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& Innovation**

*The Research Organ of
South Asian Forum for Environment*
ISO 14001:2015 Certified Organization



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Seeds of Resilience

The Untold Story of the
Indigenous Paddy of the
Indian Sundarban

A Coffee Table Book

by
Progyan Foundation for Research and Innovation



Foreword

Amidst growing environmental challenges, indigenous paddy varieties stand as symbols of nature's wisdom and traditional farming ingenuity. In the Indian Sundarban, these resilient cultivars thrive, safeguarded by marginal agrarian communities—especially women, the stewards of sustainability.

At Progyan Foundation for Research and Innovation (PFRI), we champion the conservation of these time-honored seeds, linking biodiversity, community resilience, and gender-inclusive conservation. This coffee table book celebrates their enduring legacy, fostering ecological harmony and food security for future generations.

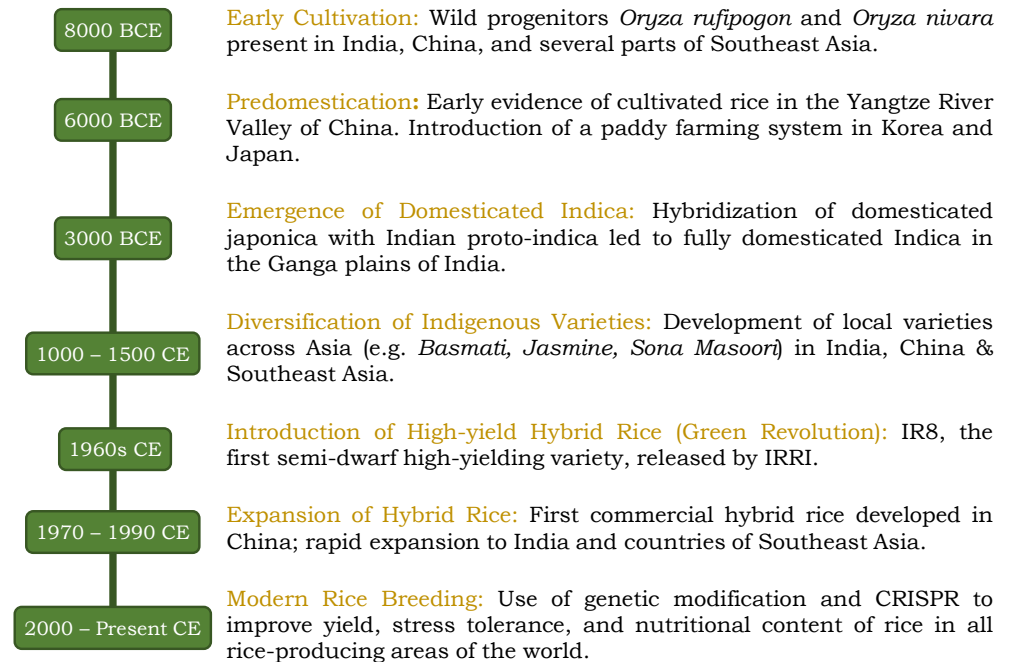
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Parts of a rice panicle and tiller



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Genesis of Modern Rice





Overview of the landscape of the Indian Sundarban

The landscape of the Indian Sundarban, a vital segment of the largest mangrove ecosystem in the world, is a dynamic and ecologically rich expanse in the coastal regions of West Bengal. Spread across an intricate network of tidal waterways, mudflats, and saline soils, this unique landscape is shaped by the confluence of the Ganges, Brahmaputra, and Meghna rivers. A UNESCO World Heritage Site, it is home to iconic species such as the Royal Bengal Tiger, estuarine crocodiles, and a diverse array of aquatic and avian life. Beyond its ecological significance, the Indian Sundarban plays a crucial role in supporting the livelihoods of millions of people, particularly marginalized agrarian communities. The fragile environment of the region demands adaptive and sustainable practices, such as the cultivation of indigenous paddy varieties. These crops, inherently resilient to the saline and flood-prone conditions of the Sundarban, reflect the deep-rooted harmony between the land and its people. Preserving this landscape is not only essential for safeguarding biodiversity but also the cultural and economic well-being of its communities.

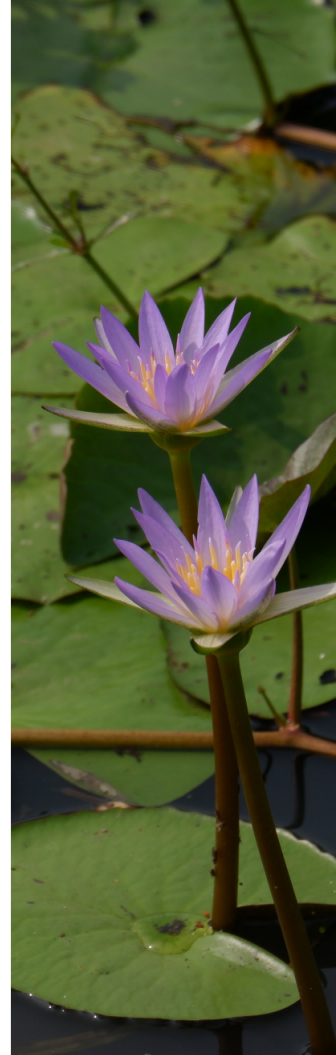
Importance of preserving indigenous rice varieties

In the face of escalating climate change and biodiversity loss, conserving indigenous paddy in the Indian Sundarban is of paramount importance. These paddy varieties, cultivated traditionally for generations, are uniquely adapted to the local physiographic conditions, including saline soils, fluctuating water levels, and frequent tidal inundations. Their resilience makes them invaluable for ensuring food security in an area highly vulnerable to rising sea levels and erratic weather patterns. Indigenous paddy also plays a critical role in



biodiversity conservation. Unlike monoculture practices, which deplete soil health and reduce ecological diversity, traditional farming systems support a wide array of flora and fauna. These paddy fields act as microhabitats, nurturing aquatic species, birds, and insects, thereby contributing to the overall ecological balance of the Indian Sundarban.

Furthermore, the preservation and cultivation of such varieties uphold traditional knowledge and cultural heritage, fostering community resilience. Empowering local farmers, particularly women, to continue these practices not only sustains their livelihoods but also reinforces the region's capacity to adapt to climate change. As the Sundarban stands as a frontline defence against climate-induced disasters, preserving its indigenous paddy is a critical step toward sustainable agriculture and ecological restoration.





