

# CROP DIVERSIFICATION IN INDIA: A STUDY

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## Abstract

*Traditionally less profitable crops are abandoned in favour of more lucrative ones as a result of crop diversification in India. The genetic and phenotypic variation among cultivars grown by farmers is referred to as "crop diversity." Varieties of crops can differ in obvious ways, such as in height, branching pattern, flower colour, fruiting time, seed size, etc., but also in less evident ways, such as in how they react to heat, cold, drought, or even how resistant they are to a particular chemical. Pests and diseases. Part of India's economy relies heavily on the agricultural industry. India is home to a wide range of agricultural production. Post-Green Revolution crop production strategies rely heavily on cutting-edge agricultural technology. The wide range of Indian crops is reflected in this study. This study will cover all aspects of the crop, including its many possible variants (in terms of height, branching pattern, flower colour, fruiting time, seed size, etc.).*

## Paper Identification



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## INTRODUCTION

There are somewhere in the neighbourhood of a billion people living in India. More than two-thirds of India's people call rural areas their home, and the majority of them work in agriculture. Small ranch holdings are indicative of Indian agriculture. The typical farm is only 1.57 ha in size. Nearly half of all farmland is produced by ranchers, however the vast majority of these farmers own less than four hectares of land. On the other hand, only 1.6% of the ranchers own and actively farm an area larger than 10 ha, even though they use 17.4% of all developed land. Numerous horticulture items are manufactured because of the wide range of agro-climatic conditions present in the country. These can be broadly classified into two groups: crops grown for human consumption and crops grown for commercial purposes. In the past 50 years, our strategies have been grounded in "faith" in foodgrains as a result of the challenge of providing for our massive population and the memory of food shortages in the pre-freedom era. Sixty-six percent of the completely developed area is devoted to food crop production (cereals and heartbeats). At the same time, commercial farming established for a variety of reasons during the pre-autonomous period also flourished during the post-free time period. In addition to serving the domestic

market, commercial agriculture has provided a sizable number of jobs in the country's foreign trade.

Genetic and phenotypic variation among cultivars grown in a given region is what we mean when we talk about crop variety. Varieties of crops can differ from one another in obvious ways, such as height and spread, leaf shape and colour, flower and fruit timing, and seed size, to more nuanced ways, such as how they handle heat, cold, and drought. Different varieties can be distinguished by a wide range of factors, including nutritional value, ease of preparation, and overall flavour. In addition, if a desirable trait is absent from a crop, it is often present in a related wild plant that shares many of the same characteristics but is not currently being cultivated. Developing conditions also contribute to crop variation; for example, a crop planted in nutrient-poor soil would likely have fewer mature fruits than one planted in fertile soil. Hereditary differences can also contribute to the collected plant's diversity; for example, a crop may exhibit early development or disease resistance. These traits are of particular significance since they are passed down from generation to generation and ultimately determine the overall quality and future potential of a crop. Plant breeders can cultivate new crop varieties to match specific conditions by pooling together desirable traits from several hybrids.

#### **Indications of the health of India's crop diversity**

The Indian quality community is one of the world's 12 uber diversity zones due to its extremely diverse environment, terrain, and vegetation. A small number of agricultural plants and their uncultivated progeny can produce an abundance of variation. India has domesticated over 25 different types of crops. More than 18,000 different species of higher plants have been identified there, including 160 major and minor crop species and 325 members of their wild family. Clans in the area tend to misuse the about 1,500 wild

