



# India's Basmati Rice Cultivation Dispute and the Direct Seeded Rice

**For Prelims:** [Indian Agricultural Research Institute](#), [Rice](#), [Green Revolution](#), [Indian Council of Agricultural Research](#), [Direct Seeded Rice](#), [World Trade Organisation](#), [Intellectual Property Rights \(IPR\)](#)

**For Mains:** Regulations governing intellectual property protection, Direct Seeded Rice method of rice implantation

**Source:** [IE](#)

## Why in News?

Recently, India's prized [basmati rice varieties](#), like **Pusa-1121** and **1509 Basmati**, have been found in Pakistan under new names, raising concerns among Indian scientists at the [Indian Agricultural Research Institute \(IARI\)](#), urging legal action to safeguard Indian farmers and exporters.

- This highlights the urgency for unified action to protect Indian farmers and maintain equitable trade practices.
- In another development, the **Federation of Seed Industries of India (FSII)** and Sathguru Consultants have emphasised the necessity for collaborative endeavours in rice cultivation, with a particular focus on [direct seeded rice \(DSR\) techniques](#).

## How are Indian Basmati Varieties Illegally Cultivated in Pakistan?

- **Illegal Cultivation:**
  - The cultivation of Indian basmati varieties in Pakistan began with Pusa **Basmati-1121 (PB-1121)**, officially registered as '**PK 1121 Aromatic**' in Pakistan.
    - Other popular IARI-bred varieties like **Pusa Basmati-6 (PB-6)** and **PB-1509** have also been grown and renamed in Pakistan, posing a significant challenge to Indian agricultural authorities.
  - More recent varieties such as Pusa Basmati-1847 (PB-1847), PB-1885, and PB-1886, designed to **resist bacterial blight and rice blast fungal disease**, have also been identified in Pakistani fields.
- **Implications:**
  - The unauthorised cultivation of Indian basmati varieties in Pakistan undermines the **rights of Indian farmers and breeders** protected under the [Seeds Act, 1966](#), and the [Protection of Plant Varieties and Farmers' Rights Act, 2001 \(PPV & FR Act\)](#).
    - The Protection of Plant Varieties and Farmers' Rights Act in India, enacted in 2001, protects the rights of Indian farmers to **sow, save, re-sow, exchange, or share the seed/grain produced from registered varieties**.
      - The Act prohibits selling the seeds of protected varieties in branded form without the breeder's rights.
      - **IARI-bred improved basmati varieties are registered under this Act.**

- The Seeds Act of 1996, allows cultivation of IARI varieties only in the officially demarcated **Geographical Indication (GI) area** of basmati rice within India.
  - All basmati varieties bred by IARI are officially notified under the **Seeds Act, 1966 for cultivation.**
  - These varieties are designated for cultivation within the **officially demarcated Geographical Indication area of basmati rice in India, spanning 7 northern states** (Punjab, Haryana, Himachal Pradesh, Delhi, Uttarakhand, Uttar Pradesh (west) and two districts of Jammu & Kashmir (Jammu and Kathua)).
  - Even Indian farmers are prohibited from violating the breeder's rights by selling the seeds in branded, packaged, or labelled form.
  - These regulations aim to safeguard the intellectual property rights of breeders and ensure the exclusive rights of Indian farmers to cultivate and trade in protected basmati varieties.
- Cultivation of the protected basmati varieties in **Pakistan would potentially violate intellectual property rights (IPR)** and could be raised by India in relevant bilateral forums and at the **World Trade Organisation.**

## Protection of Plant Varieties and Farmers' Rights Act, 2001

### ▪ Rights under the Act:

#### ◦ Breeders' Rights:

- Breeders are granted exclusive rights to produce, sell, market, distribute, import, or export protected varieties.
- Breeder's rights include the ability to appoint agents or licensees and seek civil remedies for infringement.

#### ◦ Researchers' Rights:

- Researchers can utilise registered varieties for experimentation or research purposes.
- **Initial use of a variety for developing another variety is permitted**, but repeated use requires prior permission from the registered breeder.

