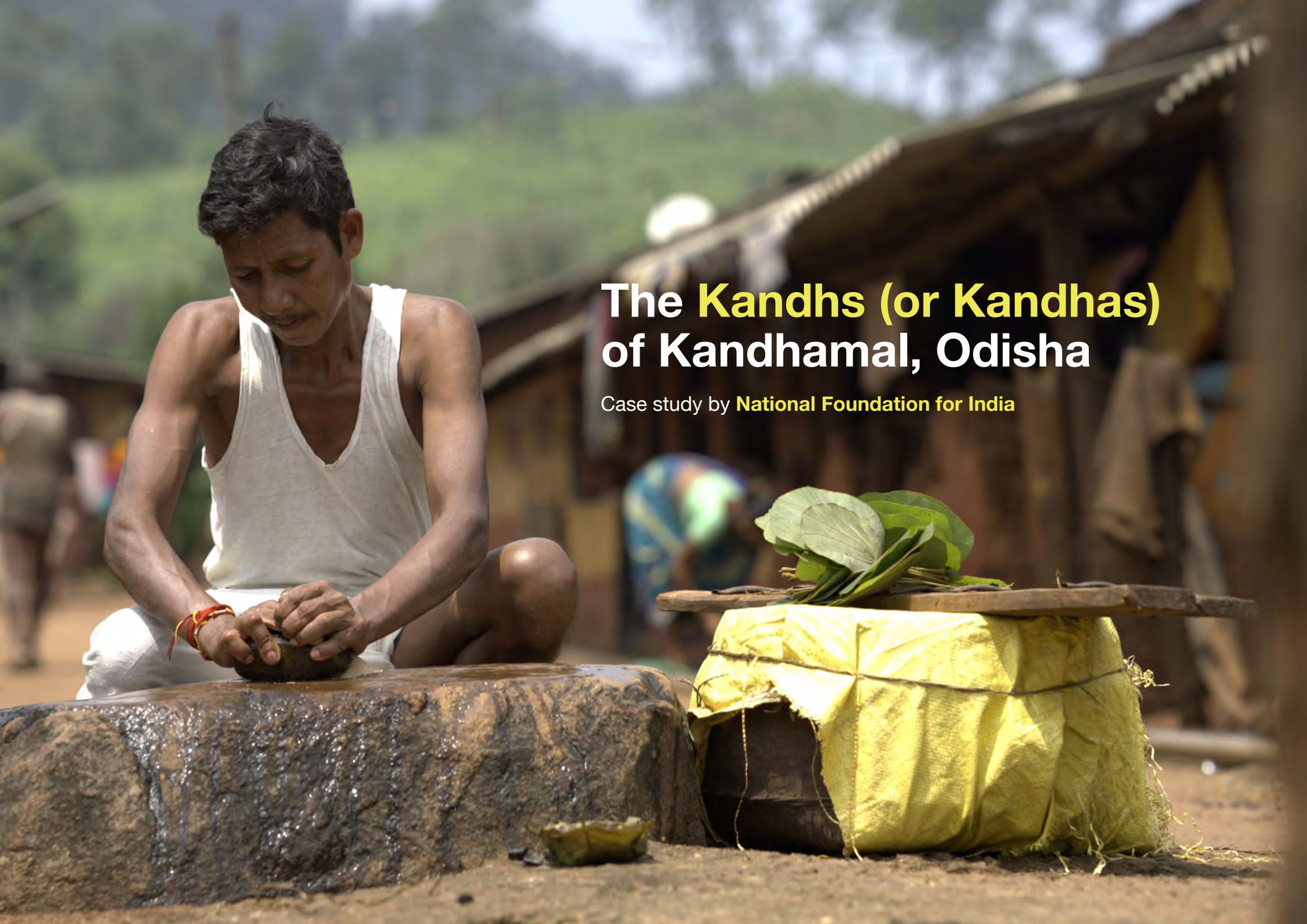

The Kandhs (or Kandhas) of Kandhamal, Odisha

Case study by **National Foundation for India**

The Kandhs (or Kandhas) of Kandhamal, Odisha

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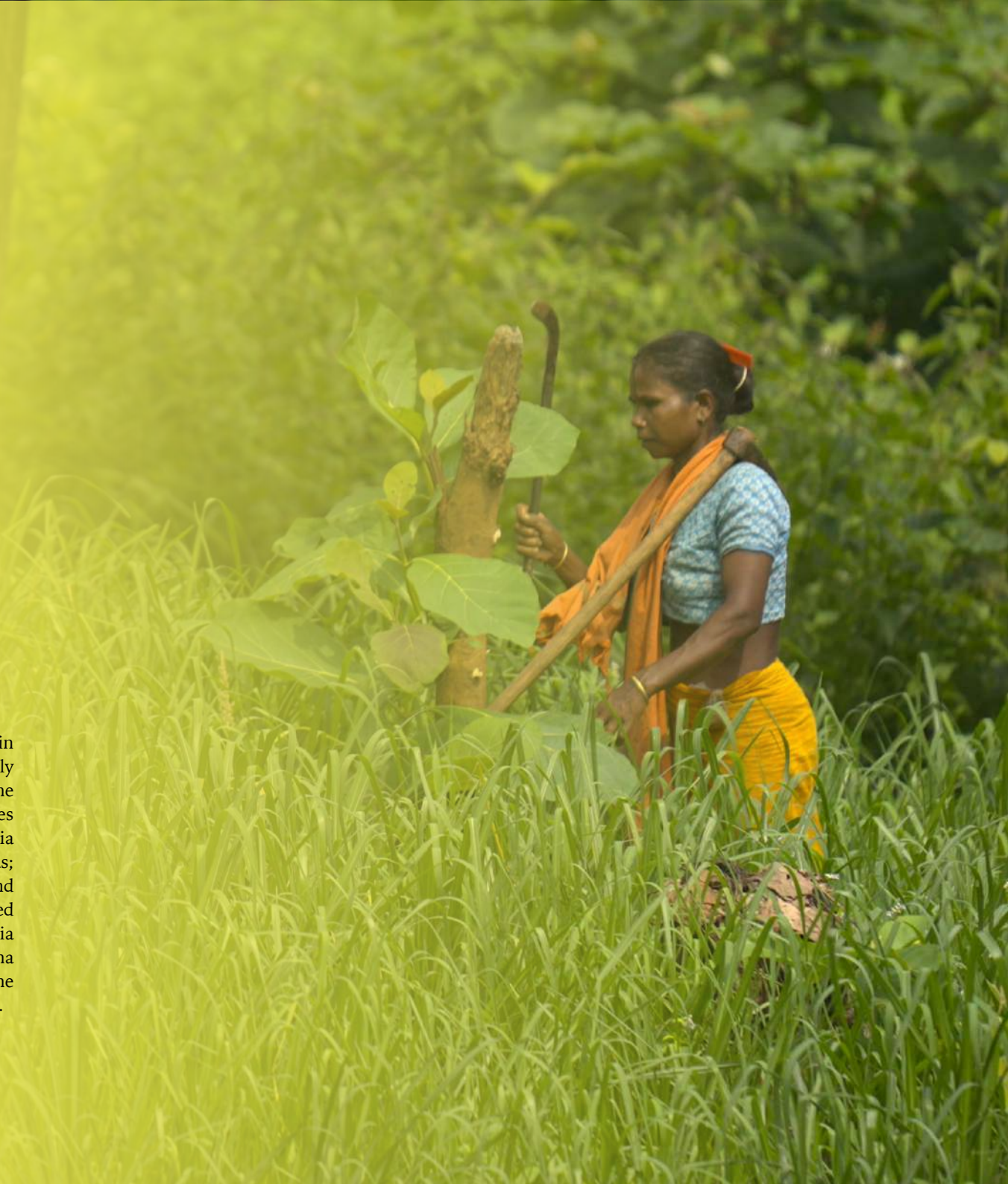
The weather is highly unpredictable now. Irregular rainfall, rising temperatures, and extreme weather conditions are making it harder for us to live the way we have we have always lived. It also threatens our crops and water resources.