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Challenges posed by climate change in the region

The Indian Sundarban faces mounting challenges from the impacts of climate change. Rising sea levels, increasing salinity, and intensifying cyclones threaten the local biodiversity and the livelihoods of millions who depend on its natural resources. Coastal erosion and submergence of islands have displaced communities, while saline intrusion into agricultural lands has rendered vast areas unsuitable for traditional farming. Erratic rainfall patterns and higher temperatures exacerbate the vulnerability of both terrestrial and aquatic ecosystems, disrupting delicate ecological balances. These changes not only jeopardize the habitat of iconic species like the Royal Bengal Tiger but also augment socio-economic inequalities, as marginalized agrarian communities bear the brunt of these transformations. Addressing these challenges requires an integrated approach that combines climate adaptation, biodiversity conservation, and community resilience strategies.

Significance of Indigenous Rice Varieties

Cultural, ecological, and nutritional value

Indigenous paddy varieties are a treasure trove of cultural heritage, ecological balance, and nutritional richness. Rooted in centuries of traditional agricultural practices, these varieties are deeply intertwined with the cultural identity of agrarian communities, reflecting their knowledge, rituals, and harmonious coexistence with nature. Ecologically, these strains are uniquely adapted to diverse and challenging environments, such as the saline soils and flood-prone landscapes of the Indian Sundarbans. By supporting biodiversity and maintaining soil health, they play a pivotal role in sustainable farming practices. Nutritionally, indigenous paddy varieties often surpass hybrid counterparts, offering a rich source of essential nutrients, minerals, and antioxidants. They contribute to food security by providing climate-resilient, high-quality staples that are integral to traditional diets. Preserving these rice varieties ensures the conservation of cultural legacies, ecological sustainability, and healthier food systems for future generations.

Role in biodiversity and sustainable agriculture

Indigenous paddy varieties play a critical role in fostering biodiversity and advancing sustainable agriculture, particularly in the climate-vulnerable Indian Sundarban. Unlike modern hybrid cultivars, these traditional varieties have evolved over centuries to thrive in diverse and often challenging environmental conditions, including saline soils, waterlogged terrains, and erratic weather patterns. This adaptability contributes to on-farm genetic diversity, which enhances ecosystem resilience and provides a natural buffer against pests, diseases, and climatic stressors. In terms of sustainable agriculture, indigenous paddy varieties support ecological balance by reducing the need for chemical inputs such as synthetic fertilizers and pesticides.



Their compatibility with organic farming practices promotes soil health and preserves beneficial microorganisms, while their cultivation supports a range of associated flora and fauna, from pollinators to aquatic species. By prioritizing the cultivation of these resilient varieties, farmers can achieve long-term productivity, maintain ecosystem services, and ensure food security for marginalized communities. The conservation and utilization of indigenous rice varieties thus represent a synergistic approach to addressing global challenges of biodiversity loss, climate change, and agricultural sustainability.

The Journey

Efforts in identifying, preserving, and promoting these rice varieties

In the post-Amphan and Yaas-affected Sundarbans, 50 indigenous rice landraces, which have been largely wiped out in post-Green Revolution India, have been subjected to plot tests in widely dispersed plots, each 10sq. metre in area, maintaining a spacing of 16 hills per m².

Indigenous crops are more resilient to the effects of climate change, as they can withstand environmental stressors like saline conditions, etc. far better than hybrid ones. The Progyan Foundation for Research and Innovation is committed to the preservation, promotion, and sustainable cultivation of indigenous paddy varieties in the Indian Sundarban.





These efforts emphasize the value of traditional agricultural practices and their scientific refinement to address modern challenges. Partnering with local farmers, including women environmental stewards, the organization has been deeply involved in seed collection, conservation, and organic farming techniques. Through meticulous processes such as seed selection, pre-germination, transplantation, and the application of organic inputs like vermicompost and neem oil, it has cultivated multiple landraces of paddy in experimental plots designed to maintain genetic purity. These practices enhance biodiversity and sustain agricultural productivity while promoting eco-friendly methods.

PFRI's focus extends to in-situ conservation, maintaining critical *Oryza* species and wild relatives of paddy to ensure genetic diversity and ecosystem resilience. Its work illustrates the intricate relationship between traditional knowledge, modern science, and community-based conservation, ensuring these invaluable cultivars endure as a legacy of cultural heritage and as a critical resource for food security and climate adaptation.



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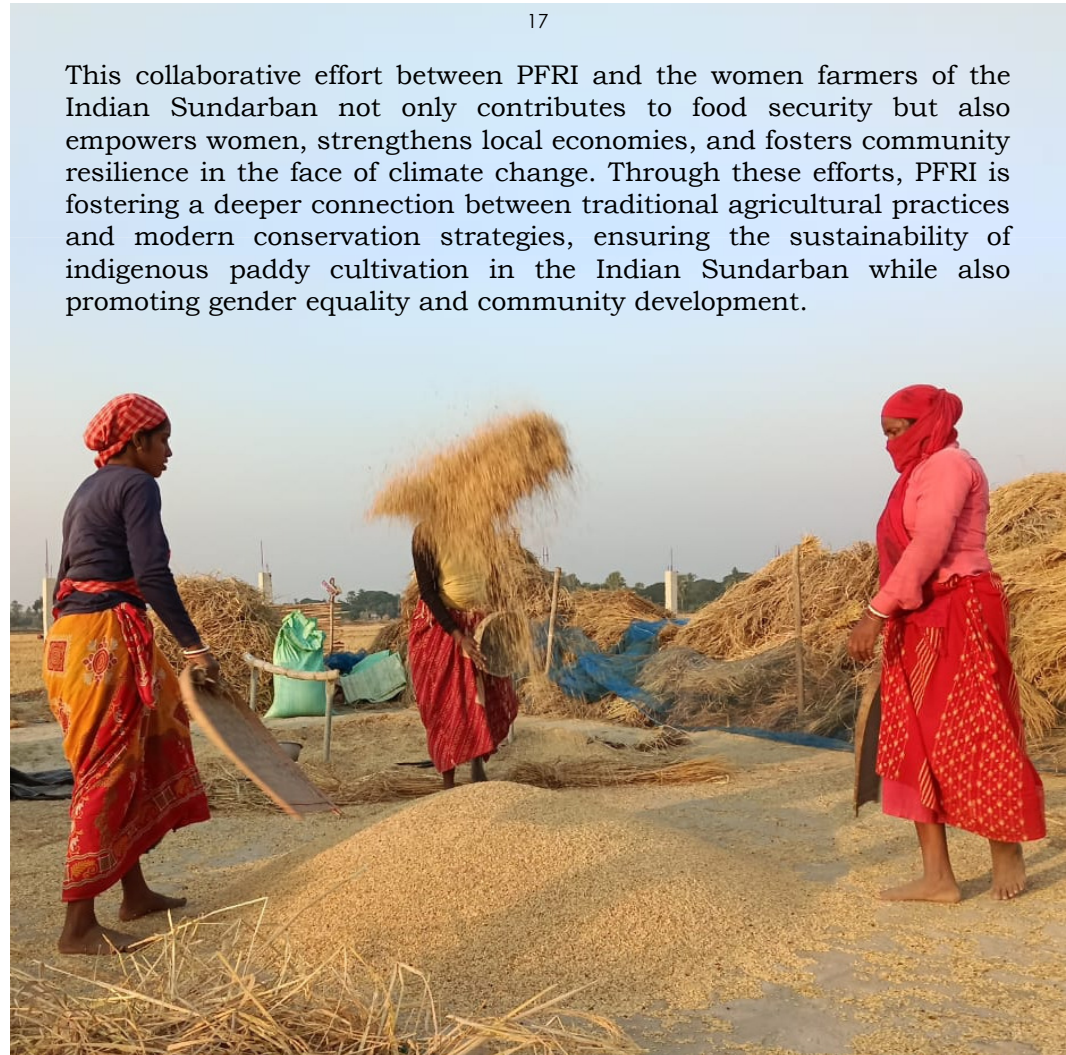
Community involvement and success stories

