

Empowering Rural Women: Evaluating Livelihood Security through Deendayal Antyodaya Yojana - National Rural Livelihoods Mission in Chitradurga District

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ABSTRACT

The Deendayal Antyodaya Yojana - National Rural Livelihoods Mission (DAY-NRLM) aims to improve the social and economic empowerment of rural poor households, especially women, by offering access to financial services, skill development and livelihood support to reduce poverty. To assess the livelihood security of rural women beneficiaries under DAY-NRLM, a study was conducted in Chitradurga district, Karnataka, in July 2024. Using simple random sampling, data was collected from 80 rural women beneficiaries, 40 from Chitradurga taluk and 40 from Hiriyur taluk through a pre-tested interview schedule. The results from Chitradurga taluk revealed an equal distribution of rural women beneficiaries between average (35.00%) and better (35.00%) livelihood security, followed by 30.00 per cent falling into the poor category. In case of Hiriyur taluk, more than one-third (35.00%) of beneficiaries were in the better category, while the rest were equally divided between average (32.75%) and poor (32.75%). Overall, in Chitradurga district, 36.25 per cent of beneficiaries achieved better livelihood security, 36.25 per cent fell into the average category and only 27.50 per cent were in the poor category. A Mann-Whitney U-Test was performed to evaluate differences in livelihood security between the two taluks. The analysis showed that the mean rank for beneficiaries in Chitradurga taluk was 34.11, compared to 46.89 in Hiriyur taluk. The test yielded a Z-value of 2.465* and a p-value of 0.013, indicating a significant difference in livelihood security levels between the taluks. The rural women beneficiaries of Hiriyur taluk exhibited significantly higher livelihood security, compared to those in Chitradurga taluk.

Keywords : DAY-NRLM, Livelihood security, Rural women, Simple random sampling

INDIA is a country of heritage as majority of its population lives in villages and far-flung remote areas. Around six lakh villages are scattered across India and 74.00 per cent population accommodated in the rural society. Women constitute 48.46 per cent of the total population in India (Pratima, 2021). Rural women are the backbone of both rural society and the economy. In addition to their vital contributions to the household, they play an active role in running enterprises and driving economic activities. In the age of globalization and urbanization slowly rural women

are moving towards development but expected success could not reach to the rural society of India. According to National Sample Survey report 2011-12, 59.30 per cent of the female workers living in rural India were self-employed while in urban areas the corresponding figure is 42.80 per cent. In 2016, at all India level 46.00 per cent of the elected representations in Panchayat Raj Institutions were women. Women form an important segment of the labour force and the economic role played by them cannot be out of the way from the total framework of development. The

role and degree of amalgamation of women in economic development is always an indicator of economic independence and social status (Pratima, 2021).

The Deendayal Antyodaya Yojana (DAY-NRLM), a flagship poverty alleviation program implemented by the Ministry of Rural Development, Government of India launched in June 2011 by restructuring the erstwhile Swarnajayanti Gram Swarajgar Yojana, aimed at reducing poverty by promoting self-reliance and sustainable livelihoods among rural populations. Specifically targeting women, the program recognizes their crucial role in economic development and strives to empower them through various skill development and income-generating activities. Skill development initiatives tailored to rural women have demonstrated positive outcomes in enhancing employability, improving household income and fostering entrepreneurial ventures (Sudha, 2016).

In the context of Chitradurga district, Karnataka, the livelihood security of rural women is of paramount importance due to the region's socio-economic challenges. Traditional gender roles often restrict women's access to resources, education and employment opportunities, leading to economic dependency. The DAY-NRLM seeks to address these disparities by facilitating women's participation in Self-Help Groups (SHGs), providing access to microfinance and enhancing their skills in diverse sectors like agriculture, handicrafts and small-scale industries, targeted training programs enable women to diversify income sources and build resilience against socio-economic challenges (Singh and Jain, 2018). It not only facilitates access to credit and markets but also strengthens social networks, promoting collective action and leadership among women (Patel *et al.*, 2020). By enhancing their livelihoods, the program contributes to broader goals of poverty alleviation, gender equality and sustainable development in Chitradurga district. The present study has been conceptualized with the objective of measuring livelihood security of rural women beneficiaries under DAY-NRLM in Chitradurga district.

