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Struggling for stability: Livelihood security and system analysis of Iruliga Tribes in Ramanagara

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Abstract

The study was conducted in Ramanagara district to assess the livelihood security of the Iruliga tribes during 2023–24. Primary data was gathered from 120 randomly selected households through personal interviews using an ex-post-facto research design. The results revealed that 41.17 per cent of respondents had medium livelihood security, with 43.33 per cent in Ramanagara taluk and 45.00 per cent in Magadi taluk. About 48.33 per cent had high food security, while 50.83 per cent had medium health security. Financial security was medium for 61.67 per cent, and transportation security was low for 52.50 per cent of respondents. Agricultural labor was the dominant livelihood source, engaging 95.83 per cent of households and contributing 54.62 per cent of total income. Livestock rearing (56.67%) and agriculture (55.83%) were also major income contributors. The most prevalent livelihood pattern combined agriculture, wage labor, and livestock (22.50%), with agricultural labor taking up the most time (62.53%). Sericulture was seen as the riskiest livelihood (66.67%), while those in government and semi-government jobs had the highest technical competency. The study highlights the need for targeted interventions to strengthen the economic resilience of the Iruliga tribes.

Keywords: Iruliga tribes, livelihood security, livelihood system and Ramanagar district

Introduction

India, a nation known for its remarkable "unity in diversity," embodies a wide spectrum of communities that differ in geography, culture, and social organization. Among them, tribal societies, often referred to as *Adivasis* (original inhabitants), have historically maintained a harmonious relationship with nature, preserving distinct ways of life passed down through generations. Despite their cultural richness, tribal communities remain among the most marginalized and disadvantaged sections of Indian society, facing systemic challenges in securing sustainable livelihoods, education, health, and socio-economic development.

Defining tribes is complex due to their diverse socio-economic settings and evolving integration with mainstream society. However, common characteristics such as shared ancestry, territorial affiliation, cultural uniqueness, and traditional governance structures are widely recognized (The Imperial Gazetteer of India, 1911). According to the 2011 Census, Scheduled Tribes (STs) constitute 8.6 per cent

of India's population, with Karnataka alone accounting for 6.95 per cent of the state's population. Among Karnataka's indigenous groups, the Iruliga community, primarily residing in Ramanagara district, represents a distinct cultural and socio-economic entity grappling with persistent livelihood challenges.

The Iruliga, belonging to the Dravidian ethnic group, have traditionally depended on occupations like rat-catching, snake-handling, honey collection, and agricultural labor. However, historical land alienation, poverty, health vulnerabilities, educational barriers, and the pressures of modernization have severely impacted their traditional livelihood systems. Despite government interventions and welfare initiatives, the Iruligas continue to face difficulties in accessing resources, securing land rights, utilizing development programs, and sustaining their cultural identity. In this context, livelihood security — defined as the sustainable access to income, food, health, education, and shelter (FAO, 1995; Chambers and Conway, 1992) ^[1, 4] — becomes a crucial lens to understand and address the

vulnerabilities faced by the Iruliga community.

Objectives

- To measure the livelihood security of the Iruliga tribes in Ramanagara district.
- To examine the different livelihood systems followed by tribes

Methodology

The present investigation was conducted in Ramanagara district of Karnataka, focusing on the Iruliga tribal community. Two taluks-Ramanagara and Magadi-were purposively selected due to their accessibility and concentration of tribal populations. From each taluk, six villages/hamlets were randomly selected, and from each village/hamlet, ten respondents were chosen through simple random sampling. This yielded a total sample size of 120 tribal respondents.

A structured personal interview schedule was developed in accordance with the objectives of the study and the variables identified. The variables were categorized into dependent and independent variables. The dependent variable, livelihood security of the tribal respondents, was assessed using a Livelihood Security Index developed by Ramya (2016) [10]. The independent variables included a range of demographic, socio-economic, and psychological factors, each measured using established scales and procedures, with necessary modifications to suit the local context.

The Livelihood Security Index was conceptualized as a multidimensional construct, encompassing eleven key components: Food security, Habitat security, Health security, Occupational security, Cultural security, Asset security, Transportation security, Social security, Financial security, Educational security, Information security. Each component was assessed using a set of indicators relevant to the rural tribal context. The index score for livelihood security was computed using the following formula:

Livelihood security index score

$$\frac{A + B + C + D + E + F + G + H + I + J + K}{11}$$

Where, A. Food security
B. Habitat security
C. Health security
D. Occupational security
E. Cultural security
F. Asset security
G. Transportation security
H. Social security
I. Financial security
J. Educational security
K. Informational security

Each of the above dimensions was further standardized into a percentage score using the following formula:

$$\text{Security Index} = \frac{\text{Obtained score}}{\text{maximum obtainable score}} \times 100$$

After obtaining the index score and calculating the mean

and standard deviation, livelihood security among the respondents was categorized into three groups for a comprehensive assessment which has been given in the below table.

Sl. No.	Livelihood security	Criterion
1.	Low	Below (Mean – ½SD)
2.	Medium	Between (Mean ± ½SD)
3.	High	Above (Mean + ½SD)

To study the livelihood system, six main aspects were considered:

- 1. Livelihood Combinations:** All existing combinations of different livelihood activities followed by the tribal households were recorded. A total of sixteen combinations involving ten different livelihood options were found. These were grouped into ten broad categories based on how many people were following them.
- 2. Distribution of Livelihood Options:** The number of households engaged in each livelihood option, whether alone or in combination, was counted. Based on this, the livelihood options were ranked according to how commonly they were practiced.
- 3. Proportion of Income and Time Spent:** To understand how much each activity contributed to livelihood security, both income and time spent were measured. Contribution of each livelihood option was calculated by using the formula:

$$\frac{\text{Annual income generated from each livelihood by all the respondent}}{\text{Total annual income of all the respondents}} \times 100$$

