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Role of Villages and Villagers in Mitigating Climate Change: Need for Re-Culturing Livelihood and Unscientific Practices

R Rajesh^{1,*}

¹Professor of Sociology, Bangalore University, Bengaluru, 560056, Karnataka, India

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* Corresponding author.

R Rajesh

rajesh_rrs@yahoo.com

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ABSTRACT

In the phase of global climate change, the role of villages and rural populations is increasingly recognized as both critical and complex. This paper explores the potential for villages and villagers to significantly contribute to climate change mitigation by transforming livelihoods and abandoning unscientific practices. It is argued that rural areas hold traditional ecological knowledge and practices that, if re-cultured and updated with scientific insights, could lead to substantial reductions in greenhouse gas emissions and enhance local resilience to climate impacts. The paper first examines the existing agricultural methods, energy use, and waste management practices prevalent in villages that contribute to environmental degradation and climate change. It then outlines the socio-cultural, educational, and economic barriers that hinder the adoption of more sustainable practices. Drawing on diverse case studies, we highlight how innovative policies at local, national, and international levels can support the necessary transitions. It proposes a multi-faceted approach to re-culture village livelihoods, integrating traditional wisdom with modern technologies and sustainable practices. The paper discusses the importance of policy interventions sensitive to local contexts, including the decentralization of governance, financial incentives for sustainable practices, investment in renewable energy, and the strengthening of village institutions. Furthermore, we stress the imperative of embedding climate change education within villages to foster behavioral change and empower villagers to participate in climate action actively. Our analysis concludes that villages, through re-cultured livelihoods and scientifically informed practices, can become dynamic frontiers in the global effort to mitigate climate change. Policy reforms are vital to catalyze this transition.

Keywords: Climate change mitigation; Traditional ecological knowledge; Sustainable practices; Rural practices; Policy interventions; Socio-cultural interventions; Education

INTRODUCTION

Global warming and climate change are the two terms that are in vogue both in academics and in policy formulation in almost all parts of the world. Several summits, conferences, congregations, and deliberations are being conducted to mitigate this world's temperature increase. The logic of reducing it to modern industry and the urban phenomenon is undoubtedly understandable. But, the factors of climatic variation, earth's internal factors, and external factors of cosmic energy or even the planet's aging could also be probable factors. Undoubtedly, urban-based industries are the identified causal factors of global warming, but is that all? Nevertheless, most of the population still resides in rural areas, and rural agglomeration and activities have hardly been debated. Climate change is a reason, and the

changed situation is the reality. Global, regional, and local challenges are changing rapidly. Many times, we do not need to follow Western and dominant models. Many local experiments and success stories have sustained all-weather tests. While contextualizing the issue in India as space and geopolitical location, it's time for a change. We are debating whether to go forward or backward, which is a significant concern. Development is essential, but at what and at whose cost? With the Indian population crossing 1.5 billion and 65% of the total population still residing in rural areas and dependent on agriculture & allied activities, there are many chances to bring significant change in India. Most of the rural population depends on the old and existing lifestyle patterns, and there are many opportunities to bring change to that. Heat, human performance, and occupational health



are critical for assessing global climate change impacts¹.

This paper aims to understand life, livelihood, and routine patterns. These will help decode them to various impacts and influences on the local and global challenges. However, global warming and climate change are severe matters of concern at the larger systems, yet they matter regarding scalable changes. Rural society, rural eco-system, and rural machinery significantly impact all social, economic, political, and climatic systems. Age-old livelihood patterns need to be studied: 1. To understand the then need and differentiate it from today's need. 2. Need was critical for numerical, economic, resource use, political, and cultural available knowledge.

Production of heat through crops, use, misuse, and abuse of cropping patterns, creation of waste and consumption, overutilization of resources, and livelihood are visible aspects of village economy and heat or cold generating mechanisms. Even more meaningful or bad practices could need to be understood from a larger perspective. This is not only required to protect the far-away people, but their self-protection is essential as nature is testing now and then everyone without any exceptions.

All these sectors have activities that continuously impact climate, temperature, nature, and, ultimately, global warming. Large and small cities are undoubtedly red spots on the temperature radar. Equally potential are the rural and village settlements, which spread throughout the country into nooks and corners of the geographical spaces. This, at times, can be independently and collectively, and either singly or cumulatively, can add to global warming.

Villages are crucial in mitigating climate change, and a sociological perspective can provide valuable insights into the dynamics at play. Sociologists examine the collective behavior of communities, the impact of social norms, and the structures of societies that can both hinder and facilitate climate action.