Livelihood Security

According to Chaithra (2023), Livelihood security is defined as adequate and sustainable access to income and resources to meet needs of the farmers. Researcher operationally defined the livelihood security as 'Efficient and effective institutional platforms for the rural women enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services'.

METHODOLOGY

The present study was purposively carried out in Chitradurga district of Karnataka state. Chitradurga and Hiriyur taluks were selected purposively for the study as there are equal number of beneficiaries in these two taluks. The ex-post facto research design was used. Simple random sampling method was employed for the selection of respondents. Livelihood security was measured by developing a scale, ensuring a comprehensive assessment of various dimensions. The primary data were collected from 80 rural women beneficiaries, 40 from Chitradurga taluk and 40 from Hiriyur taluk through personal interview method using pre-tested structured schedule. The responses were scored, classified and analysed to calculate the mean score, standard deviation (SD) using Microsoft excel-2019 and Mann-Whitney U-Test using SPSS. Further, the classification into better, average and poor categories was based on the mean and $\frac{1}{2}$ standard deviation. Respondents falling above the mean + $\frac{1}{2}$ SD were classified as having better livelihood security, those between mean $\pm \frac{1}{2}$ SD were categorized as average and those below mean - $\frac{1}{2}$ SD were classified as poor.

Mann Whitney U Test

The Mann-Whitney U test is a non-parametric test used to determine whether there is a significant difference between two independent samples. The test compares the ranks of the data rather than the data itself.

The formula for the Mann-Whitney U statistic is:

$$U_1 = n_1 \times n_2 + n_1 \times (n_1 + 1) / 2 - R_1$$

$$U_2 = n_1 \times n_2 + n_2 \times (n_2 + 1) / 2 - R_2$$

Where:

U_1 and U_2 are the Mann-Whitney U statistics for sample 1 and sample 2, respectively.

n_1 and n_2 are the sample sizes of group 1 and group 2.

R_1 and R_2 are the sums of the ranks for group 1 and group 2.

The smaller of the two U values is used for statistical significance testing.

The test statistic U is compared to a critical value (based on the rank sum and sample sizes) or converted into a z-score if the sample sizes are large enough to approximate a normal distribution:

$$z = \frac{U - \mu U}{\sigma U}$$

$$\mu U = \frac{n_1 \times n_2}{2} \text{ is the mean of } U$$

$$\sigma U = \sqrt{n_1 \times n_2 (n_1 + n_2 + 1) / 12}$$

is the standard deviation of U .

The z-score is then used to determine the p-value, which tells you whether the difference between the groups is statistically significant.

RESULTS AND DISCUSSION

Livelihood Security Component Wise Distribution of Rural Women Beneficiaries Chitradurga Taluk

The DAY-NRLM rural women beneficiaries are distributed into different categories based on the livelihood security components *viz.*, economic security, food and nutritional security, health security, social security, ecological security, psychological security and physical security.

The results in the Table 1 and Fig. 1 shows the distribution of rural women beneficiaries under the DAY-NRLM in Chitradurga taluk across seven key livelihood components. A significant (70.00%) of rural women beneficiaries reported achieving better economic security, indicating that DAY-NRLM interventions have been effective in improving income levels and employment opportunities for rural women. Only a small fraction (10.00%) reported average conditions and 20.00 per cent remain poor in economic