The Kandha community, a particularly vulnerable tribal group (PVTG), is one of the prominent indigenous[1] groups living in the Kandhamal district of Odisha. Kandhamal is considered to be the one of the most socio-economically 'backward' districts as per the report of the Government of Odisha[2], with a high concentration of Kandhas.

A study done by Rath et al in 2011, highlights, that scholarly literature has divided the Kandhas into three sub-tribes i.e. Kutia Kandhas, Dongria Kandhas and Desia Kandhas; the Dongaria Kandha and Kutia Kandha are classified as primitive tribes. The Desia Kandhas and Kutia Kandha geographically belong to the Kandhamal district in Odisha[3].



The paper elaborates:

Although, as the country is marching ahead through developmental programmes, tribals are also influenced by it and changes are witnessed in their every walk of life. We can find changes in their social, political, cultural, economic, and religious sphere.

The Kui-speaking Kutia and Desia Kandha sub-tribes have traditionally relied on forests for their sustenance and livelihoods, which has deepened the bond with their natural environment. This connection has shaped their unique indigenous knowledge, encompassing agricultural practices, seed preservation techniques, water conservation strategies, and rich cultural traditions. Kutia Kandhas are found in Belghar hill regions of Tumudibandha Blocks and some Gram Panchayats of Kotagarh Block. Desia Kandhas are settled agriculturists and live at the foothills which has allowed them to get better access to mainstream services like education, health, and even jobs. As a result, while the Desia Kandhas are more integrated into the broader socio-economic framework, the Kutia Kandhas continue to live relatively isolated lives, preserving their distinct cultural identity and traditional ways.

As per both the Kutia and Desia Kandh communities, irregular and delayed patterns of rainfall, rising temperatures, and heat waves are reducing the productivity of crops and disappearing water sources. The indigenous practices of these communities which had earlier equipped them to adapt and persevere, are becoming less effective in conserving biodiversity, maintaining soil health, and managing water resources.

At the same time, socio-economic pressures leading to urban migration for better opportunities are impacting their way of life and gradually leading to the loss of indigenous knowledge, as younger generations are less involved in farming activities and less aware of their culture including dance, and music.

How does Kandh understand climate change?

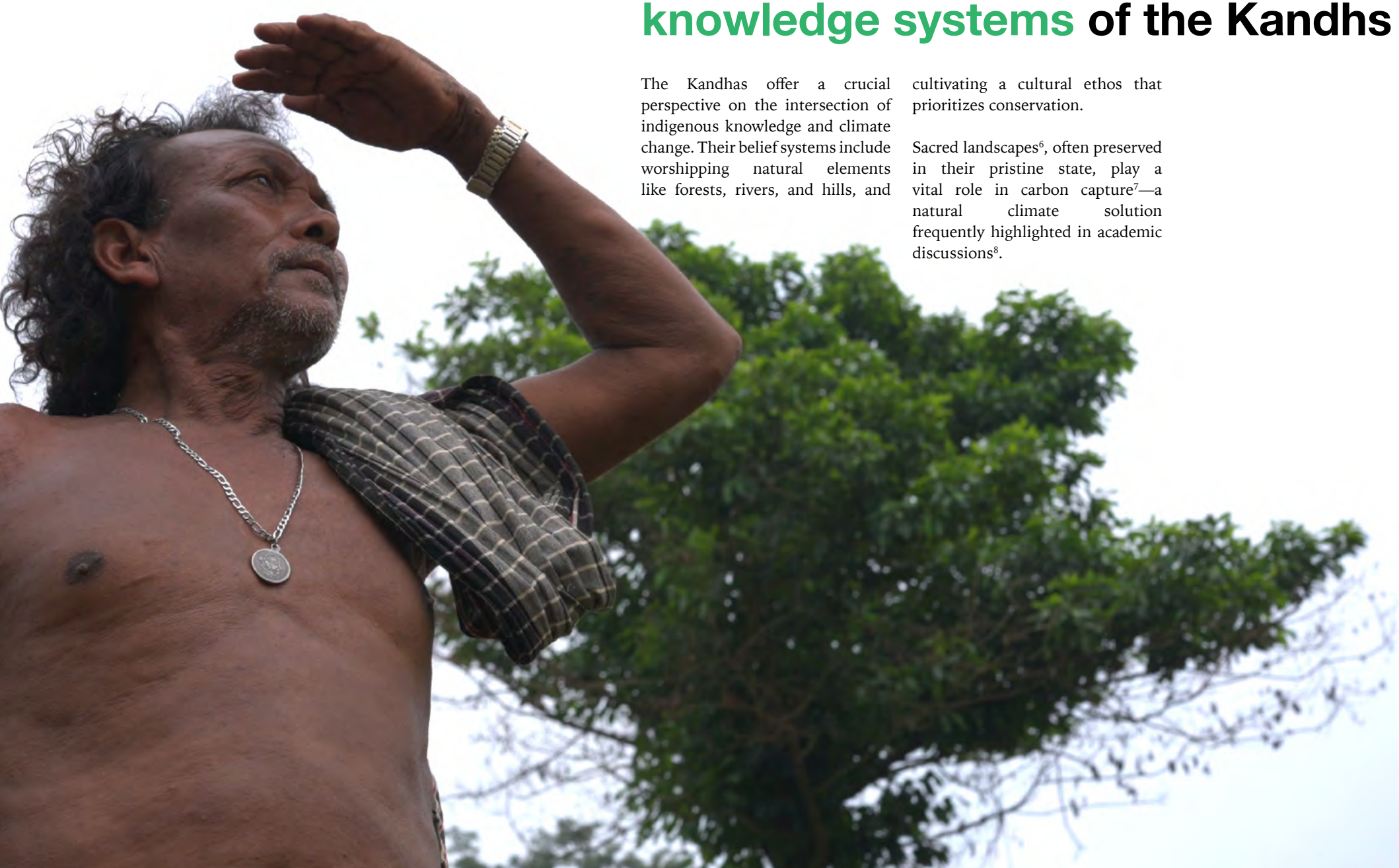
> Over the past 2-3 years, we have noticed significant changes in rainfall patterns. Earlier, the rain would typically begin in the first week of June, allowing us to transplant paddy seedlings in July. However, with the delay and irregularity in rainfall, which now starts around the first week of July, the transplanting period has shifted to August.