To calculate the time spent on each livelihood option the following formula was used:

$$\text{Time spent} = \frac{\text{"Number of man days spent on the livelihood option"}}{\text{Year}} \times 100$$

- 4. Male and Female Participation:** The role of men and women in each livelihood activity was noted. Their involvement was rated as fully involved (score = 2), partially involved (score = 1), or not involved (score = 0). The male and female share for each livelihood option was calculated by using the formula:

$$\text{Male share of each livelihood option} = \frac{\text{Male score of each livelihood option}}{\text{Total score of each livelihood option}} \times 100$$

$$\text{Female share of each livelihood option} = \frac{\text{Female score of each livelihood option}}{\text{Total score of each livelihood option}} \times 100$$

- 5. Technical Competency:** The skill level of the respondents in each livelihood option was measured using a scale – enough (3), moderate (2), and less (1).

$$\text{Degree of Technical competency (\%)} = \frac{\text{Total technical competency score}}{\text{Maximum possible score}} \times 100$$

- 6. Perceived Risk:** The risk felt by the respondents in each activity was also measured on a scale – high (3), moderate (2), and low (1).

$$\text{Extent of Risk involvement (\%)} = \frac{\text{Total risk involvement score}}{\text{Maximum possible score}} \times 100$$

This method helped in understanding which livelihood options were more common, how much they contributed to income and time, the role of men and women, how skilled people were, and how risky each option was.

Results and Discussion

Overall livelihood security

Table 1 provides information on the overall livelihood security of tribes. Among respondents in Magadi taluk, nearly half (45.00%) belonged to the medium category followed by over one-third (36.67%) in the high category and nearly one-fifth (18.33%) in the low category. In Ramanagara taluk, nearly half (43.33%) of respondents belonged to the medium category followed by more than two-fifths (41.67%) in the low category and one-sixth (15.00%) in the high category. Overall, nearly two-fifths (41.17%) of respondents were categorized under the medium category followed by three-tenths (30.00%) in the low category and one-fourth (25.83%) in the high category. The variation in distribution could be attributed to factors such as differences in access to resources, socioeconomic conditions, education levels and external influences like environmental challenges or availability of employment opportunities. In Magadi, better access to land for agriculture, improved habitat, and infrastructure contribute to higher livelihood security. These factors along with stable living conditions likely support the overall better performance in livelihood security compared to other areas. Socioeconomic factors such as income opportunities also play a significant role in shaping the security levels. The findings are in line with studies of Dhanasree *et al.* (2014)^[5] and Ramya (2016)^[10].

Table 1: Livelihood security distribution pattern among Iruliga tribes (n=120)

Sl. No.	Category	Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled	
		f	%	f	%	f	%
1.	Low (< 529.68)	11	18.33	25	41.67	36	30.00
2.	Medium (529.68- 614.61)	27	45.00	26	43.33	53	41.17
3.	High (> 614.61)	22	36.67	09	15.00	31	25.83
	Total	60	100	60	100	120	100

Mean = 572.15 S.D = 84.93

Dimension wise

Food security

Data from Table 2 shows that food security levels among the Iruliga tribes in Magadi and Ramanagara taluks. In Magadi, nearly two-thirds (61.66%) of respondents had high food security followed by about one-third (31.67%) in the medium category and only a small portion (6.67%) in the low category. In Ramanagara, three-fifths (56.67%) in the medium category followed by nearly two fifths (35.00%) were in the high category and nearly one-tenth (8.33%) in the low category. Overall, nearly half (48.33%) of the respondents were categorized under high food security followed by less than half (44.17%) in the medium category and nearly one-tenth (7.50%) in the low category.

The probable reasons may be families in Magadi having better access to agricultural resources, markets, or government support, which helps them achieve greater food security compared to Ramanagara. Higher income levels or

more stable earning opportunities in Magadi contribute to their ability to afford sufficient and nutritious food, while Ramanagara families struggle with limited income sources. In Magadi, where many members cultivate and produce crops, families are better able to rely on these reserves during times of scarcity. In contrast, the lower number in Ramanagara reflects limited agricultural activity or storage practices, contributing to lower food security. The findings are in line with Ramya (2016)^[10].

Health security

Data from Table 2 depicts that more than half (53.33%) of the respondents in Magadi had medium health security, while nearly one-third (31.67%) were in the high category and 15.00 per cent were in the low category. In Ramanagara, nearly half (48.33%) of respondents had medium health security, whereas more than two-fifths (41.67%) were in the low category and only one-tenth (10.00%) fell into the high category. Overall, half (50.83%) of the respondents had medium health security followed by more than one-third (28.34%) in the low category and one-fifth (20.83%) in the high category.

The potential factors include poor sanitation in Ramanagara, which contributes to the spread of epidemic diseases, significantly impacting health security. Inadequate waste management, contaminated water sources, and poor hygiene practices further increase the risk of disease outbreaks. Additionally, the distant location of healthcare facilities from residential areas limits access to timely medical care, particularly during emergencies or for routine check-ups. Addressing these challenges could involve improving healthcare infrastructure, making services more affordable and enhancing health awareness. These findings align with those of Mandal and Sengupta (2016)^[6].

Occupational security

Data from Table 2 highlights the occupational security levels among the respondents. In Magadi taluk, nearly half (45.00%) of the respondents were in the medium category followed by over one-third (35.00%) in the high category and one-fifth (20.00%) in the low category. In Ramanagara taluk, over two-fifths (41.67%) of the respondents belonged to the medium category, followed by nearly one-third (30.00%) in the high category and more than one-fourth (28.33%) in the low category. Overall, across both taluks nearly half (43.33%) of the respondents fell into the medium category, while one-third (32.50%) were in the high category and nearly one-fourth (24.17%) were in the low category.