PFRI has been actively engaging with local communities in the Indian Sundarban to preserve and cultivate indigenous paddy varieties. Its approach emphasizes the importance of community involvement, particularly that of women, who play a pivotal role in the traditional agricultural practices of the region. Women in the Sundarban have long been the stewards of indigenous rice cultivation, and their involvement in every aspect of

rice farming—from sowing to harvesting—is integral to the success of the initiative. PFRI has worked closely with these women to facilitate the collection, conservation, and sustainable cultivation of indigenous paddy varieties. They have been actively involved in the processing of rice including cleaning, threshing, and drying the grains in traditional methods passed down through generations. This process not only preserves the cultural heritage of paddy farming but also ensures the genetic purity of these varieties, which are vital for maintaining biodiversity. Sowing is another critical aspect where women play a central role. PFRI supports these women by providing training and access to organic farming techniques, ensuring that farming is conducted sustainably and with minimal environmental impact.

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This collaborative effort between PFRI and the women farmers of the Indian Sundarban not only contributes to food security but also empowers women, strengthens local economies, and fosters community resilience in the face of climate change. Through these efforts, PFRI is fostering a deeper connection between traditional agricultural practices and modern conservation strategies, ensuring the sustainability of indigenous paddy cultivation in the Indian Sundarban while also promoting gender equality and community development.



Catalogue of Rice Varieties



Adanshilpa

Unique Characteristics

- Distinct aroma enhancing its appeal, subtle, nutty taste favored by rice connoisseurs
- Remarkable resilience to drought and salinity, high yield potential and adaptability to various climates

Origin

- West Bengal and Assam, India

Historical or Cultural Anecdotes

- Revered in the agrarian traditions of its region, associated with harvest festivals and culinary rituals

Best-Suited Conditions for Cultivation

- Thrives in loamy, well-drained soils, prefers moderate rainfall conditions



Aghanikalam

Unique Characteristics

- Mild, floral aroma, delicate, buttery taste complementing traditional cuisines
- Renowned for resilience in challenging conditions (e.g., flooding or erratic rainfall), dependable yield, making it a trusted choice for smallholder farmers.

Origin

- Originated from Bihar and Uttar Pradesh, India, grown as a winter rice.

Historical or Cultural Anecdotes

- Intertwined with cultural traditions, often featured in community feasts and rituals celebrating abundance.

Best-Suited Conditions for Cultivation

- Thrives in fertile alluvial soils, requires consistent water availability, ideal for regions with moderate-high humidity.





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Agnishikha

Unique Characteristics

- Warm, earthy aroma, rich, nutty taste enhancing traditional recipes.
- Exceptional resilience to high temperatures and drought-prone conditions, commendable yields.

Origin

- Originated from Madhya Pradesh, India.

Historical or Cultural Anecdotes

- Staple in ceremonial offerings, symbolizing strength and prosperity.

Best-Suited Conditions for Cultivation

- Thrives in sandy-loam soils with good drainage, flourishes under moderate irrigation conditions.

Altapati

Unique Characteristics

- Subtle, sweet aroma, light, fluffy texture, ideal for various dishes.
- Highly resilient to waterlogging and thrives in flood-prone areas, consistent yield, even under challenging environmental conditions.

Origin

- Originated from North 24 Parganas, West Bengal, India.



Historical or Cultural Anecdotes

- A cornerstone of local diets, mentioned in folklore as the 'grain of endurance' symbolizing hope during tough times.

Best-Suited Conditions for Cultivation

- Thrives in clayey, water-retentive soils, requires high humidity for optimal growth.

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Asfal

Unique Characteristics

- Exquisite aroma and rich taste, exceptional resilience to both drought and flood conditions, consistent yields with natural pest and disease resistance.

Origin

- Originated from Murshidabad district, West Bengal, India.

Historical or Cultural Anecdotes

- Cherished in royal feasts and community rituals, symbolizes prosperity and cultural heritage.

Best-Suited Conditions for Cultivation

- Thrives in well-drained loamy soils, requires moderate rainfall for optimal growth.



Babui

Unique Characteristics

- Delicate aroma with a subtle sweetness, highly adaptable, thriving in challenging conditions, natural resistance to pests and environmental stress.

Origin

- Originated from Malda district, West Bengal, India.

Historical or Cultural Anecdotes

- A staple in traditional feasts and rituals, regarded as a symbol of abundance in rural communities.

Best-Suited Conditions for Cultivation

- Grows well in clay-rich soils, requires moderate rainfall for optimal production.





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Baduma

Unique Characteristics

- Earthy aroma with a rich, nutty flavor, highly resilient to diverse climatic conditions, natural resistance to pests, reducing dependency on chemicals.
- Dependable yields, making it a sustainable choice for farmers.

Origin

- Originated from Mayurbhanj district, Odisha, India.

Historical or Cultural Anecdotes

- Integral to traditional cuisines and ceremonies, symbolizes fertility and abundance in agrarian communities.

Best-Suited Conditions for Cultivation

- Thrives in water-retentive clayey soils, requires moderate to high rainfall for optimal growth.

Balam

Unique Characteristics

- Enchanting aroma with a rich, buttery flavor, highly resilient, thriving in diverse agro-climatic conditions, resistant to pests and diseases.

Origin

- Originated from South 24 Parganas, West Bengal, and Cachar district, Assam, India.



Historical or Cultural Anecdotes

- A staple in festive meals and rituals for generations.

Best-Suited Conditions for Cultivation

- Grows best in fertile alluvial soils, requires moderate rainfall for optimal production.

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Baskathi

Unique Characteristics

- Delicate aroma with an exceptional taste.
- Robust resilience, thriving in varied conditions, natural resistance to pests and diseases.

Origin

- Originated from Paschim Medinipur district, West Bengal, India.

