



Original Research

Comparative Study on the Socio-Economic Profile of Soligas in Core and Buffer Zone of Biligiri Rangana Hills (B. R. Hills) of Karnataka

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Abstract

The present study was carried out purposively to study socioeconomic status and existing animal husbandry practices of soliga tribe in Biligiri Ranga Hills of Karnataka state. Randomly 105 respondents from 11 villages/podus of core zone and 149 respondents from 16 villages of buffer zone were selected. Results indicated that male respondents are predominant both in buffer zone and core zone. No joint family reported. The literacy rate (15-22%) is low in both zones. Landholding patterns among the individual Soliga families are forest and revenue land. Majority soligas have marginal land (up to 2.5 acres) and Non Timber Forest Products was the common and top source of income and least was the animal husbandry. The percentage of livestock keepers in core and buffer zone was 67.6% and 65.77% respectively. Predominant species in both zones was goat, cattle and poultry. However, poultry was relatively highest (17.14%) in core zone compare to buffer zone.

Key words: B. R. Hills, Buffer Zone, Land, Literate, Livestock, NTFP, Soliga

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Introduction

Tribal population of Karnataka is about 34.64 lakhs (6.95%) of total population of Karnataka. The Soliga is a scheduled tribe, who lives in the hilly forest areas of Bili Giri Rangana Hill and Mahadeshwara hill of Chamarajanagar district. The Soligas were also referred as Sholiga, Soliga, and Soligaruru by early authors. After declaration of BRT as wildlife sanctuary (1974), Soliga life style got affected and displaced Soligas settlements to periphery (buffer area) and allowed some of the settlement to stay inside (core area) the forest. Earlier researchers (Kumar, 2006; Madegowda *et al.*, 2017) discussed that after the amendment to





Wildlife Protection Act in 2002, banning the collection of NTFP for commercial use affected 15,000 *Soliga* tribals. The government agencies what ever worked in *Soliga*'s area, mostly with respect anthropological point of view like providing medical facilities', electricity, low cost houses and other basic necessities. The available literature of the life style of the *Soliga* tribes in general, and of the Bilgiri Rangaswamy Temple Wildlife Sanctuary in particular, in core and buffer zone is very less. To fill up the research gaps identified, the study was under taken to compare the socio-economic profile of *Soligas* in buffer and core zone of B. R. hills.

Material and Methods

The present study was carried out during August 2017 to February 2018 in Biligiri Rangaswamy Temple (BRT) Wildlife Sanctuary which is located in the Chamarajanagar district of Karnataka because of the highest population of *soliga* tribes and it forms the most backward district of the Karnataka state. The B. R. T. wildlife sanctuary covers three taluks of Yelandur, Chamarajanagar, and Kollegal. It lies in the coordinates of 77°–77°16'E, 11°47'– 12°9'N, covering an area of 540 sq km. BRT Wildlife Sanctuary houses 61 *Podus*. The site was declared as tiger reserve in December 2010.

Randomly a total of 105 respondents from 11 villages of core zone and randomly 149 respondents from 16 villages of buffer zone were selected for the study. Core zone is an inner most area in the BR hills where wild animal population is more and is free from human pressures. Buffer zone is an area peripheral to a national park or equivalent to reserve. Only those *Podus* was chosen who are maintained different species of livestock by random sampling design. Only the head of the family/responsible person of the family was considered for the purpose of the interview. The interview schedule was developed in consultation with the experts, keeping in view the objectives and variables of the study. The following parameters were collected from the selected respondents. The methods and procedures for the measurement of variable are given below-

Respondents: Whether respondent is male and female was recorded.

Family Type: This refers to the family type of the livestock owners, whether it is joint family or nuclear family.

Family size: This refers to the number of members in family. It was categorized into family size of two members, two to four members and more than four.

Literacy: Person aged seven years or above who can read and write with understanding was considered as *literate*. A person who cannot read and write was considered as *illiterate*.

Assets/Materials Possessed: Respondents possessing mobile, bike/bicycle and television

Land Holding: It refers to total operational land in acres possessed by the respondent. The respondent were categorized into three groups viz. *landless*; *marginal (with up to 2.5 acres)* and *small (2.5 to 5 acres)*.

Type of Land: Whether respondent possess forest land (given by forest department) and revenue land (which is distributed by revenue department).

Livestock Holding: It refers to the total number of livestock possessed by the respondent at the time of investigation without livestock or with livestock having different species like goat, sheep, cattle and poultry.

