



Diversity of Living Souls

Diversity Uniqueness **Stewardship**

Seed Diversity

From root *se meaning to sow

Saat—Saet—Sed—Sad—Sediz—Seed (14th century)

That from which something springs; latent beginning

Diversity: from *diversus* –turned different ways, difference (14th century)

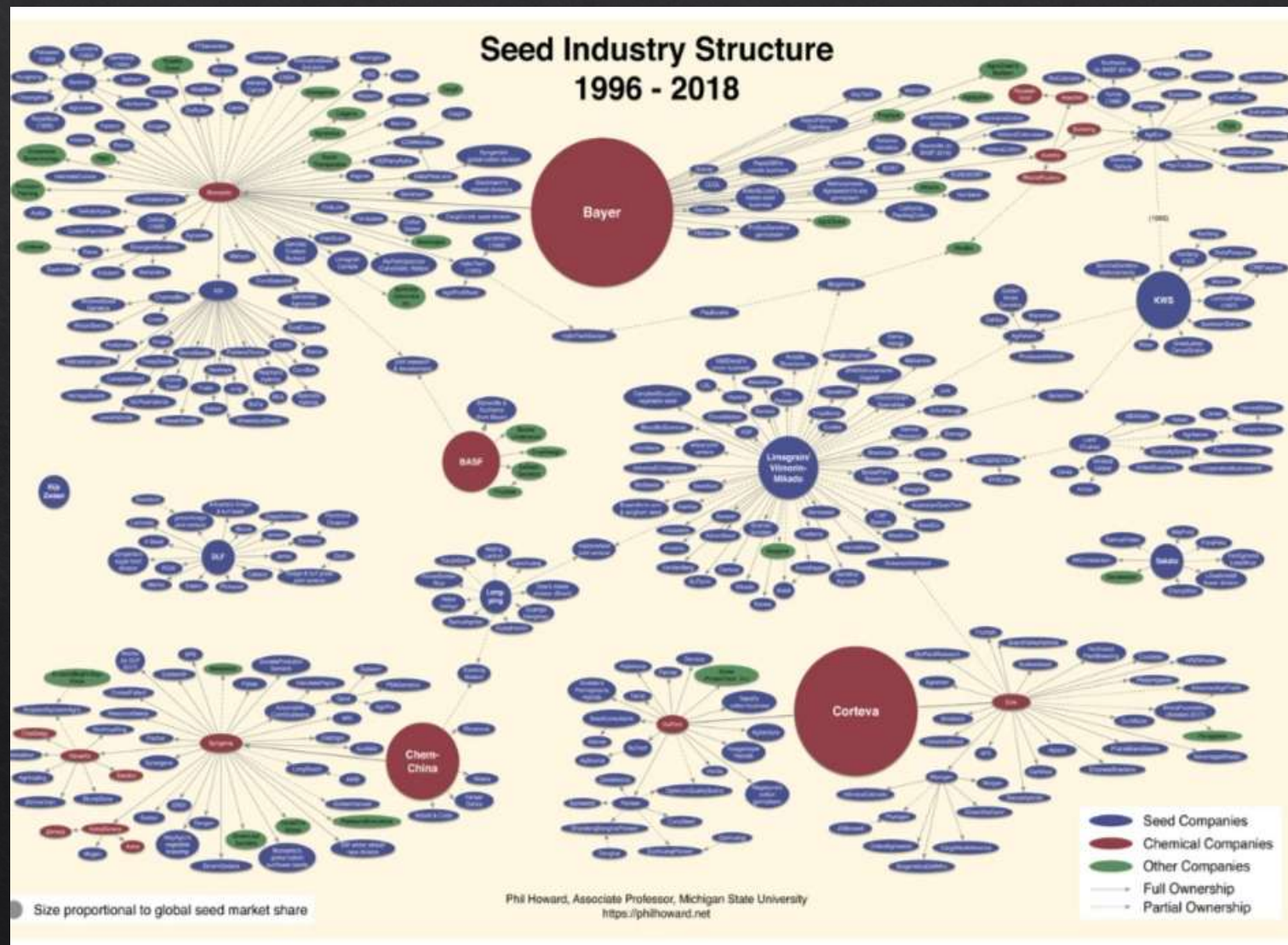
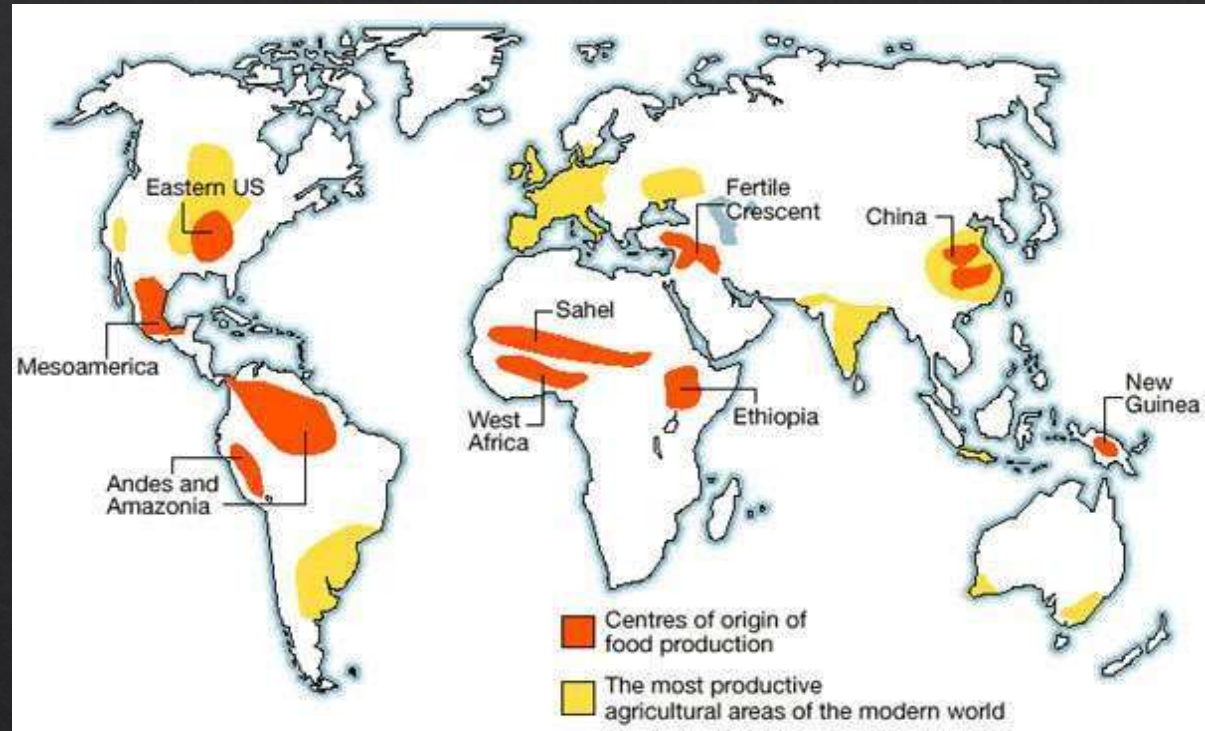
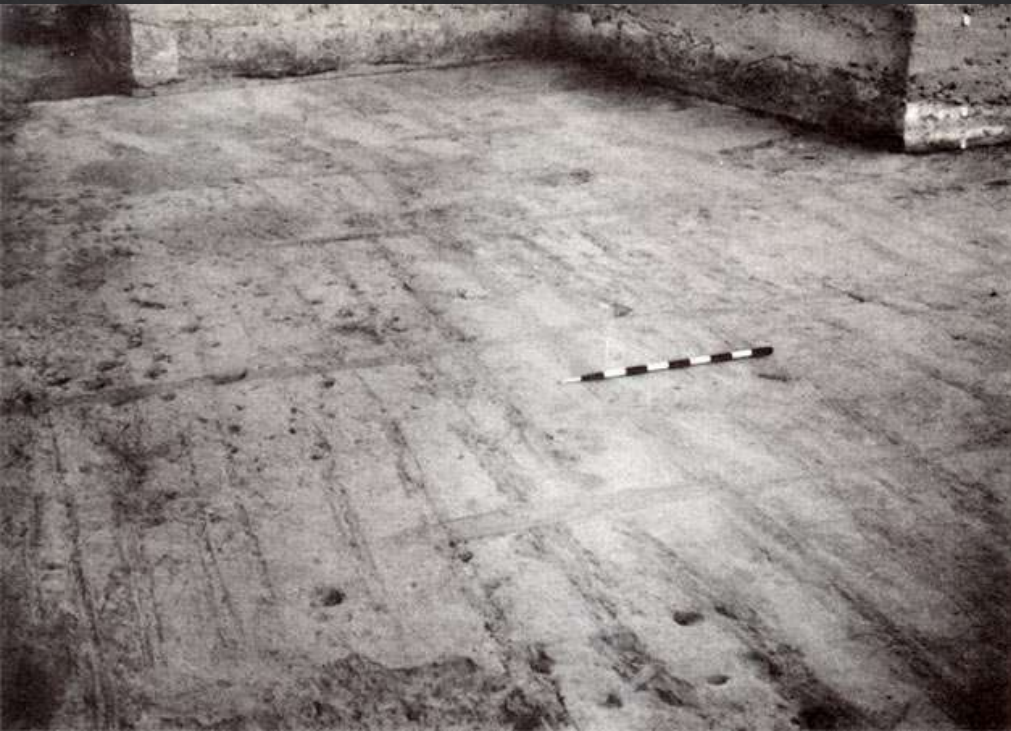