plant species that can be eaten. There are 145 different kinds of tubers and roots, 521 different kinds of leafy greens, 101 different kinds of buds and flowers, and 647 different kinds of seeds and nuts among these. Also, over 9,500 plant kinds used for ethnotherapeutic reasons and 3,900 multipurpose/consumable species have been recorded from the country (NAAS, 1998). Similarly, new crop introductions and cultivars have been a driving force in advancing Indian horticulture from ancient times. The existing plant variety comes from all around the world and includes native plants alongside their wild and weed relatives. Wheat, oats, maize, chickpeas, and peas are all illustrative examples of grains; potatoes, onions, cabbage, carrots, cherries, peaches, and apricots are all examples of vegetables; soybeans, sunflower seeds, and groundnuts are all examples of oilseeds; cotton is an example of a fibre plant; mint, liquorice, foxglove, Cinchona, Hyoscyamus (herb), and other species. Thus, India's vast network of crop diversity is comprised of both indigenous and highly modified exceptional arrangement of elements. The indo-Chinese-Indonesian, chinese-japanese, central and western Asian districts, and others are all within easy travelling distance of the Indian quality community. In addition, extensive privately selected diversity has emerged as a result of the historic outpouring of germplasm from the Mediterranean, Africa, and the tropical Americas. Rice, black gram, moth bean, pigeon pea, cucurbits (smooth gourd, edge gourd, pointed gourd), tree cotton, Capsularis jute, jack organic product, banana, mango, Syzygium cuminii/jamun, huge cardamom, dark pepper, and a few minor millets and therapeutic plants like Rauwolfia serpentina and Saussure lappa all have their genetic origins in More regional diversity in staple crops like mung bean, rice bean, blade bean, tomato, citrus, little cardamom, sugarcane, ginger, turmeric, tuber crops like taros and sweet potatoes, and bamboos is also highly likely due to the region's

geological proximity to the Far East or possibly the Indo-Burmese and Indo-Malayan belt.

In order to better understand the diversity of India's flora and fauna, the country has been divided into eight distinct regions: (1)the Western Himalayas, (2)the Eastern Himalayas, (3)the North-Eastern locale, (4)the Gangetic fields, (5)the Indus fields, (6)the Western Ghats, (7)the Eastern Ghats (the Peninsular areas), and (8)the Islands district, which includes the Lakshadweep and the Andaman and Nicobar gathering of The range of crops grown in these areas is more extensive and varied. Here are some specific examples of India's wide range of important crop plants:

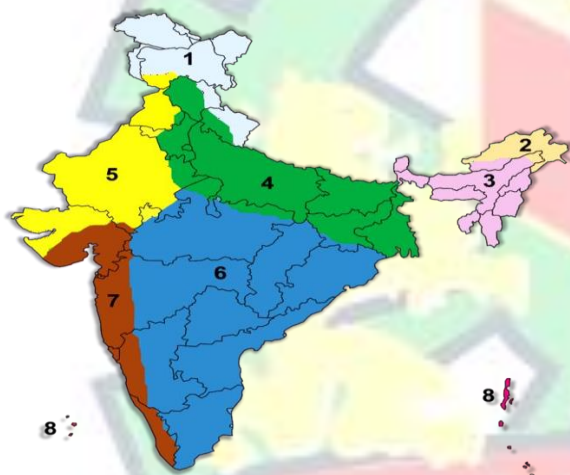


Figure 1

**i. Western Himalayas:**

- Barley, wheat, maize, buckwheat, amaranth, prosomillet, finger millet
- French bean, soybean, lentil, black gram, peas
- Pumpkin, cucumber, Allium species, ginger, Brassicae
- Pome, stone, soft and nut fruits
- Medicinal plants

**ii. Eastern Himalayas:**

- Barley, maize, buckwheat, amaranth, foxtail millet, finger millet
- French bean, soybean, cowpea, black gram, peas, scarlet bean

- Pumpkin, cucumber, Allium species, ginger, chayote, tree tomato, Brassicae
- Pome and stone fruits

**iii. North-Eastern Region**

- Rice, maize, sorghum, finger millet, foxtail millet, job's tears
- French bean, soybean, pigeon pea (perennial), black gram, rice bean, winged bean
- Pumpkin, chayote, cucumber, okra, eggplant, chilli/Capsicum species, pointed gourd, ash gourd
- Taros, yams
- Citrus sps- Lime/lemon/orange/grape fruit, banana
- Tea, tree cotton, jute, kenaf, mesta, large cardamom, ginger, long pepper, sugarcane