As per a study[4] by Nath T.K, 2018, also highlights that districts like Jagatsinghpur, Kandhamal, Koraput, Malkangiri, Nayagarh, and Puri in Odisha are experiencing rising temperatures at statistically significant levels. The rainfall has a delayed and decreased inflow during the month of June, which has delayed the start of the cropping season. Rainfall has now shifted to late June or early July.

"The heat was never this intense before. We never needed umbrellas for protection. All we used was a simple gamcha (towel) to shield ourselves from the sun, and it was sufficient. But now, everyone uses umbrellas during the summer" says Sushanta Pradhan from Kutiguda village, Baliguda block.

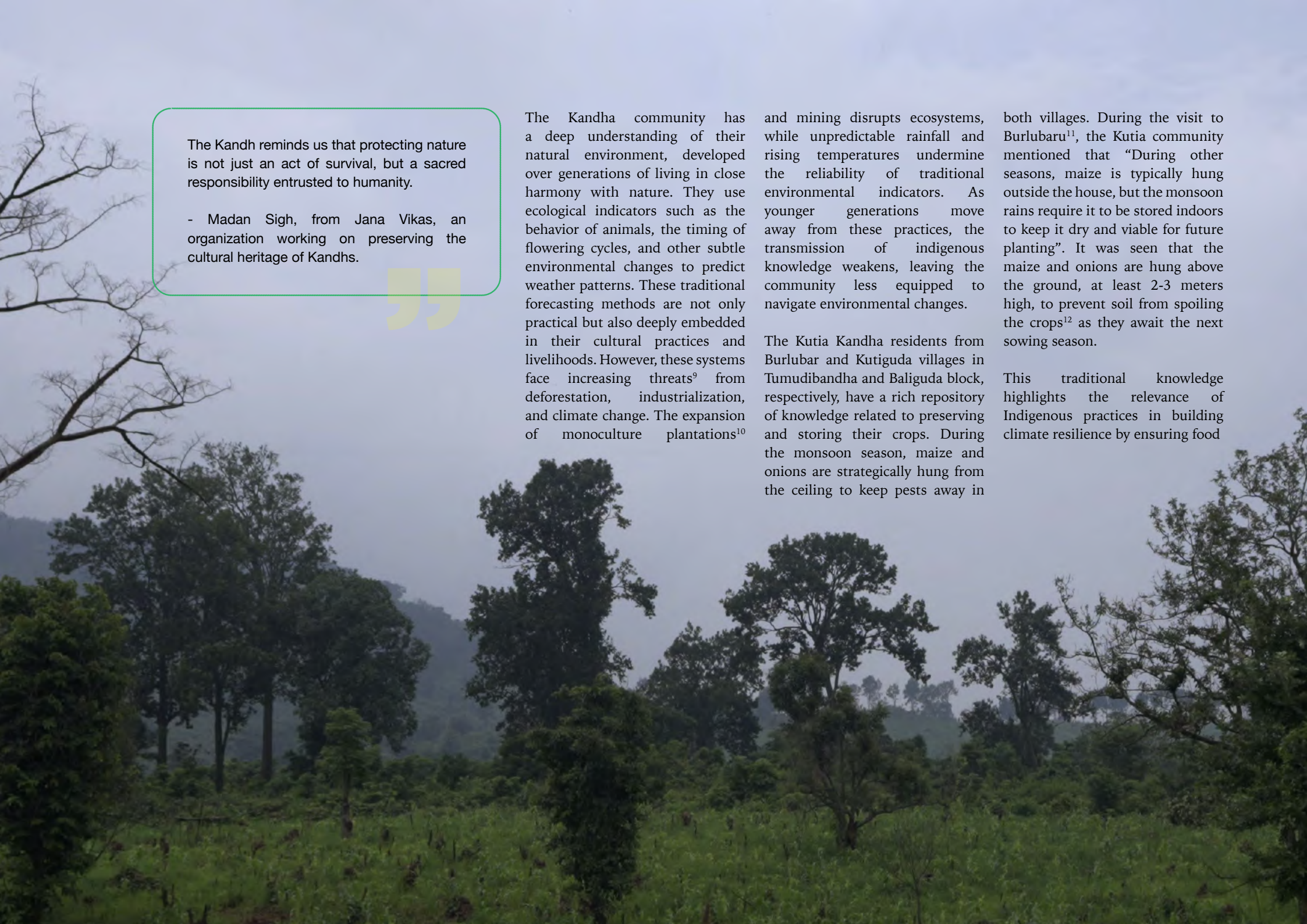
Sushanta Pradhan, a Kutia Kandh from Kutiguda village in Baliguda block[5], shared his experience on how summers have become significantly hotter over the years. He said that in his childhood, the intensity of the heat was much milder, and villagers only needed a simple towel for protection from the sun. "Umbrellas were rarely seen and were primarily used by outsiders during the rains," he says. Today, however, even the villagers have adopted umbrellas as a necessity during summer to shield themselves from the intense heat.

Understanding indigenous knowledge systems of the Kandhs



The Kandhas offer a crucial perspective on the intersection of indigenous knowledge and climate change. Their belief systems include worshipping natural elements like forests, rivers, and hills, and cultivating a cultural ethos that prioritizes conservation.

Sacred landscapes[6], often preserved in their pristine state, play a vital role in carbon capture[7]—a natural climate solution frequently highlighted in academic discussions[8].



> The Kandh reminds us that protecting nature is not just an act of survival, but a sacred responsibility entrusted to humanity.
>
> - Madan Sigh, from Jana Vikas, an organization working on preserving the cultural heritage of Kandhs.