Table 1. Top 9 corporations in the commercial seeds sector

Ranking	Company (Headquarters)	Sales in 2023 (US\$ millions)	% Global market share
1	Bayer (Germany) ²⁰	11,613	23
2	Corteva (US) ²¹	9,472	19
3	Syngenta (China/Switzerland) ²²	4,751	10
4	BASF (Germany) ²³	2,122	4
Total top 4		27,958	56
5	Vilmorin & Cie (Groupe Limagrain) (France) ²⁴	1,984	4
6	KWS (Germany) ²⁵	1,815	4
7	DLF Seeds (Denmark) ²⁶	838	2
8	Sakata Seeds (Japan) ²⁷	649	1
9	Kaneko Seeds (Japan) ²⁸	451	0.9
Total top 9		33,695	67
Total world market ²⁹		50,000	100%

WHO OWNS KNOWLEDGE & THE SEEDS --& WHO TAKES THE PROFITS ?



A history of farming for more than 8000 years.

Indus Valley –one of the most productive areas of Neolithic agriculture

One of the 12 Mega biodiversity Centres of the World

WHERE MOTHER'S GIFTS ARE GODS



GANGI ARIAE

Is held in October where newly harvested Maize, Pumpkin, Cucumber & Banana is worshipped and then eaten



TIALO ARIAE

is held in January where freshly harvested Sorghum, Cowpea, Ricebean, Finger Millet & Amaranthus flower is worshipped and then eaten.



PUN TADI

is the most important festival held in February where Kachnar, Jiruli & Spear Grass is worshipped & Sorghum beer is brewed.

Soumik, Oct-19



TALMI ARIAE

is held in May where Palmyra Palm and Bauhinia Vahlia are worshipped and collection started.



THATGE ARIAE

Is held in mid May where Mango fruits and Sal Leaves are worshipped & harvest initiated.

Crops, Fruits, Vegetables, Grass & Trees are Gods of the Paharias in Rajmahal hills of Jharkhand. The freshly harvested crops in different months are first worshipped and offered to the Mother Earth before being consumed or collected. There are social sanctions to the collection or consumption before the rituals and ceremonies. With mainstreaming many of these Pujas are becoming realms of a bygone era disconnecting them from land and nature.