About Cultural and Social Norms in Adaptation Strategies, Sociologists recognize that social and cultural factors influence adaptation to climate change. Nielsen and Reenberg's study on Northern Burkina Faso illustrates how local culture, including factors such as ethnicity, gender roles, and traditional practices, can act as barriers to adopting successful adaptation strategies, such as labor migration and female economic engagement². Empowerment and Collaboration in Climate Planning are areas of sociological research that emphasize the importance of personalizing the climate change experience and bringing diverse voices into the conversation³ underline the success of a neighborhood-based model that builds trust and social capital, ensuring that residents' adaptation policies are relevant to and owned³.

Traditional knowledge and innovations are vital in creating resilient agricultural practices and sustainable resource management. While understanding the Integrating Traditional Knowledge with Modern Techniques, sociolo-

gists note the significance of this integration for empowering village economies and enabling them to contribute to climate mitigation effectively. Innovation in approach is essential to redress the present challenges, and the bottom-up approach to climate action could be one such actionable plan. Village-level initiatives can provide a bottom-up approach to climate change mitigation. By engaging and empowering local communities, as seen in the Village Adoption Scheme in India, residents can utilize existing resources toward sustainable practices, creating models that other regions can replicate⁴.

Impactful village-centric studies and understanding have been seldom explored, and for sustained impact, Education for Long-Term Sustainability is the best alternative. Amrita SeRVE's project in Sadivayal village underscores the importance of environmental education, particularly among children, to instill the importance of sustainable practices from a young age. Teaching children about the broader impacts of their actions on the environment ensures the perpetuation of sustainable behaviors⁵.

On a global scale, villages reflect localized versions of larger societal dynamics, and thus, their involvement in climate action reflects wider participation in sustainability efforts. Using a sociological lens to evaluate and address these efforts, strategies can become more inclusive, culturally sensitive, and effective in mobilizing communities toward mitigating climate change.

Villages and villagers play a crucial role in combating climate change. Their way of life, traditional knowledge, and sustainable daily life practices notably impact the environment². As we delve into the understanding of the role of villages in mitigating climate change, it becomes evident that re-culturing livelihoods and addressing unscientific practices are essential for fostering sustainable solutions. This article explores the critical contributions of villages and villagers in the fight against climate change and the need to re-culture livelihoods and practices for a more sustainable future⁶. Human adaptation to climate change is a complex process influenced by factors beyond economic and technological development^{2,5}. The literature on climate change adaptation increasingly recognizes the significant impact of factors like class, gender, and culture in the decision-making of adaptation strategies at the local level.

Renewable energy: Should it be learned from urbanites or the village itself? Villages and villagers' role in mitigating climate change extends beyond their economic and technological development. They have a unique knowledge of their local ecosystems and can employ sustainable practices in agriculture, forestry, water management, and energy production.

Significant progress has been achieved in developing scientific principles and tools for adapting to climate change through science-management partnerships that emphasize education, vulnerability assessment, and the creation of



adaptation strategies and tactics. However, the impact of climate change and the need for mitigation go beyond technological and economic aspects. Villages and villagers deeply connect with their natural surroundings and often rely on natural resources for their livelihoods. Their sustainable practices and traditional knowledge can mitigate climate change by 1. Conserving and protecting natural resources, such as rain forests, reserve forests, and water bodies, which act as carbon sinks and help regulate the climate.

Nature-based solutions, such as agroforestry and sustainable farming practices, reduce carbon emissions and enhance biodiversity. We are implementing renewable energy solutions, like solar power and biogas from Gobar, to decrease fossil fuel dependency and reduce greenhouse gas emissions. Using these sustainable energy sources can help create a cleaner environment and a more sustainable future for future generations. Investing in renewable energy technologies can also lead to job creation and economic growth in the green energy sector. We must continue to prioritize and support the transition to renewable energy to mitigate the impacts of climate change and ensure a healthier planet for all.

They are promoting community-led initiatives that focus on waste management, recycling, and reducing carbon footprints in daily life. Villages and villagers can play a crucial role in mitigating climate change through their traditional practices and cultural values. They can act as stewards of the environment and promote sustainable lifestyles by preserving local biodiversity, practicing organic farming, promoting traditional knowledge and wisdom, and embracing alternative forms of energy. Villages and villagers have a unique connection with their natural environment, which provides them with a deep understanding of the ecosystems on which they rely for their livelihoods. This ancestral wisdom, transmitted over generations, offers valuable insight into sustainable practices that can help mitigate the effects of climate change. Villages can act as guardians of these vital carbon sinks by preserving and protecting natural resources such as forests and water bodies, contributing to climate regulation and biodiversity preservation.