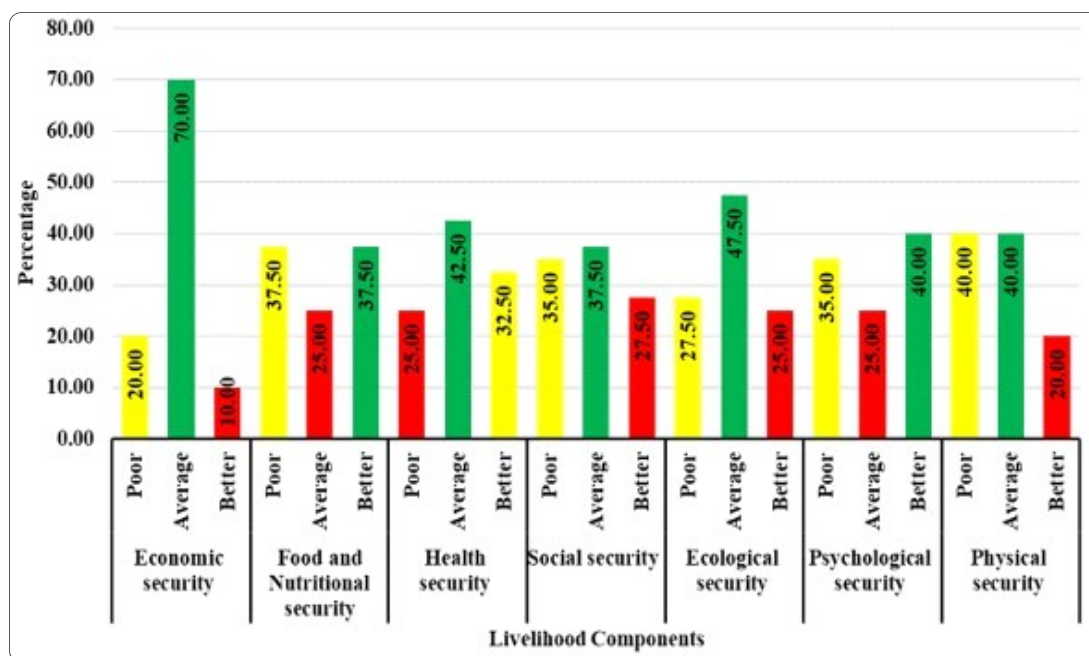


Fig. 1 : Livelihood security component wise distribution of rural women beneficiaries under DAY-NRLM in Chitradurga taluk

TABLE 1
Livelihood security component wise distribution of rural women beneficiaries
under DAY-NRLM in Chitradurga taluk

n₁ = 40

Livelihood security components	Categories	Frequency	Percentage
Economic security	Poor (< 52.64)	08	20.00
Mean = 53.33	Average (52.64 - 54.01)	28	70.00
SD= 1.37	Better (>54.01)	04	10.00
½ SD = 0.68			
Food and Nutritional security	Poor (< 31.22)	15	37.50
Mean = 1.93	Average (31.22 – 32.63)	10	25.00
SD= 1.40½	Better (>32.63)	15	37.50
SD = 0.70			
Health security	Poor (< 17.93)	10	25.00
Mean = 18.53	Average (17.93 – 19.12)	17	42.50
SD= 1.20	Better (>19.12)	13	32.50
½ SD = 0.60			
Socials ecurity	Poor (< 46.03)	14	35.00
Mean = 46.75	Average (46.03 – 47.47)	15	37.50
SD= 1.45	Better (>47.47)	11	27.50
½ SD = 0.72			
Ecological security	Poor (< 13.61)	11	27.50
Mean = 13.98	Average (13.61 – 14.34)	19	47.50
SD= 0.73	Better (>14.34)	10	25.00
½ SD = 0.37			
Psychological security	Poor (< 26.86)	14	35.00
Mean = 7.60	Average (26.86 28.34)	10	25.00
SD= 1.48½	Better (>28.34)	16	40.00
SD = 0.74			
Physical security	Poor (< 27.33)	16	40.00
Mean = 27.78	Average (27.33 – 28.22)	16	40.00
SD= 0.89	Better (>28.22)	08	20.00
½ SD = 0.45			

security. In case of food and nutritional security, the results show a balanced split between average (37.50%) and poor (37.50%) categories. Only one-fourth (25.00%) of rural women were categorised into better category. These results suggest that while food security initiatives have shown positive outcome, additional efforts are still required to ensure sustainable improvements in food access and dietary