Diversity of Food & Embedded Culture

- ◆ 6000 cultivated plants
- ◆ 200 for Global Food Supply
- ◆ 9 Crops are 66% by weight
- ◆ Sugarcane, Rice, Maize, Wheat, Soya, Cassava, Sugarbeet, Potato & Oil Palm
- ◆ 4000 Uncultivated Plants used as food
- ◆ 200-700 still found in healthy forest areas



Crop	Accessions
Paddy	109,153
Wheat	33,475
Maize	11,179
Sorghum	25,997
Pearl Millet	8,212
Chickpea	14,699
Pigeon pea	11,617
Mung bean	4,224
Pea	4,198
Cowpea	3,842
Groundnut	13,832
Oilseed Brassica	11,369
Sesame	10,163
Cotton	10,031
Jute	3,290
Mesta	2,017
Tomato	2,595
Brinjal	4,460
Chili	4,959
Okra	3,714

National Bureau of Plant Genetic Resources-
NBPGR claims to conserve 4,38,922 accessions .

However, there is NO DETAILED CATALOG
of FARMER's VARIETIES being conserved.

Despite having a thousands of accessions, of
each crop; every year "NEW" varieties are
released citing their "improved" characters,
which are pushed and promoted by mainstream
institutions and Seed Replacement Rate-SRR,
considered one of the earmarks of agricultural
progress in the area.

Farmers are not aware about the different
varieties being conserved, nor their characters and
status, even though it was built on the native seeds
taken from the very farmers.

Farmers seldom have access to this enormous
collection, while its doors are quite open to
corporations.



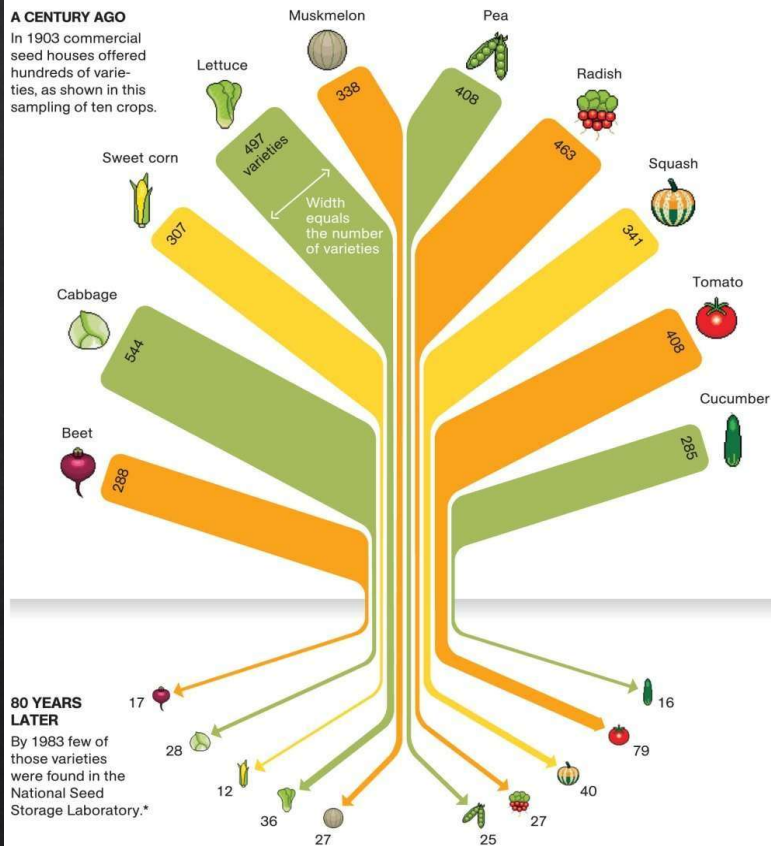
OUR DWINDLING FOOD VARIETY

As we've come to depend on a handful of commercial varieties of fruits and vegetables, thousands of heirloom varieties have disappeared. It's hard to know exactly how many have been lost over the past century, but a study conducted in 1983 by the Rural Advancement Foundation International gave a clue to the

scope of the problem. It compared USDA listings of seed varieties sold by commercial U.S. seed houses in 1903 with those in the U.S. National Seed Storage Laboratory in 1983. The survey, which included 66 crops, found that about 93 percent of the varieties had gone extinct. More up-to-date studies are needed.

A CENTURY AGO

In 1903 commercial seed houses offered hundreds of varieties, as shown in this sampling of ten crops.



80 YEARS LATER

By 1983 few of those varieties were found in the National Seed Storage Laboratory.*

*CHANGED ITS NAME IN 2001 TO THE NATIONAL CENTER FOR GENETIC RESOURCES PRESERVATION.

