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Socioeconomic and livelihood analysis of tribals in the Angara Block of Ranchi District, Jharkhand from agroforestry interventions

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ABSTRACT : Agroforestry offers various tangible and non-tangible benefits including livelihood benefits to farmers in terms of higher crop yields and income, greater food security and better resilience to climate change, etc. The purpose and role of agroforestry practices are better explained by the farmers who adopt agroforestry as an appropriate land management option. In order to determine the socioeconomic and livelihood analysis of tribals in the Angara Block of district Ranchi in Jharkhand, the present study was undertaken. The study was conducted using standardised questionnaire methods for collecting information on different aspects of agroforestry interventions in general and lac based agroforestry in particular. The results revealed that major share of the tribal block is from agriculture, especially agroforestry and integrated farming systems. However, it was observed that the farm income can be increased if interventions like training on modern scientific cultivation of crops as well as lac, mass scale introduction of Semialata, a busy host, post-harvest management and value addition of crops and lac, and participatory approaches for improvement of agroforestry practices are done in the area, to double the income of the stakeholders. The findings also helped in identifying prevailing agroforestry systems with potential for wider adoption and also in designing wide adoptable and useful agroforestry practices in the region.

Keywords: Agroforestry interventions, lac cultivation, socioeconomic status and tribals.

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1. INTRODUCTION

Agroforestry is an integrated approach of using the interactive benefits from combining agriculture and forestry, with ecological and economical interaction between different components (Lundgren and Raintree, 1982). An agroforestry intervention has constantly remained productive for the farmers and generated continuous revenue and has gained importance throughout the world as a sustainable production system for food and trees products on farm-land and rural development. However, increasing demand for fuel wood, fodder and timber has greatly affected the practice of leaving trees on farms, resulting in their felling. The traditional fallow periods have also reduced drastically leading to land degradation and lower agricultural productivity. The agri-ecosystems can be rejuvenated through agroforestry practices and the multifarious demands of the people and their livestock can be met from such systems. Besides, integrating trees into agricultural landscapes on a massive scale would also create an effective carbon sink, while ensuring sustainable food production, particularly in upland ecosystems.

Lac cultivation has been a prominent cash crop in eastern Indian states. Lac is a natural, biodegradable, non-toxic, odourless, tasteless, hard resin and non-injurious to health and secreted by tiny lac insect *Kerria lacca.* India is the global leader in lac production with mean annual lac production of 16,978 tons (Yogi *et al.*, 2017). Jharkhand state ranks first (8,630 tons), followed by Madhya Pradesh (2,586 tons), Chhattisgarh (2,336 tons), Maharashtra (1,525 tons) and Odisha (715 tons). These five states contribute around 93% of the national lac production. Important lac hosts include trees like *Ziziphus mauritiana, Butea monosperma, Schleichera oleosa* and bushy plants like *Flemengia semiliata* and *Cajanus cajan.*

Angara block of the Ranchi district comes under one of the rural populated area of Jharkhand state and has huge potential for lac cultivation due to presence of host trees in village and lac host based agroforestry at farmer's fields, which has enough impact on their socioeconomic unit. Since the returns through lac are higher than agricultural crops, introduction of lac hosts in the farmers' field leads to overall improvement in returns. Thus, lac cultivation can contribute towards economic security of the tribals, while cereal, vegetable and horticultural crops can provide the much needed nutritional security. Hence, this study was carried out with a purpose to know the socioeconomic and livelihood status of tribal farmers practicing agroforestry in the Angara Block of Ranchi district.

2. MATERIALS AND METHODS

Study area

The study was conducted in Angara block of Ranchi. The block is located on the north- east corner of the Ranchi between 23° 21' N and 85° 20' E to 23.35° N

and 85.33° E at about 544 metre above mean sea level. It consists of 23 panchayats from 142 villages. There are 13,525 households in the block with 1,27,000 human populations (66,040 male and 60,960 female). Ranchi, Ramgarh and Patratu are the nearby markets to Angara. The northern most and southern most parts of the district are covered with hillocks and forests. Out of total geographical area of 7,58,00 ha, forest area is 20.97%, land put to non-agricultural use is 5.6%, barren land is 4.2%, current fallow is 16.35%, land other than current fallow is 8.7%, net area sown is 33.64%, cultivable waste land is 3.4% and area sown more than once is 2.21%. The soil is well drained and sandy loam in texture with poor consistency and low water holding capacity.