#### ◦ Farmers' Rights:

- Farmers who have evolved or developed new varieties are entitled to registration and protection similar to breeders.
- Farmers **can save, use, exchange, share, or sell farm produce, including protected varieties**, subject to certain conditions.
- Recognition and rewards are provided for farmers' conservation efforts related to plant genetic resources.
- Compensation provisions exist for farmers in cases of non-performance of protected varieties.
- Farmers are **exempt from paying fees in proceedings** under the Act before relevant authorities or courts.

## How does this Affect the Global Basmati Market?

- In 2022-23, India exported **45.61 lakh tonnes of basmati rice** valued at USD 4.79 billion. India's basmati rice exports are on the brink of reaching record levels, with projections **indicating exports of 50 lakh tonnes worth \$5.5 billion in the current fiscal year.**
  - Notably, 89% of the estimated 21.35 lakh hectares of basmati area sown during Kharif 2023 was under IARI-bred varieties, with significant portions under specific varieties such as PB-1121, PB-1718, PB-1885, PB-1509, PB-1692, PB-1847, PB-1, PB-6, and PB-1886, raising concerns about the impact of illicit cultivation on export volumes and revenues.
- Pakistan's basmati exports, although lower than India's, have gained traction due to the **depreciation of the Pakistani rupee**, enabling competitive pricing in international markets.
- The piracy of Indian basmati varieties by Pakistan poses a **threat to India's dominance in key export markets**, especially in the **European Union** and the United Kingdom.

- **Pakistan holds an 85% share of the EU-UK market** due to its cheaper currency, allowing it to dominate these markets.
- However, **India maintains dominance in markets such as Iran, Saudi Arabia, and other West Asian countries**, where consumers prefer **parboiled rice** with harder grains that are less susceptible to breakage during cooking.

## Indian Agricultural Research Institute

- The **Indian Agricultural Research Institute (IARI)** is India's largest and foremost institute in research, higher education, and training in agricultural sciences.
- It played a pivotal role in the **Green Revolution**, contributing significantly to scientific advancements and the development of appropriate agricultural technologies.
- Established in 1905 in the village of Pusa in north Bihar, it was relocated to New Delhi in 1936 after a devastating earthquake.
- The administrative control of the IARI is vested with the **Indian Council of Agricultural Research (ICAR)**, an autonomous organization established under the **Societies Registration Act, of 1860**.

## What is the Direct Seeded Rice (DSR) Technique?

- **About:**
  - Direct seeded rice (DSR) is a method of rice cultivation where **seeds are sown directly in the main field**, bypassing the traditional nursery raising and transplanting process.
- **Advantages of DSR:**
  - **Labour and Cost Savings:**
    - Eliminates the **need for labour-intensive nursery** raising and transplanting, reducing overall production costs.
    - Reduces manual labour requirements and associated costs, potentially leading to higher yields and better returns for farmers.
  - **Water Conservation:**
    - **Reduces water consumption by approximately 40%** compared to traditional methods, minimising soil erosion and methane emissions.
    - Requires less water than traditional transplanting, making it suitable for areas facing water scarcity.
  - **Early Crop Maturity:** Crops mature **7-10 days' sooner than usual (115-120 days)**, allowing for the timely planting of successive harvests.
- **Methods of DSR:**
  - **Dry Seeding:** Seeds are sown in dry soil, suitable for areas with assured rainfall or irrigation facilities.
  - **Wet Seeding:** Seeds are sown in puddled soil, similar to conditions for transplanting, suitable for areas with assured water availability.
- **Challenges:**
  - **Weeds:**
    - Weeds pose a significant challenge to DSR due to their competitiveness and initial infestation in the absence of water layers, leading to potential yield losses ranging from 20% to 85%.
    - Shifts in weed composition and diversity from **puddled transplanted rice (PTR)** to DSR further complicate weed management strategies.
    - Weedy rice, genetically similar to cultivated rice, has become a major concern in areas where DSR is extensively practised, causing significant yield losses and quality degradation.
  - **Development of Herbicide Resistance:**
    - Increased herbicide use in DSR has led to the emergence of herbicide-resistant weed biotypes, compromising weed control efforts.
    - **Root-knot nematodes** pose a severe constraint in DSR, affecting crop yield, particularly in areas transitioning from PTR to DSR.