Source of Income: Percentage of respondent who get income from different sources was calculated. The source of income is mostly from agriculture crops, agricultural labour, animal husbandry and Non-Timber Forest Products (NTFP). Income from the sale of NTFP products through Large Adivasis Multipurpose Cooperative society (LAMPS) was considered. One or other NTFP are obtained throughout the year. The details are given in the Table 5.

Percentage of respondents for each source of income was calculated. Respondents who considered for one source of income were also taken in to consideration for calculating the other source of income. Higher the percentage of respondents was considered as most important source of income to the respondents.

Statistical Analysis

The data collected from respondents were coded, tabulated, analyzed and presented in the form of tables. The various statistical tools like arithmetic mean, percentage, and chi square test etc. were used in analysis of data.

Results and Discussion

The results (Table 1) indicate that male respondents are predominant than female respondents both in buffer zone (79%) and core zone (65%) respectively. This is an indicative of male being the family head patriarchal system followed in both zones. The mean values (gender wise) of respondents in two zones were highly significant ($p \leq 0.01$). Smriti (2013) reveals that majority (75%) of respondents were male and 25% were female. Similar results was observed by Jyoti (2017) in tribal households of Jharkhand state.

The family size consisting of 2 members was more in core zone (56.19%) and less in buffer zone (24.16%). However, a family size 2-4 member was more (46.30%) in buffer zone than core (29.52%). Family with more than 4 members was more in buffer zone (28.85%) than core zone (1.33%). The effect of family size of respondents in two zones was highly significant ($p \leq 0.01$). There were no joint families either in buffer zone or core zone. Krishna Raj *et al.* (2017) findings reveals that majority (87.9%) of the respondents emerged from nuclear family as compared to joint family of *soliga* tribes. Singh and Sadangi (2012) opined only 88 families (38.66%) of the total sample were found living jointly and the majorities (63.66%) were in nuclear family. The findings of present study are in line with the findings of Nagaraja and Kusugal (2013) and Islam *et al.* (2015) who also found that more than 60 % respondents belonged to nuclear family and rest in joint family in Koraput and Rayagada district of Odisha, in Chitradurga district of Karnataka states and in Ranchi district of Jharkhand states respectively. Similarly, Nanjunda (2010) has also reported that



84.3 % of the respondents belong to nuclear families, 9.2 % of the respondents belong to joint families and 6.5 % respondents belong to extended families.

Table 1: Socio economic parameters of *Soliga* tribe in core zone & buffer zone of B. R Hills

S. No.	Particulars	Core Zone (n=105)	Buffer Zone(n=149)	Overall (N=254)	Pearson Chi-Square
1	Respondents				6.54**
	Male	68(64.76%)	118(79.19%)	186(73.22%)	
	Female	37(35.23%)	31(20.80%)	68(26.77%)	
2	Family Size				27.93**
	2	59(56.19%)	36(24.6%)	95(37.40%)	
	4-Feb	31(29.52%)	69(46.30%)	100(39.37%)	
	> 4	14(1.33%)	43(28.85%)	57(22.44%)	
	Joint family	0	0		5.86**
3	Literacy				
	Literate	22(20.95%)	15(10.06%)	37(14.56%)	
	Illiterate	83(79.04%)	134(89.93%)	217(85.43%)	5.31*
4	Assets/Materials Possessed				
	Mobile	61(58.09%)	133(89.26%)	194(76.37%)	
	Bike/Bicycle	92(87.61%)	125(83.89%)	217(85.43%)	
	TV	42(40%)	74(49.66%)	116(45.66%)	

Values given in parenthesis is number of respondents for respective parameter; **Significant at $p \leq 0.01$; Significant at $*p \leq 0.05$

The literacy rate is low both in case of core zone (20.95%) and buffer zone (10.06%). Marginally higher percentage in core zone may be due to presence of Vivekananda Girijana Kalyana Kendra (VGKK) which has been working for education and human health since 1981. The level of literacy among respondents in two zones was highly significant ($p \leq 0.01$). Krishna Raj *et al.* (2017) findings reveals that majority (83.2%) of respondents were illiterate followed by 12.4 % with primary education and 4.4% with higher secondary among *soliga* tribes. Pandey (1996) and Verma (2003) found low level of education among the tribal respondents in Bihar and Jharkhand states respectively. Maousami *et al.* (2017) discusses that literacy is one of the important factors in adoption level for scientific animal rearing.