The Kandha community has a deep understanding of their natural environment, developed over generations of living in close harmony with nature. They use ecological indicators such as the behavior of animals, the timing of flowering cycles, and other subtle environmental changes to predict weather patterns. These traditional forecasting methods are not only practical but also deeply embedded in their cultural practices and livelihoods. However, these systems face increasing threats[9] from deforestation, industrialization, and climate change. The expansion of monoculture plantations[10] and mining disrupts ecosystems, while unpredictable rainfall and rising temperatures undermine the reliability of traditional environmental indicators. As younger generations move away from these practices, the transmission of indigenous knowledge weakens, leaving the community less equipped to navigate environmental changes.

The Kutia Kandha residents from Burlubar and Kutiguda villages in Tumudibandha and Baliguda block, respectively, have a rich repository of knowledge related to preserving and storing their crops. During the monsoon season, maize and onions are strategically hung from the ceiling to keep pests away in both villages. During the visit to Burlubaru[11], the Kutia community mentioned that “During other seasons, maize is typically hung outside the house, but the monsoon rains require it to be stored indoors to keep it dry and viable for future planting”. It was seen that the maize and onions are hung above the ground, at least 2-3 meters high, to prevent soil from spoiling the crops[12] as they await the next sowing season.

This traditional knowledge highlights the relevance of Indigenous practices in building climate resilience by ensuring food

security and resource conservation. Techniques such as sun-drying beans and using natural materials like neem leaves and dung for storage were seen[13] and demonstrate sustainable, low-carbon approaches to preserving crops.

These methods[14] reduce reliance on modern energy-intensive preservation technologies and adapt to changing environmental conditions, such as increased humidity due to climate change. By protecting[15] grains from pests and decay, these practices mitigate losses, maintain biodiversity, and ensure the availability of seeds for future planting—essential strategies in adapting to a warming and unpredictable climate.

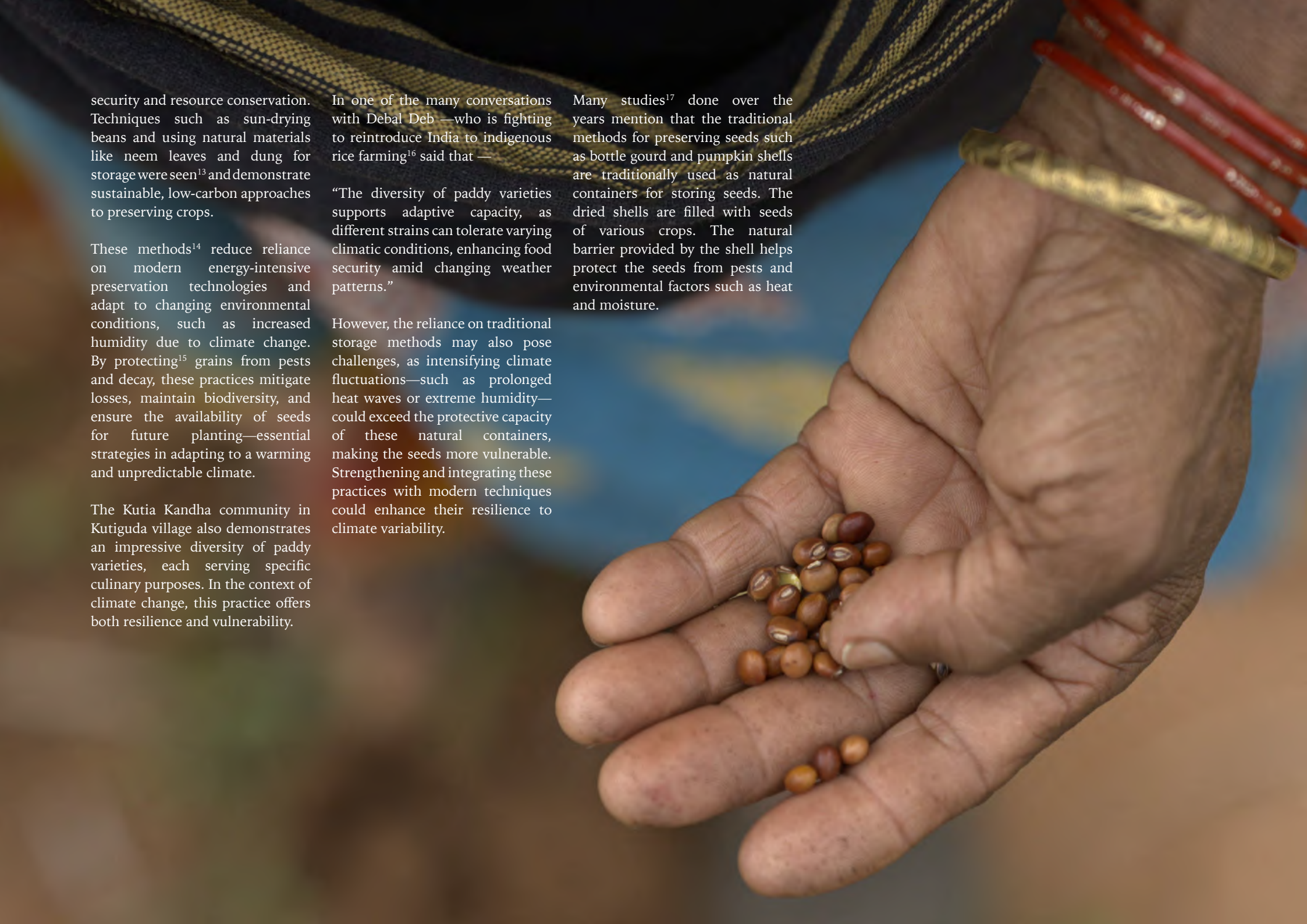
The Kutia Kandha community in Kutiguda village also demonstrates an impressive diversity of paddy varieties, each serving specific culinary purposes. In the context of climate change, this practice offers both resilience and vulnerability.

In one of the many conversations with Debal Deb —who is fighting to reintroduce India to indigenous rice farming[16] said that —