practices. More than two-fifth (42.50%) of rural women reported average health security, followed by 32.50 per cent categorised in to better and exactly one-fourth (25.00%) were having poor health security. This reflects the program's focus on improving healthcare access, quality and awareness among its beneficiaries. Social security shows moderate results, with 37.50 per cent reporting better conditions. The

remaining beneficiaries report average (35.00%) and poor (27.5%) levels, suggesting the need for promoting community cohesion and support networks. The program appears to have made progress in ecological security, with 47.75 per cent of beneficiaries in the average category and 25.00 per cent in the better category, it implies that the program's eco-friendly initiatives and awareness campaigns were somewhat effective in promoting ecological well-being. The program's efforts to address stress, mental health concerns, social pressures and build resilience have resulted in positive progress in psychological security. With two-fifth (40.00%) in the better category and 25.00 per cent in the average category, these efforts have likely contributed to these favourable results. Physical security is the weakest component, shows a balanced split between poor (40.00%) and average (40.00%) categories with only one-fifth (20.00%) of rural women achieving better outcomes. This indicates significant gaps in infrastructure, safety and access to essential services like housing and safe environments. The results are in line with the findings of Rajesh *et al.* (2024).

Livelihood Security Component Wise Distribution of Rural Women Beneficiaries in Hiriyur Taluk

The results in the Table 2 and Fig. 2 provides a comprehensive overview of the distribution of rural women beneficiaries in different livelihood components as part of the DAY-NRLM program in Hiriyur taluk. The DAY-NRLM program made progress in enhancing economic security among the beneficiaries, with majority (75.00%) of rural women in the average category and 15.00 per cent in the better category. This improvement could be attributed to the program's interventions, such as skill development and income generating activities. In case of food and nutritional security the rural women beneficiaries were distributed across all three categories, with a slightly higher proportion (40.00%) in the better category, followed by 30.00 per cent in average and 30.00 per cent in poor category. This highlights the program's dedication to fostering sustainable enhancements in food access and dietary practices. The program demonstrated positive outcomes in terms of health security, where more than half (55.00%) of the rural women fell into better category, followed by 22.50 per cent categorized in to average and 22.50 per cent

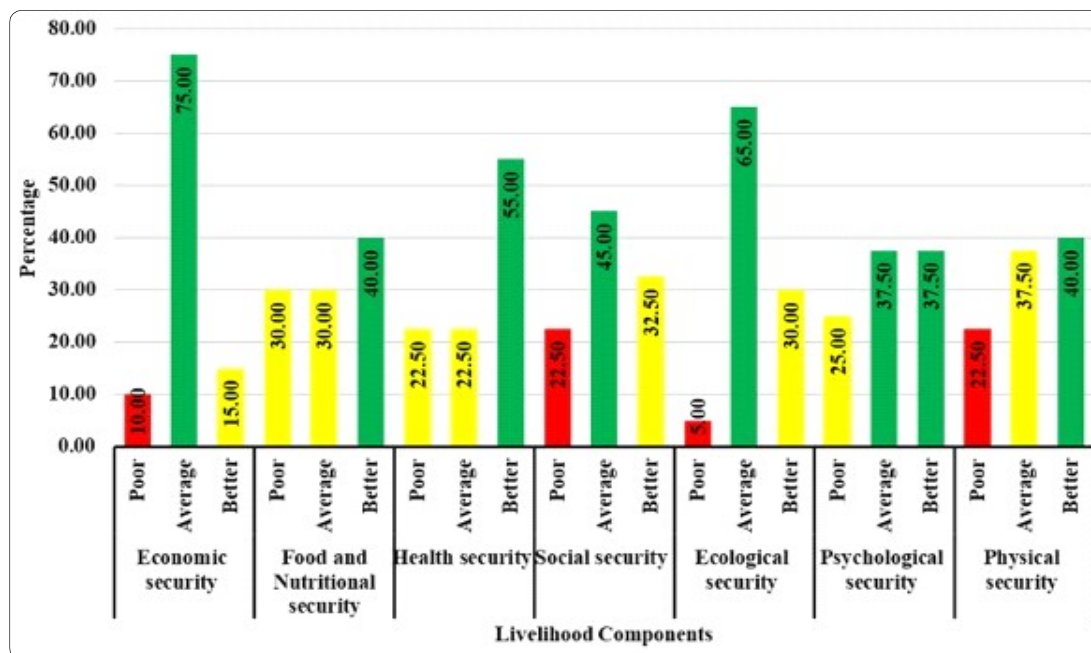


Fig. 2 : Livelihood security component wise distribution of rural women beneficiaries under DAY-NRLM in Hiriyur taluk