The reasons may include many tribes relying on seasonal work or manual labor, which often results in inconsistent income and job insecurity. Limited skills beyond basic wage work further restrict their opportunities for stable and better-paying employment. In rural areas, the scarcity of available job options exacerbates the challenge of securing higher-paying or year-round work. Additionally, inadequate support, such as infrastructure, financial assistance and training for small businesses, hinders individuals from creating their own sources of income. Consequently, they remain reliant on unpredictable and unreliable forms of labor.

Habitat security

Data from Table 2 reveals that in Magadi, above two-fifths (43.33%) of the respondents reported high habitat security followed by 26.67 per cent in the medium category and 30.00 per cent in the low category. Conversely, in Ramanagara, half (50.00%) of respondents had low habitat security followed by 33.33 per cent were in the high category and 16.67 per cent were in the medium category. Overall, two-fifths (40.00%) of respondents were in the low category, while nearly two-fifths (38.33%) had high security and above one fifth (21.67%) were in the medium category. The underlying reasons might be that Magadi benefits from stronger local governance and policies that prioritize housing and infrastructure development. In contrast, Ramanagara seems to lack similar levels of investment, resulting in poorer living conditions. Additionally, the growing family size in Ramanagara has caused overcrowding in homes originally designed for smaller families. As a result, children are often forced to construct their own tents or thatched houses. This situation highlights the challenges posed by population growth and inadequate housing space, emphasizing the urgent need for improved housing solutions and infrastructure development in Ramanagara.

Cultural security

From Table 2, it is evident that more than three-fifths (61.67%) of respondents in Magadi had medium cultural security, while 26.66 per cent were in the high category and 11.67 per cent were in the low category. In Ramanagara, nearly half (46.66%) of the respondents had high cultural security, 36.67 per cent had medium security and 16.67 per cent were in the low category. Overall, nearly half (49.17%) of the respondents were in the medium category, 36.66 per cent were in the high category and 14.17 per cent were in the low category.

The key factors could include sufficient access to clothing and resources in both taluks, which may be driven by a combination of local economic stability, government welfare programs and the ability of families to meet basic needs through available resources. The rarity of child marriage and absence of widow marriage reflect increased awareness of social norms and legal frameworks. Higher festival expenditures in Ramanagara may result from cultural expectations and variations in income levels. Minimal participation in folk events might be attributed to limited opportunities, a declining focus on traditional practices or the influence of modernization.

Educational security

The results from Table 2 highlight that in Magadi, the two-thirds (65.00%), of respondents fall under the high educational security category, followed by the medium category with nearly one-fifth (18.33%) and one-sixth (16.67%) in the low category. In Ramanagara, just above two-fifths (43.34%) of respondents fall under the high category, with nearly two-fifths (38.33%) in the medium category and nearly one-fifth (18.33%) in the low category. Overall, more than half (54.17%) of the respondents were categorized under high educational security followed by above one-fourth (28.33%) in the medium category and nearly one-fifth (17.50%) in the low category.

The probable reasons could be better access to educational resources and infrastructure in Magadi, leading to higher educational security. In contrast, Ramanagara faces challenges like longer travel distances to schools making education less accessible, especially for girls. Additionally, many children in Ramanagara drop out of school to support their families by working instead of continuing their education. The findings are in line with Barela *et al.* (2018) [2].

Financial security

Table 2 reveals that in Magadi, nearly three-fourths (71.67%) of respondents were observed to have medium financial security, while 15.00 per cent were in the high category and 13.33 per cent were in the low category. In Ramanagara, slightly more than half (51.67%) of respondents had medium financial security, above two-fifths (43.33%) were in the low category and only 5.00 per cent had high security. Overall, above three-fifths (61.67%) reported medium financial security, above one-fourth (28.33%) were in the low category and 10.00 per cent had high security.

The probable reasons could be differences in land ownership and farming practices with people in Magadi possibly having better access to productive land and more diverse agricultural opportunities. Additionally, Ramanagara's proximity to Bengaluru may lead to higher living costs and increased competition for resources, making it more difficult for residents to maintain financial security due to higher expenses and limited affordable resources. However, opportunities to improve financial security exist by focusing on expanding credit access, enhancing financial education, and creating more stable job opportunities.

Asset security

Data in Table 2 highlights that nearly half (46.67%) of respondents in Magadi experienced low asset security, while nearly two-fifths (38.33%) were in the high category and about one-sixth (15.00%) were in the medium category. In Ramanagara, two-fifths (40.00%) had low security, while nearly one-third (31.67%) were in the medium category and above one-fourth (28.33%) were in the high category. Overall, more than two-fifths (43.33%) of respondents reported low security, one-third (33.34%) had high security and nearly one-fourth (23.33%) were in the medium category.

The probable reasons for low asset security could include the Iruliga tribes primary reliance on agricultural labor, non-agricultural labor and livestock, which often provide unstable and seasonal incomes. Limited access to land and resources for farming can restrict wealth accumulation, while dependence on labor-based work may lead to lower financial security due to inconsistent wages. Additionally, the lack of diversified income sources or skills development may leave them vulnerable to economic fluctuations. Livestock rearing, may not generate enough income to build substantial assets, especially without access to proper markets or support systems. Furthermore, the lack of financial services and government schemes could prevent them from securing assets.

Transportational security

As shown in Table 2, nearly half (48.33%) of respondents in Magadi were categorized under medium transportation security followed by one-third (33.34%) in the high category and less than one-fifth (18.33%) in the low category. In Ramanagara, nearly half of respondents (45.00%) had medium transportation security, two-fifths (40.00%) were in the high category and nearly one-sixth (15.00%) had low security. Overall, less than half (44.17%) had medium transportation security, more than one-third (36.67%) were in the high category and nearly one-fifth (19.16%) were in the low category.