JOHN TOMANIO, NGM STAFF. FOOD ICONS: QUICKHONEY
SOURCE: RURAL ADVANCEMENT FOUNDATION INTERNATIONAL

Farmer- Plant Breeder, Consumer
& Conservator

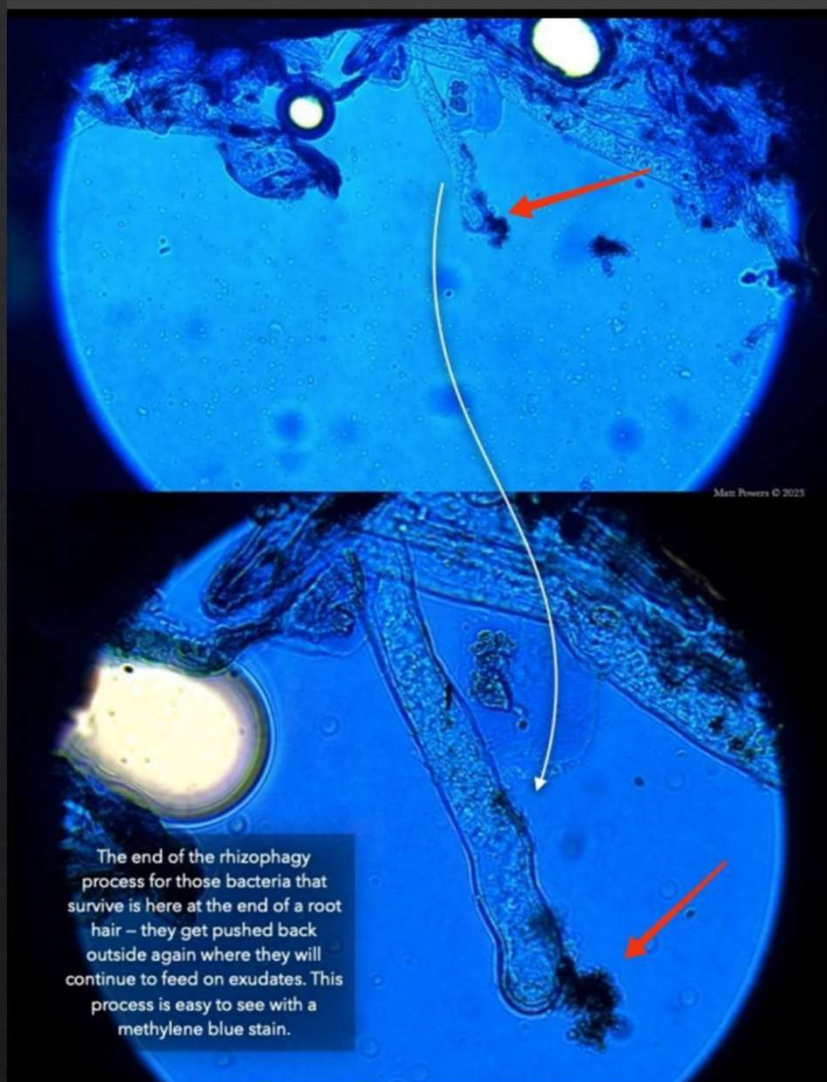
Why Diversity

- ◆ Food Security & Sovereignty
- ◆ Resilience to pests & diseases
- ◆ Stress tolerance
- ◆ Diverse Seed Supply Systems
- ◆ Agrochemicals
- ◆ Nutritional & Cultural uses

Value of Use

- High yield, vigorous plants
- Palatability, Color, Texture, Flavour, Cooking time, Storage etc
- High nutritional levels
- Adaptation to soil & climate
- Disease resistance
- Pest resistance
- Medicinal value
- Fodder value
- Soil enrichment value
- Cultural & Other uses

SEED IS INCOMPLETE WITHOUT ENDOPHYTES



This Seed Treated with _____



POISON TREATED

CAUTION: Do not use for food, feed, or oil purposes or for processing.

ANTIDOTE: EXTERNAL - Wash skin with soap and water, for eyes flush with water.
INTERNAL - Call physician immediately! Induce vomiting by giving salt or mustard in warm water. Repeat until vomit fluid is clear. Keep in prone position and quiet until doctor arrives.



WHICH "MODERN" VARIETIES HAVE SUCH ACHEIVEMENTS ?