Keeping in view the objectives of the study, a comprehensive interview schedule was developed on the basis of reconnaissance survey to study the socioeconomic parameters, for economic analysis of lac host based agroforestry. Pre-testing of the schedule was done in selected village among the randomly selected respondents for necessary modification. The respondents were contacted and purpose of the study explained to the villagers so that they could frankly discuss about the various aspects of the project. Field data was collected by personal interview of the respondents through questionnaire, and quantitative and qualitative analysis of the data was done. The study was carried out in five villages where maximum potential for lac cultivation existed due to presence of host trees and lac based agroforestry practices. These villages included Tati, Singari, Gutidih, Jaradih and Mungadih. A total of 40 respondents were studied from each village, totalling to 200 respondents from the five villages.

Socioeconomic analysis

The selected socio-personal and economic characters of the respondents namely age, sex, size of family, house type, education, social class, occupation, source of income, land holding, land-use practices, types and nature of components, farm machineries, livestock utilities, monthly income of household and food production capacity were measured. The variables were measured with the help of questionnaire developed for the purpose, following standard procedures (Trivedi, 1963).

Besides, the agroforestry practices of the respondents especially the assessment of lac based agroforestry systems, knowledge level of respondent about lac cultivation, matrix ranking of major lac hosts, matrix ranking for lac crops, agricultural crops grown with lac hosts, types of lac host, brood lac, market accessibility, market channel, training, package of practices followed, collection of lac, value addition, source of support, loan details and key challenges ahead were evaluated

Statistical analysis

The data were systematically arranged and tabulated for analysis and interpretation. The data obtained were quantified as per rules and subjected to statistical analysis for drawing meaningful conclusion. The statistical methods used were frequency, percentage and mean. The statistical analysis was done by Microsoft excel software 2010.

3. RESULTS AND DISCUSSION

Socioeconomic characteristics

The socioeconomic characters such as age, gender, size of family, house type, education, social class, occupation and source of income, land size, land-use practices of the respondents was analysed and presented in Table 1. The age group of the household was categorized in four groups *i.e.* 20-30, 30-40, 40-50 and 50-60 years. Perusal of data indicated that the mean maximum age of majority of respondents was found in 30-40 years category (39.50%), followed by 20-30 years (34.00%) and 50-60 years (7.00%). Among villages, the majority of respondents of Mungadih and Singri had maximum age under 20-30 years category, while in Jaradih and Gutidih villages, the maximum age was under 30-40 years. Male respondents (99.50%) dominated. Majority of the respondents had small family (59%), followed by medium family (36%) and large family (5%).

Small size of family was found in all the villages. Among villages, the maximum small size of family was found in Jaradih, followed by Tati. In Jaradih and Singari villages, large size of family was not found. Most of the households had kutchha type of house (70.50%), followed by mixed type (29%) and minimum was pucca type of house (0.5%). A similar trend was found among all villages, except Tati where one pucca house was also found. The educational status indicated that maximum number of respondents had attended high school level, but least of them had attended the college and above. Only one respondents of Singari village had educational level of college and above few respondents had not attended any school. Analysis of the social status of the households revealed that schedule tribe caste was the dominant (99.50%). In Mungadih village, one household belonged to other backward caste. Besides, farming system being the major livelihood option and agricultural labour, construction worker, private job and government service were other

Table 1. Socioeconomic characteristics of the respondents of the Angara block, Ranchi