The contributing factors may include limited or poorly maintained roads, particularly in rural areas, which restrict mobility and access to essential services. The high cost of owning and maintaining vehicles forces many families to rely on inefficient or expensive transport options. Public transportation is often irregular, making it difficult to reach work or other important destinations on time. School children face commuting challenges, relying on scarce transport options like autos and jeeps. Additionally, geographic isolation in both taluks exacerbates the situation further reducing overall transportation security.

Social security

As outlined in Table 2, in Magadi nearly two-thirds (61.67%) of respondents fall under the high social security category followed by just about one-fifth (21.67%) in the medium category and a small proportion (16.66%) in the low category. In Ramanagara, more than two-fifths (45.00%) are in the medium category, one-third (33.34%) in the high category and one-fifth (21.66%) in the low category. Overall, nearly half (47.50%) of respondents fall under the high category, with a significant portion 33.34 per cent in the medium category and a smaller portion nearly one-fifth (19.16%) in the low category.

The probable reasons could be that Magadi has better access to self-help groups, where participation enhances social security through mutual support, financial assistance and collective decision-making. Greater involvement in social organizations in Magadi fosters a sense of solidarity, which contributes to stronger social security. In contrast, Ramanagara may have lower participation in such organizations, resulting in weaker social networks and fewer support opportunities. The major difference in social security likely stems from the level of participation in group meetings. In Magadi, more active participation in self-help groups and social organizations may have led to better social cohesion and access to resources, while lower participation in Ramanagara could limit these benefits.

Information security

The findings from Table 2 show that nearly half (45.00%) of respondents in Magadi were classified as having medium informational security, while 31.67 per cent were in the low category and 23.33 per cent were in the high category. In Ramanagara, two-thirds (68.33%) had medium security, 16.67 per cent were in the low category and 15.00 per cent were in the high category. Overall, 56.67 per cent of respondents were in the medium category, 24.17 per cent in the low category and 19.16 per cent in the high category.

The likely causes may include variations in the implementation and awareness of NGO-led informational support programs coupled with weaker community networks, which contribute to the lower informational security in Magadi. The comparatively better performance of local leaders and NGOs in Ramanagara may explain its higher medium security. Overall, the medium to low levels of informational security indicate a need to strengthen NGO efforts improve community networks and enhance the role of local leaders to elevate informational security to a high level, ultimately supporting better livelihoods.

Table 2: Distribution of Iruliga tribes based on livelihood security components (n=120)

Sl. no	Livelihood Security	Category	Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
			No.	%	No.	%	No.	%
1	Food security Mean =85.20 SD =15.64	Low (<77.38)	04	6.67	05	8.33	09	7.50
		Medium (77.38-93.03)	19	31.67	34	56.67	53	44.17
		High (>93.03)	37	61.66	21	35.00	58	48.33
2	Health security Mean =83.33 SD =12.41	Low (<77.12)	09	15.00	25	41.67	34	28.34
		Medium (77.12-89.54)	32	53.33	29	48.33	61	50.83
		High (>89.54)	19	31.67	06	10.00	25	20.83
3	Occupational security Mean =56.87 SD =26.99	Low (<43.37)	12	20.00	17	28.33	29	24.17
		Medium (43.37-70.37)	27	45.00	25	41.67	52	43.33
		High (>70.37)	21	35.00	18	30.00	39	32.50
4	Habitat security Mean =41.04 SD =11.88	Low (<35.10)	18	30.00	30	50.00	48	40.00
		Medium (35.10-46.98)	16	26.67	10	16.67	26	21.67
		High (>46.98)	26	43.33	20	33.33	46	38.33
5	Cultural security Mean =61.42 SD =6.01	Low (<58.41)	07	11.67	10	16.67	17	14.17
		Medium (58.41-64.43)	37	61.67	22	36.67	59	49.17
		High (>64.43)	16	26.66	28	46.66	44	36.66
6	Educational security Mean =46.66 SD =27.01	Low (<33.16)	10	16.67	11	18.33	21	17.50
		Medium (33.16-60.17)	11	18.33	23	38.33	34	28.33
		High (>60.17)	39	65.00	26	43.34	65	54.17
7	Financial security Mean =28.91 SD =8.44	Low (<24.69)	08	13.33	26	43.33	34	28.33
		Medium (24.69-33.13)	43	71.67	31	51.67	74	61.67
		High (>33.13)	09	15.00	03	5.00	12	10.00
8	Asset security Mean =27.72	Low (<19.18)	28	46.67	24	40.00	52	43.33
		Medium (19.18-36.26)	09	15.00	19	31.67	28	23.33

	SD =17.08	High (>36.26)	23	38.33	17	28.33	40	33.34
9	Transportation security Mean =52.41 SD =9.47	Low (<47.67)	11	18.33	09	15.00	23	19.16
		Medium (47.67-57.14)	29	48.33	27	45.00	53	44.17
		High (>57.14)	20	33.34	24	40.00	44	36.67
10	Social security Mean =52.97 SD =19.46	Low (<43.24)	10	16.66	13	21.66	23	19.16
		Medium (43.24-62.70)	13	21.67	27	45.00	40	33.34
		High (62.70)	37	61.67	20	33.34	57	47.50
11	Information security Mean =34.91 SD =15.05	Low (<27.38)	19	31.67	10	16.67	29	24.17
		Medium (27.38-42.44)	27	45.00	41	68.33	68	56.67
		High (>42.44)	14	23.33	09	15.00	23	19.16

Livelihood system analysis

Available Livelihood options

Table 3 indicates that the available livelihood options among respondents revealed varied engagements across activities. In Magadi taluk, agriculture was a prominent option just above three-fourths (76.67%) of the respondents, while just above three-fifths (61.67%) were involved in livestock activities. Collection of non-timber forest products (NTFPs) was another notable option, utilized by more than half (51.67%) of the respondents. Nearly all (95.00%) participated in agricultural labor, indicating its dominance as a livelihood activity. Additionally, nearly one-third (30.00%) were engaged in non-agricultural labor, while small proportions were involved in migration activities (3.33%), government or private jobs (1.67%), or as small vendors (1.67%).