Historical or Cultural Anecdotes

- Integral to festive feasts and traditional ceremonies, symbolizes prosperity and community bonding, deeply rooted in agrarian heritage and cultural rituals.

Best-Suited Conditions for Cultivation

- Thrives in fertile loamy soils, requires moderate rainfall for optimal growth, adaptable to balanced agro-climatic environments.



Baspata

Unique Characteristics

- Exquisite fragrance with a subtle yet rich flavor, highly resilient, thriving in diverse climatic conditions.
- Strong resistance to pests and diseases.

Origin

- Originated from Cooch Behar district, West Bengal, India.

Historical or Cultural Anecdotes

- A prized grain in traditional feasts and religious ceremonies.

Best-Suited Conditions for Cultivation

- Flourishes in fertile, well-drained soils, requires moderate to high rainfall, ideal for tropical and subtropical climates.





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Birohi

Unique Characteristics

- Mild aroma with a rich, earthy flavor, soft texture.
- Highly resilient, tolerates drought and low soil fertility.

Origin

- Originated from Nadia district, West Bengal, India.

Historical or Cultural Anecdotes

- A staple in rural households and traditional cuisine, featured in festivals and community gatherings.

Best-Suited Conditions for Cultivation

- Thrives in sandy-loam soils with adequate drainage, grows well in regions with low to moderate rainfall, adaptable to marginal farming areas.

Black

Unique Characteristics

- Striking dark color, rich in anthocyanins and antioxidants, rich aroma and distinct nutty flavor, highly nutritious, packed with essential minerals and fibers.
- Resilient, thrives in diverse environmental conditions, naturally resistant to pests and diseases.

Origin

- Originated from Purulia district, West Bengal, India.

Historical or Cultural Anecdotes

- Considered a symbol of health and well-being, used in medicinal recipes and traditional healing practices.

Best-Suited Conditions for Cultivation

- Thrives in moist, fertile soils with an abundant water supply, ideal for tropical climates with moderate rainfall.



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Burma Black

Unique Characteristics

- Deep black grains with a distinct earthy aroma, sweet, rich flavor that enhances traditional dishes.
- Resilient to harsh conditions, ensuring consistent yields, natural resistance to pests and diseases.

Origin

- Originated from Purulia district, West Bengal, India.

Historical or Cultural Anecdotes

- Highly valued in regional cuisine and rituals, a staple in the diets of indigenous communities, featured in special dishes during harvest festivals.

Best-Suited Conditions for Cultivation

- Thrives in fertile, well-irrigated soils, ideal for tropical and subtropical climates with moderate rainfall, adaptable to varying environmental conditions.



Barshalakshmi

Unique Characteristics

- Mild, non-aromatic flavour with a tender, slightly sticky texture when cooked.
- Moderate yield, resilient to varying climatic conditions.

Origin

- Burdwan district (Purba Bardhaman) in West Bengal, India.

Historical or Cultural Anecdotes

- A revered variety in local festivals, traditional feasts and community gatherings, symbolizing prosperity and good harvests.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, clayey soils, and suitable for areas with unpredictable water availability.





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Dadshal

Unique Characteristics

- Renowned for its aromatic fragrance, delicate taste.
- Resilience to varying climatic conditions, highly resistant to pests and diseases.

Origin

- Originated from North 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- A staple in the meals of rural communities, cherished as a symbol of agricultural heritage and community sustenance.

Best-Suited Conditions for Cultivation

- Thrives in fertile, well-drained soils, ideal for regions with moderate rainfall, flourishes in tropical and subtropical climates.

Dopana

Unique Characteristics

- Exceptional aroma, soft, sweet flavor, making it a favorite in traditional dishes.
- Known for its resilience, thriving in diverse conditions, natural resistance to pests and diseases.

Origin

- Originating from Mayurbhanj district, Odisha, India.



Historical or Cultural Anecdotes

- Cherished by local communities for generations, often served during festivals and important gatherings.

Best-Suited Conditions for Cultivation

- Thrives in well-drained, fertile soils, requires consistent water supply, ideal for regions with moderate rainfall, best suited for tropical climates.



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Dudheswar

Unique Characteristics

- Subtle, non-aromatic flavor, rich, creamy texture, soft, slightly sweet taste.
- Moderate yield, but a dependable crop.

Origin

- Originates from the North and South 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- Culturally significant in local communities, often featured in community feasts and local rituals.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, lowland soils, suitable for both flood-prone and drought-affected areas.



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Gheus

Unique Characteristics

- Robust aroma, full-bodied flavor and excellent texture.
- Known for its resilience, thriving in diverse agro-climatic conditions, natural resistance to pests.

Origin

- Originating from North and South 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- A staple in the diets of indigenous communities for centuries.

Best-Suited Conditions for Cultivation

- Performs best in well-drained, fertile soils, thrives in regions with moderate rainfall and mild temperatures, adaptable to both high-altitude and lowland areas.



Gilgit

Unique Characteristics

- Fragrant aroma and delicate, yet rich flavor.
- Known for its resilience, thriving in tough environmental conditions, naturally resistant to pests and diseases.

Origin

- Originating in Murshidabad district, West Bengal, India.

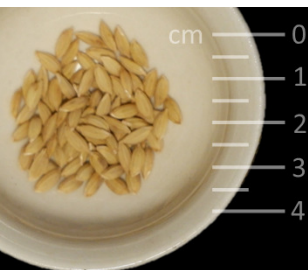
Historical or Cultural Anecdotes

- Cultivated for centuries, often considered a symbol of the region's agrarian heritage

Best-Suited Conditions for Cultivation

- Thrives in fertile, well-drained soils, suited for regions with moderate to high rainfall, adaptable to higher altitudes and cooler climates.





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Gobindobhog

Unique Characteristics

- Unique aroma, delicate flavor, and sticky texture.
- This short-grain variety is resilient, thriving in diverse environments and yielding high-quality crops consistently.

Origin

- Originating from Bardhaman, Hooghly, Nadia, Bankura, Birbhum, North 24 Parganas, Murshidabad, Howrah, West Bengal.

Historical or Cultural Anecdotes

- A staple in the region's culinary culture for centuries, a favorite for traditional bengali dishes like khichuri and payesh.

Best-Suited Conditions for Cultivation

- Thrives in rich, well-drained soils, best suited for regions with moderate rainfall and a tropical monsoon climate, adaptable to both irrigated and rain-fed fields.

Harinakhuri

Unique Characteristics

- Known for its light, fragrant aroma and delicate, sweet taste.
- Resilient to varying climatic conditions, providing steady yields, naturally resistant to pests and diseases.

Origin

- South-North 24 Parganas, Purba Medinipur of West Bengal.

Historical or Cultural Anecdotes

- A prized variety in regional cuisine, celebrated during harvest festivals and traditional feasts.