Parameter	Category	Villages					Mean (SE)	%
		Mungadih	Jaradih	Gutidih	Tati	Singari		
Age group (years)	20-30	15	14	11	22	6	13.6 ± 2.86	34
	30-40	12	18	15	13	21	15.8 ± 2.31	39.5
	40-50	8	6	12	4	9	7.8 ±1.74	19.5
	50-60	5	2	2	1	4	2.8 ± 1.14	7
Gender	Male	40	40	40	40	39	39.8± 0.83	99.5
	Female	0	0	0	0	1	0.2± 0.27	0.5
Family size	Small (1-6 members)	23	26	20	25	24	23.6± 2.36	59
	Medium (6-9 members)	10	14	19	13	16	14.4± 2.17	36
	Large (>9 members)	7	0	1	2	0	2.00 ± 1.33	5
House type	Kutchha	28	28	29	26	30	28.2 ± 2.45	70.5
	Mixed	12	12	11	13	10	11.6 ± 1.59	29
	Pucca	0	0	0	1	0	0.2 ± 0.27	0.5
Education	Not attended	8	1	4	2	5	4 ± 1.47	10
	Elementary	14	12	13	13	9	12.2 ± 1.74	30.5
	High School	14	18	19	15	17	16.6 ± 2	41.5
	Intermediate	4	9	4	10	8	7 ± 1.63	17.5
	College	0	0	0	0	1	0.2 ± 0.26	0.5
Social class	SC	0	0	0	0	0	0	0
	ST	39	40	40	40	40	39.8 ± 2.83	99.5
	BC	1	0	0	0	0	0.2 ± 0.27	0.5
	Others	0	0	0	0	0	0	0
Occupation and	Farming	40	40	40	40	40	0	100
source of income	Agricultural labour	0	0	0	0	1	0.2 ± 0.267	0.5
	Construction worker	11	8	20	10	10	11.8 ±2.43	29.5
	Private job	0	0	0	0	2	0.4 ± 0.46	1
	Government service	2	2	3	1	7	3 ± 1.21	7.5
Farm size	Marginal	40	40	40	40	40	40 ± 2.83	100
land-use	Agroforestry and IFS	40	40	40	40	40	40 ± 2.83	100
Monthly income of	Below 2,250	0	0	0	0	0	0	0
the household	2,250 to 4,500	15	16	18	18	14	16.2 ± 1.94	40.5
	4,500 to 6,750	18	20	16	12	15	16.2 ± 2.17	40.5
	6,750 to 9,000	4	2	5	8	9	5.6 ± 1.56	14
	Above 9000	3	2	1	2	2	2 ± 0.69	5
Food security	1-3 months only	3	0	0	0	0	0.6±0.634	1.50
(Food enough for)	3-6 months only	16	19	14	14	17	16.6±1.96	41.5
	6-12 months only	15	18	17	17	14	16.4±1.95	41
	>12 months only	6	3	9	9.0	9.0	6.4±1.54	16

occupations. A recent report by the Jharkhand State Livelihood Promotion Society also revealed that there is lack of rural non-farm sector employment in the area, and hence, cultivation and wage labour are the main sources of occupation of the populace (JSLPS, 2015). The farmers on the basis of land size were classified into marginal, small, semi medium, medium and large farmers (Table 1). But all households in the study area were marginal farmers. The land-use practices were categorized into five categories *i.e.* agriculture, horticulture, agroforestry/integrated farming, fallow land and others, wherein agroforestry/integrated farming dominated all other land-use systems.

Maximum (40.50%) monthly income group was found in between of Rs. 2,250–4,500 and Rs. 4,500-6,750. None of households had monthly income below Rs. 2,250. Regarding the food production, 41.5% of the households had enough food for 3-6 months, while 41% households had enough food for 6-12 months. Very few households had enough food for 1-3 months (1.50%). Gutidih, Tati and Singari villages had maximum households with enough food for more than 12 months, followed by Mungadih village and least in Jaradih.

Five types of components from agricultural and allied sectors were classified (tree species, agricultural crops, horticultural crops, home garden and others) in the study area (Table 2). Among tree species, *Gmelina arborea, Bombax ceiba, Dalbergia sissoo, Tamarus indica* and *Moringa oleifera* were found in all the villages, whereas *Oryza sativa, Zea mays* and pigeon pea were major agricultural crops. Horticultural crops included *Ziziphus mauritiana, Mangifera indica, Artocarpus heterophyllus, Carica papaya, Syzygium cumini* and *Psidium guajava*. In their homegardens, villagers mainly grow *Solanum tuberosum, Lycopersicon esculentum, Capsicum annuum*, *Phaseolus vulgaris*, *Zingiber officinale*, *Curcuma longa*, *Brassica oleracea (Var. Capitata)*, *Brassica nigra, Solanum melongena* and *Abelmoschus esculentus*. Livestock, poultry, duckery and piggery were found in the study area.