Moreover, adopting nature-based solutions, including agroforestry and sustainable farming practices, not only reduces carbon emissions but also fosters biodiversity, creating resilient ecosystems better equipped to withstand the effects of climate change. Promoting renewable energy solutions, such as solar power and biogas, reduces reliance on fossil fuels and significantly decreases greenhouse gas emissions, making a tangible impact on mitigating climate change at the local level.

Additionally, community-led initiatives focusing on waste management, recycling, and reducing carbon footprints in daily life demonstrate the commitment of

villages and villagers to sustainable living. By embracing traditional practices and cultural values, villages can be role models for sustainable lifestyles, promoting organic farming, conventional wisdom, and alternative energy sources. Through these efforts, villages and villagers can contribute significantly to global efforts to mitigate climate change, demonstrating their crucial role in creating a more sustainable future.

While villages and villagers can play a significant role in mitigating climate change, some barriers need to be considered. One of the opposing arguments to the crucial role of villages and villagers in mitigating climate change is the challenge of limited resources and access to modern technology. In numerous rural areas, particularly in developing nations, villages frequently need more infrastructure and resources to adopt renewable energy solutions and sustainable practices fully. The initial investment required to switch to renewable energy sources, like solar power or biogas, can be unaffordable for villages with restricted financial resources.

In addition, while traditional knowledge and cultural values are invaluable in promoting sustainable living, they may also hinder the adoption of modern scientific approaches to mitigating climate change. Resistance to Change and reluctance to embrace new technologies and practices can arise, particularly when firmly entrenched in traditional beliefs and customs.

Furthermore, the increasing pressures of population growth and urbanization can lead to encroachment on natural habitats and overexploitation of resources, undermining the efforts of villages and villagers to preserve their local ecosystems. As rural areas experience population growth and migration to urban centers, the traditional way of life and sustainable practices in villages may be at risk, diminishing their potential impact on climate change mitigation.

Despite these challenges, it is essential to recognize the significance of villages and villagers in combating climate change. While addressing the barriers and limitations they face, it is necessary to provide support in the form of technological and financial assistance, as well as education and awareness programs, to empower villages to overcome these challenges and continue their vital contributions to climate change mitigation. By acknowledging and addressing these opposing arguments, the role of villages and villagers in combating climate change can be further strengthened, leading to more comprehensive and practical solutions in global efforts to address climate change. The transformation of livelihood practices in rural areas can play a vital role in addressing and mitigating climate change. By adopting sustainable agriculture practices, supporting renewable energy sources, and investing in eco-friendly infrastructure, rural communities can substantially contribute to decreasing greenhouse gas emissions and enhancing resilience to



climate change impacts. This shift towards more climate-resilient livelihood practices benefits the environment and improves the well-being and livelihoods of rural populations.

Conceptual Framework

The concept of global warming and climate change has taken a severe turn recently. Most countries have pledged to act and perform very swiftly toward this. Some countries and low-lying regions will be affected the most quickly and, later, impact other areas. The thought was that global warming was only melting ice in both the north and south poles, increasing the sea level. However, the recent unprecedented rainfall all over the globe, including many parts of India, has given rise to a new concern that not only selected people and regions will be affected, but everybody is likely to be affected directly or indirectly. This has raised doubts about the logic of prediction of impact understanding and even the causal factors. The regression analyses of urban spaces and industries are visible. Still, hidden and not-so-visible parameters of the non-urban spaces and livelihood are affected, but this could also be the casual factor/s. This approach would enable many to conduct profound research and address concerns from other dimensions. Warming is not unidimensional; it is multidimensional: time factors, external factors like cosmic, aging of the planet, and many other aspects that are not in this research domain and limitations of the setup. Nevertheless, those aspects can be considered throughout the process.

Hence, it could be the dense population region, density, timing of people, production, consumption, livelihood, and lifestyle of urban spaces and areas. However, the missing factor on the other side of this coin is the rural space, time, livelihood, and related activities. If factors of concern are established, a more extensive study covering different parts of the country could be thought of later. It is necessary to understand the local and indigenous knowledge, which has been sustained for quite some time. Since they have been experimented with and are well established but have yet to be shared across the nation, it is essential to understand their presence, practice, and hidden aspects. Let's hope that the knowledge is still prevalent and used. Modern knowledge and commercial cropping patterns have marred the practice, and even knowledge as generations have passed without passing on the hidden meaning and agenda behind them.