Best-Suited Conditions for Cultivation

- Thrives in fertile, well-drained soils, best suited for moderate rainfall and tropical climates, adaptable to both irrigated and rain-fed fields.



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Harmalona

Unique Characteristics

- Known for its robust aroma and distinctive taste, flavor profile includes rich, earthy notes and a smooth texture.
- Resilient variety, thriving in diverse environmental conditions, offers high yield potential with minimal irrigation.

Origin

- Originated from Burdwan district (Purba Bardhaman), West Bengal, India.

Historical or Cultural Anecdotes

- Cherished for traditional culinary practices and medicinal remedies.

Best-Suited Conditions for Cultivation

- Thrives in well-drained soils, best suited for moderate climates with minimal irrigation.



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Unique Characteristics

- Enchanting aroma and rich, nutty taste.
- Resilient to climate stress, including drought and moderate salinity, ensures stable yields even under challenging conditions.

Origin

- Traces its roots to the fertile plains of India.

Historical or Cultural Anecdotes

- Referred to as the 'celebration grain'.

Best-Suited Conditions for Cultivation

- Thrives in well-drained loamy soils with good water retention, best suited for regions with moderate rainfall and temperate to warm climates.





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Janaka

Unique Characteristics

- Slender grains that are flavorful and nutritious.
- Remarkable resilience and adaptability, thrives in waterlogged and saline conditions

Origin

- Originates from the fertile plains of Bihar, India.

Historical or Cultural Anecdotes

- Revered in local folklore and often associated with sustenance during climatic adversity, embodies the spirit of survival and abundance.

Best-Suited Conditions for Cultivation

- Ideal for low-lying, flood-prone areas, thrives in waterlogged and saline environments.

Jugal

Unique Characteristics

- Enchanting aroma and delectable taste, prized for fine, fragrant grains.
- Resilience against drought and pests, moderate yield with consistent performance.

Origin

- Originates from the Bankura district in West Bengal, India.

Historical or Cultural Anecdotes

- Linked to rituals and festivities, symbolizing abundance and cultural pride.

Best-Suited Conditions for Cultivation

- Ideal for upland and rainfed conditions, thrives in well-drained soils, sustainable choice for climate-resilient farming.



Kalaboti

Unique Characteristics

- Long, slender grains with a distinct aroma and exceptional taste.
- Resilience to salinity and waterlogging.

Origin

- Originates from Mayurbhanj district, Odisha, India.

Historical or Cultural Anecdotes

- Often mentioned in local folklore as a grain of prosperity, symbolizes the enduring bond between communities and their land.

Best-Suited Conditions for Cultivation

- Thrives in low-lying, coastal plains, ideal for challenging conditions, including salinity and waterlogging, flourishes in tropical and coastal climates.



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Kalabhat

Unique Characteristics

- Captivating dark hue, subtle aroma and nutty flavor, known for its high antioxidant content and health benefits.
- Resilience to drought and pests, ensuring stable yield.

Origin

- Originates from South 24 Parganas, West Bengal, India

Historical or Cultural Anecdotes

- Known as "forbidden rice," traditionally reserved for royalty, historically cherished for its rarity and exceptional qualities.

Best-Suited Conditions for Cultivation

- Thrives in upland, well-drained soils, ideal for regions with tropical and moderate climates.





Kanakchur

Unique Characteristics

- Unparalleled aroma and exquisite taste, slender, golden grains, visually appealing.
- Known for its moderate drought resilience and ability to thrive in loamy soils under irrigated conditions.

Origin

- Originates from the Sundarban area of North 24 Parganas, India.

Historical or Cultural Anecdotes

- Name 'Kanakchur' translates to 'golden thread,' reflecting the visual beauty and quality of its grains, historically, it was featured in royal and festive celebrations, symbolizing luxury and tradition, an essential part of culinary heritage of Bengal.

Best-Suited Conditions for Cultivation

- Thrives in loamy soils under irrigated conditions, best suited for moderate drought areas, performs well in regions with stable water supply and temperate climates.



Khandagiri

Unique Characteristics

- Pleasant aroma and subtle taste
- Robust resilience and adaptability to diverse agro-climatic zones, sturdy nature, able to withstand drought and moderate salinity.

Origin

- Originates from the Khordha district in Odisha, India.

Historical or Cultural Anecdotes

- Known for being a cornerstone of food security for generations, valued for its role in sustaining local communities.

Best-Suited Conditions for Cultivation

- Thrives in rainfed and upland conditions, best suited for areas with moderate salinity and drought-prone regions, performs well in regions with unstable climatic conditions.



Khara

Unique Characteristics

- Offers a wholesome taste, known for adaptability and resilience, especially in saline and waterlogged coastal areas

Origin

- Originates from Madhya Pradesh, India.

Historical or Cultural Anecdotes

- A staple crop for communities living in flood-prone and saline environments, plays an integral role in food security in challenging regions.

Best-Suited Conditions for Cultivation

- Thrives in low-lying, saline soils, ideal for coastal ecosystems and flood-prone regions, grows well in waterlogged conditions.





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Khejurchori

Unique Characteristics

- Mild aroma and balanced flavor.
- Known for its resilience, particularly in waterlogged and low-lying areas.

Origin

- Originates from South 24 Parganas, West Bengal.

Historical or Cultural Anecdotes

- Holds cultural significance as a reliable source of sustenance, used in a variety of traditional meals.

Best-Suited Conditions for Cultivation

- Thrives in regions with heavy rainfall and clayey soils, ideal for waterlogged and low-lying areas.

Kutepatnai

Unique Characteristics

- Subtle taste but no certain aroma.
- Sturdy grains that perform reliably in challenging conditions.

Origin

- Originates from South 24 Parganas, West Bengal.

Historical or Cultural Anecdotes

- Celebrated as a staple for everyday meals in rural communities.

Best-Suited Conditions for Cultivation

- Thrives in rainfed uplands and areas with limited irrigation, best suited for marginal soils and regions prone to drought.



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Laljoyari

Unique Characteristics

- Reddish hue and earthy taste, subtle, robust flavor that adds a unique touch to regional dishes.
- Known for its resilience and ability to thrive in challenging conditions.

Origin

- Originates from Birbhum district, West Bengal, India.

Historical or Cultural Anecdotes

- Cultural significance as a symbol of resilience in rural communities, associated with food security.

Best-Suited Conditions for Cultivation

- Thrives in both upland and lowland conditions, resilient to drought and adverse weather, can withstand poor soil and is resistant to pests.

Lilaboti

Unique Characteristics

- Delicate, non-aromatic flavour, soft, fluffy texture, subtly sweet and light taste.
- Resilient in challenging environments, making it a dependable crop

Origin

- Originates from South 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- Appreciated for its reliability and resilience in local communities.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, low-lying areas, adapts well to regions prone to moderate flooding, best suited for clayey soils with ample water supply.