Farm machineries

Perusal of data indicated that all the farmers had sprayer, weeder and plough for their own farming purposes (Table 3). Whereas, 22.4% household had pump-set and only 0.2% household had tractors. No household had power tiller in the study areas. The maximum number of pump-sets was found in Singari village, followed by Gutidih and Mungadih village. The maiden tractor was found in Jaradih village. Livestock plays an important role in economics of farmers. The livestock was categorized into bullock, cow, buffalo and goats (Table 3). All households had bullocks, followed by poultry (91.50%) and fishery (1.50%). The decreasing order of livestock in the study area was bullock > poultry > cow > buffalo > goat > pig > duck > fishery. All the villages followed the same trends in case of bullock, poultry and cow. In Mungadih and Singari village, goats were more compared to buffalo. Fishery was found only in Singari village.

Agroforestry systems

The study revealed that all the villagers followed the practices of agroforestry and integrated farming system. The distribution of agroforestry components of household *i.e.* agriculture, lac cultivation, fruit trees, poultry, livestock, piggery, duckery, fishery and sheep is given in Table 3. Results indicated that agriculture, lac cultivation, fruit trees and livestock components were adopted by all households, except poultry which was adopted by 92.50% households. The maximum poultry was adopted by villagers of Tati, followed by Jaradihand and Singari. Due to less cultivable land holding, the farmers have adopted the integrated farming system and agroforestry to meet their increasing requirements of food, fodder and other agri-horti-silvipastoral products, and extra income generation. The findings of this study are in line with the findings of Sood *et al.* (2008) in Eastern Himalayas and Pattanayak and Mercer (1998) in Philippines.

Assessment of lac based agroforestry system

The knowledge level on lac based agroforestry system was surveyed and it was observed that all households had knowledge of lac insect, brood lac, lac hosts, *F. semialata*, lac strains, phunki lac, ari lac, use of lac, crop cycle, pruning of lac hosts, diseases and pests of lac insect and their control. This indicated that all the households knew about the lac cultivation with all basic knowledge. Main reason behind the technical know how about lac cultivation is the age old practices being followed by the villagers and the human resource developments by the ICAR-Indian Institute of Natural Resins and Gums, Ranchi, which is training about 10,000 beneficiaries per year, through JASCOLAMPF, state forest department, JLDS and other local NGOs (IINRG, 2017).

Matrix ranking of major lac host trees

The matrix ranking of major lac host trees *i.e.* ber, kusum, palas and semialata in the study areas revealed that the overall best ranking was found for ber, followed by kusum, palas and semialata (Table 4). Ber was found best choice with respect to species preference, cost of cultivation, revenue generation,

labour intensiveness, possibility of lac based agroforestry system and B: C ratio; while *S. oleosa* was ranked best for yield per unit of lac inoculated, pest attack incidence and disease incidence. Results from matrix ranking for lac hosts indicated that Baishakhi was the most cultivated one, followed by Aghani, Kathki and Jethwi (Table 5). Among parameters, Baishakhi had 1st rank regarding the brood lac availability, ari lac, brood lac market, scrap lac market, B: C ratio but is highly labor intensive. Aghani lac had 1st rank in yield per unit of brood lac inoculated, crop cycle but suffers maximum pest/disease problem.

Agricultural crops grown with lac host

The agricultural crops are the main components along with the tree species, horticulture and homegarden. The economic positions indirectly depend on these agriculture crops. Almost all the villages grow agricultural crops along with lac host trees species. The main agriculture crops *Lycopersicon esculentum, Allium cepa, Capsicum annuum, Cucurbita moschata, Phaseolus vulgaris, Abelmoschus esculantus, Pisum sativum, Cucumis sativum, Solanum tuberosum, Raphanus sativus, Momoradica charantia, Cajanus cajan, Allium sativum, Zingiber officinale, Curcuma longa, Lagenaria siceraria, Brassica nigra, Oryza sativa* and *Amaranthus gangeticus* were grown in the study area. Area under different agricultural and lac hosts is presented in Table 6. Survey further revealed that natural plantations of lac hosts were more (98.50%) as compared to plantation type of lac host. Only in Gutidih village, plantation of lac host was found (only 1.50% of households).