In Ramanagara taluk, the majority (96.67%) of respondents

participated in agricultural labor, followed by just above half (51.67%) involved in livestock rearing.

Agriculture, however, was pursued by more than one-third (35.00%), indicating less emphasis on this activity compared to Magadi. Non-agricultural labor was significant, engaging nearly half (48.33%) of the respondents. Few were involved in the collection of NTFPs (5.00%), migration activities (3.33%), or government/private jobs (3.33%).

Overall, agricultural labor was the primary livelihood activity for almost all (95.83%) respondents, followed by livestock rearing (56.67%) and agriculture (55.83%). While nearly two-fifths (39.16%) of respondents were engaged in non-agricultural labor, while other options like NTFP collection (28.33%) and migration (3.33%) were less common. Activities like small vending and government jobs were rare, reflecting limited diversification into non-traditional livelihoods.

Table 3: Distribution of Irliga tribes according to livelihood options (n=120)

Sl. No	Available Livelihood options	Magadi (n ₁ =60)			Ramanagara (n ₂ =60)			Pooled (n=120)		
		No.	%	Rank	No.	%	Rank	No.	%	Rank
1	Agriculture	46	76.67	II	21	35.00	IV	67	55.83	III
2	Horticulture	01	1.67	X	01	1.67	VIII	02	1.67	VIII
3	Livestock	37	61.67	III	31	51.67	II	68	56.67	II
4	Collection of NTFP's	31	51.67	IV	03	5.00	V	34	28.33	V
5	Agricultural labour	57	95.00	I	58	96.67	I	115	95.83	I
6	Non- agricultural labour	18	30.00	V	29	48.33	III	47	39.16	IV
7	Small vendor	01	1.67	VIII	00	0.00	IX	01	0.83	IX
8	Govt / semi- govt job/private job	01	1.67	VIII	02	3.33	VI	03	2.50	VII
9	Migration activities	02	3.33	VI	02	3.33	VI	04	3.33	VI
10	Sericulture	02	3.33	VI	00	0.00	IX	02	1.67	VIII

The probable reasons for these patterns could be attributed to several factors. In Ramanagara taluk, the reliance on wage labor may stem from landlessness or limited access to agricultural resources, forcing respondents to seek non-agricultural employment. This reflects a shift from traditional farming to alternative livelihoods. In contrast, in Magadi taluk, the greater involvement in the collection of non-timber forest products (NTFPs) could be due to better proximity to forested areas. The low participation in small vending or skilled jobs across both areas suggests limited access to education, training, and more diverse livelihood opportunities, highlighting a need for interventions to address these gaps and promote sustainable livelihood options. These outcomes support the conclusions of Barman *et al.* (2013)^[3].

Different combinations of Livelihood systems followed by tribes

It is observed from Table 4 that the livelihood options pursued by the respondents revealed significant variation. In

Magadi taluk, one-fourth (25.00%) of the respondents combined agriculture, wage work, livestock rearing, and NTFP collection, emphasizing diversified livelihood strategies. Nearly one-fourth (23.33%) engaged in agriculture, wage work, and livestock activities, while smaller proportions opted for combinations like agriculture and wage work (8.33%) or agriculture with wage work and NTFP collection (13.33%). A small percentage of respondents (1.67%) pursued combinations like sericulture with livestock and agriculture or sericulture with livestock, NTFP, and agriculture.

In Ramanagara taluk, more than one-fourth (28.33%) of the respondents depended solely on wage work, while just above one-fourth (26.67%) engaged in wage work and livestock rearing. Other combinations, such as agriculture and wage work (10.00%), were also present but less prominent. Overall, a considerable proportion of respondents nearly one-fourth (22.50%) across both taluks combined agriculture, wage work, and livestock rearing. Standalone wage work accounted for more than one-tenth

(16.67%) of respondents, while combinations like wage work and livestock (17.50%) and agriculture with wage work and NTFP collection (6.67%) were less common. A few respondents pursued niche options like small vending (0.83%), horticulture (0.83%), or migration activities (3.33%), while sericulture combinations accounted for another small proportion (0.82%). This reflects a limited diversification in livelihood options.

The probable reasons for these livelihood strategies could be attributed to several factors. In Magadi taluk, the combination of agriculture, wage work, livestock rearing, and NTFP collection suggests a diversified approach, likely driven by limited land holdings and the need to generate income from various sources to sustain livelihoods. The small proportion of respondents pursuing sericulture

combinations highlights the presence of favorable climatic conditions and some knowledge of sericulture practices, though limited by insufficient support for scaling up or accessing markets. In Ramanagara taluk, the reliance on wage work reflects limited access to agricultural opportunities, landlessness, or the preference for stable, daily income from labor. The higher participation in livestock activities may indicate adaptive strategies to supplement income. However, the low engagement in niche activities such as horticulture, small vending, or sericulture points to constraints in market access, lack of training, and limited opportunities for skill development, restricting economic diversification. These outcomes support the conclusions of Nisha (2013)^[9].