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Machkantha

Unique Characteristics

- Non-aromatic variety with a distinct nutty flavor and satisfying texture.
- Highly resilient to climate change, tolerating erratic rainfall and marginal soils

Origin

- Jharkhand, Odisha, and West Bengal.

Historical or Cultural Anecdotes

- Revered as the 'grain of hope' in local folklore.

Best-Suited Conditions for Cultivation

- Thrives in loamy soils with moderate to high rainfall, suited for regions with challenging climatic conditions.

Machkanya

Unique Characteristics

- Slightly nutty taste, firm, satisfying texture, non-aromatic.
- Moderate yield, adapted well to both waterlogged and drought-prone conditions.

Origin

- Originates from Bargarh district, Odisha, India.

Historical or Cultural Anecdotes

- A staple in rural households, valued for its taste and resilience

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, lowland soils.



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Narasingho

Unique Characteristics

- Subtle, non-aromatic flavour, slightly earthy, nutty taste, mild sweetness.
- Moderate yield, adapts to waterlogged and moderately dry regions.

Origin

- Originates from Burdwan district (Purba Bardhaman), West Bengal, India.

Historical or Cultural Anecdotes

- Often grown during harvest festivals, cherished for its role in sustaining rural communities.

Best-Suited Conditions for Cultivation

- Thrives in lowland, irrigated soils, resilient to occasional flooding.



Narkelmuchi

Unique Characteristics

- Delicate, non-aromatic flavour with a subtle sweet taste and a soft, slightly sticky texture when cooked.
- Moderate yield, highly resilient to environmental conditions.

Origin

- Birbhum district, West Bengal, India.

Historical or Cultural Anecdotes

- A key crop in traditional feasts and harvest celebrations.

Best-Suited Conditions for Cultivation

- Thrives in clayey, irrigated soils, and suited for regions with fluctuating water availability.





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Madhabi

Unique Characteristics

- Delicate aroma and sweet, mild taste.
- Known for its resilience in moderate climatic challenges, resilient to waterlogging and pests.

Origin

- Originates from Murshidabad district, West Bengal, India.

Historical or Cultural Anecdotes

- Linked to harvest festivals and feasts, symbolizing prosperity.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated fields and low-lying, fertile soils, ideal for flood-prone areas, ensuring steady yields in challenging conditions.

Marishal

Unique Characteristics

- Hearty grains and balanced taste, mild flavor.
- Known for its resilience to harsh conditions, such as drought and irregular rainfall

Origin

- Originates from Purulia district, West Bengal, India.

Historical or Cultural Anecdotes

- A staple in rural kitchens, favored for subsistence farming

Best-Suited Conditions for Cultivation

- Thrives in upland, rainfed areas with loamy soil, resilient to drought and irregular rainfall.



Meghnadumur

Unique Characteristics

- Soft, subtle taste, moderate aroma, ideal for everyday meals.
- Resilient to waterlogged conditions, robust against pests.

Origin

- Purulia district, West Bengal and Jharkhand, India.

Historical or Cultural Anecdotes

- The name 'Meghnadumur' translates to 'cloud-like', symbolizing its resilience during monsoon seasons, dependable in unpredictable weather.

Best-Suited Conditions for Cultivation

- Thrives in low-lying, water-rich soils, prefers humid conditions with heavy rainfall during the monsoon season, well-suited for areas with waterlogging and monsoonal weather.



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Mugi

Unique Characteristics

- Mild, nutty taste, not highly aromatic, but nutritionally beneficial and simple.
- Hardy and resilient to challenging environmental conditions, especially drought.

Origin

- Originates from the Mayurbhanj district in Odisha, India.

Historical or Cultural Anecdotes

- Historically seen as a reliable crop that ensures food security during difficult periods.

Best-Suited Conditions for Cultivation

- Thrives in rainfed upland areas with well-drained soils, best suited for dryland conditions with limited irrigation.





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Nageswari

Unique Characteristics

- Aromatic fragrance, with a subtle aroma reminiscent of fresh jasmine, rich, satisfying flavor.
- Resilient and adaptable, thriving in flood-prone and drought-affected regions.

Origin

- Originates from the fertile regions of Nadia district in West Bengal, India.

Historical or Cultural Anecdotes

- Deeply associated with local culture and rituals, symbolizing prosperity and abundance.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, clayey soils, best suited for regions prone to flooding and areas affected by drought proving it as a versatile crop.

Pathua

Unique Characteristics

- Nutty, mild flavor with a smooth texture, subtle taste, not highly aromatic.
- Resilient to environmental challenges, thriving in flood-prone and low-lying areas with moderate yield.

Origin

- Originates from the Purulia district in West Bengal, India.

Historical or Cultural Anecdotes

- Symbolizes the connection between food, culture, and agriculture.

Best-Suited Conditions for Cultivation

- Thrives in wetland and irrigated conditions, adapts well to moderate waterlogging.



43

Patnai

Unique Characteristics

- Mild, non-aromatic flavor with a firm, delicate texture, versatile taste.
- Resilient, thriving in both drought-prone and waterlogged areas, steady but moderate yield.

Origin

- Originates from South 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- Deeply culturally significant, playing a key role in the local diet and food security.

Best-Suited Conditions for Cultivation

- Thrives in lowland, well-irrigated soils, ideal for regions that experience fluctuating weather conditions, including both drought and waterlogging.



Ramchandrabhog

Unique Characteristics

- Distinctive aromatic fragrance and rich, flavorful grains, subtle yet captivating aroma combined with a delicate, nutty taste.
- Resilient, thriving in flood-prone and low-lying areas where other varieties may struggle.

Origin

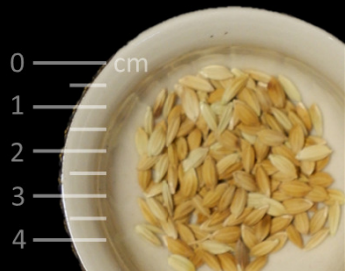
- Originates from Murshidabad district, West Bengal, India.

Historical or Cultural Anecdotes

- Highly valued for its flavor and fragrance, making it a symbol of cultural pride.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, clayey soils, ideal for flood-prone and low-lying areas, demonstrating resilience in challenging conditions.





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Shiuli

Unique Characteristics

- Delightful aroma, reminiscent of fragrant flowers, tender texture and slightly sweet taste.
- Moderate yield, but resilient and able to endure varying climates

Origin

- Originates from Birbhum district, West Bengal, India.

Historical or Cultural Anecdotes

- Named after the fragrant flower, linking it to the region's rich cultural heritage.

Best-Suited Conditions for Cultivation

- Thrives in both flood-prone areas and moderately dry conditions, best suited for irrigated, clayey soils.