Table 2. Distribution of different agroforestry components as livelihood security option in the Angara Block

Component	Mungadih	Tati	Jaradih	Gutidih	Singari
Tree species	*Gmelina arborea, Bombax ceiba, Tamarus indica, Moringa oleifera, Dalbergia sissoo, Butea monosperma, Schleichera oleosa, Anogeissus latifolia, Pongamia pinnata, Tectona grandis, Melia azedarach, Bauhinia variegata, Ficus religiosa, Plumeria rubra*	*B. monosperma, T. indica, B. ceiba, F. religiosa, G. arborea, P. pinnata, D. sissoo, M. azedarach,, Azadirachta indica, Delonix regia, S. oleosa, A. latifolia, Terminalia tomentosa, T. grandis, Acacia auriculiformis, B. variegata, Cassia fistula, P. rubra, Terminalia arjuna*	*G. arborea, B. monosperma, D. sissoo, B. variegata, T. indica, B. ceiba, A. latifolia, M. azedarach, P. pinnata, F. religiosa, A. indica, M. oleifera*	*A. indica, B. ceiba, T. indica, G. arborea, D. sissoo, T. arjuna, Bauhinia perpurea, T. grandis, Seedha, P. pinnata, B. monosperma, S. oleosa, M. azedarach, F. religiosa, T. tomentosa, A. auriculiformis*	*G. arborea, M. azedarach, D. sissoo, A. indica, P. pinnata, T. arjuna, T. grandis, M. olerifera, T. indica, F. religiosa, A. latifolia, S. oleosa, B. monosperma*
Agricultural crops	*Oryza sativa, Zea mays, Cajanus cajan*				
Horticultural crops	*Ziziphus mauritiana, Mangifera indica, Artocarpous heterophyllus, Carica papaya, Sygygium cumini, Psidium guajava*	*Z. mauritiana, C. papaya, M. indica, P. guajava, A. heterophyllus, S. cumini, Aegle marmelos*	*Z. mauritiana, P. guajava, C. papaya, A. heterophyllus, S. cumini*	*Z. mauritiana, P. guajava, A. heterophyllus, M. indica, S. cumini, A. marmelos, C. papaya*	*Z. mauritiana, A. heterophyllus, P. guajava, A. marmelos, C. papaya, S. cumini*
Homegarden	*Solanum tuberosum, Lycopersicon esculentum, Capsicum annuum, Phaseolus vulgaris, Zingber officinale, Curcuma longa, Brassica oleracea* (Var. *Botrytis*), *Brassica nigra, Solanum melongena, Abelmoschus esculentus*	*S. tuberosum, L. esculentum, B. nigra, B. oleracea* (Var. *Capitata*), *B. oleracea* (Var. *Botrytis*), *C. annuum, Z. officinale, C. longa, Pisum sativum, P. vulgaris, S. melongena, Spinacea oleracea*	*S. tuberosum, L. esculentum, P. sativum, B. nigra, P. vulgaris, B. oleracea* (Var. *Capitata*), *C. longa, B. oleracea* (Var. *Botrytis*), *A. esculentus, Z. officinale*	*S. tuberosum, L. esculentum, B. nigra, B. oleracea* (Var. *Capitata*), *B. oleracea* (Var. *Botrytis*), *Z. officinale, C. longa*	*S. tuberosum, L. esculentum, B. nigra, B. oleracea* (Var. *Capitata*), *Z. officinale, B. oleracea* (Var. *Botrytis*), *P. vulgaris, C. longa*
Others	Livestock, poultry, ducks, pigs	Livestock, pigs, ducks, poultry	Livestock, pigs, ducks	Livestock, pigs, ducks	Livestock, piggery, duck, fishery, sheep

Table 3. Distribution of farm machinery, livestock and agroforestry components in the Anagara block

