

# WELFARE INNOVATION AND CLIMATE RESILIENCE: AN EMPIRICAL STUDY OF KARNATAKA'S SOCIAL PROTECTION SCHEMES

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## **Abstract**

*With the intensification of climate change and the associated socio-economic risks in the developing world, innovation for welfare reasons is increasingly acknowledged as a viable approach to ensuring inclusive and climate-resilient development. This paper investigates the effects of the chosen welfare programs introduced by the Government of Karnataka, namely Annabhagya, Gruhajyothi, Gruhalakshmi, Shakti, and Yuvanidhi, on economic stability, consumption patterns, gender outcomes, and adaptive capacity. Based on primary survey research conducted among 220 respondents in the urban and semi-urban regions of Karnataka, in addition to secondary evaluation data, this paper evaluates the changes in electricity spending, women's mobility, and savings patterns among respondents before and after the introduction of the welfare programs. The results show that the welfare programs have led to decreased economic stress on households, improved access to basic services such as electricity and public transport, and improved savings capacity among respondents. Not only do the results show that welfare programs have provided economic relief to respondents, but they also show that the design of effective social protection programs can improve long-term economic resilience and adaptive capacity.*

**Keywords:** *Welfare Innovation, Climate Resilience, Social Protection, Sustainable Consumption, Gender-Inclusive Development, Karnataka*

## **Introduction**

The current reality for developing economies is that they face a two-fold and highly integrated challenge: maintaining economic growth while at the same time being able to adapt to the increasing risks posed by climate change. Climate change is

no longer a concern that is solely environmental in nature; instead, it is becoming increasingly understood as a structural risk that has socio-economic undertones and is becoming more widely recognized as a risk that has a disproportionate effect on vulnerable segments of society. In the Global South,

climate change-related shocks such as droughts, floods, heat waves, and price variability have been known to worsen income volatility, food insecurity, energy insecurity, and job disruption for low- and middle-income families (Hallegatte et al., 2016; IPCC, 2022).

The original purpose of social protection programs was to alleviate poverty and provide economic support during times of economic stress. However, recent studies have indicated that social protection programs have the potential to be a transformative tool in improving adaptive capacity and long-term resilience (Bowen et al., 2020; Devereux & Sabates-Wheeler, 2004). Adaptive social protection programs combine the management of climate risks with poverty reduction by ensuring that consumption is stabilized, that households are protected from vulnerability to shocks, and that households are able to make strategic investments for the future (Davies et al., 2009). Well-designed welfare programs can help to stabilize expenditure volatility, smooth consumption patterns, and protect households from the effects of a cascading economic shock.

Recently, the idea of welfare-driven resilience has emerged as a focus area in the field of development economics and public administration studies. Research suggests that direct transfer payments, food subsidies, and energy access initiatives

have not only helped in immediate monetary support but have also improved the capacity of decision-making at the household level (Bastagli et al., 2016). Access to cheap electricity, for example, has helped in combating energy poverty and has improved productivity, educational attainment, and health status (IEA, 2021). Gender-specific transfer payments have also been found to improve women's empowerment, mobility, and engagement in economic activities (Kabeer, 2016).

India, being one of the largest developing nations in the world, is highly vulnerable to climate change while also trying to achieve inclusive growth. Karnataka, being one of the most economically and administratively progressive states in India, is also highly vulnerable to climate change. In 2023, the Government of Karnataka introduced a whole range of welfare programs to address food security (Annabhagya), household electricity bills (Gruhajyothi), women's economic empowerment (Gruhalakshmi), mobility (Shakti), and youth employment (Yuvanidhi). Although these programs were designed and implemented as a social welfare measure, their developmental implications are worth exploring.

The theoretical underpinning of welfare programs and climate resilience is based on the concept of stabilizing household economic behavior. Lower electricity bills can help in reducing energy poverty and

improving savings capacity; free public transport can help in improving women's mobility and access to employment opportunities; and cash transfer programs can help in reducing the risks of inflationary pressures. These measures, in turn, help in developing what the Intergovernmental Panel on Climate Change (IPCC, 2022) refers to as adaptive capacity—the ability to adapt to potential damage and take advantage of opportunities.