Table 4: Different combinations of livelihood systems followed by Iruliga tribes (n=120)

Sl. No.	Available Livelihood options	Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
		No.	%	No.	%	No.	%
1	Wage work	03	5.00	17	28.33	20	16.67
2	Agriculture + Wage work	05	8.33	06	10.00	11	9.17
3	Wage work + Livestock	05	8.33	16	26.67	21	17.50
4	Wage work + NTFP	02	3.33	03	5.00	05	4.16
5	Agriculture + Wage work + Livestock	14	23.33	13	21.66	27	22.50
6	Agriculture + Wage work + Livestock + NTFP	15	25.00	00	00	15	12.50
7	Horticulture + Livestock + Wage work	00	0.00	01	1.67	01	0.83
8	Govt/private job	00	0.00	02	3.33	02	1.67
9	Agriculture + wage work+ NTFP	08	13.33	00	00	08	6.67
10	Small vendor	01	1.67	00	00	01	0.83
11	Sericulture + Livestock + NTFP+ Agriculture	01	1.67	00	00	01	0.83
12	Livestock + NTFP + Wage work	01	1.67	00	00	01	0.83
13	Govt job + Agriculture + Wage work + Livestock + NTFP	01	1.67	00	00	01	0.83
14	Migration activity	02	3.33	02	3.33	04	3.33
15	Horticulture + Agriculture +NTFP + Wage work	01	1.67	00	00	01	0.82
16	Sericulture + Livestock + Agriculture	01	1.67	00	00	01	0.82

Proportion of income earned by tribes on different livelihood options

Table 5 reveals that in Magadi taluk, the majority of income was derived from agricultural labor, contributing more than half (53.71%) of the total, with livestock rearing contributing just above one-tenth (12.10%). Non-agricultural labor accounted for nearly one-tenth (9.23%) of income, while the collection of non-timber forest products (NTFPs) contributed a smaller portion (4.01%). Agriculture provided a similar share of just above one-tenth (12.50%), whereas horticulture (0.77%), migration activities (2.29%), and sericulture (4.14%) contributed minimally. Negligible income came from small vending (0.60%) or government and private jobs (0.65%).

In Ramanagara taluk, agricultural labor similarly dominated, contributing more than half (55.52%) of income, followed by non-agricultural labor, which accounted for nearly one-fifth (19.17%). Livestock rearing provided a smaller share (7.93%), while government and private jobs contributed significantly at nearly one-tenth (6.12%). Other activities, such as agriculture (8.24%), migration activities (1.54%), and horticulture (1.23%), contributed minimally, and no income was reported from small vending or sericulture.

Overall, agricultural labor remained the predominant

income source, contributing more than half (54.62%) across both taluks. Non-agricultural labor made up a significant portion, more than one-tenth (14.16%), followed by livestock rearing at approximately one-tenth (10.39%). Agriculture contributed just over one-tenth (10.03%), while other activities, including NTFP collection (2.14%), government and private jobs (3.36%), sericulture (2.09%), migration (1.91%), and horticulture (1.00%), contributed marginally. Small vending was negligible (0.31%).

The possible explanations for these patterns are collection of non-timber forest products (NTFPs) is more common in Magadi due to its proximity to forested areas, though it contributes only minimally to income. The low participation in horticulture and migration activities suggests limited economic diversification, likely due to lack of knowledge, skills, or market access. The absence of small vending points to a lack of entrepreneurial activity, possibly caused by inadequate resources, skills, or market opportunities. Overall, the findings highlight systemic constraints such as landlessness, limited skill development, poor market access, and reliance on labor-based livelihoods, all of which hinder income diversification and sustainable livelihoods. These outcomes support the conclusions of Mareeswaran (2014)^[7].

Table 5: Proportion of income earned by Iruliga tribes on different livelihood options (n=120)

Sl. No.	Available Livelihood options	Proportion of income					Rank
		Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
		%	Rank	%	Rank	%	
1	Agriculture	12.50	II	8.24	III	10.03	IV
2	Horticulture	0.77	VIII	1.23	VII	1.00	IX
3	Livestock	12.10	III	7.93	IV	10.39	III
4	Collection of NTFP's	4.01	VI	0.24	VIII	2.14	VI
5	Agricultural labor	53.71	I	55.52	I	54.62	I
6	Non – agricultural labor	9.23	IV	19.17	II	14.16	II
7	Small vendor	0.60	X	0.00	IX	0.31	X
8	Govt / semi- govt job/private job	0.65	IX	6.12	V	3.36	V
9	Migration activities	2.29	VII	1.54	VI	1.91	VIII
10	Sericulture	4.14	V	0.00	IX	2.09	VII
	Total	100		100		100	

Proportion of time spent by tribes on different livelihood options

As presented in Table 6, agricultural labor was the primary activity for the Iruliga tribes in Magadi and Ramanagara taluks, constituting just above three-fifths (62.53%), with 58.81 per cent in Magadi and 66.39 per cent in Ramanagara respectively. Non-agricultural labor occupied just above one-tenth (11.74%), with higher involvement in Ramanagara 15.52 per cent compared to Magadi 8.70 per cent. Livestock rearing was another significant activity, accounting for slightly more than one-tenth (11.01%). The collection of Non-Timber Forest Products (NTFPs) was

more prevalent in Magadi nearly one-tenth (9.36%) but minimal in Ramanagara (0.23%), averaging (5.00%). Agriculture and sericulture together contributed 2.92 per cent and 1.02 per cent, respectively, while horticulture accounted for a negligible portion (0.15%). Small vendor activities and government/semi-government/private jobs were minor livelihood sources, contributing (0.79%) and (3.04%), respectively, while migration activities took a mere (1.74%) of their time. Agricultural labor clearly dominated as the primary livelihood source, with other options playing relatively minor roles.

Table 6: Proportion of time spent by Iruliga tribes on different livelihood options (n=120)

Sl. No.	Available Livelihood options	Proportion of time spent					Rank
		Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
		%	Rank	%	Rank	%	
1	Agriculture	3.64	V	2.25	V	2.92	VI
2	Horticulture	0.15	IX	0.14	VIII	0.15	X
3	Livestock	11.89	II	10.06	III	11.01	III
4	Collection of NTFP's	9.36	III	0.23	VII	5.00	IV
5	Agricultural labor	58.81	I	66.39	I	62.53	I
6	Non – agricultural labor	8.70	IV	15.52	II	11.74	II
7	Small vendor	1.53	VII	0.00	IX	0.79	IX
8	Govt / semi- govt job/private job	1.53	VII	4.69	IV	3.04	V
9	Migration activities	2.63	V	0.78	VI	1.74	VII
10	Sericulture	1.97	VI	0.00	IX	1.02	VIII
	Total	100		100		100	

The probable reasons for the reliance on agricultural labor as the primary livelihood activity for the Iruliga tribes can be attributed to their limited access to diverse opportunities and dependence on wage labor due to the lack of land ownership. Non-agricultural labor serves as a secondary income source, with higher engagement in Ramanagara, where such opportunities are more available. The underutilization of livestock rearing is due to challenges like limited resources and access to veterinary care, while minimal involvement in agriculture and horticulture stems from subsistence farming rather than commercial practices. The low engagement in small vendor activities and formal employment reflects limited entrepreneurial opportunities and inadequate skills or education for higher-paying jobs. Migration is not a significant strategy, as the tribes prefer to remain close to their communities.