Parameter	Category	Villages					Mean (SE)	%
		Mungadih	Jaradih	Gutidih	Tati	Singari		
Farm machinery	Sprayer	40	40	40	40	40	40 ± 0.83	100
	Pumpset	16	21	24	20	31	22.4 ± 3.08	56
	Weeder	40	40	40	40	40	40 ± 2.83	100
	Plough	40	40	40	40	40	40 ± 2.83	100
	Tractor	0	1	0	0	0	0.2 ± 0.27	0.5
	Power tiller	0	0	0	0	0	0	0
Livestock	Bullock	40	40	40	40	40	40 ± 2.83	100
	Cow	24	27	31	26	25	26.6 ± 2.55	66.5
	Buffalo	14	20	28	21	23	21.2 ± 2.89	53
	Goat	21	20	17	21	24	20.6 ± 2.49	51.5
	Pig	9	8	14	13	16	12 ± 2.06	30
	Duck	9	7	9	8	15	9.6 ± 1.87	24
	Fishery	0	0	0	0	3	0.6 ± 0.64	1.5
	Poultry	36	37	37	38	35	36.6 ± 2.75	91.5
Agroforestry components	Agriculture	40	40	40	40	40	40 ± 2.83	100
	Lac Cultivation	40	40	40	40	40	40 ± 2.83	100
	Fruit Trees	40	40	40	40	40	40 ± 2.83	100
	Poultry	36	38	37	39	35	37 ± 2.79	92.5
	Livestock	40	40	40	40	40	40 ± 2.83	100
	Piggery	9	14	8	14	16	12.2 ± 2.10	30.5
	Duckery	9	8	7	9	17	10 ± 2.14	25
	Fishery	0	0	0	0	3	0.6 ± 0.64	1.5
	Sheep	0	1	0	0	2	0.6 ± 0.50	1.5

Table 4. Matrix ranking of major lac hosts

Parameters	Ber	Kusum	Palas	Semialata
Yield/brood lac inoculated	2.90	3.23	1.05	0.03
Species preference	4.00	2.40	0.69	0.09
Cost of cultivation	4.00	2.15	1.00	0.03
Revenue generation	3.99	2.41	0.69	0.09
Pest attack incidence	2.85	3.24	1.01	0.09
Disease incidence	2.85	3.23	1.01	0.09
Labour intensiveness	3.99	2.19	0.96	0.03
Agroforestry possibilities	4.00	2.43	0.79	0.09
B : C ratio	4.00	2.49	0.69	0.06
Total	32.57	23.75	7.87	0.60
Mean	3.62	2.64	0.87	0.07
SD	0.57	0.46	0.16	0.03
Rank	1st	2nd	3rd	4th

Maximum area for agricultural crops was found in Singari village, followed by Tati and Jaradih villages, whereas the number of lac host trees per ha was maximum in Singari, followed by Tati and Jaradih. The decreasing order of area for agriculture crops was Singari>Tati>Mungadih>Gutidih>Jaradih. The decreasing orders of number of lac host trees per ha was Singari>Tati>Mungadih>Gutidih>Jaradih.

Brood lac and marketing of lac

The source, inoculation density and rate of purchase of brood lac were studied. All the households used locally available brood lac. The inoculation density of brood lac was good in all the study areas. The households sold their lac directly in the Jonha market without any mediators.

Training status of respondents

The training status of respondents revealed that the percentage of untrained respondents was more (54.50%) than the trained respondents (45.50%). Only in Singari village, the trained respondents were more than untrained (Table 7). In Mungadih, Jaradih, Gutidih and Tati villages, untrained respondents were more than trained respondents.

Collection of lac

The results revealed that all the farm women, farm men and farm children were involved in collection of lac in all the study areas. But, the respondents did not know anything about the value addition of the lac. Lack of technology, extension gap and innovativeness knowledge about the market of value added lac was observed among the villagers.

Support

It was also revealed that except ICAR-Indian Institute of Natural Resins and Gums, Ranchi, no other government organisations, NGOs, private firms, etc. extended support especially technical, advisory and financial.

Table 5. Matrix ranking for lac crops of Rangeeni and Kusumi strains

Parameters	Rangeeni		Kusumi	
	Kathki	Baishakhi	Aghani	Jethwi
Brood lac availability	0.685	3.96	2.425	0.03
Yield/brood lac inoculated	1.01	2.795	3.14	0.015
Crop cycle	1.32	2.815	2.935	0.03
Ari Lac	0.705	3.935	2.43	0.03
Labour intensiveness	1	3.89	2.195	0.045
Pest/disease problem	0.995	2.865	3.21	0.045
Brood lac market	0.745	3.81	2.53	0.03
Scrap lac market	0.705	3.945	2.435	0.03
B : C ratio	0.705	3.945	2.42	0.045
Total	7.87	31.96	23.72	0.3
Mean	0.87	3.55	2.64	0.03
SD	0.22	0.55	0.36	0.01
Rank	3rd	1st	2nd	4th