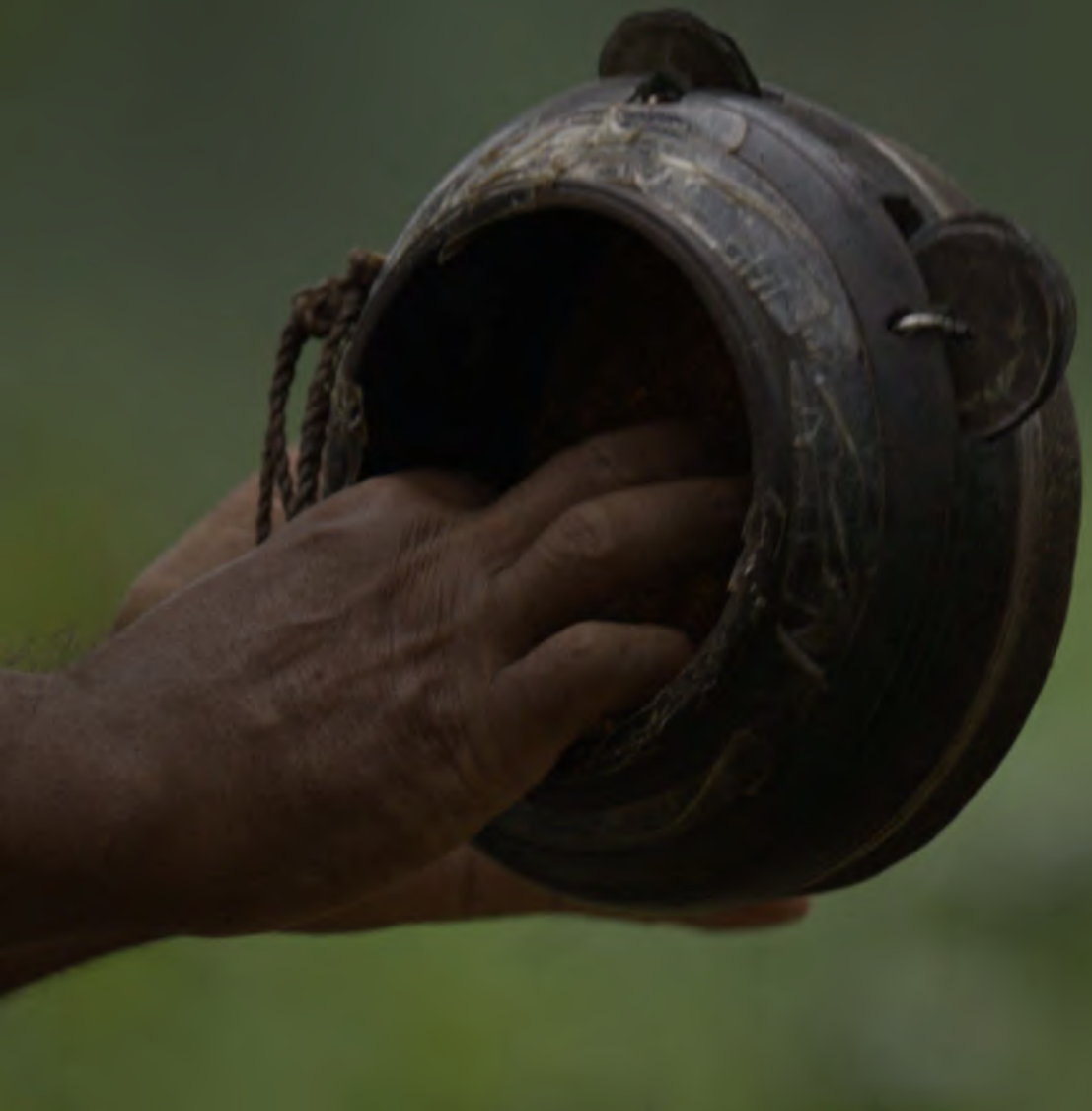
“The diversity of paddy varieties supports adaptive capacity, as different strains can tolerate varying climatic conditions, enhancing food security amid changing weather patterns.”

However, the reliance on traditional storage methods may also pose challenges, as intensifying climate fluctuations—such as prolonged heat waves or extreme humidity—could exceed the protective capacity of these natural containers, making the seeds more vulnerable. Strengthening and integrating these practices with modern techniques could enhance their resilience to climate variability.

Many studies[17] done over the years mention that the traditional methods for preserving seeds such as bottle gourd and pumpkin shells are traditionally used as natural containers for storing seeds. The dried shells are filled with seeds of various crops. The natural barrier provided by the shell helps protect the seeds from pests and environmental factors such as heat and moisture.



The Challenge of Sustaining Indigenous Knowledge Systems of the Kandh Community



> “Dominant thinking has often made indigenous people feel inferior by equating their knowledge systems with low productivity. As productivity became the ultimate goal, the larger natural resources were sacrificed in the process” says Prof. Virginius Xaxa

The Desia and Kutia Kandhas community[18], known for its deep ecological wisdom and sustainable practices, face mounting challenges in preserving their Indigenous Knowledge systems. These systems, which have evolved over centuries, are intricately linked to the community’s cultural identity, agricultural practices[19], and environmental management. However, a combination of socio-economic, environmental, and institutional factors threatens their survival.

Vikas Pradhan, Sutaghati village, Kothgarh block said:

> We used to know when to plant our seeds by watching things like flowering trees and animal behavior, but now these signs don’t work as well. Our farming cycles are getting disturbed.

One of the primary challenges is the impact of climate change which has hindered their ability to carry out the practices as they were able to do so earlier[20]. Erratic weather patterns, rising temperatures, and unpredictable rainfall undermine the reliability of the ecological cues on which the Kandha's traditional practices depend. For instance, the group discussion with Kandhas of Sutaghati village, Kothgarh block[21], highlighted their ability to predict seasonal changes based on natural indicators like flowering trees or animal behavior becoming less effective now. This disruption jeopardizes their agricultural and resource management strategies, leaving them increasingly vulnerable to climate shocks.

During one of the group discussions[22], it was mentioned that "Land alienation and deforestation have eroded the natural basis of the Kandh's knowledge systems". Banbasi Seva Samiti[23], one of the not-for-profit organisations in Baliguda block highlighted the concern regarding the encroachment of monoculture plantations usually promoted under government schemes[24], mining projects, and industrial activities. They explained:

"These activities not only displace the community from their ancestral lands but also depletes the ecosystems that sustain their practices. Sacred groves, vital for biodiversity and cultural rituals, are particularly at risk, leading to a loss of both ecological balance and spiritual heritage".

Socio-economic marginalization exacerbates these challenges[25]. The lack of secure land tenure[26], inadequate access to education that values indigenous Knowledge, and limited representation in decision-making processes isolate the Kandh from mainstream climate adaptation initiatives. Younger generations, influenced by urbanization and modern education, are increasingly[27] disconnected from traditional practices, accelerating the erosion of this knowledge.

In the Kutiguda village, the Kutia Kandha community faces significant socio-economic[28] changes due to the village's increased population. This has led to a decreased dependency on agriculture, with only 10 out of 50 families now engaged in farming activities - a stark contrast to previous generations. The elders of the community stated that the "current generation is less involved in agriculture, as many migrate for education and job opportunities and have alternative livelihood options".

Additionally, “agriculture is perceived to be less profitable or sustainable due to factors like limited market access, fluctuating crop prices, and the increasing unpredictability of climate conditions.” Although, it was mentioned during the discussion that[29], their yields are enough for their own consumption and if the crop grows well then it is sold for profit. However, they migrate in seeking better opportunities to support their family’s needs. This has also resulted in weakening the community bonds[30] as the tradition of farmers cooperating in each other’s cultivation has diminished.