**iv. Gangetic plains**

- Rice, sorghum, barnyard millet, little millet/Panicum species
- Chickpea, cowpea, mungbean
- Okra, eggplant, bottlegourd, Cucumis spp., Luffa spp.
- Jack fruit, mango, lemon/lime, orange, jujube, Indian gooseberry/Emblica spp., jamun, melons
- Linseed, niger, sesame, Brassicae
- Sugarcane, mulberry

**v. Indus plains**

- Durum wheat, pearl millet
- Moth bean, cluster bean, chickpea, black gram
- Okra, Cucumis species
- Jujube, Khirni/ Mimosa sp., phalsa/ Grewia sp.
- Sesame, Taramira, Eruca sp
- Cotton

**vi. Eastern peninsular region/Eastern Ghats / Deccan plateau**

- Rice, sorghum, finger millet, pearl millet, fox tail millet, little millet, prosomillet, kodo millet
- Blackgram, greengram, cowpea, horse gram, Mucuna spp., pigeon pea, Dolichos bean, rice bean



- Taro, yam, elephant-foot yam
- Banana, mango, lemon/lime, jackfruit
- Niger, Brassicae, sesame
- Ginger, turmeric, chilli/Capsicum spp., kenaf, sugarcane, coconut, cotton

**vii. Western peninsular region/Western Ghats**

- Rice, sorghum, finger millet, small millet/Panicum spp.
- Blackgram, greengram, cowpea, pigeon pea, Dolichos bean, horse gram, sword bean
- Okra, eggplant, cucumber, chilli/Capsicum spp.
- Taros, yams, elephant-foot yam
- Jackfruit, banana, lime/lemon, orange, jamun/Syzygium spp.
- Sugarcane, black pepper, turmeric, ginger, coconut, areca nut, cotton

**viii. The Islands regions**

- Coconut, bread fruit, chilli, taros, yams, Xanthosoma spp.

**DIVERSITY AND COMPOSITION OF CROP**

Both trim specialisation and edit enhancement can result from relocating regions or modifying crop designs. Partially as a result of government efforts aimed to stimulate food creation and eradicate food imports, the region's share of foodgrains increased between 1967 and 1976. This was largely owing to the crop potential improvements created by water system expansion and Green Revolution inventions. As a result, there was an inclination toward oat-centric specialisation. Later, however, when the increased utility of foodgrains, especially cereals, made it possible to allocate more land to diverse crops like oilseeds with an exceptional stock deficiency, the earlier tendency toward specialisation gave way to generally speaking crop broadening. It is possible to observe specialisation tendencies within each crop group even within a very widespread crop broadening. For example, inside oats, the declining portion of coarse grains and expanding portion of wheat and rice

shows a rice and wheat focused specialization. Since the dietary repercussions of coarse oats have decreased essentially in tandem with their declining demand brought on by an inexorably lowering wage level, specialising in this area has become possible within the attainment of independence, primarily through a growing creation of wheat and rice. However, inside oilseeds, despite groundnut really having a substantial region share, the expansion of region under rapeseed and mustard, sunflower, and soybean demonstrates a constant primary shift prompting improvement within the oilseed region. Despite being framed in regional terms, the issue of crop diversification is expected to be significant due to the effects it has on the stock interest equilibrium of primary crops and agricultural harvests. For instance, the concentrate on rice and wheat has led to an increase in the stock of rice and wheat while coarse oats have been depleted. Changes in the pay structure have reduced demand for coarse grains while increasing demand for wheat and rice, making it imperative to maintain an appropriate stock level of each in order to maintain a steady supply of interest. Similar lines of reasoning can be extrapolated to other crops where, in addition to domestic interest, international interest and supply also accept important. While the non-food-grains category has shown a growing propensity to distinguish with an enhanced spatial equilibrium, the food-grains category has clearly showed a growing tendency towards specialisation throughout the Green Revolution era due to an unequal area synthesis. However, during 1976-97 the non-foodgrains class has additionally found the specialisation propensity and region irregularity that portrayed foodgrains all through the whole period. The justification the specialisation propensity inside foodgrains is somewhat clear considering the declining region portion of coarse cereals and the expanding region portion of rice and wheat. A similar explanation for the observed specialisation tendencies in non-foodgrains can be found in the shifting regional