Table 6. Area for agricultural crops grown with lac host

Particulars	Villages									
	Mungadih		Jaradih		Gutidih		Tati		Singari	
	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Area for agricultural crops	0.50	0.02	0.26	0.02	0.39	0.01	0.64	0.09	1.28	0.04
No of lac host trees/ha	18.9	0.56	15.58	1.68	18	0.22	21.88	1.43	25.8	1.12

Table 7. Training status of respondents

Training Status	Villages					Mean	%
	Mungadih	Jaradih	Gutidih	Tati	Singari		
Trained	16	15	19	18	23	18.2	45.5
Untrained	24	25	21	22	17	21.8	54.5

Table 8. Total income share from different components in the Angara block, Ranchi

Income share	Mungadih		Jaradih		Gutidih		Tati		Singari	
	(in Rs.)	%	(in Rs.)	%	(in Rs.)	%	(in Rs.)	%	(in Rs.)	%
Agriculture	35,226.72	51	33,309.00	52	32,525.34	51.5	35,025.12	52	36,091.00	49
Livestock	10,360.8	15	8647.56	13.5	6,947.00	11	6,735.60	10	6,629.04	9
Lac	17,958.72	26	16,104.78	25.5	16,104.78	25.5	18,859.68	28	21,360.24	29
Other	5,525	8	5,765.04	9	7,578.72	12	6,735.60	10	9,575.00	13
	69,072	100	64,056	100	63,156	100	67,356	100	73,656	100

Total income share

The income share in agriculture, livestock, lac cultivation and others is presented in Table 8. More than 50% of total income share was from agriculture and rest income from the livestock, lac cultivation and others. Amongst the villages, Mungadih and Jaradih villagers had maximum percentage of income share from agriculture, followed by lac cultivation, livestock and minimum from others. In Gutidih, Singari and Tati villages, the maximum percentage of income share was from agriculture, followed by lac cultivation. Maximum revenue was generated by Singari village (Rs. 73,656), followed by Mungadih (Rs. 69,072) and Gutidih (Rs. 63,156). The village wise decreasing order of total income was Singari >Mungadih >Tati >Jaradih>Gutidih.

4. CONCLUSION

Socioeconomic and livelihood analysis of tribals in the Angara Block of Ranchi District in Jharkhand revealed that major share of the tribal block is from agriculture, especially agroforestry and integrated farming systems. However, it was observed that the farm income can be increased if interventions like training on modern scientific cultivation of crops as well as lac, mass scale introduction of semialata-a busy host, post-harvest management and value addition of crops and lac, and participatory approaches for betterment of agroforestry practices are done in the area. Also, holistic development can only happen if both the genders progress at the same pace.

REFERENCES

IINRG. 2017. Annual Report 2016. ICAR-Indian Institute of Natural Resins and Gums Namkum, Ranchi - 834 010, Jharkhand, India.

JSLPS. 2015. Baseline Survey Report on Livelihood in Jharkhand.

Lundgren, B. and Raintree, J.B. 1982. Sustained Agroforestry. Agricultural Research for Development Potential and Challenges in Asia. The Hauge, ICNAR, pp. 1-25.

Pattanayak, S. and Mercer, D.E. 1998. Valuing soil conservation benefits of agroforestry: Contour hedgerows in Eastern Visayas, Philipines. *Agricultural Economics*, 18: 31-46.

Sood, K.K., Najiar, C., Singh, K.A., Handique, P., Singh, B. and Rethy, P. 2008. Association between socioeconomic parameters and agroforestry uptake: Evidences from the eastern Himalayas. *Indian Journal of Forestry*, 31(40): 559-564.

Trivedi, G. 1963. Measurement and analysis of socio-economic status of rural families. Ph.D. Thesis, Indian Agricultural Research Institute, New Delhi.

Yogi, R.K., Kumar, A. and Jaiswal, A.K. 2017. Lac, Plant Resins and Gums Statistics 2015 at a Glance. ICAR-Indian Institute of Natural Resins and Gums, Ranchi (Jharkhand), India. Bulletin (Technical) No. 17/2017, pp. 1-72.