Contextualisation

Apart from the 3 R's of literacy, the level of education in these two agglomerations, urban and rural, is significantly different. Especially concerning climate and global warming, many think they will not be affected, and hence, they need not bother about their contribution to the GW and CC; therefore, their participation in mitigating it is abysmal. However, as the saying goes, every drip counts; thus, every

step matters. Approximately 40% of the total population of developed countries and 80% of developing countries live in rural spaces, depending on agriculture/ allied activities. Though season, they contribute significantly. There is an urgent need to educate them from a different angle altogether. Our indigenous and Indian knowledge system has identified which vegetable and edible products produce heat or cold in our bodies after consumption and how to regulate them. The same knowledge must also be available to maintain or sustain temperature in a region's land, water, and air. Local knowledge and practices with deep connectivity with the culture and eco-system must be unearthed rather than borrowing ideas and practices from an 'acontextual' perspective. Many practices connected with the ground reality of our cultural ethos are not in practice but probably are prevalent in the memories and minds of existing older generations. If not now, we cannot see that aspects like the human genome and cultural genome are essential and connected to the roots and ground realities.

Objectives

There is a need to understand the ground reality; at times, there will be a need to induce some new practices and culture. Hence, the following aspects are explored;

1. To understand varieties of practices in agriculture and allied activities that accelerate or decelerate warming and climate change in that region.
2. To understand how cultural/practice mapping is embedded in their daily lives by warming or cooling the land, water, and air around them.
3. To understand how different regions and zones respond differently to the varied situations concerning natural challenges and how they are transmitted through generations.
4. To understand how villages have built their livelihood systems and an Integrated Nature Assimilation System beyond regular seasonal changes/challenges.
5. To understand the role of each vis-à-vis village as a community that knowingly or unknowingly contributes to global warming.

Generic to Specific

In broader terms, many known or unknown practices exist, and people have made them a part of their lives. One has to understand the generality of the matter and then synthesize it to specificities. Hence, many more broad ways of understanding reality will suffice for the study. The following are some more necessities for deliberations for further analyses.

a) To analyze the unique position of villages and villagers in the context of climate change and identify the potential they hold for significant contributions to climate mitigation efforts worldwide.



b) To examine the existing livelihood practices in villages that may contribute to or hinder efforts in combating climate change, focusing on understanding how 'unscientific practices' impact environmental sustainability.

c) To explore the concept of 're-culturing'—the transformative process of revising traditional village practices to be more environmentally conscious and climate-resilient.

d) To investigate the barriers that prevent adopting sustainable practices in rural areas, including sociocultural, economic, and structural challenges.

e) To identify and evaluate innovative strategies and policy interventions that support the transition towards sustainable living and farming practices among rural populations.

f) To propose a framework for empowering villagers to engage in climate action through educational initiatives, technology transfer, and capacity-building efforts.

g) To emphasize the importance of integrating indigenous knowledge with modern scientific approaches to create a holistic, culturally sensitive model of environmental stewardship.

h) To advocate for policy frameworks that incentivize the shift towards sustainable practices and reinforce the value systems that underpin these practices within village communities.

i) To emphasize the role of collaboration between villagers, local governments, NGOs, and the international community in scaling up successful climate action initiatives at the village level.

To contribute to the existing body of literature by providing empirical evidence of successful village-led climate mitigation initiatives and identifying avenues for future research.

The Rationale

1. Local Impact on Global Challenge: Villages play a vital role in the global ecosystem. As a significant portion of the global population resides in rural areas, understanding and leveraging their potential impact on climate change is critical for global mitigation strategies.

2. Sustainable Practices: Many villages are repositories of traditional knowledge and sustainable land-use practices. Research is needed to highlight these practices, understand their impact on climate mitigation, and explore how they can be adapted and scaled up in different contexts.

3. Transition Away from Unscientific Practices: Unscientific and unsustainable practices contribute to environmental degradation in various rural areas. A study to analyze these practices, understand their origins, and develop methods to transform them sustainably is necessary.

4. Educational and Behavioral Change: Understanding how education and awareness among villagers about climate issues can drive behavioral change and the adoption of eco-friendly practices offers a pathway to profound societal

transformation toward sustainability.

5. Barriers to Change: Cultural, structural, and socioeconomic barriers to adopting sustainable village practices exist. A study that systematically identifies and proposes models to overcome these barriers can inform policy and grassroots initiatives.

6. Policy and Empowerment: This study would propose ways to empower villagers and integrate them into the broader climate action discourse by evaluating the effectiveness of current policy frameworks and identifying gaps.

7. Technological and Social Innovation: There is a need to explore how technology can support climate change mitigation in rural areas. This includes studying the implementation of innovative agricultural techniques, renewable energy solutions, and sustainable waste management systems.

8. Collaborative Action: The study aims to highlight the importance of multi-stakeholder collaboration, including the vital roles of NGOs, government bodies, and the villagers themselves in driving change.