Both in core and buffer zone, mobile and bike/bicycle were common assets. Respondents having mobile were 58.09% in core zone and 89.26% in buffer zone. Users of mobile was much in buffer zone area was due to their *podus* (villages) located to the taluka headquarters which has better network connectivity. Percentages of people with bike/bicycle in both zones were 87.61% and 83.89% respectively which indicates that they are mainly relying on their own vehicles than the public transport system. Nearly 50% of respondents in buffer zone had television. Nearly 40% of respondents had television in the core zone and villages (8 villages) of these respondents' villages were located adjacent to pilgrimage temple (Bili Ranganatha Swammy temple). These *poduses* were also well connected by road due to great movement of

pilgrimages who are visiting to the temple. However, rest of the (3 villages) did not have any electricity connection, but mostly they were dependent on solar light and the fire light produced by igniting with the help of tree branches which they cut in-front of their house for all other activities. The effect of assets or materials possessed by respondents in two zones differed significantly ($p \leq 0.05$). In the same *soligas*, Madegowda (2017) reported that 71.9 % of the respondents own a radio, 44.6 % have a watch, 20.3 % have bicycle and television, and due to the influence of the outside the world 5.7 % possessed gold. Jyoti (2017) also observed that 78.77 % tribal families were having cycle, 40.77 % having radio, about 30 % having mobile, 6 % having TV and rest 1.85 % having motor cycle.

Land holding of *soliga* tribes in core zone and buffer zone of B. R Hills has been presented in Table 2. The percentage of landless, marginal and small respondents in core zone are 25%, 55% and 11% and the corresponding values for buffer zone are 30%, 90% and 10% respectively. Table shows that majority of the *soligas* have marginal land (< 2.5 acres). Very small population (11.4%) in core and 6.71% in buffer zone has more than 2.5 to 5.0 acres of land. The landholding possessed by respondents in two zones differed significantly ($p \leq 0.05$). Madegowda (2017) reports that 37.5 % of the respondents were holding 1-2 acres of land, 26.6 % of the respondents were holding less than 99 cents of land, 7.2 % of the respondents holding 2-3 acres of land and 20 % of the respondents were landless. Madegowda (2017) reports that the average size of landholding was 1.6 acres of revenue land, 1.5 acres of forest land and 1.3 acres of other land. Smriti (2013) reveals that majority of tribals respondents of Ranchi district (75%) were marginal farmers, 25% were small farmers, and no respondents were either landless, medium or large farmers among.

Table 2: Land holding of *Soliga* tribe in core zone and buffer zone of B. R Hills

S. No.		Core Zone (n=105)	Buffer Zone(n=149)	Overall (N=254)	Pearson Chi-Square
1	Land Holding				2.16*
	Land less	27(25.71%)	45(30.20%)	72(28.34%)	
	Marginal (Up to 2.5 acres)	58(55.23%)	90(60.40%)	148(58.26%)	
	Small (2.5 to 5.0 acres)	12(11.4%)	10(6.71%)	22(8.66%)	
2	Type of Land				11.77**
	Forest land	101(96.19%)	122(81.87%)	223(87.79%)	
	Revenue land	04(3.80%)	27(18.12%)	31(12.20%)	

**Significant at $p \leq 0.01$; Significant at * $p \leq 0.05$; Value in parenthesis indicate percentage of respondent.

The landholding patterns among the individual *Soliga* families are forest land and revenue land. The effect of type of landholding among respondents in two zones was highly significant ($p \leq 0.01$). *Soligas* reveal whatever land possessed was given by forest department. This land is given on agreement basis for their livelihood. This land will be carry forwarded to their children but cannot be sold. Madegowda (2017) also reports that in 1960, the Government of Karnataka distributed revenue land among a few of the *Soliga*

families living inside and on the periphery of the BRT Wildlife Sanctuary. Forest land is the land provided by the forest department without record in 2010 under the scheduled tribes and other forest dwellers (Recognition of Forest Rights Act, 2006). The *Soligas* received the title deed or Patta for the forest land later.

However, little percentage (18.12% and 3.80%) of *soligas* (core and buffer) had revenue land. Those who were residing in the B.R. hills continuously at one place have got *patta* for revenue land. Revenue land is the land provided by the Revenue Department with RTC and Patta. Madegowda (2017) also reports that 61.6 % of the respondents were holding forest land. 11.9 % of the respondents were holding revenue land and 20% of the respondents were landless. This meant that most of the *Soligas* were holding forest land while (25%) of the respondents were landless which included those who cultivated the leased land and the landless families. These findings are in consonance with Singh and Sadangi (2012) that 41.66 % of the tribal families were landless, around 39.16 % of the households owned less than one acre, and 12.50 %, 1-2 acres land and only 6.67 % had more than 2 acres of land in Rayagada district of Odisha. Table 3 represents the species wise percentage distribution in different zones. The percentage of livestock keepers in core and buffer zone was 67.6% and 65.77% respectively. The effect of livestock possessed by respondents in two zones differed significantly ($p \leq 0.05$).