The higher prevalence of Non-Timber Forest Products (NTFP) collection in Magadi is attributed to better access to

forest resources, though its limited contribution may result from declining forest cover and regulatory restrictions. The low involvement in sericulture could stem from factors such as lack of awareness, insufficient training, and inadequate resources. These findings suggest the need for interventions such as skill development, support for livestock, horticulture, and sericulture, as well as better access to land and resources to improve and diversify the livelihoods of the Iruliga tribes. These outcomes support the conclusions of Ramya (2016)^[10].

Proportion of male and female Share in each livelihood option

The data in Table 7 reveals a gender-based distinction in livelihood involvement among the Iruliga tribes. Male participation in agriculture was notably higher, constituting nearly three-fifths (59.56%) of the workforce, while female participation stood at slightly more than two-fifths

(40.44%). In horticulture, male and female participation was perfectly balanced 50.00 per cent for both genders, and the same distribution applied to sericulture (50.00%) for both. Livestock involvement saw almost equal contributions from both genders, with males slightly leading at 51.60 per cent, compared to 48.40 per cent female participation. Collection of Non-Timber Forest Products (NTFPs) was largely male-driven, with males contributing nearly three-fourths (74.44%), while females contributed a smaller portion slightly more than one-fourth (25.55%). Agricultural labor also had a more equal distribution, with males forming just above half of the workforce (53.77%) and females slightly less than half (46.23%). Non-agricultural labor was highly male-dominated, with males contributing 91.30 per cent and females only 8.69 per cent. Small vendor activities had equal male and female participation in Magadi (50.00%) each, but remained minimal overall. Government, semi-government, and private jobs saw a predominance of male workers (75.00%), with females making up just (25.00%). Migration activities were exclusively male-dominated, with no female involvement.

The underlying reasons for gender-based participation in livelihood activities among the Iruliga tribes can be attributed to traditional gender roles. Males predominantly engage in more physically demanding and outdoor work, such as non-agricultural labor, collection of Non-Timber Forest Products (NTFPs), and migration activities, often due to limited local employment opportunities and the need for income generation outside the household. In contrast, women are more involved in agriculture and livestock, though still less than men, with the higher economic value of livestock driving more male participation. The relatively balanced gender participation in horticulture suggests shared responsibility in this less labor-intensive activity. Similarly, sericulture also sees equal involvement from both genders, indicating its relatively accessible nature for women, alongside traditional male roles. Women's minimal involvement in non-agricultural labor and formal employment reflects limited access to formal job opportunities, indicating a need for interventions promoting gender equality, skill development, and increased access to resources.

Table 7: Proportion of male and female share in terms of their involvement in different livelihood options. (n=120)

Sl. No.	Available Livelihood options	Proportion of male and female Share in each livelihood option					
		Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
		Male	Female	Male	Female	Male	Female
		%	%	%	%	%	%
1	Agriculture	61.74	38.25	55.26	44.73	59.56	40.44
2	Horticulture	50.00	50.00	50.00	50.00	50.00	50.00
3	Livestock	51.85	48.14	51.30	48.69	51.60	48.4
4	Collection of NTFP's	75.30	24.69	66.67	33.33	74.44	25.55
5	Agricultural labour	51.45	48.54	56.25	43.75	53.77	46.23
6	Non- agricultural labour	88.23	11.76	93.10	6.89	91.30	8.69
7	Small vendor	50.00	50.00	0.00	0.00	50.00	50.00
8	Govt / semi- govt job/private job	100	0.00	66.67	33.33	75.00	25.00
9	Migration activities	100	0.00	100	0.00	100.00	0.00
10	Sericulture	50.00	50.00	0.00	0.00	50.00	50.00

Percentage of Risk perceived

The data presented in Table 8 highlights the perceived risk levels across various livelihood activities. Horticulture had the lowest risk perception, averaging one-third (33.33%), consistent across both taluks. Livestock activities were moderately risky, with nearly two-fifths (39.70%) risk perception, slightly higher in Ramanagara 43.24 per cent

than in Magadi 35.48 per cent. Collection of Non-Timber Forest Products (NTFPs) showed low to moderate risk, averaging nearly one-third (34.31%). Agricultural labor also exhibited minimal risk perception, at about one-third (33.91%), with negligible differences between Magadi (33.33%) and Ramanagara (34.48%).