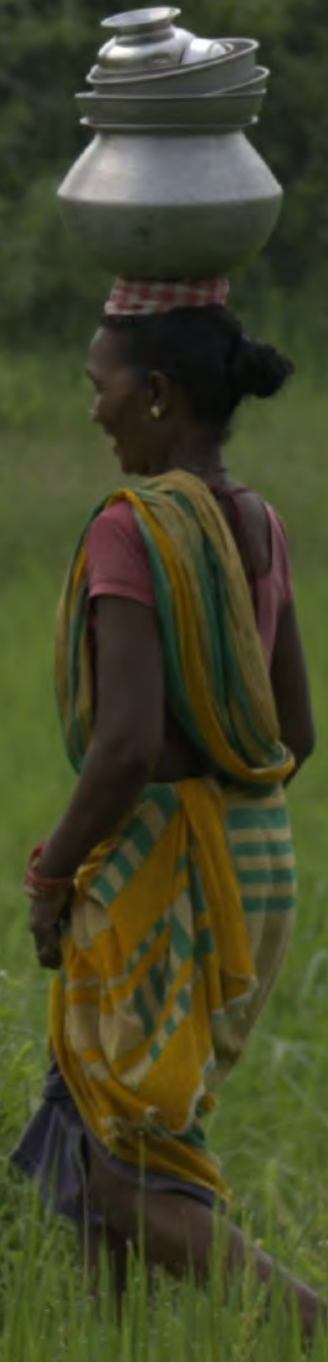
In discussion with the community, similar disruptions have occurred in villages like Pabangaon[31], where resettlement efforts from valleys to plains have provided infrastructure through a government scheme, however, disrupted indigenous practices and systems. While families have been provided with basic amenities, they still feel detached from their natural surroundings[32], impacting their relationship with indigenous seed conservation practices.

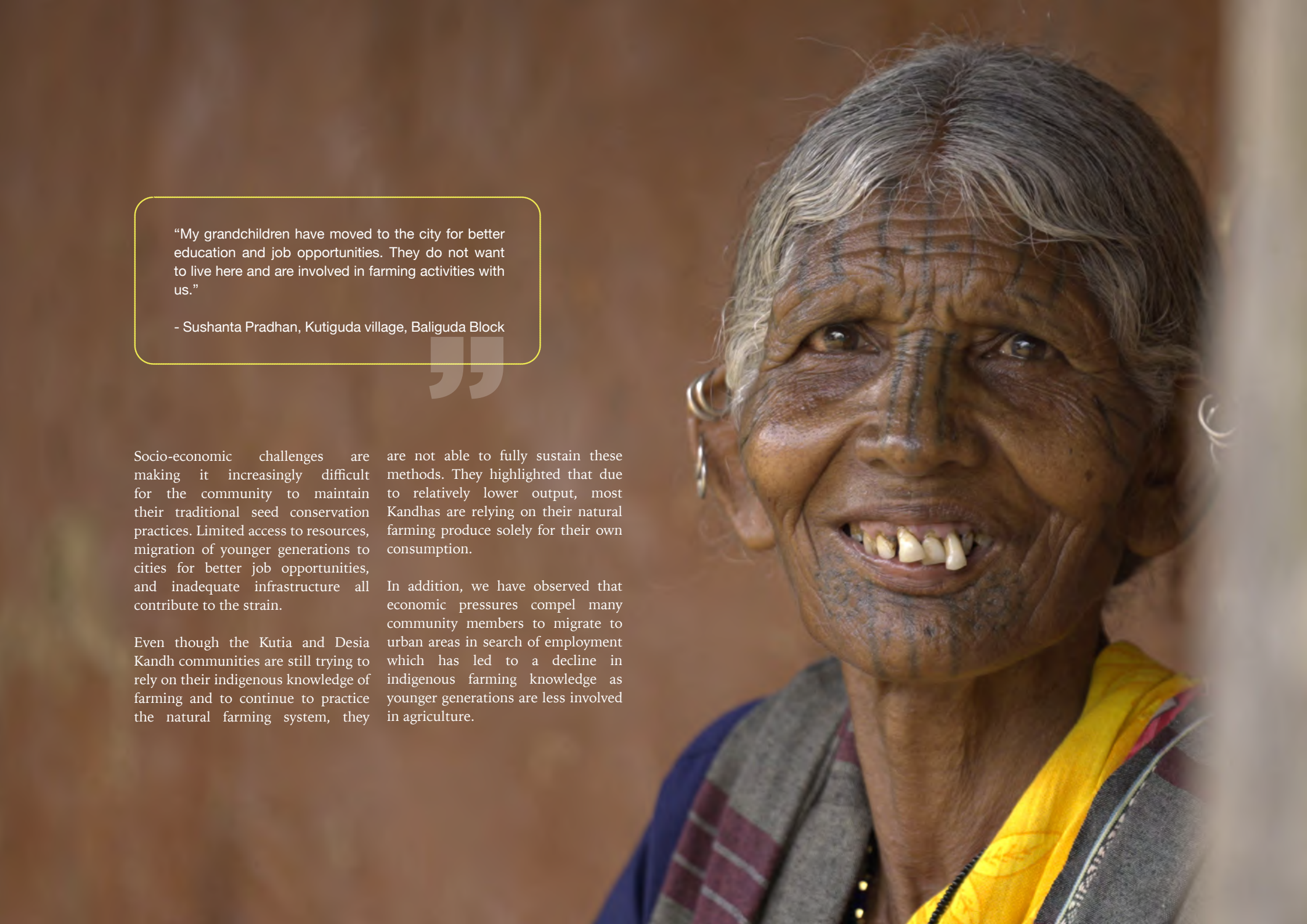
Despite the potential for cultivating traditional varieties, the youth is gradually getting disengaged from agriculture due to migration and lifestyle changes. This trend is exemplified by the extinction of a local foxtail millet variety, Arca, over the past 30-40 years. Interestingly, the reduced agricultural activities have lessened the workload on women, allowing them to shift focus from both domestic and fieldwork.

The Kandh are critical for furthering the interconnectedness of Indigenous Knowledge and Climate Change.

> "These seeds are not just our past; they are our future. Even when the rains don't come as they used to, these seeds grow."
>
> - Balakrishna Jani, Burlubar village, Tumudibandha block.

Both the Desia and Kutia Kandhss have long depended on their traditional seed conservation techniques and diverse cropping practices to sustain agriculture and protect biodiversity. However, these time-honored methods are now under stress Climate change has brought unpredictable rainfall, rising temperatures, and more frequent extreme weather in its wake, events which are all threatening the survival of indigenous crops and seeds[33]. In discussion with the community in Burlubar village[34], the Kutia Kandh is worried about the survival of native crops and seed preservation even if these seeds are now adjusting to changing conditions. Precisely, they are concerned about the viability of indigenous crops and seed preservation. The uncertainty surrounding the viability of indigenous seeds has left the community anxious about the future of their agricultural heritage.