TABLE 2
Livelihood security component wise distribution of rural women beneficiaries
under DAY-NRLM in Hiriyur taluk

n₁ = 40

Livelihood security components	Categories	Frequency	Percentage
Economic security	Poor (< 52.81)	04	10.00
Mean = 53.65	Average (52.81 - 54.49)	30	75.00
SD= 1.67	Better (>54.49)	06	15.00
½ SD = 0.84			
Food and Nutritional security	Poor (< 31.81)	12	30.00
Mean = 2.55	Average (31.81 – 33.29)	12	30.00
SD= 1.48	Better (>33.29)	16	40.00
½ SD = 0.74			
Health security	Poor (< 17.95)	09	22.50
Mean = 18.43	Average (17.95 – 18.90)	09	22.50
SD= 0.96	Better (>18.90)	22	55.00
½ SD = 0.48			
Social security	Poor (< 46.46)	09	22.50
Mean = 47.15	Average (46.46– 47.84)	18	45.00
SD= 1.39½	Better (>47.84)	13	32.50
SD = 0.69			
Ecological security	Poor (< 13.98)	02	05.00
Mean = 14.25	Average (13.98 – 14.52)	26	65.00
SD= 0.54½	Better (>14.52)	12	30.00
SD = 0.27			
Psychological security	Poor (< 26.89)	10	25.00
Mean = 7.60	Average (26.89 28.31)	15	37.50
SD= 1.43½	Better (>28.31)	15	37.50
SD = 0.71			
Physical security	Poor (< 27.93)	09	22.50
Mean = 28.65	Average (27.93 – 29.37)	15	37.50
SD= 1.44	Better (>29.37)	16	40.00
½ SD = 0.72			

were having poor health security. This reflects the program's sustainable efforts on improving healthcare access, quality and awareness among its beneficiaries. Social security also saw positive outcomes through the DAY-NRLM program. With 45.00 per cent of rural women in the average category and 32.50 per cent in better category, the program seems to have contributed to strengthening social safety nets within the community. The DAY-NRLM program seems to have

made positive strides in ecological security. The distribution of rural women in the categories indicates that nearly two-third (65.00%) enjoyed average ecological security and nearly one-third (30.00%) were in the better category. It implies that the program's eco-friendly initiatives and awareness campaigns were effective in promoting ecological well-being reflecting favourable environmental conditions or sustainable practices. In terms of

psychological security, the rural women were evenly (37.50%) split between average and better category, with a quarter (25.00%) in the poor category. This balance indicates the program's efforts to address stress, mental health concerns and social pressures have resulted in positive progress in psychological security. Physical security showed significant progress as well. Exactly two-fifth (40.00%) of the rural women in the better category and more than one-third (37.50%) in the average category. Which indicates the program's efforts in improving infrastructure and living conditions likely contributed to this positive change, but the 22.50 per cent in the poor category highlights concerns over physical safety or protection for a subset of the population. The results are in line with the findings of Rajesh *et al.* (2024).

Livelihood Security Component Wise Distribution of Rural Women Beneficiaries in Chitradurga District

