (7.69) |
| 2 | Goat | - | 10 (3.82) | 18 (4.89) | - | 5 (3.21) | 9 (4.35) | 42 (3.69) | - | 7 (53.85) | 19 (44.19) | 2 (100) | 5 (19.23) | 11 (57.89) | 44 (42.31) |
| 3 | Sheep | 1 (1.12) | 5 (1.91) | 14 (3.80) | - | 5 (3.21) | 4 (1.93) | 29 (2.55) | 1(100) | 6 (46.15) | 24 (55.81) | - | 13 (50) | 8 (42.11) | 52 (50.00) |
| | Total | 89 (100) | 262 (100) | 368 (100) | 56 (100) | 156 (100) | 207 (100) | 1138 (100) | 1 (100) | 13 (100) | 43 (100) | 2 (100) | 26 (100) | 19 (100) | 104 (100) |

Note: Figures in parenthesis is the percentage to the column total

Table 8: Distribution of respondents based on land holdings in study area

(Numbers)

| Sl. No. | Particulars | Dairy sample respondents | | | | | | Poole d (n=240) | Non-Dairy sample respondents | | | | | | Poole d (n=240) |
|---------|-------------|--------------------------|----------------------|-----------------|-----------------------|----------------------|-----------------|-----------------------|------------------------------|----------------------|-----------------|----------------------|----------------------|-----------------|-----------------------|
| | | North transect(n=120) | | | South transect(n=120) | | | | North transect(n=60) | | | South transect(n=60) | | | |
| | | Urban (n=20) | Transition (n=50) | Rural (n=50) | Urban (n=20) | Transition (n=50) | Rural (n=50) | | Urban (n=20) | Transition (n=50) | Rural (n=50) | Urban (n=20) | Transition (n=50) | Rural (n=50) | |
| 1 | landless | 19 (95) | 45 (90) | 42 (84) | 18 (90) | 46 (92) | 35 (70) | 205.00 (85.42) | 13 (65) | - | - | 20 (100) | - | - | 33 (27.50) |
| 2 | Marginal | 1 (5) | 2 (4) | 5 (10) | 2 (10) | 2 (4) | 10 (20) | 22.00 (9.17) | 4 (20) | 8 (40) | 10 (50) | - | 8 (40) | 10 (50) | 40 (33.33) |
| 3 | Small | - | 3 (6) | 3 (6) | - | 1 (2) | 3 (6) | 10.00 (4.17) | 3 (15) | 7 (35) | 7 (35) | - | 6 (30) | 6 (30) | 29 (24.17) |
| 4 | Medium | - | - | - | - | 1 (2) | 2 (4) | 3.00 (1.25) | - | 5 (25) | 3 (15) | - | 6 (30) | 4 (20) | 18 (15.00) |

| | | | | | | | | | | | | | | | |
|--|-------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|
| | Total | 20 (100) | 50 (100) | 50 (100) | 20 (100) | 50 (100) | 50 (100) | 240.0 0 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 120 (100) |
|--|-------|-------------|-------------|-------------|-------------|-------------|-------------|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|--------------|

Note: Figures in parenthesis is the percentage to the column total

Table 9 :Average land holding (Acres) in study area.

(Acres)

| Sl. No . | Particulars | Dairy sample respondents | | | | | | Poole d (n=35) | Non- Dairy sample respondents | | | | | | Poole d (n=87) |
|----------|-------------|--------------------------|------------------|-------------|----------------------|------------------|---------------|----------------|-------------------------------|-------------------|---------------|----------------------|-------------------|---------------|----------------|
| | | North transect(n=14) | | | South transect(n=21) | | | | North transect(n=47) | | | South transect(n=40) | | | |
| | | Urban (n=1) | Transition (n=5) | Rural (n=8) | Urban (n=2) | Transition (n=4) | Rural (n=15) | | Urban (n=7) | Transition (n=20) | Rural (n=20) | Urban (n=0) | Transition (n=20) | Rural (n=20) | |
| 1 | Marginal | 1.11 | 0.76 | 0.79 | 0.75 | 0.82 | 0.75 | 0.80 | 0.81 | 0.77 | 0.96 | - | 0.89 | 0.79 | 0.80 |
| 2 | Small | - | 3.53 | 4.99 | - | 4.50 | 2.60 | 3.60 | 2.99 | 3.53 | 2.60 | - | 3.71 | 4.10 | 3.40 |
| 3 | Medium | - | - | - | - | 6.04 | 6.44 | 6.40 | - | 7.36 | 7.35 | - | 7.35 | 6.25 | 7.10 |
| | Average | 1.11 | 4.29 | 5.78 | 0.75 | 11.36 | 9.79 | 10.80 | 3.80 | 11.66 | 10.91 | - | 11.95 | 11.14 | 11.30 |

Table 10: Occupation patterns of sample respondents in study area

(Numbers)

| SI · No. | Particu lars | Dairy sample respondents | | | | | | Poo led (n=240) | Non- Dairy sample respondents | | | | | | Poo led (n=120) |
|----------------|-------------------|--------------------------|--------------------------|---------------------|--------------------------|--------------------------|---------------------|---------------------------|-------------------------------|--------------------------|---------------------|-------------------------|--------------------------|---------------------|---------------------------|
| | | North transect(n=120) | | | South transect(n=120) | | | | North transect(n=60) | | | South transect(n=60) | | | |
| | | Ur ba n (n=20) | Tran sition (n=50) | Ru ral (n=50) | Ur ba n (n=20) | Tran sition (n=50) | Ru ral (n=50) | | Ur ba n (n=20) | Tran sition (n=50) | Ru ral (n=50) | Ur ba n (n=20) | Tran sition (n=50) | Ru ral (n=50) | |
| 1 | Agricul ture | 1 (5) | 5 (10) | 8 (16) | 2 (10) | 4 (8) | 15 (30) | 35 (14.58) | 7 (35) | 20 (100) | 20 (100) | - | 20 (100) | 20 (100) | 87 (72.50) |
| 2 | Dairyin g | 19 (95) | 45 (90) | 42 (84) | 18 (90) | 46 (92) | 35 (70) | 205 (85.42) | - | - | - | - | - | - | - |
| 3 | Casual labours | - | - | - | - | - | - | - | 13 (65) | - | - | 2 (10) | - | - | 15 (12.50) |
| 4 | Busines s | - | - | - | - | - | - | - | - | - | - | 18 (90) | - | - | 18 (15.00) |
| | Total | 20 (100) | 50 (100) | 50 (100) | 20 (100) | 50 (100) | 50 (100) | 240 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 20 (100) | 120 (100) |

Note: Figures in parenthesis is the percentage to the column total