Table 8: Risk perceived by Iruliga tribes with respect to different livelihood options. (n=120)

Sl. No.	Available Livelihood options	Percentage of Risk perceived					
		Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	Rank
		%	Rank	%	Rank	%	
1	Agriculture	65.94	III	61.90	III	64.67	II
2	Horticulture	33.33	VII	33.33	VI	33.33	VIII
3	Livestock	35.48	V	43.24	IV	39.70	V
4	Collection of NTFP's	34.40	VI	33.33	VI	34.31	VI
5	Agricultural labour	33.33	VII	34.48	V	33.91	VII
6	Non- agricultural labour	59.25	IV	65.51	II	63.12	III
7	Small vendor	33.33	VII	0.00	IX	33.33	VIII
8	Govt / semi- govt job/private job	33.33	VII	33.33	VI	33.33	VIII
9	Migration activities	66.67	I	66.67	I	58.33	IV
10	Sericulture	66.67	I	0.00	IX	66.67	I

Non-agricultural labor was perceived as moderately risky, averaging just above three-fifths (63.12%), with higher

perception in Ramanagara nearly two-thirds (65.51%) compared to Magadi nearly three fifths (59.25%). Small

vendor activities, reported only in Magadi, showed minimal risk, averaging one-third (33.33%). Government/semi-government/private jobs had a similarly low risk perception, consistently at one-third (33.33%) across both taluks. Migration activities demonstrated moderate risk, averaging more than three-fifths (58.33%), consistent in both regions. Sericulture had the highest risk perception, with two-thirds (66.67%), exclusively reported in Magadi.

The perceived risks associated with various livelihood options among the Iruliga tribes highlight their reliance on natural resources and economic uncertainties. Agriculture, livestock, and the collection of Non-Timber Forest Products (NTFPs) were perceived as moderately risky due to dependency on erratic weather, fluctuating market demands, and limited technical knowledge. Non-agricultural labor, particularly in Ramanagara, was viewed as highly risky due to the physically demanding nature of activities like construction and woodcutting, safety concerns, and the lack of stable wages.

Small vendor activities, though less risky, were constrained by inconsistent customer traffic and limited sales opportunities. Minimal risk perception in agricultural labor reflects its familiarity and low entry barriers, though it offers modest economic returns. The moderate risk in migration activities is attributed to uncertain job availability and potential exploitation in distant locations. Sericulture was perceived as the riskiest livelihood due to its technical complexity, high investment requirements, and susceptibility to environmental factors. Addressing these risks through targeted interventions, such as capacity building, market linkages, and enhanced safety measures,

can reduce vulnerabilities and improve livelihood resilience.

Percentage of Technical competency

Table 9 reveals that the technical competency among the Iruliga tribes in relation to different livelihood options was notably high. Agriculture showed more than three-fourths (76.28%) competency, with Magadi reporting a slightly higher level more than three-fourths (77.29%) compared to Ramanagara nearly three-fourths (74.07%). Horticulture demonstrated slightly more than four-fifths (83.33%) competency, with better proficiency in Ramanagara more than seven-eighths (88.89%) than in Magadi just above three-fifths (77.78%). Livestock activities exhibited nearly three-fourths (74.18%) technical understanding, higher in Magadi just above three-fifths (77.47%) compared to Ramanagara more than two-thirds (70.25%). Collection of NTFPs reflected four-fifths (84.64%) competency, with minimal variation between Magadi more than four-fifths (84.94%) and Ramanagara just above four-fifths (81.48%). Agricultural labor showed more than four-fifths (83.76%) competency, slightly higher in Ramanagara (85.82%) than in Magadi (81.67%). Non-agricultural labor demonstrated nearly nine-tenths (89.36%) technical proficiency, with Ramanagara (94.25%) leading over Magadi (81.48%). Small vendor activities, exclusive to Magadi, showed nearly nine-tenths (88.89%) competency. Sericulture, also exclusive to Magadi, exhibited a similar level of competency (88.89%). Both government/semi-government/private jobs and migration activities achieved full competency across both taluks.

Table 10: Technical competency of tribal farmers with respect to different livelihood options (n=120)

Sl. No.	Available Livelihood options	Percentage of Technical competency					
		Magadi (n ₁ =60)		Ramanagara (n ₂ =60)		Pooled (n=120)	
		%	Rank	%	Rank	%	Rank
1	Agriculture	77.29	X	74.07	VII	76.28	IX
2	Horticulture	77.78	VIII	88.89	IV	83.33	VIII
3	Livestock	77.47	IX	70.25	VIII	74.18	X
4	Collection of NTFP's	84.94	V	81.48	VI	84.64	VI
5	Agricultural labour	81.67	VI	85.82	V	83.76	VII
6	Non- agricultural labour	81.48	VII	94.25	III	89.36	III
7	Small vendor	88.89	III	0.00	IX	88.89	IV
8	Govt / semi- govt job/private job	100	I	100	I	100	I
9	Migration activities	100	I	100	I	100	I
10	Sericulture	88.89	III	0.00	IX	88.89	IV

The underlying reasons for the high level of technical competency among the Iruliga tribes across various livelihood activities reflect their adaptability and ability to manage diverse economic opportunities. Agriculture demonstrates strong skills due to its long-standing role as a primary livelihood. Livestock activities, NTFP collection, and sericulture showcase considerable technical know-how, linked to their reliance on natural resources and traditional practices. Horticulture, agricultural labor, and non-agricultural labor show even higher competency, especially in Ramanagara, likely due to better support and advanced opportunities.

Conclusion

The study on the Iruliga tribes of Ramanagara district

revealed a multifaceted livelihood system characterized by diverse income sources and varying levels of livelihood security. Agricultural labor emerged as the dominant livelihood option, contributing the most to household income and time spent, while wage work combined with livestock and agriculture formed the most common livelihood pattern. Despite their dependence on traditional activities like agriculture and NTFP collection, many households also diversified into non-agricultural labor, livestock, and small-scale enterprises to sustain their livelihoods. However, disparities in technical competency, gender participation, and perceived risks across different livelihood options highlight the vulnerability and constraints faced by this tribal community.

Efforts to enhance livelihood security among the Iruliga

tribes must focus on improving technical skills, reducing risk in high-risk occupations such as sericulture and non-agricultural labor, and promoting equitable gender participation. Interventions should aim at strengthening support systems, creating opportunities for market access, and building infrastructure that can support sustainable livelihood diversification. These targeted strategies, backed by policy support and tribal-inclusive development planning, are essential to ensure long-term livelihood sustainability and upliftment of the Iruliga community.

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