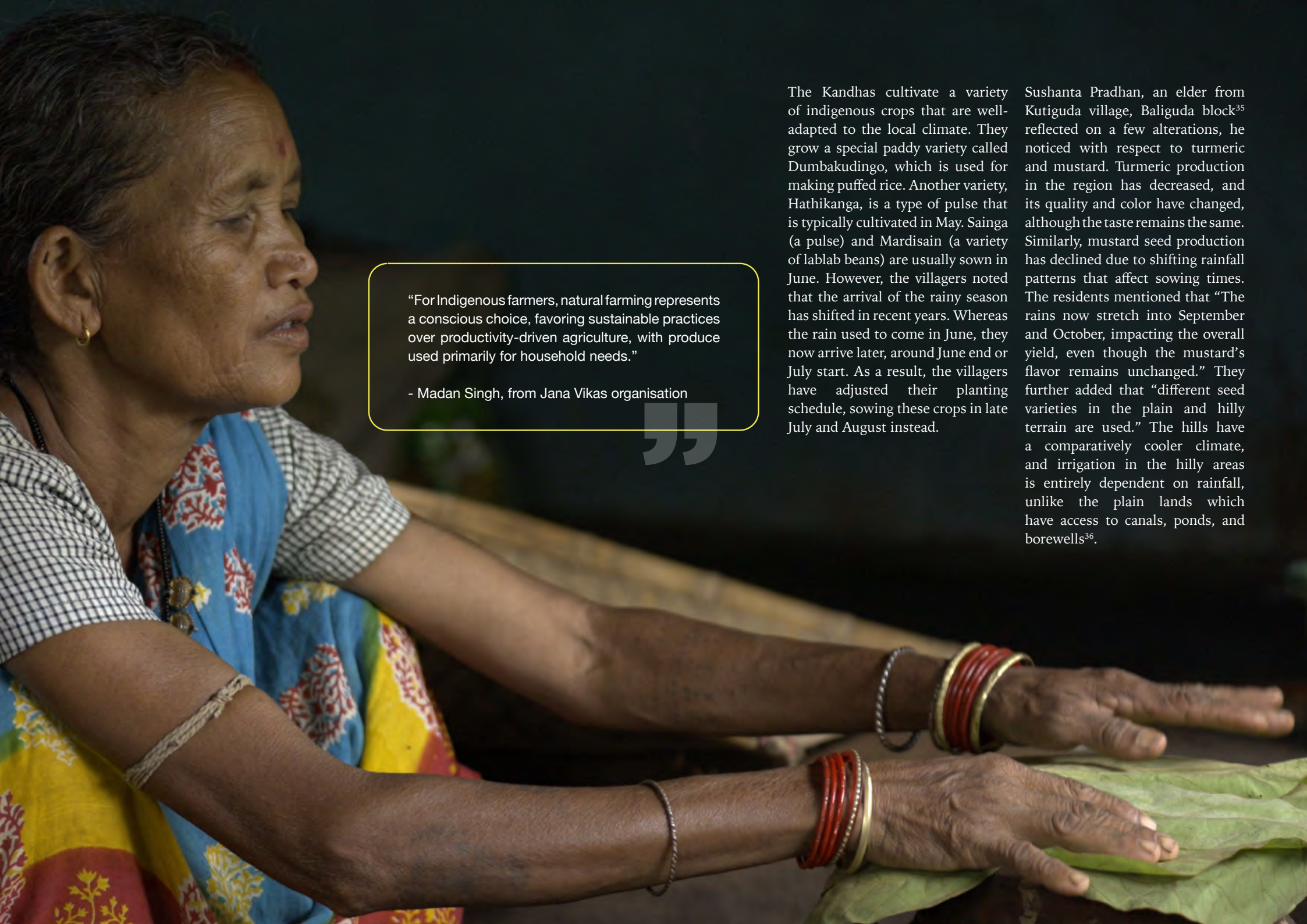


> “My grandchildren have moved to the city for better education and job opportunities. They do not want to live here and are involved in farming activities with us.”
>
> - Sushanta Pradhan, Kutiguda village, Baliguda Block

Socio-economic challenges are making it increasingly difficult for the community to maintain their traditional seed conservation practices. Limited access to resources, migration of younger generations to cities for better job opportunities, and inadequate infrastructure all contribute to the strain.

Even though the Kutia and Desia Kandh communities are still trying to rely on their indigenous knowledge of farming and to continue to practice the natural farming system, they are not able to fully sustain these methods. They highlighted that due to relatively lower output, most Kandhas are relying on their natural farming produce solely for their own consumption.

In addition, we have observed that economic pressures compel many community members to migrate to urban areas in search of employment which has led to a decline in indigenous farming knowledge as younger generations are less involved in agriculture.



> "For Indigenous farmers, natural farming represents a conscious choice, favoring sustainable practices over productivity-driven agriculture, with produce used primarily for household needs."
>
> - Madan Singh, from Jana Vikas organisation

The Kandhas cultivate a variety of indigenous crops that are well-adapted to the local climate. They grow a special paddy variety called Dumbakudingo, which is used for making puffed rice. Another variety, Hathikanga, is a type of pulse that is typically cultivated in May. Sainga (a pulse) and Mardisain (a variety of lablab beans) are usually sown in June. However, the villagers noted that the arrival of the rainy season has shifted in recent years. Whereas the rain used to come in June, they now arrive later, around June end or July start. As a result, the villagers have adjusted their planting schedule, sowing these crops in late July and August instead.

Sushanta Pradhan, an elder from Kutiguda village, Baliguda block[35] reflected on a few alterations, he noticed with respect to turmeric and mustard. Turmeric production in the region has decreased, and its quality and color have changed, although the taste remains the same. Similarly, mustard seed production has declined due to shifting rainfall patterns that affect sowing times. The residents mentioned that "The rains now stretch into September and October, impacting the overall yield, even though the mustard's flavor remains unchanged." They further added that "different seed varieties in the plain and hilly terrain are used." The hills have a comparatively cooler climate, and irrigation in the hilly areas is entirely dependent on rainfall, unlike the plain lands which have access to canals, ponds, and borewells[36].

Additionally, villagers also mentioned one noteworthy adaptation technique used by the Kandha community in Baliguda block called the stone bounding technique for conserving soil and water from erosion. By using locally available materials to slow down water runoff and promote rainwater percolation, the community reduces soil erosion, flooding, and water scarcity.