Table 3: Species wise (%) distribution of livestock holding of *Soliga* tribe in core & buffer zone of B. R. hills

S. No.		Core Zone (n=105)	Buffer Zone(n=149)	Overall (N=254)	Pearson Chi-Square
1	Livestock	67.6% (71)	65.77 (98)	66.53% (169)	0.09*
	Without livestock	32.38% (34)	34.22% (51)	33.46% (85)	
2	Goat	41.9%## (44)#	36.24%## (54)#	37.4% (95)	37.10**
3	Cattle	16.19%## (17)#	40.93%## (61)#	30.7% (78)	24.17**
4	Sheep	7.61%## (8)#	11.40%## (17)#	9.84% (25)	7.57*
5	Poultry	17.14%## (18)#	6.04%## (9)#	10.62% (27)	

indicates no of respondents who had respective species out of total livestock; ## % was calculated as no. of respondents kept one of the species by total no. of livestock respondents; **Significant at $p \leq 0.01$; Significant at $*p \leq 0.05$

Although, rest of the people had animals at one or other time but were sold in difficult times. Those who had livestock kept either one of the species like goat, sheep, cattle and poultry and mixture of all. The predominant species in core zone was goats (41.9%) followed by poultry (17.14%) cattle (16.19%), sheep (8%). In buffer zone, people had cattle (40.93%), goat (36.24%), poultry (6.04%) and sheep (11.40%). Relatively high percentage of cattle and sheep was found in buffer zone. However, poultry was relatively highest (17.14%) in core zone compared to buffer zone (6.04%). Results clearly indicate that in buffer zone

cattle and goats are most preferred species and conversely in core zone goat and poultry are more preferred species. There is no trend of buffalo rearing among the *Soligas* in both core and buffer zone as *Soligas* believe that if they consume the buffalo milk their intelligence will be decreased. The number of goats and cattle possessed by respondents in two zones was highly significant ($p \leq 0.01$). The number of sheep possessed by respondents in two zones also differed significantly ($p \leq 0.05$).

Among each species, percentage of female adult of goat (39.42%), cattle (6.2%) and sheep (41.42%) was higher in core and buffer zone followed by lactating goat (18.53%), cattle (23.65%) and sheep (15.71%). This indicates that males were removed as and when they felt excess or for their emergency need leading to more female adults in the group. Results show that 18% of the respondents had bullock in buffer zone and 3.22% in core zone. This clearly indicates that bullocks are used for ploughing in the buffer zone for growing agricultural crops like *ragi* and maize. However, respondents though had land in the core zone, but mostly used for growing pepper and *ragi* where bullocks are so important. Further, poultry was also kept as alternative species in core zone. A study by Sorathiya (2015) shows combination of goat keeping with other classes of livestock by *Ahirs* tribal in Gujarat. The goat keeping by *Ahirs* with large animals was quite popular enterprise as 44% of respondents had possessed goats + large animals and 17% have reared goat + sheep + large animals. Thus, total 68% *Ahirs* had reared large animals with goats. Only 17% of them had reared goats alone; where as 39% of they had combined their goat rearing with sheep. More numbers of *Ahirs* had reared large animals in combination with goats in Navsari. More numbers of goat keepers (22%) in Valsad district had reared only goats. Table 4 reveals that source of income from agriculture labour, NTFP, agriculture crop and animal husbandry was 59 %, 82 %, 69 % and 23 % respectively in core zone.

Table 4: Source of income from different sources in core and buffer zone of B. R. hills

S. No.	Source of Income	Core Zone(n=105)	Rank	Buffer Zone(n=149)	Rank	Overall (N=254)	Pearson Chi-Square
1	Agriculture Labour	59.04% (62)	III	79.19% (118)	II	70.86% (180)	16.03**
2	NTFP	82.85% (87)	I	53.02% (79)	III	35.35% (166)	
3	Agriculture	69.52% (73)	II	83.89% (125)	I	77.95% (198)	
4	Animals Husbandry	23% (24)	IV	35% (52)	IV	29.92% (76)	

Values in parenthesis indicate no. of respondents in under each source of income out of total respondents; **Significant at $p \leq 0.01$; Significant at $p \leq 0.05$

The corresponding values for buffer zone is 79 %, 53 %, 83 % and 35 % respectively. Based on the respondents, it was concluded that NTFP was the common and highest source of income in the core zone, followed by agriculture, labour and least was the animal husbandry. However, in buffer zone agriculture is

the first source of income followed by labour and NTFP and least was the animal husbandry. The most common source of income was NTFP in core zone. NTFP includes honey, amla, lichen, broom sticks, *Acacia concinna* (Babul), *Terminalia chebula* (Harad), bee wax and fruits like jackfruit, orange, watermelon and chakota etc. Out of 28 NTFPs honey, amla, broomsticks and lichen are the major NTFPs collected by the *Soligas*.