Rice Bean-Pulse that tolerates water logging



Ramnagar Giant Brinjal that weighs upto 1.5 kg



Khil- Cotton that has the longest boll & tolerates one of the highest rainfall



Kumragore Rice tolerates 5 feet submergence



Lutni Mustard that grows without irrigation



Kalanamak is a contemporary of Buddha

MAIZE of INDIA

Bokri Janna
Araha, Andhra Pradesh

Kalya Kales Janna
Araha, Andhra Pradesh

Thekati Janna
Araha, Andhra Pradesh

Rang Janna
Araha, Andhra Pradesh

Khatiya Janna
Araha, Andhra Pradesh

Khatiya Rang Janna
Araha, Andhra Pradesh

Dholi
Gadch, Jharkhand

Khamdi, Jharkhand

Chitrapadi
Gadch, Jharkhand

Tao
Gadch, Jharkhand

Bahro
Gadch, Jharkhand

Sara Hilla, Meghalaya

Shakori, Madhya Pradesh

Phak, Nagaland

Juhari, Madhya Pradesh

Kashambi, Odisha

Piyagada, Odisha

Kandighat, Odisha

Lal Maas Dandia
Nandurbar, Maharashtra

Kakumadhya
Nandurbar, Maharashtra

Gadchi
Baramwadi, Rajasthan

Putta
Baramwadi, Rajasthan

Ashlamb, Telangana

Sustaran
Nanded, Maharashtra

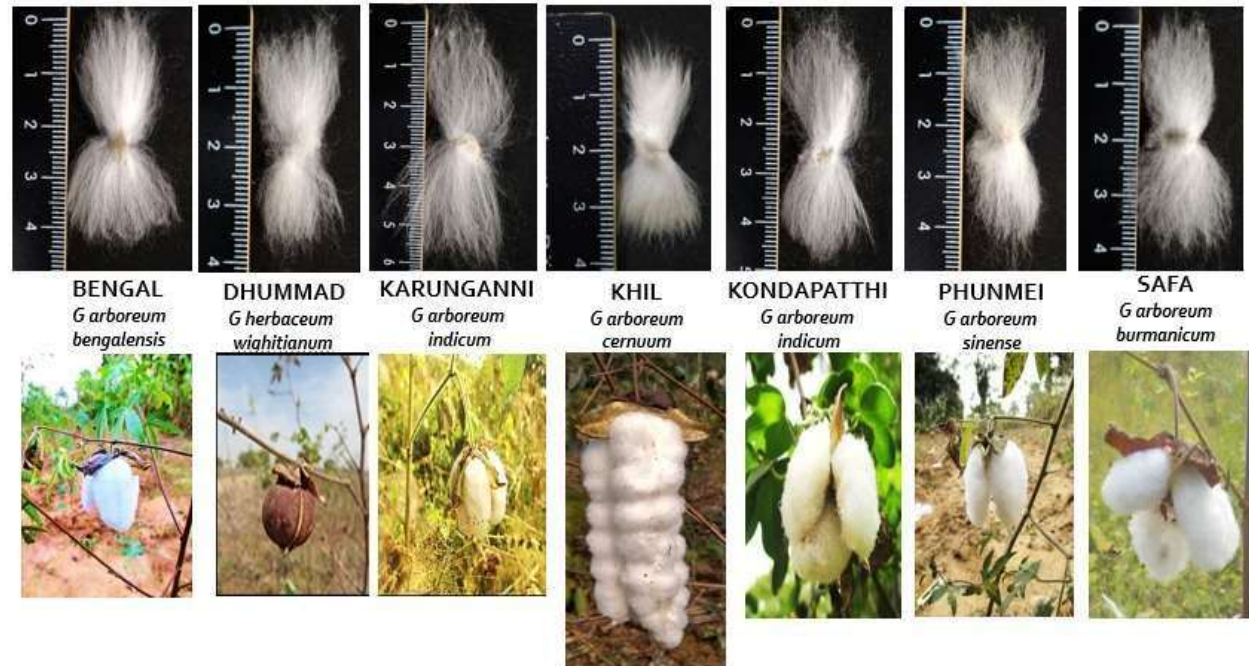
Kempu Jala
El R. Arvi, Karnataka

Harpita
Nashik, Uttaranchal

consortium of IISc/BITD
Sankar Banerjee & Dipankar Bose

Sahaia Samrutha, No-7, 2nd Cross, 7th Main, Sulthanpally, Bangalore-560 032
080-23655302 / sahaiasamrutha@gmail.com | www.sahaigasamrutha.org

Bharat Bhoj Swaraj March



**India is home to 5 out of 6 landraces of arboreum cotton & 1 out of 5 landraces of herbaceum cotton;
These cotton had a global appeal & made INDIA a world leader in textiles.**

WHEAT CULTIVARS



KHAPLI



BANSI



KALI BAL



KATHIA



PAIGAMBARI



CHANDAUSI



DAUDKHANI



PISI



MUNDA
PISI

YIELDS IN PRE-"GREEN REVOLUTION" INDIA-3



Krishi Pandit Awards were instituted in 1949 by the then Central Govt for principal Kharif & Rabi Crops. These competitions were held in 5 tiers village, tehsil, district, state and country for 6 major crops- Paddy, Wheat, Sorghum, Pearl Millet, Potato & Gram with cash prizes from Rs 100 to Rs 5000 along with certificates of Krishi Pandit for the all India winners from the Agriculture Minister in an annual function in New Delhi.

The table gives the list of 18 Krishi Pandit Awardees between 1949-55.

Some of the yields obtained with indigenous varieties and organic inputs in these Pre-Green Revolution era far exceeds even the best yields now.

Year	Krishi Pandit	Location	Crop	Yield-MT/ha
1949-50	J C Pani	Midnapur, W Bengal	Paddy (Abhiman)	6.9
	Jagdish Prakash	Meerut, Uttar Pradesh	Wheat	5.4
	Rattan Prakash	Hapur, Uttar Pradesh	Potato	63.7
1950-51	K Vellaiya Gounder	Salem, Tamil Nadu	Paddy	11.6
	J C Sangayya	Coorg, Karnataka	Paddy (Kirubiliya)	12.8
	Padam Singh	Meerut, Uttar Pradesh	Wheat	5.7
	Gurudev Singh	Ludhiana, Punjab	Wheat	6.7
	Madho Kripal	Hapur, Uttar Pradesh	Potato	68.2
	Jaipal Chandra	Bulandsahar, Uttar Pradesh	Potato	68.9
	Walaiti Ram	Ludhiana, Punjab	Pearl Millet	4.3
1951-52	Bhimginda Dada Patil	Kolhapur, Maharashtra	Sorghum (Kalbondi)	7.9
	Vaman Ramchandra Marathe	Khandesh, Maharashtra	Gram (Akola)	2.7
	Kalappa Bharna Chougule	Satara, Maharashtra	Sorghum (Kamdapuri)	9.6
1952-53	Ramakrishna Singh	Bulandsahar, Uttar Pradesh	Wheat	5.9
	K Byatrangapa	Bangalore, Karnataka	Potato	61
1953-54	S S Rishabh Kumar	Sagar, Madhya Pradesh	Wheat	9.4
	Narayan Lal	Bhandara, Maharashtra	Paddy	6.7
	Venkatrao Bhaga Patil	Khandesh, Maharashtra	Sorghum	8.2



BAGH JHAPTA
6.5 mg



BOURANI
4.5 mg



CHEENAKAMINI
6.8 mg



DEHRADUN
5.2 mg



HAMILTON
4.3 mg



KELAS
3.5 mg



KHARA
4.9 mg



KUMROGORE
3.4 mg



LAL BAHAL
3.2 mg



LAL GETU
8.5 mg



MOINAGURI
4.3 mg



MOTI
4.3 mg



NOICHI
3.9 mg



SUBASITA
4.6 mg



TALMUGUR
4.5 mg

FORTIFIED FOLK RICES

These Folk Rices from West Bengal **have IRON content MORE than that of Spinach**, ranging from 3.2 mg to 8.5 mg per 100 gram of serving.

There are hundreds of Folk Rices that are **naturally fortified with Iron, Zinc, Manganese, Copper and different vitamins**.

Folk Rices offer **low-cost, healthy and sustainable solution** to address the Anemia and Micronutrient deficiency challenges of the nation as to synthetic fortification.

Source: Deb, D et al, CURRENT SCIENCE, VOL. 109, NO. 3, 10 AUGUST 2015

These Folk Rices are being conserved by Bhairab Saini at V-Panchal (Bankura dist) & Paschim Sridharkati Jonokalyan Sangha (North 24 Parganas dist) of West Bengal.