The results in Table 3 and Fig. 3 highlights the percentage distribution of overall rural women beneficiaries under the Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM) across various livelihood components in Chitradurga

district. Economic security shows significant improvement, with 72.50 per cent of beneficiaries falling into average category 12.50 per cent in the better category. This highlights the success of the DAY-NRLM program in promoting financial inclusion, income generation and livelihood opportunities among the rural women. A small percentage (15.00%) remains in poor conditions, indicating minor gaps in coverage or accessibility. In case of food and nutritional security the results show a positive trend, with 47.50 per cent of rural women falling under better category, followed by 33.75 per cent under poor and 18.75 per cent average category. These results suggest that while food security initiatives have shown positive outcome, additional efforts are still required to ensure sustainable improvements in food access and dietary practices. More than half (55.00%) of the rural women having average health security and 21.25 per cent categorized into better category, reflecting progress in access to healthcare services and awareness programs. However, more than one-fifth (23.75%) of the beneficiaries falling in to poor category, indicates gaps in healthcare infrastructure, especially in rural areas, requiring further improvements in health

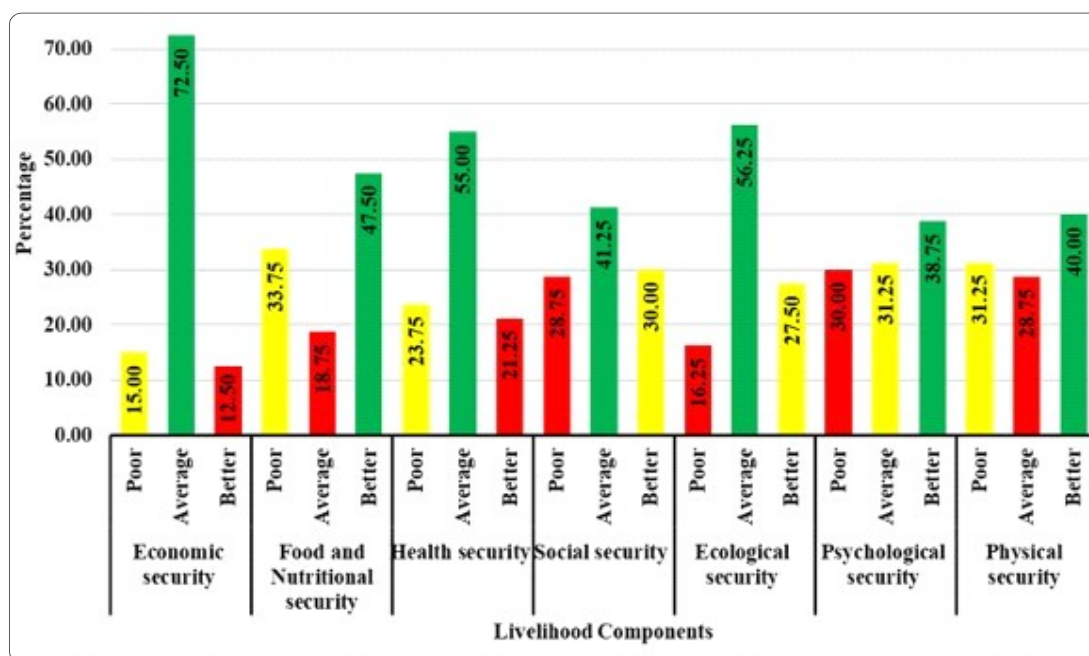


Fig. 3 : Livelihood security component wise distribution of rural women beneficiaries under DAY-NRLM in Chitradurga district

TABLE 3
Livelihood security component wise distribution of rural women beneficiaries
under DAY-NRLM in Chitradurga district

n= 80

Livelihood security components	Categories	Frequency	Percentage
Economic security	Poor (< 52.72)	12	15.00
Mean = 53.49	Average (52.72 - 54.25)	58	72.50
SD= 1.53½	Better (>54.25)	10	12.50
SD = 0.76			
Food and Nutritional security	Poor (< 31.50)	27	33.75
Mean = 2.24	Average (31.50 – 32.97)	15	18.75
SD= 1.47½	Better (>32.97)	38	47.50
SD = 0.73			
Health security	Poor (< 17.94)	19	23.75
Mean = 18.48	Average (17.94 – 19.01)	44	55.00
SD= 1.08½	Better (>19.01)	17	21.25
SD = 0.54			
Social security	Poor (< 46.24)	23	28.75
Mean = 46.95	Average (46.24– 47.66)	33	41.25
SD= 1.42½	Better (>47.66)	24	30.00
SD = 0.71			
Ecological security	Poor (< 13.78)	13	16.25
Mean = 14.11	Average (13.78 – 14.44)	45	56.25
SD= 0.66½	Better (>14.44)	22	27.50
SD = 0.33			
Psychological security	Poor (< 26.88)	24	30.00
Mean = 7.60	Average (26.88 28.32)	25	31.25
SD= 1.45½	Better (>28.32)	31	38.75
SD = 0.72			
Physical security	Poor (< 27.58)	25	31.25
Mean = 28.21	Average (27.58 – 28.85)	23	28.75
SD= 1.27½	Better (>28.85)	32	40.00
SD = 0.63			