- Root-knot nematodes are **plant-parasitic nematodes from the genus *Meloidogyne***. They are commonly found in soil in regions with hot climates or short winters, and they can cause significant damage to various plants.
- **Stagnant Yield:**
  - Reports indicate yield decline in DSR, attributed to soil sickness, plant autotoxicity, and continuous cultivation without proper rotation.
- **Lodging:**
  - DSR is more prone to lodging compared to the puddled transplanting system (PTR), **affecting crop quality and harvest efficiency**, necessitating the preference for lodging-resistant cultivars.
- **Diseases and Insect Pests:**
  - DSR is susceptible to various diseases such as **rice blast and sheath blight**, as well as insect pests, compromising crop health and yield potential.
- **Other Challenges:**
  - Challenges such as exposure of rice seeds to birds and rats, adverse effects of sudden rain after seeding, and uneven crop stand further add to the complexities of DSR cultivation.
- **Possible solutions:**
  - Integrated and systematic weed monitoring programme. **Biocide** use for nematode control.
  - Hill seeding, lodging resistant cultivars can help to overcome lodging.
  - Integrated management as well as bio-technological and genetic approaches may help resolve insect, pest and disease issues.
- **Industry Perspective:**
  - Recognized as a technological advancement in rice cultivation, creating opportunities for businesses involved in seeds, fertilizers, pesticides, and farm machinery.
  - Aligns with global sustainability goals, appealing to environmentally conscious stakeholders.
  - Economic viability for farmers and the agricultural value chain is evaluated.
- **Government Support and Policies:**
  - Support from government policies and procurement systems is crucial.
  - Synergies between Central and state government policies are needed for effective transition to DSR.