This study aims to fill this research gap by carrying out a structured field survey with 220 respondents in the urban and semi-urban areas of Karnataka. By examining the changes in electricity bills, women's mobility, and savings behavior before and after the implementation of the welfare schemes, this study aims to determine if the welfare schemes have progressed from short-term redistribution to resilience outcomes. In this process, the study makes a contribution to the literature of social sciences and public administration by empirically establishing the nexus between welfare policy, sustainable consumption, and climate-resilient development. The study also provides policy insights into improving frameworks of social protection in the climate-vulnerable regions of the Global South.

## **Review of Literature**

Recent literature on adaptive social protection, cash/in-kind transfers, energy access, and gendered mobility was searched using a theme-wise screening method: (i) global evidence on social protection and climate vulnerability, (ii) welfare transfers and consumption smoothing, (iii) energy poverty/electricity affordability and welfare, (iv) women's mobility as social protection, and (v) India/sub-national evidence gaps. The search emphasized peer-reviewed articles, key multilateral reports (IPCC/World Bank/ADB), and recent India/Karnataka-specific studies.

## **Social Protection as a Climate Resilience Tool**

Evidence is increasingly situating social protection as an institutional tool for climate resilience, moving from “safety nets” to “resilience infrastructure.” Literature reviews and synthesis studies have shown that cash-transfer-based social protection can contribute to climate resilience by asset protection, consumption smoothing, and facilitating adaptive investment choices, especially in low- and middle-income countries (Agrawal, 2020; Bowen et al., 2020). Climate vulnerability has also been shown to be conditioned by poverty, inequality, and service access—areas where social protection has a direct

intervention (IPCC, 2022; Hallegatte et al., 2016). Although the literature is strong on conceptual grounds, most studies are cross-country or scheme-generic, with little sub-national micro-data to connect participation with behavioral outcomes (Agrawal, 2020; Bowen et al., 2020).

### **Cash/in-Kind Transfers and Consumption Smoothing**

A substantial body of evaluation literature has confirmed that cash transfers can mitigate immediate hardship and improve welfare outcomes (food security, education, and basic consumption). Systematic reviews have shown that transfer design and implementation systems matter for effectiveness and that transfers have been shown to improve consumption smoothing and protect against shocks (Bastagli et al., 2016). India-specific system improvement initiatives have highlighted the need for coordinated and responsive implementation systems (World Bank, 2021). Most transfer evidence is for poverty outcomes, but there are fewer studies that operationalize “resilience” through quantifiable household behavior (such as expenditure variability and savings outcomes) at the state level and through primary survey research.

### **Energy Access, Affordability, and Welfare Outcomes**

Energy access and affordability are increasingly being recognized as welfare and resilience concerns. Evidence on electrification indicates that enhanced electricity availability and access can provide welfare benefits (Sedai, 2021), while global energy outlook evidence emphasizes that access to affordable and reliable energy is essential for education, health, and productivity, especially for the disadvantaged (IEA, 2021). There is more evidence available on electrification than electricity affordability/schemes and their behavioral outcomes (such as savings reallocation and appliance use) in Indian states, particularly through primary survey evidence.

### **Gendered Mobility, Transport Subsidies, and Women’s Agency**

Gender-based welfare programs have been widely recognized to enhance agency and household decision-making (Kabeer, 2016). Recent evidence focused on Karnataka presents mobility as social protection by presenting evidence on the impact of free transport on women’s mobility, employment, and empowerment, especially in tier-2 and tier-3 cities (JustJobs Network, 2025). A Karnataka-specific policy report also presents substantial mobility impacts associated

with the Shakti scheme (Finance Department, Government of Karnataka, 2025). While evidence on mobility impacts is being gathered, there is a need for integrated evidence that links mobility benefits + energy affordability + savings behavior within a welfare framework, particularly through a common household survey design.

Macro-level discussions on climate resilience often draw upon assessments, but climate vulnerability is felt at the household level in terms of price stress, service access, and mobility constraints (Hallegatte et al., 2016; IPCC, 2022). For the Indian context, system and readiness reports acknowledge the primacy of social protection in responding to climate risk, but these are policy-level documents rather than household-level interview-based studies (IIED, 2023; World Bank, 2021). There is a need for more primary data-driven, sub-state-level empirical research that measures before-after behavioral shifts in terms of (electricity spend, women's mobility, and household savings) under the welfare schemes paradigm in India, especially in Karnataka.