The Table 5 represents the different source of income available throughout the year. Table also reveals that honey, amla, broomsticks, lichen, *Acacia concinna* (Babul), *Terminalia chebula* (Harad), bee wax and jackfruit, watermelon and chakota (Pomelo) are commonly NTFP items.

Table 5: Distribution of income source from different months in core zone#

Months	NTFP	Agriculture	Livestock sale	Labour/Wages
January			Kule mari*	
February	Orange: Rs20/kg	Pepper-Rs 400-800/kg	Rotti habba *	Migration to coffee estate area (Kodagu)
March			Mari habba*-	
April	Honey: Rs 170/kg		Rs 6000/goat or sheep	Mini. Rs 500/person
	Bee wax: Rs 400/kg			Max. Rs 800-1000/person
	Acacia concinna(Babul:Rs 400/kg			
	Terminalia chebula(Harad):Rs 25/kg			
	Broom Sticks: Rs 30/bunch			
May	Jackfruit: Rs 50-60/Fruit			Agriculture laboure in the local area
June	Jamun hannu: Rs20/kg			
July				
August	Lichen: Rs 230/kg			
September	Chakota/pomelo: Rs10/kg			
			Rs 6000/goat or sheep	Female-Rs150/person
October		Coffee-Rs145/kg		
November				
December	Amla: Rs 15/kg			

*Name of festivals /celebrations during which animals are sold; # Same hold good for the buffer zone except wages (higher than core zone) and crops grown (Ragi and maize)



These products were available during different months of the year based on their season of growth leading to availability of products throughout year. Madegowda (2002) revealed that *Soligas* get 58.6% from NTFPs collection, 22.7 % from agricultural activities and 8.6 % from labour, 7.2 % from allied and 2.8 % from other sources of income per year per family through Large Scale Adivasi Multipurpose Cooperative Societies (LAMPS). Agriculture is one of major sources of income in buffer zone and the most common crops grown are finger millet (*Ragi*) and maize. However, land holding is less in core zone; the crops grown are of commercial importance like coffee and pepper. The effect of income from different sources of respondents in two zones was highly significant. Madegowda *et al.* (2017) reported that earlier *soligas* used to cultivate crops for their personal consumption but nowadays they have started to cultivate some of the crops to be sold. Earnings from the sale of agriculture products (spices and condiments, aromatic plants) are called cash income. *Ragi* is also grown for self- consumption is called non-cash income.

Considerably good percentages (60%) in core zone and (75%) in buffer zone of *soligas* work as labour in off-seasons. When individual respondents are engaged in their daily work as a laborer or works in the farmers' lands, collects non timber forest products or is engaged in any other type of labour work, it is called as wage labour. Although, income from the livestock is last in the list, but they do get financial help during emergency by selling livestock. Smriti (2013) reported that income from crop production is seasonal; dairying provides a stable round year income. Madegowda (2017) reports that agriculture and wage labour are the main occupations and collection of NTFPs are secondary occupations. Singh and Sadangi (2012) studied that all the tribal households (100%) had forest activities as their secondary or tertiary source of income. The sources of income of respondents in two zones was highly significantly different ($p \leq 0.01$) in the present study.

The common constraints or bottlenecks faced by *Soliga* were also recorded. Lack of sufficient pasture land and restriction of grazing for animals in forest area, problem of land alienation and land rights, illiteracy and ignorance of the government facilities, problem of transportation and communications, lack of scientific knowledge about the livestock farming, non-availability of pure breeds, timely delivery of veterinary services, etc. were the most predominant constraints. Maousami *et al.* (2017) also reports that lack of good breeding male, unavailability of concentrate feeds, non-availability of the veterinarian in time are main constraints in hill *Korwa* tribes of Chattisgarh.

Conclusion

Results conclude that *soligas* live in nuclear family in both zones and depend on non-timber forest products (NTFP). Majority of *soligas* work as labour, agriculture and livestock farming as the subsidiary occupations. Further, majority of the *soligas* area rearing one of livestock species and cattle and goats are



being major. This contributes seasonal income. It can be concluded that *soligas* in the buffer zone is better settled than core zone.

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