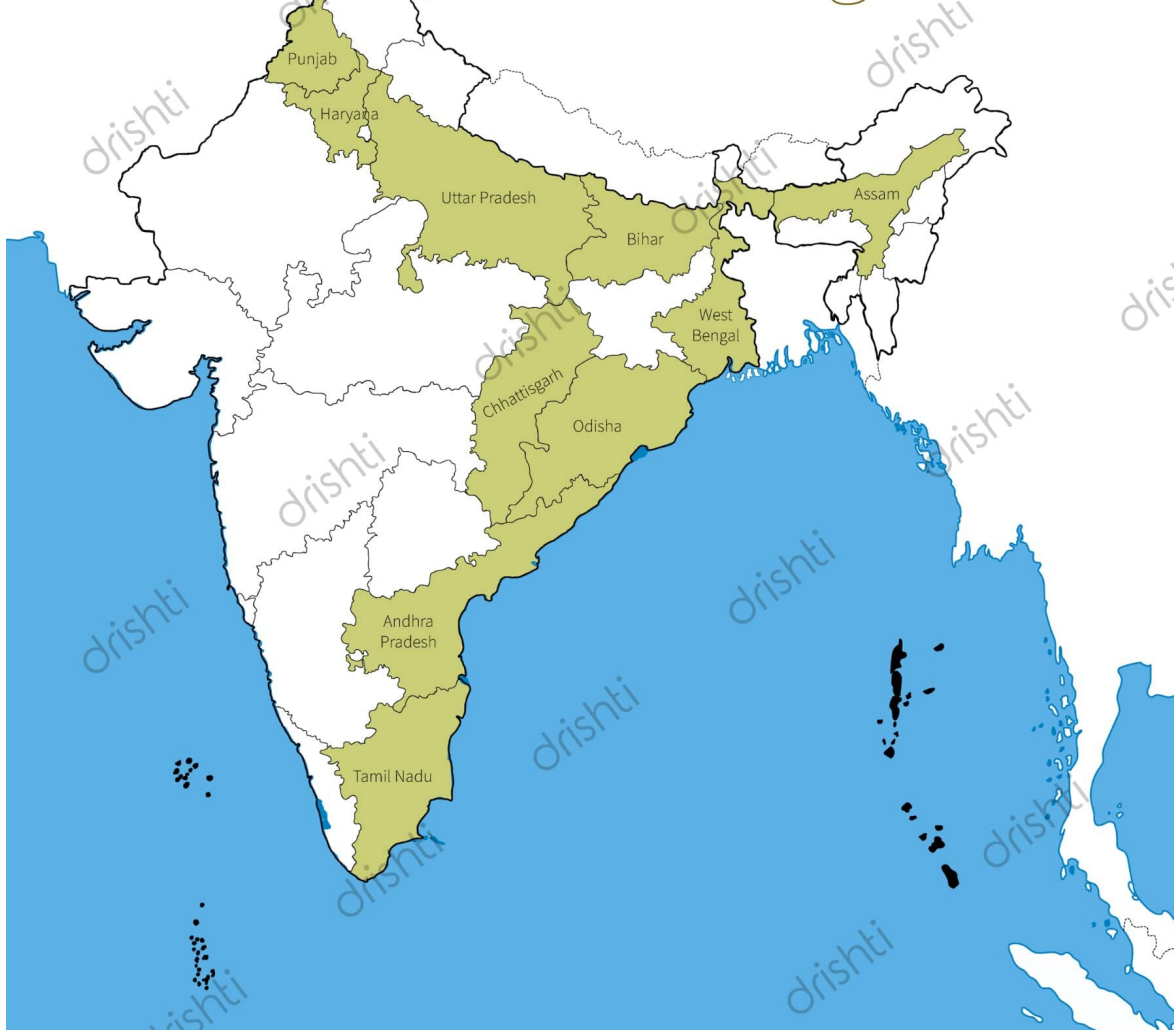
## Note

- FSII is an industry body of the R&D-based plant science industry, engaged in the production of high-performance quality seeds for food, feed and fibre in India.

## Rice

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# Major Rice Producing States



- **Temperature:** Between 22-32°C with high humidity.
- **Rainfall:** Around 150-300 cm.
- **Soil Type:** Deep clayey and loamy soil.
- **Top Rice Producing States:** West Bengal, Punjab, Uttar Pradesh, Andhra Pradesh, and Bihar.
- It is the **staple food crop of the majority** of Indian people.
- India is the **second largest producer of rice in the world after China**.
- In states like **Assam, West Bengal and Odisha**, three crops of paddy are grown in a year. These are **Aus, Aman and Boro**.
- [National Food Security Mission](#), [Hybrid Rice Seed Production](#) and [Rashtriya Krishi Vikas Yojana](#) are few government initiatives to support rice cultivation.

**UPSC Civil Services Examination Previous Year Question (PYQ)**

**Prelims**

**Q. What is/are the advantages/advantages of zero tillage in agriculture? (2020)**

1. Sowing of wheat is possible without burning the residue of the previous crops.
2. Without the need for a nursery of rice saplings, direct planting of paddy seeds in the wet soil is possible.
3. Carbon sequestration in the soil is possible.

**Select the correct answer using the code given below:**

- (a) 1 and 2 only  
(b) 2 and 3 only  
(c) 3 only  
(d) 1, 2 and 3

**Ans: (d)**

**Mains:**

**Q.1** How is science interwoven deeply with our lives? What are the striking changes in agriculture triggered off by science-based technologies? **(2020)**

**Q.2** Sikkim is the first 'Organic State' in India. What are the ecological and economical benefits of Organic State? **(2018)**

**Q.** How far is Integrated Farming System (IFS) helpful in sustaining agricultural production? **(2019)**

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