Sitasal

Unique Characteristics

- Mild, non-aromatic flavor with a subtly sweet and comforting taste, soft, fluffy texture.
- Moderate yield with resilience to varying weather conditions.

Origin

- Originates from Birbhum, Bankura, South and North 24 Parganas, and Hooghly, West Bengal, India.



Historical or Cultural Anecdotes

- Associated with seasonal harvest festivals and rituals honoring the land.

Best-Suited Conditions for Cultivation

- Thrives in lowland, well-irrigated areas, known for its ability to withstand moderate floods and droughts.

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Sonalu

Unique Characteristics

- Golden-hued grains with a slightly sweet and nutty taste, non-aromatic, rich, satisfying texture.
- Moderate yield and resilience to environmental stress

Origin

- Originates from the Bankura district, West Bengal, India.

Historical or Cultural Anecdotes

- Symbolizes prosperity and abundance, often associated with local festivals and agricultural practices.

Best-Suited Conditions for Cultivation

- Thrives in lowland, well-irrigated soils, adaptable to both waterlogged areas and dry conditions.



Swarnakanti

Unique Characteristics

- Subtle aromatic fragrance with tender grains.
- Moderate yield with resilience under varying conditions.

Origin

- Originates from Murshidabad and Birbhum districts, West Bengal, India.

Historical or Cultural Anecdotes

- Associated with prosperity and harvest festivals.

Best-Suited Conditions for Cultivation.

- Thrives in well-irrigated areas, especially lowland fields, prefers fertile, clayey soils, capable of flourishing in varying climatic conditions.





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Talmugur

Unique Characteristics

- Mild aroma, with a robust, earthy, and slightly nutty taste.
- Moderate yield with resilience in adverse conditions.

Origin

- Originates from North 24 Parganas, West Bengal, India.

Historical or Cultural Anecdotes

- Integral part of local cultural practices, linked with community events and traditional harvest celebrations.

Best-Suited Conditions for Cultivation

- Thrives in wetland and irrigated soils, adapted to water management and soil fertility fluctuation.

Tulaipanji

Unique Characteristics

- Captivating aroma delicate, nutty flavor.
- Moderate yield, but prized for its superior quality and fragrance.

Origin

- Originates from Uttar Dinajpur, Dakshin Dinajpur, and the Plains of Darjeeling, West Bengal, India.

Historical or Cultural Anecdotes

- Deep cultural and historical connection with the region, often celebrated in local festivals and culinary traditions.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, clayey soils, suited for flood-prone areas, resilient to challenging climatic conditions.



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Tulsimukul

Unique Characteristics

- Mild, non-aromatic flavor, soft, fluffy texture, delicate taste that absorbs flavors well.
- Moderate yield, but a reliable crop for farmers.

Origin

- Originates from the Purulia district, West Bengal, India.

Historical or Cultural Anecdotes

- Revered for its role in local cuisine and cultural heritage.

Best-Suited Conditions for Cultivation

- Thrives in well-irrigated, lowland areas, adapted to both waterlogged and moderately dry conditions.



Tulai

Unique Characteristics

- Aromatic, exceptional taste, delicate texture.
- Resilient to varying climatic conditions, offering reliable yields.

Origin

- Primarily cultivated in Cooch Behar district.

Historical & Cultural Anecdotes

- Revered as a farmer's treasure and integral to cultural and festive rice-based delicacies.

Best-Suited Conditions for Cultivation

- Thrives in well-drained clayey or loamy soils, requires adequate but not excessive rainfall grows well in moderate temperatures with proper field management.



Farmers' Perspectives

Mr. Vivekananda Mandal

Santigachi, Gosaba block, Indian Sundarban

Mr. Vivekananda Mandal, a resident of Santigachi in the Gosaba block of West Bengal, shared a transformative experience that has shaped his farming practices and empowered his community. As a beneficiary of the Indigenous salt-tolerant paddy program supported by PFRI, Mr. Mandal had the opportunity to cultivate Dudheswar paddy, a variety designed to thrive in saline, waterlogged conditions.

With enthusiasm and pride, Mr. Mandal reflected on the positive changes he observed since adopting salt-tolerant paddy farming. "The Dudheswar paddy not only delivers a high yield but also shows remarkable resistance to floods and waterlogging", he said. "It thrives in conditions where other crops would fail". Beyond its resilience to extreme weather, Dudheswar paddy is naturally pest-resistant, making it a sustainable and cost-effective choice for farmers, reducing the need for chemical interventions.

Mr. Mandal's experience has inspired him to encourage fellow farmers in his community to consider adopting salt-tolerant paddy cultivation. He firmly believes in the potential of such innovative farming techniques to ensure food security and enhance agricultural productivity, even in the most challenging environments. His story is a testament to the power of knowledge-based, climate-resilient agricultural practices in transforming livelihoods and fostering long-term sustainability.

Through his journey with salt-tolerant paddy farming, Mr. Mandal not only contributes to the success of his own farm but also to the broader goal of agricultural resilience in West Bengal. His success story reflects the significant impact of such innovations on both farmers' lives and the environment, highlighting the path toward sustainable and resilient farming practices.



Mr. Vivekananda Mandal
Santigachi, Gosaba C.D. Block
Indian Sundarban

Mrs. Dipali Sardar

Tipligheri, Gosaba block, Indian Sunadarban

Mrs. Dipali Sardar, a resident of Tipligheri in the Gosaba block of West Bengal, has witnessed a remarkable transformation in her life and farming practices with the support of PFRI. As a beneficiary of the salt-tolerant paddy program, Mrs. Sardar was provided with comprehensive technical training and continuous guidance, enabling her to embrace innovative farming techniques.

With a deep sense of pride, she shared how this invaluable support has not only enhanced her farming skills but also significantly boosted her family's income. The salt-tolerant paddy cultivation has opened up new avenues for financial stability and empowerment, allowing Mrs. Sardar to provide better for her family and improve their quality of life.

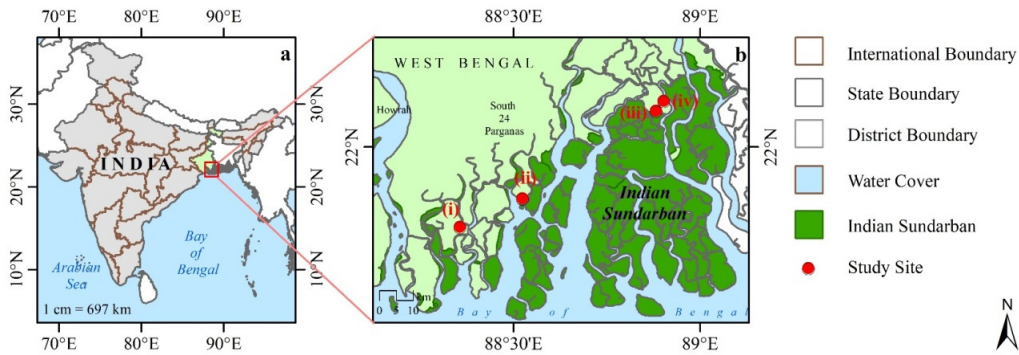
Beyond her personal success, Mrs. Sardar has become a beacon of inspiration in her community. Actively engaged in sustainable farming practices, she plays a pivotal role in encouraging fellow farmers, especially women, to adopt salt-tolerant paddy cultivation. She believes that these innovative practices are key to tackling the increasing climate challenges faced by farmers in the region.