Panicle photos taken by Dipankar Bose @ Panchal & Hingalganj (WB).

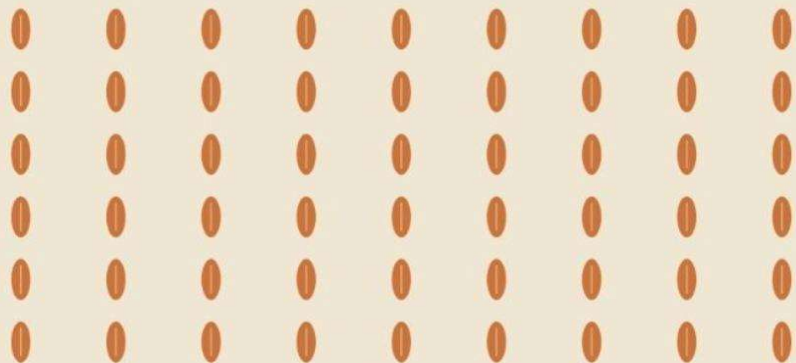
Variety & Landrace

One is bred for uniformity. The other is shaped by diversity.

THE BRED VARIETY

IR8

"Miracle Rice" · IRRI, 1966



Every plant the **same** — one height, one harvest, made in a station.

SHAPED BY A **breeder**, in a single cross

BUILT FOR High yield on fertiliser & water

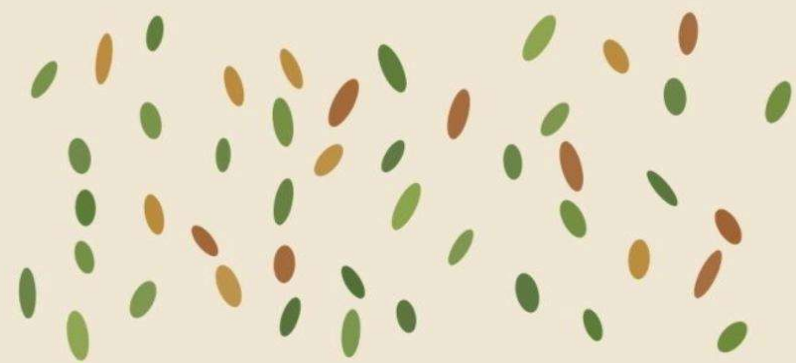
GENETICS **Narrow** & fixed

IF LOST Reissued from a seed bank

THE LIVING LANDRACE

Gobindobhog

Aromatic rice of Bengal · farmer-kept



Every plant a little **different** — the spread *is* the design.

SHAPED BY A **community**, season on season

BUILT FOR Local soil, climate & taste

GENETICS **Broad** & evolving

IF LOST Gone — no one to remake it

1. Cluster Selection

Target 8-10 villages, focusing on undulating/hilly marginal lands with mixed farming.



2. Community Mobilization

Conduct local Seed Mapping Exercises to document historical cropping trends.



3. Facility Setup

Finalize location, build infrastructure, and appoint the Beej Sanyojak (Coordinator).



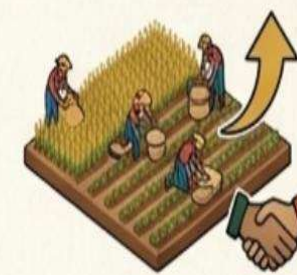
4. Varietal Conservation

Establish Diversity Blocks led by a Farmer-Conservator for in-situ characterization.



5. Upscaling

Deploy dedicated Seed Farmers to multiply promising varieties via Participatory Varietal Selection.



1

2

3

4

5

What is a Community Seed Bank?



Community Managed:
Operated by local institutions
like SHGs or FPOs.

Short-Term Storage:
A localized, cyclical
repository, not a static vault.



Landrace Focus:
Dedicated to indigenous and
heirloom varieties.

Timely Access:
Seed distribution via exchange
or fair cash purchase.



The Power of Indigenous Seeds



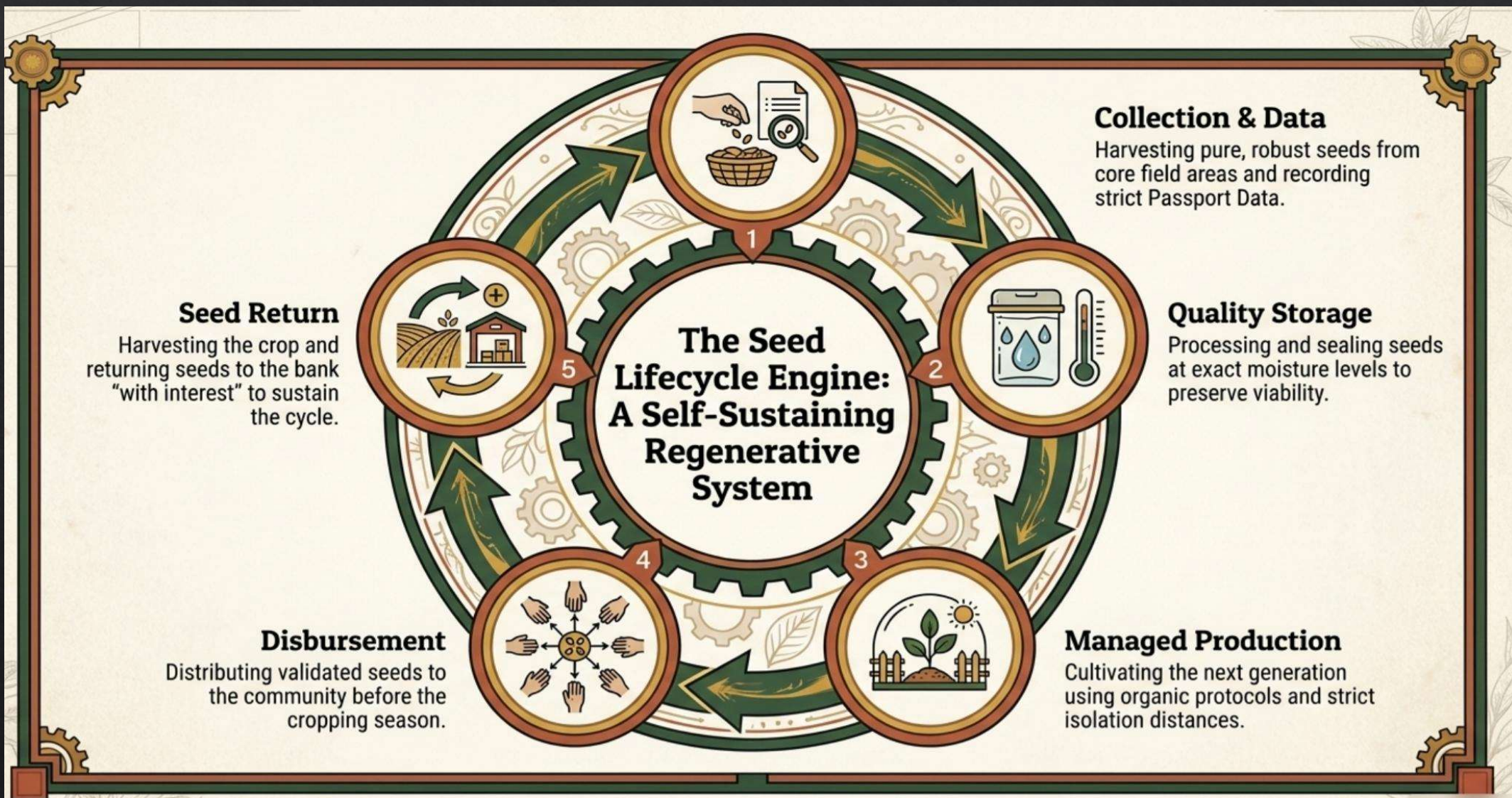
Climate Resilience
Built-in adaptability to
local abiotic stress,
pathogens, and
extreme weather.