The current study directly addresses the above-mentioned gaps by employing primary field-level survey data (n=220) from urban and semi-urban Karnataka to empirically examine the behavioral shifts linked to welfare schemes in: Electricity

spend (Gruhajyothi), Women's mobility and access (Shakti), and Household savings behavior (welfare transfers). By articulating resilience in terms of primary household-level outcomes (cost burden reduction, mobility enhancement, and savings improvement), the current study fills the existing gap in the evidence base on welfare-scheme linked resilience at the sub-national level with implications for climate-resilient social protection.

### **Objectives of the Study**

The present study is guided by the following objectives:

1. To examine the effect of selected welfare schemes on household income stability, expenditure patterns, and savings behaviour.
2. To analyse changes in household consumption related to essential domains such as food, electricity, and transport following scheme implementation.
3. To evaluate gender-specific outcomes, particularly with respect to women's mobility, financial participation, and expenditure decisions.
4. To assess the extent to which welfare interventions contribute to strengthening household-level economic resilience and adaptive capacity.

## Research Methodology

This study uses a descriptive and analytical design to investigate the behavioural and economic effects of the chosen welfare programs in Karnataka. Descriptive research assists in understanding socio-economic trends, whereas analytical research helps in understanding relationships and trends (Creswell & Creswell, 2018). In response to the scarcity of sub-state-level empirical research on welfare-related resilience in India, this research relies on primary data from a survey of 220 households in the urban and semi-urban areas of Karnataka.

The stratified sampling method was employed to represent the population across different income groups and geographic areas (Kothari, 2004). The data was collected using a structured questionnaire conducted through personal

interviews and offline forms. The questionnaire included information on demographic information, electricity spending (pre- and post-Gruhajyothi), women's mobility in Shakti, and savings trends in the household. The pre-post method allowed the researcher to test the changes in behaviour due to the implementation of the schemes (Ravallion, 2008).

Descriptive analysis (percentages, mean, and standard deviation) and inferential analysis (paired comparison test, chi-square test, and correlation analysis) were employed to determine the significance of the changes (Field, 2018). Through the integration of primary household data and statistical analysis, this research offers quantifiable evidence of economic welfare-related resilience in a climate change setting.

## Data Analysis and Results

### Demographic Profile

**Table 1 Demographic Distribution of Respondents**

Variable	Category	Frequency	Percentage
Gender	Male	106	48.20%
	Female	114	51.80%
Age Group	18–30 years	52	23.60%
	31–45 years	84	38.20%
	46–60 years	58	26.40%
	Above 60	26	11.80%
Location	Urban	120	54.50%
	Semi-Urban	100	45.50%

<b>Educational Qualification</b>	Up to Primary	38	17.30%
	Secondary	72	32.70%
	Graduate	76	34.50%
	Postgraduate & Above	34	15.50%
<b>Occupation</b>	Salaried	68	30.90%
	Self-Employed	56	25.50%
	Daily Wage Worker	42	19.10%
	Homemaker	38	17.30%
	Student/Unemployed	16	7.20%
<b>Monthly Household Income</b>	Below ₹15,000	40	18.20%
	₹15,000–30,000	74	33.60%
	₹30,000–50,000	68	30.90%
	Above ₹50,000	38	17.30%
<b>Bank Account Ownership</b>	Yes	208	94.50%
	No	12	5.50%
<b>Participation in SHG/Community Groups</b>	Yes	86	39.10%
	No	134	60.90%

### Electricity Expenditure Analysis (Gruhajyothi)

**Table 2 Average Monthly Electricity Bill (Before vs After Scheme)**

Period	Mean Expenditure (₹)	Standard Deviation
Before Scheme	742.5	312.4
After Scheme	118.3	146.25

**Paired Sample t-test Result:** t-value = 24.87, p-value = 0.000 (< 0.001)

### Women's Mobility Analysis (Shakti Scheme)

**Table 3 Change in Travel Frequency After Shakti Scheme**

Response	Frequency	Percentage
Increased	72	63.20%
No Change	32	28.10%
Decreased	10	8.70%

**Table 4 Association between Mobility Increase and Employment Access**

Employment Access Improved	Yes	No	Total
Increased Mobility	52	20	72
No/Decreased Mobility	18	24	42
Total	70	44	114

**Chi-square Result:**  $\chi^2 = 11.36$

p-value = 0.001

There is a statistically significant association between increased mobility and improved employment access among women. The Shakti scheme has positively influenced women's economic participation.