interventions. Furthermore, the program has made notable progress in improving social security, with 41.25 per cent falling into the average category and 30.00 per cent in the better category. The program's efforts to cultivate community networks, improve access to social support and fortify safety nets have likely contributed to these positive outcomes. The program's impact on ecological security is evident, with 56.25 per cent in the average category and 27.50

per cent in the better category. The program's eco-friendly initiatives and awareness campaigns have likely played a role in promoting ecological well-being. Psychological security seems to have improved significantly, with 38.75 per cent in the better category and 31.25 per cent in the average category. This suggests that the programs's efforts to address mental health and well-being challenges were effective and well-received by the beneficiaries.

Psychological security remains a concern, with 38.75 per cent achieving better outcomes. Physical security has seen an improvement as well, with 40.00 per cent in the better category and 28.75 per cent in the average category. The program's focus on infrastructure development, safety measures and living conditions has likely played a pivotal role in this enhancement. But still 31.25 per cent of beneficiaries categorised in to poor category highlights concerns over physical safety or protection for a subset of the population. The results are in line with the findings of Rajesh *et al.* (2024).

Taluk Wise Livelihood Security of Rural Women Beneficiaries

Table 4 provides a taluk-wise breakdown of livelihood security among 80 rural women beneficiaries. In Chitradurga taluk, a slightly higher percentage (35.00%) of beneficiaries fall into the poor and average categories, while 30.00 per cent were categorised as better. In case of Hiriyur taluk, slightly higher percentage (35.00%) of beneficiaries were having better livelihood security, while the rest were equally divided between average (32.75%) and poor (32.75%). From the above results it is evident that, the rural women beneficiaries of Hiriyur taluk exhibited significantly higher livelihood security, compared to those in Chitradurga taluk. The likely reasons could be that Hiriyur taluk benefits from assured irrigation facilities provided by the Vani Vilas reservoir, ensuring consistent water availability for

year-round cultivation of diverse crops and increased agricultural productivity. This reliable irrigation system also supports allied activities like horticulture and animal husbandry, creating additional income sources and improving livelihoods. Moreover, the presence of extensive coconut orchards in the region has facilitated the adoption of skill-based secondary agricultural activities, such as rope-making from coconut coir and mat weaving from coconut fronds. These activities contribute significantly to income generation and employment opportunities. In contrast, Chitradurga taluk lacks extensive coconut orchards, limiting the potential for such income-diversifying activities and thereby reducing livelihood opportunities. The results are in line with the study conducted by Chaithra and Shivalingaiah (2023).

Overall Livelihood Security of Rural Women Beneficiaries in Chitradurga District

Table 5 presents the overall livelihood security of 80 rural women beneficiaries under the DAY-NRLM in Chitradurga district. The findings reveal an equal distribution between beneficiaries with better (36.25%) and average (36.25%) levels of livelihood security. However, over more than one-fourth (27.50%) of the beneficiaries fall into the poor category. While progress has been made in enhancing livelihood security, the data indicates the need for more inclusive and targeted efforts to promote financial inclusion, income generation and sustainable livelihood opportunities for rural women. Addressing