Superior Quality
Nutritionally richer,
culturally diverse, and
optimally responsive to
organic manure.



**Seed Sovereignty
& Economics**
Zero dependence on
external synthetic
fertilizers or proprietary
commercial protocols.



The CMSS Lifecycle Unfolds Across a Single Agricultural Season

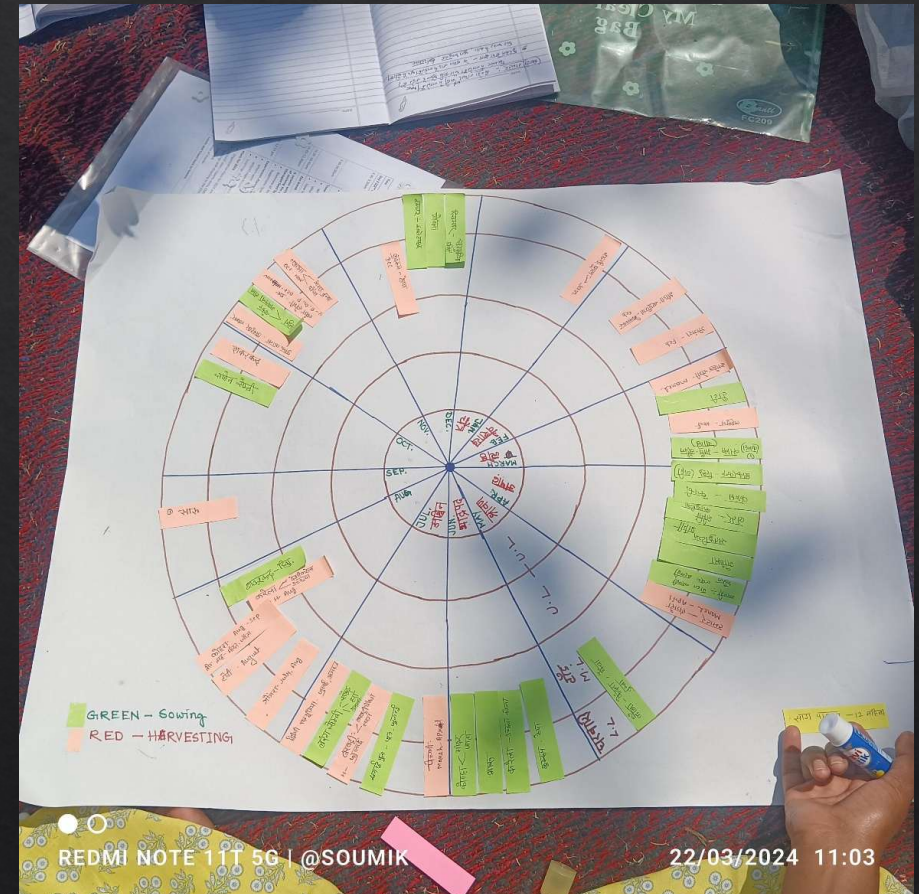


This operational sequence transforms unstructured local biodiversity into a stable, community-owned seed security system.