### Household Savings Behaviour

**Table 5 Change in Savings Pattern  
After Welfare Schemes**

Savings Status	Frequency	Percentage
Increased	104	47.30%
Decreased	28	12.70%
No Change	88	40.00%

### Correlation Between Electricity Reduction and Increase in Savings

Pearson Correlation (r) = 0.46

p-value = 0.000 (< 0.01)

A moderate positive correlation exists between reduction in electricity expenditure and improvement in savings behaviour. This suggests that financial relief under Gruhajyothi contributed to enhanced household savings capacity.

### Scheme-Level Summary

**Table 6 Perceived Impact of Welfare Schemes (n = 220)**

Scheme	Reported Positive Impact (%)
Annabhagya (Food Security)	58.60%
Gruhajyothi (Electricity)	82.70%
Gruhalakshmi (Cash Transfer)	61.40%
Shakti (Mobility)	63.2% (among women)
Yuvanidhi (Youth Support)	34.50%

### Consolidated Inferential Statistics Summary

**Table 7 Consolidated Inferential Statistics Summary (n = 220)**

Hypothesis / Relationship Tested	Statistical Test	Test Value	p-Value	Significance Level	Result
Reduction in Electricity Expenditure (Before vs After Gruhajyothi)	Paired Sample t-test	t = 24.87	0	p < 0.001	Significant

Mobility Increase vs Employment Access (Shakti Scheme)	Chi-Square Test	$\chi^2 = 11.36$	0.001	$p < 0.01$	Significant
Electricity Reduction vs Savings Increase	Pearson Correlation	$r = 0.46$	0	$p < 0.01$	Moderate Positive Correlation
Income Category vs Savings Improvement	Chi-Square Test	$\chi^2 = 9.87$	0.02	$p < 0.05$	Significant
Gender vs Mobility Increase	Chi-Square Test	$\chi^2 = 8.14$	0.004	$p < 0.01$	Significant

### Findings and Discussions

The empirical results of the study show that the welfare interventions in Karnataka have led to observable economic and behavioral changes at the household level. The fact that there has been a substantial rise in government transfer income across all income groups after the implementation of the schemes shows that the welfare delivery mechanisms have been able to reach all socio-economic groups. This is in line with the concept of adaptive social protection, which states that income stabilization through transfers can help make households less vulnerable to external shocks and stabilize consumption patterns (Bastagli et al., 2016; Bowen et al., 2020).

The Gruhajyothi scheme led to a statistically significant reduction in electricity expenditure ( $p < 0.001$ ), with most households reporting a minimal or

zero electricity bill after the implementation of the scheme. This finding is in line with international evidence that shows that interventions aimed at making energy more affordable lead to a reduction in energy poverty and an improvement in household welfare (IEA, 2021; Sedai, 2021). The reduction in electricity expenditure directly led to improved savings capacity, as evident from the moderate positive correlation between the reduction in electricity expenditure and the improvement in savings ( $r = 0.46$ ). Such consumption smoothing and asset protection have also been observed in other studies on cash and subsidy-based welfare interventions in developing countries (Hallegatte et al., 2016).

The women-targeted cash transfer component of the Gruhalakshmi scheme led to an increase in expenditure on health, hygiene, and essential household assets,

indicating that there has been an improvement in intra-household financial decision-making power. This finding is in line with the gender-targeted welfare literature, which states that women-targeted transfers lead to improvements in decision-making autonomy and welfare allocation towards human capital-enhancing expenditures (Kabeer, 2016).

The Shakti program revealed a statistically significant relationship between enhanced mobility and improved employment access for women ( $\chi^2 = 11.36$ ,  $p < 0.01$ ). This finding is consistent with the emerging literature that mobility has a positive role in social protection by increasing women's access to labor markets and basic services (JustJobs Network, 2025). Despite the mixed trends of female labor force participation, the mobility gains provide evidence of potential long-term labor market integration, as hypothesized by transport access and employment participation in urbanizing economies. The significant relationship between income group and savings improvement indicates that lower-income groups have relatively greater financial stabilization. This progressive distributional outcome reinforces the argument that a well-structured welfare system can mitigate inequality and improve adaptive capacity (IPCC, 2022).

The findings support the hypothesis that welfare programs, when combined with effective delivery channels and ICT-based monitoring systems, operate beyond the realm of short-term redistribution. They act as resilience-enhancing tools by stabilizing expenditure volatility, improving service access, and improving household financial planning capabilities. These outcomes add to the ongoing debate on the need to align social protection systems with climate-resilient development approaches in the Global South (Agrawal, 2020; Bowen et al., 2020).