TABLE 4

Taluk wise livelihood security of rural women beneficiaries under DAY-NRLM in Chitradurga district

n= 80

Taluks	Categories	Frequency	Percentage
Chitradurga ($n_1=40$) Mean = 219.88 SD= 4.37½ SD = 2.18	Poor (< 217.69)	14	35.00
	Average (217.69 – 222.06)	14	35.00
	Better (> 222.06)	12	30.00
Hiriyur ($n_2=40$) Mean = 222.28 SD= 4.18½ SD = 2.09	Poor (< 220.18)	13	32.50
	Average (220.18 – 224.37)	13	32.50
	Better (>224.37)	14	35.00

TABLE 5
Livelihood security of rural women beneficiaries under DAY-NRLM in Chitradurga district

n = 80

Categories	Overall livelihood security of rural women beneficiaries under DAY-NRLM		
	Criteria	Frequency	Percentage
Poor	< 218.87	22	27.50
Average	218.87 – 223.28	29	36.25
Better	> 223.28	29	36.25
Mean= 221.08, Standard Deviation= 4.42, ½SD= 2.21			

these gaps will be essential to ensuring equitable development and long-term improvement in their socio-economic conditions. The results are in line with the study conducted by Chaithra and Shivalingaiah (2023).

Comparative Analysis of Livelihood Security Components in Chitradurga District

Mann Whitney U-Test was employed to examine the significant differences in livelihood security components among beneficiaries of different taluks in Chitradurga district. Table 6 provides a comparative analysis of livelihood security dimensions between Chitradurga and Hiriya taluks, highlighting

significant differences in specific areas. Hiriya taluk demonstrated superior economic security, with a significantly higher mean rank (46.00) compared to Chitradurga (35.00), supported by a Z value of -2.362 and a p-value of 0.017. Similarly, Hiriya showed better food and nutritional security (mean rank 45.54) compared to Chitradurga (35.46), with a Z value of -1.983 and a p-value of 0.047. Physical security exhibited the largest disparity, with Hiriya achieving a mean rank of 48.80, far exceeding Chitradurga 32.20 and a highly significant Z value of -3.284 (p-value 0.001). However, dimensions such as health security, social security, ecological security and psychological security revealed no significant differences between the two taluks, as indicated by p-values greater than 0.05. Overall, Hiriya taluk outperformed Chitradurga in livelihood security, with a significantly higher mean rank of 46.89 compared to 34.11, reflected in a Z value of -2.465 and a p-value of 0.013, underscoring Hiriya taluk's overall advantage in livelihood conditions.

The significant difference in economic security between Hiriya Taluk and Chitradurga Taluk can be attributed to several factors. In Hiriya Taluk, enhanced skill-based activities have played a crucial role in improving income levels, which in turn leads to higher savings. Additionally, the facilitation of bank

TABLE 6
Comparative analysis of livelihood security components among the DAY-NRLM rural women beneficiaries in Chitradurga district

n = 80

Livelihood Dimensions	Chitradurga Taluk (n ₁ = 40)	Hiriya Taluk (n ₂ = 40)	Maan-Whitney U Test	P value
	Mean rank	Mean rank	Z value	
Economic security	35.00	46.00	-2.362	0.017 *
Food and Nutritional security	35.46	45.54	-1.983	0.047 *
Health security	41.40	39.60	-0.358	0.757 NS
Social security	37.58	43.43	-1.175	0.243 NS
Ecological security	36.40	44.60	-1.768	0.087 NS
Psychological security	40.75	40.25	-0.100	0.910 NS
Physical security	32.20	48.80	-3.284	0.001 *
Livelihood security	34.11	46.89	-2.465	0.013 *

* : 5 per cent level of significance, NS : Non-significant

linkages under the DAY-NRLM has further supported economic security. While assured irrigation and the presence of other essential resources in Hiriyur have positively influenced the consumption patterns of households, contributing to better food and nutritional security. Furthermore, the increased income from secondary agricultural activities has enabled beneficiaries to afford physical assets such as vehicles, household items and even house ownership or renovation, thereby significantly improving physical security. In contrast, these benefits are less pronounced in Chitradurga Taluk, highlighting the importance of resource access and targeted interventions in fostering both economic and physical security. This comprehensive development in Hiriyur has not only enhanced the standard of living but also promoted overall socio-economic well-being, making a marked difference between the two taluks.

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