Trend Analysis Field Crops & Vegetables

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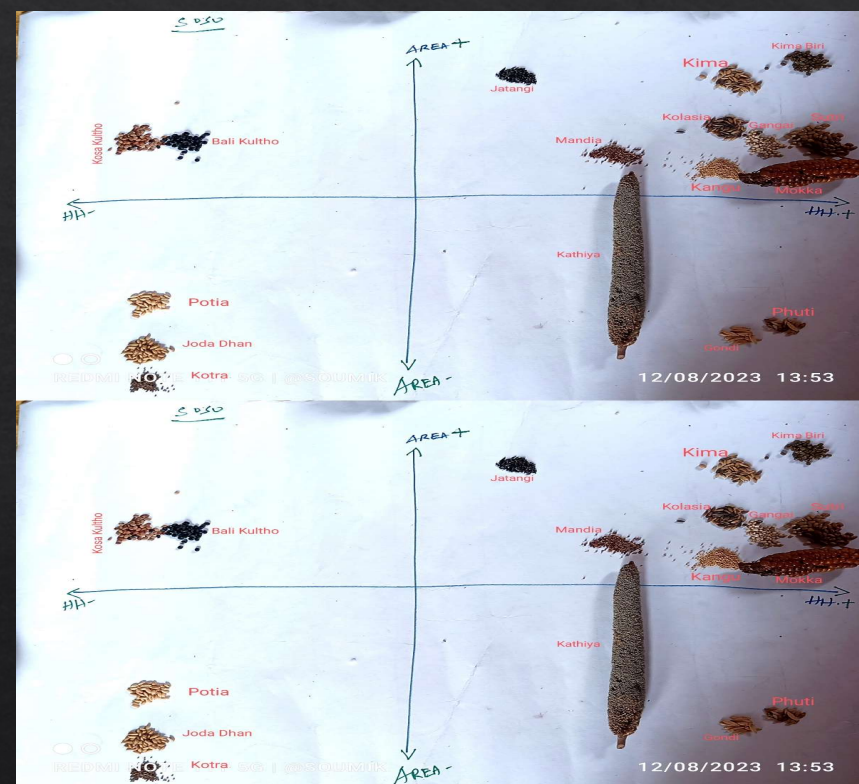
Seasonal Calender -Field Crops & Vegetables



Four Field Analysis

Varietal mapping

फसल	किसम	नाम का अर्थ	कितने परिवार	कितने एकड़	मार्केट उपज	स्वास बातें
धान	सैरी		10	5 = 50	8	किसी 30 दिन बाद फसल के अंक, बरफि रूप में है।
	लकड़ा		15	7 = 105	7	किसी 30 दिन बाद, फसल के अंक बादल में है।
	धिन मैजरी		2	1 = 2	5	किसी 30 दिन बाद, फसल के अंक बादल में है।
गेहूँ	मर्गलधार		2	1 = 2	5	किसी 30 दिन बाद, फसल के अंक बादल में है।
	कुम्हार		3	1 = 3	4	किसी 30 दिन बाद, फसल के अंक बादल में है।
मक्का	सक्रेड मक्का		150	0.5 = 75	4	मक्का के अंक, फसल के अंक बादल में है।
	पीला मक्का		200	0.5 = 100	5	मक्का के अंक, फसल के अंक बादल में है।
जवा	सक्रेड जवा		30	0.5 = 15	4	जवा के अंक, फसल के अंक बादल में है।
कोरी	अनार कोरी		20	0.5 = 10	3	कोरी के अंक, फसल के अंक बादल में है।
	कोरी		15	0.5 = 7.5	4	कोरी के अंक, फसल के अंक बादल में है।
कुचली	भरदली कुचली		15	0.5 = 7.5	2	कुचली के अंक, फसल के अंक बादल में है।
भरदली	कोरी भरदली		250	0.5 = 125	2	भरदली के अंक, फसल के अंक बादल में है।
	कोरी भरदली		150	0.5 = 75	2	कोरी भरदली के अंक, फसल के अंक बादल में है।
भूँ	भरदली भूँ		100	0.5 = 50	2	भूँ के अंक, फसल के अंक बादल में है।
उड़	भरदली उड़		100	0.5 = 50	1	उड़ के अंक, फसल के अंक बादल में है।
चमल	भरदली चमल		50	0.5 = 25	2	चमल के अंक, फसल के अंक बादल में है।
बारी	सक्रेड बारी		10	0.5 = 5	10	बारी के अंक, फसल के अंक बादल में है।
नारली	धिन नारली		15	0.5 = 7.5	10	नारली के अंक, फसल के अंक बादल में है।
त्रिली	सक्रेड त्रिली		200	0.5 = 100	2	त्रिली के अंक, फसल के अंक बादल में है।
अमली	सक्रेड अमली		10	0.5 = 5	10	अमली के अंक, फसल के अंक बादल में है।





Rice Diversity Block of Bhairab, Panchal, Bankura -WB

Bhata Masuri

High Yields
High Expansion
on cooking

Ramigeli

High Protein
Medicinal Value

Black

Purple Rice
High Price
Medicinal Value

Pandri Lochal

High Yields
Soft Rice
Non Lodging

Bishnubhog

Scented
Market Value
Flavor
High Yields

Nagri Dubraj

Scented
Flavorful
Shorter Height
Higher Price

Community Managed Seed Systems

A Field Guide to Mapping, Selecting,
and Multiplying Crop Diversity



How FPO can set up Community Seed Bank

2 FUNCTIONS SEPARATE: Conservation (small plots, seed savers, low-demand varieties) and production (selected varieties multiplied by trained growers) should run in parallel without contaminating each other.

SET THE PROCUREMENT PRICE, MARGIN AND BONUS RULE BEFORE THE FIRST SEASON.

REVOLVING SEED LOANS: Seed is lent and returned at more the quantity, and the returned grain can be sold to fund future procurement.

KEEP SOME INSTITUTIONAL BUYERS AND ORGANIC MARKETS.

A RECORDED QUALITY PROTOCOL

LEGAL POSITION

Examples of Benefits

- Members got quality seed cheaper than market price, growers got a fair procurement price, and profit was shared as a patronage bonus.
- Market-linked multiplication sustains the bank's revenue, and seed demand grew once access improved
- Traditional seed is now seen as viable and profitable

Why FPO need to go LOCAL

COST AND DEPENDENCE: An FPO that only aggregates and sells produce stays exposed to input markets.

FIT AND RESILIENCE: Local varieties are adapted to the local soil, rainfall and pest pressure.

Local varieties support BRANDS and VALUE ADDITION.

COMMUNITY GOVERNED not individual monopoly

CIRCULAR ECONOMY



Seed is not just a grain—it's a living representation of thousands of years of unbroken legacy of history, culture, traditions, food security and sovereignty...

We ignore them to our own demise...

THANK YOU