Mrs. Dipali Sardar, Tipligheri
Gosaba C.D. Block, Indian Sunadarban

Her journey highlights the transformative power of knowledge and innovation in empowering women and creating resilient, sustainable farming communities. Mrs. Sardar's success story is a shining example of how women, when provided with the right tools and support, can lead the way toward a more sustainable and prosperous future for their communities.

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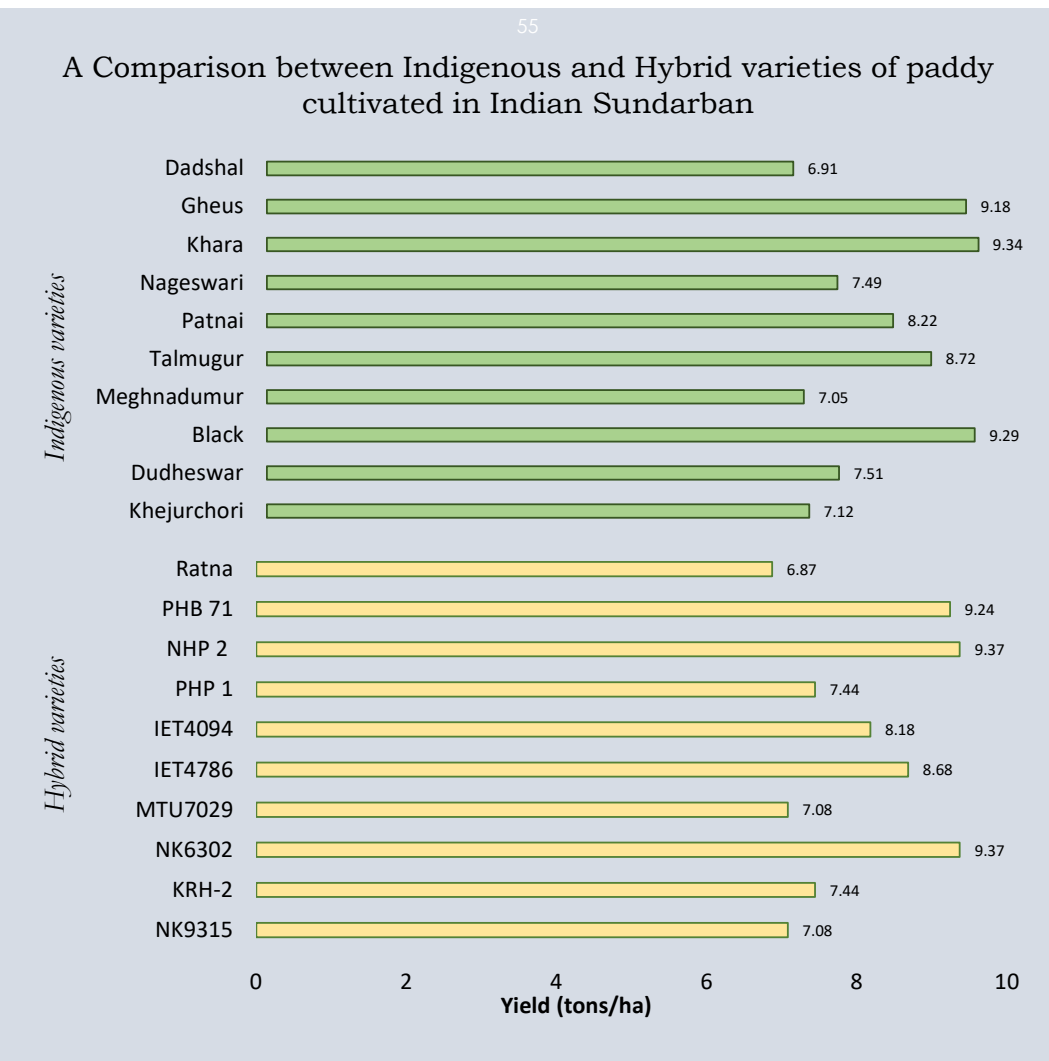
Sundarbans and Climate Change

Insights into how indigenous practices help mitigate climate challenges

Indigenous practices in the Sundarbans have long been a cornerstone of resilience against environmental challenges, particularly in the face of climate change. Communities in this region, deeply rooted in the natural rhythms of their surroundings, have developed sustainable agricultural practices, such as the cultivation of salt-tolerant rice varieties and the conservation of local seed banks, that enhance food security even in increasingly erratic climatic conditions. Traditional knowledge, passed down through generations, enables the sustainable use of mangroves and other local resources, which act as natural buffers against rising sea levels and extreme weather events. Practices like controlled fishing, agroforestry, and the careful management of water resources help to maintain biodiversity and ecological balance. These methods not only strengthen the community's resilience to climate change but also offer valuable lessons for contemporary climate adaptation strategies, making indigenous knowledge integral to long-term sustainability efforts in the Sundarbans.

Cultivated Sites





From Harvest to Market

Through dedicated efforts, our indigenous rice varieties have reached 50-60 corporate customers, earning praise for their freshness, aroma, and versatility. Whether used for *payesh*, *pulao*, or *baby food*, customers appreciate its superior quality.

Beyond premium whole grains, mixed broken rice finds a market in *Bantala Haat*, ensuring that no part of the harvest goes to waste.

This initiative is made possible by ResolveT2C, a pioneering MSME in recycling art and artisanal food entrepreneurship, bridging the gap between traditional farmers and conscious consumers.

By choosing indigenous rice, customers are not just savoring exceptional flavors but also supporting sustainable agriculture, rural livelihoods, and biodiversity conservation.



Collaborations and Acknowledgments

We extend our heartfelt gratitude to the West Bengal Biodiversity Board (WBBB), South Asian Forum for Environment (SAFE), Indian Council of Agricultural Research (ICAR), Krishi Vigyan Kendra Nimpith (KVK), and the Global Alliance for the Future of Food for their invaluable collaboration and support in the cultivation and conservation of indigenous paddy in the Indian Sundarban. Their unwavering support and expertise have been instrumental in preserving this critical facet of our heritage and fostering sustainability for future generations.

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