In Sutagathi village, Kothagrh block, the villagers have various indigenous crop varieties they cultivate that are more resilient to unseasonal rains. It ensures a steady food supply even as the climate changes. Local varieties of pulses, such as Kalika (Pigeon Pea), Kaoodka (Black Gram), and Jhudung (Green gram), as well as millets like Mande (Panicum sumatrense), Kuari (Proso Millet), and Sakra (Foxtail Millet) are sustainable if there is less or heavy rain. The villagers interpreted that these indigenous crop varieties had the resilience to survive, at least partially, if not entirely, even during heavy rains. Overall, the local communities in this region have developed a range of adaptive strategies to maintain their agricultural livelihoods in the face of a changing climate.

Observations

The Kandh showcases exceptional expertise in conserving agricultural biodiversity through traditional seed conservation methods. For instance, they store seeds like maize, pulses, and millets in earthen containers lined with neem leaves or dung-covered bamboo baskets, ensuring protection from pests and moisture. Balakrishna Jani, Burlubar village, Tumudibandha block reflected that —

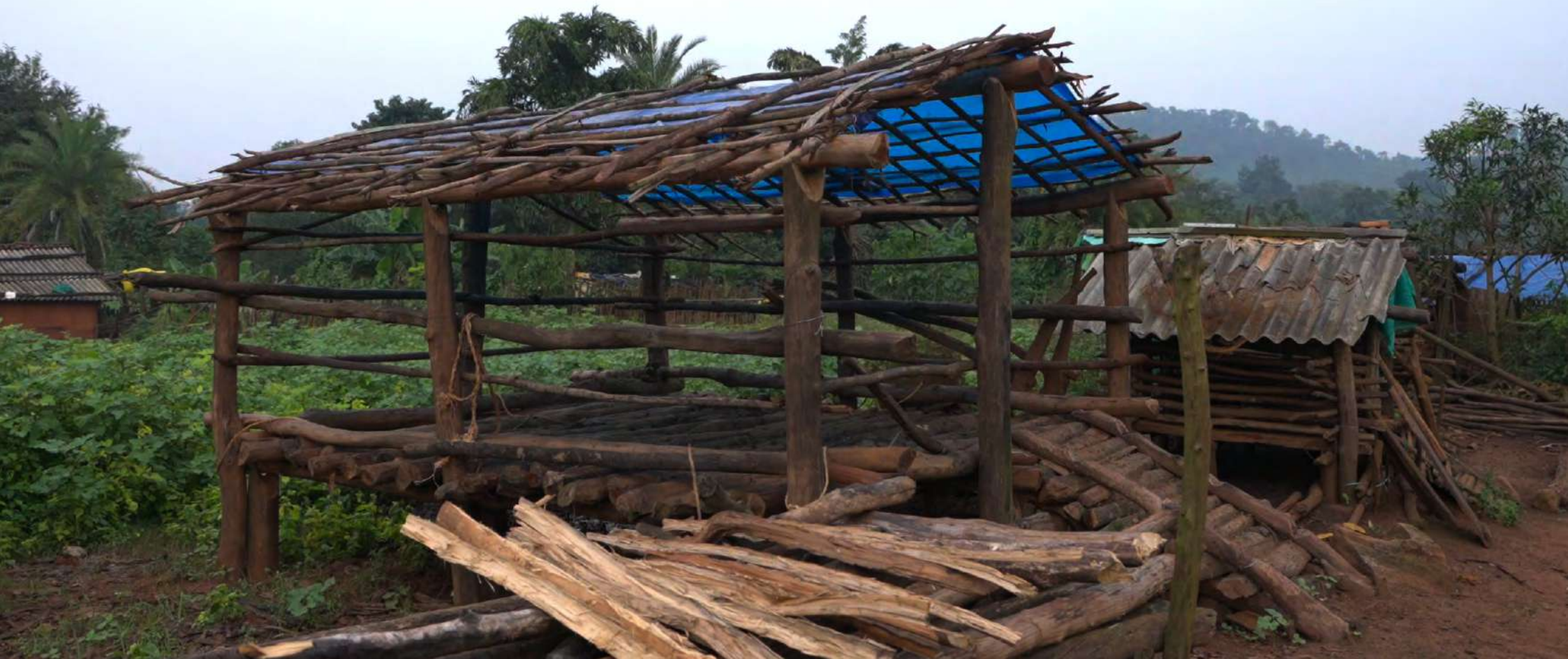
"This knowledge has been passed down from our ancestors. It is our way of protecting our future harvest."

Moreover, their innovative use of local materials, such as hanging maize and onions above the ground or storing seeds in dried pumpkin shells, highlight resourcefulness adapted to the changing climate. Villagers in Sutaghati shared how their indigenous seed varieties, like Kalika (Pigeon Pea) and Kuari (Proso Millet), remain resilient against unseasonal rains. A farmer remarked, "Our seeds do not get destroyed by unexpected rains. They give us steady food, even in bad years."

To preserve these invaluable practices, support and intervention are essential. Initiatives that provide infrastructure, financial incentives, and knowledge-sharing platforms can help the Kandha communities sustain their traditional agricultural practices. The government has made efforts, such as resettling communities like the Kutia Kandh in Pabangaon under schemes like Pradhan Mantri Awas Yojana - Gramin (PMAY-G), providing access to water, schools, and markets. However, inadequate infrastructure, such as poorly constructed schools and under-equipped hospitals, remains a challenge.

Both the Kutia and Desia Kandhas have long upheld traditional practices that reflect a deep connection to sustainable living and climate resilience. These practices, including seed conservation, mixed cropping, and traditional water management systems, have been carefully developed over centuries to harmonize with local ecosystems. However, modern agricultural practices and the growing impacts of climate change—like erratic rainfall and rising temperatures—now threaten these time-honored methods.

To protect and promote these practices, support is crucial for two key reasons. First, tribal communities often lack the resources and institutional support needed to preserve their traditional systems amidst external pressures. Second, there is an urgent need to raise awareness about the importance of traditional knowledge in addressing the climate challenges we face today.
Sushanta Pradhan, an elderly man, from Kutiguda village, Baliguda block says, “Our practices have withstood the test of time. But now, we need help to ensure they survive in this changing world.”



Footnotes

1
The Indian government does not officially recognize the concept of “indigenous peoples”. The country voted in favour of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) on the condition that post-independence all Indians are Indigenous. (Source: https://www.iwgia.org/en/india.html#:~:text=India%20voted%20in%20favour%20of,independence%20all%20Indians%20are%20Indigenous.). The word ‘indigenous’ has been broadly used in India, the term ‘Adivasi,’ which refers to the original inhabitants of the land, also known as tribal communities, is the closest and equivalent to ‘indigenous.’ The idea of Adivasis being ‘indigenous’ is more of a political movement that began in the 1920s-1930s to resist British rule and exploitation. This movement continues today as Adivasis assert their rights and challenge government policies that affect their lands and communities. (Kohli, 2013).

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