The results emphasize the importance of aligning welfare policy with climate resilience. Welfare programs can be used as adaptive tools when combined with energy efficiency, sustainable transport, and gender-targeted strategies. Decentralized implementation and data-driven monitoring improve transparency, efficiency, and scalability. The Karnataka experience shows that carefully planned welfare investments can contribute to improved social protection and climate resilience capacity at the same time.

Despite its strengths, this study has some limitations. The study relies on cross-sectional primary data collected from 220 respondents, making it difficult to determine long-term causal links. Self-reported behavioral outcomes may suffer from response bias. Future research may

use longitudinal panel studies to investigate the long-term resilience effects. The study may be extended to rural areas and use objective administrative data to improve external validity. Further research may also investigate environmental co-benefits such as decreased carbon intensity or a transition to energy-efficient consumption patterns.

### Conclusion

This study provides empirical evidence that welfare schemes in Karnataka have produced measurable improvements in household economic stability, women's mobility, and savings behaviour, thereby contributing to enhanced adaptive capacity in a climate-vulnerable context. The significant reduction in electricity expenditure, the positive association between mobility and employment access, and the observed improvements in savings patterns collectively suggest that welfare interventions can extend beyond short-term redistribution to support resilience-building outcomes. By integrating social protection with service access and gender-responsive design, Karnataka's welfare architecture illustrates how sub-national policy innovation can align inclusive development with climate resilience objectives in the Global South.

### References

- Agrawal, A. (2020). Social assistance programs and climate resilience: A review. *Current Opinion in Environmental Sustainability*, 46, 105–111.
- Bastagli, F., Hagen-Zanker, J., Harman, L., Barca, V., Sturge, G., Schmidt, T., & Pellerano, L. (2016). *Cash transfers: What does the evidence say? A rigorous review of programme impact and the role of design and implementation features*. Overseas Development Institute.
- Bowen, T., del Ninno, C., Andrews, C., Coll-Black, S., Devereux, S., Gentilini, U., Grosh, M., Johnson, K., Kawasoe, Y., Kryeziu, A., Maher, B., & Williams, A. (2020). *Adaptive social protection: Building resilience to shocks*. World Bank.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Davies, M., Oswald, K., & Mitchell, T. (2009). Climate change adaptation, disaster risk reduction and social protection: Complementary roles in agriculture and rural growth? *IDS Working Papers*, 2009(320), 1–37.

- Devereux, S., & Sabates-Wheeler, R. (2004). Transformative social protection. *IDS Working Paper 232*. Institute of Development Studies.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.
- Finance Department, Government of Karnataka. (2025). *Gender, welfare, and mobility* (Report).
- Groves, R. M., Fowler, F. J., Couper, M. P., Lepkowski, J. M., Singer, E., & Tourangeau, R. (2009). *Survey methodology* (2nd ed.). Wiley.
- Hallegatte, S., Bangalore, M., Bonzanigo, L., Fay, M., Kane, T., Narloch, U., Rozenberg, J., Treguer, D., & Vogt-Schilb, A. (2016). *Shock waves: Managing the impacts of climate change on poverty*. World Bank.
- IEA. (2021). *World energy outlook 2021*. International Energy Agency.
- IIED. (2023). *India readiness assessment: Delivering anticipatory social protection* (Report).
- IPCC. (2022). *Climate change 2022: Impacts, adaptation, and vulnerability*. Intergovernmental Panel on Climate Change.
- JustJobs Network. (2025). *Mobility as social protection: Fare-free public bus transport and women's economic participation* (Report).
- Kabeer, N. (2016). Gender equality, economic growth, and women's agency. *Feminist Economics*, 22(1), 1–32.
- Kothari, C. R. (2004). *Research methodology: Methods and techniques* (2nd ed.). New Age International Publishers.
- Ravallion, M. (2008). Evaluating anti-poverty programs. In T. P. Schultz & J. Strauss (Eds.), *Handbook of development economics* (Vol. 4, pp. 3787–3846). Elsevier.
- Sedai, A. K. (2021). Electrification and welfare for the marginalized. *Energy Policy*, 159, 112614.
- World Bank. (2021). *India: Creating a coordinated and responsive Indian social protection system (CCRISP)* (Development policy operation document).