9. Adaptation and Mitigation Synergies: Assessing how villagers' climate change adaptation efforts can simultaneously serve as mitigation strategies is crucial for creating dual-benefit solutions.

10. Theoretical Contribution: The proposed study intends to contribute to theoretical knowledge by linking sociological and environmental perspectives towards policy implications, offering a nuanced analysis of how societal transformations can support climate change mitigation.

In summary, the rationale for this study lies in harnessing the transformative potential of villages and villagers—a potential that, if tapped, could significantly support global efforts in mitigating the adverse effects of climate change.

Furthering the rationale and argument, climate change is evolutionary; however, human intervention can slow it down significantly. Urban spaces and modern, urbanized established have been brought under one roof to mitigate global warming through proper policies and programs both at international and national agencies with the government. However, the more significant chunk of the population, unaware of the policies and programs, are the victims of global warming and climate change. Indirectly, they are affected, and they contribute to this effect. The significant population, which is kept away from the changing pattern, needs to be made a stakeholder by understanding their lifestyles and patterns and by which we can access their role and percentage of contribution and, hence, decrease the same.

Due to their geographical and topographic advantages, the southern states have different logical connectivity and linkages but can contribute significantly. For logistic reasons, a comprehensive study focusing on different regions and clusters of states can provide a broader perspective of information and linkages.



Essential Policy level changes

a) Fostering Sustainable Agricultural Practices: Agricultural policies must incentivize climate-smart farming, including organic agriculture, permaculture, and agro-forestry, which can reduce greenhouse gas emissions and increase carbon sequestration.

b) Supporting Renewable Energy Transition: Energy policies must facilitate the shift from fossil fuels to renewable sources such as solar, wind, and biogas in villages, ensuring energy security and reducing carbon footprints.

c) Promoting Local Employment: Economic policies can stimulate local economies by creating green jobs, thus reducing migration and allowing villagers to maintain sustainable livelihoods within their communities.

d) Enabling Access to Climate Finance: Financial policies should ensure villages can access funds for climate mitigation and adaptation projects, enabling them to invest in sustainable technologies and infrastructure.

e) Integrating Traditional Knowledge: Cultural policies can uphold and integrate indigenous and local knowledge systems with scientific research to create effective and culturally appropriate climate solutions.

f) Education and Capacity Building: Educational policies must prioritize environmental awareness, equipping villagers with the knowledge and skills to implement and maintain sustainable practices.

g) Building Resilience: Policies must focus on strengthening villages' resilience to climate impacts through infrastructure development, disaster risk reduction, and emergency response systems.

h) Enhancing Participation in Decision-Making: Governance policies should involve villages in planning and implementing climate-related policies to ensure that their needs and perspectives shape the interventions.

i) Incentivizing Technological Adoption: Policies should provide subsidies or tax incentives for adopting eco-friendly technologies like efficient irrigation systems, clean cookstoves, and sustainable waste management.

j) Strengthening Collaboration and Networking: Institution-building policies can support the creation of networks and platforms for knowledge exchange, collaboration, and peer-to-peer learning among villages on climate change matters.

These policy changes can empower villages and villagers to be active leaders in climate change mitigation, ultimately leading to a more sustainable and resilient future.

Implication

There is a sufficient movement of the population from rural areas to urban spaces. The research needs to shift from urban to rural spaces as the migration pattern was altered from pre- to post-corona. If we need to understand the

global pattern or establish and create new international trends, it is a matter of concern in the present situation. Policies have to be directional to our needs rather than the formulation of policies as per the requirements of others. If this paradigm shift is achieved, there will be a better scope to address multiple challenges, and climate change or 'global warming' will be just one of them. Hence, better methods and techniques can be used to control and manage probable climate change.

The main reason is that the urban culture, from factories to vehicles and then to industry, is moving toward villages. There is a significant probability of multiplying the urban spaces and cultures and, consequently, multiple warming spots. We need to learn from our mistakes and not repeat the errors. However, in the process of urbanization and while improving rural spaces, the unfortunate Western model of development and the Indian model of applying for programs, policies, infrastructure, and industry will be in a disaster. Policies must be seen from the new dimension and not further create disaster spaces and unmanageable warming areas.

Repeating the development model will be a disaster if it is not altered or arrested. New models of rural development and livelihood are essential now. This project work would enable policy formulation from present to/and future Bharath and rural India. It is necessary to note that India as a nation needs a new model for Bharath of development, if not following another but ingeniously developed model based on a self-sustainable, locally manageable model. Many schemes are launched, but a new model of integrated rural livelihood in the context of new development is a must to regulate the unnecessary pressure of migration.

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