composition of crops. Based on the data in Tables 2 and 3, we know that oilseeds and other commercial crops have grown in importance to local economies, particularly after the Green Revolution, when the rise in production costs made cost- and market-responsive farming an inevitable consequence of achieving food independence. But it's important to remember that oilseeds are more specialised and have better spatial balance. While oats show a propensity for specialisation within the food grain category and an increasing clumsiness in their spatial organisation, beats show a propensity for expansion and a diminishing asymmetry. This final result is caused by the gradual contraction of the dominant heartbeat regions, such as those containing gramme, to make room for less prominent heartbeats such as pigeon pea. It's important to note, too, that the expansion and regional parity achieved by beats has occurred together with a diminished region share. Flavors stand out among non-foodgrain crops because of their increasing propensity towards expansion and decreasing spatial unevenness. The trend toward specialisation in the production of fibres, green vegetables, other field crops, and manor crops became apparent, especially after 1986/87.

### **DIVERSITY AND THE ECONOMY**

Agriculture is the economic establishment for the majority of the nations particularly for agricultural nations like India the wellspring of financial development. Development is most quick where horticultural efficiency has risen the most and the converse is likewise obvious. Development in horticulture, albeit useful for the more extensive economy, benefits for the most part poor people and by giving moderate food grains these advantages reach out past the 70% of the world's least fortunate of the helpless who live in provincial regions and for whose jobs agribusiness stays focal. Guaranteeing agribusiness to assume this crucial part requires a

scope of upgrades including: the developing of higher worth crops, advancing worth adding exercises through improved preparing, growing admittance to business sectors and bringing down food costs through expanding creation, handling and showcasing productivity, especially for resource and low pay cultivating families. Basic to every one of these potential arrangements is crop variety – the variety that empowers ranchers and plant raisers to create higher cropping, more useful assortments having improved quality attributes needed by ranchers and wanted by shoppers. They can raise assortments more qualified to specific preparing strategies or store longer or can be moved with negligible wastage. They can deliver assortments that oppose bugs and infections and are dry season open minded, giving more assurance against crop disappointment and better protecting helpless ranchers from hazard. Agribusiness' part in battling destitution is perplexing, however without the hereditary variety found inside crops, it can't satisfy its latent capacity.

### **GOVERNMENT POLICIES**

Considering the significance of crop enhancement in the by and large formative system in Indian agribusiness, the public authority of India has taken a few drives for farming improvement all in all and crop broadening specifically. These drives are as per the following:

1. Launching a Technology Mission for the Integrated Development of Horticulture in the Northeastern Region: The program will build up compelling linkages between research, creation, expansion, post-gather the board, handling, advertising and trades and achieve a fast advancement of farming in the district.
2. Implementing National Agriculture Insurance Scheme: The plan will cover food crops and oilseeds and yearly

- business and cultivation crops. Little and peripheral ranchers are qualified for 50% endowment under the Scheme.
3. Operationalizing Technology Mission on Cotton: The Technology Mission will have separate Mini-Missions on innovation age, item backing and expansion, market foundation and modernization of ginning and squeezing units.
  4. Seed Bank Scheme: About 7-8 percent of confirmed seeds created in the nation will be kept in support stock to meet any inevitabilities emerging out of dry spell, floods or some other type of common cataclysms.
  5. Cooperative Sector Reforms: Amendment to the National Cooperative Development Corporation (NCDC) Act, 1952, and Replacement of the Multi-State Cooperative Societies (MSCS) Act, 1984.
  6. Provision of Capital Subsidy of 25% for development/modernization/extension of cold stockpiles and stockpiles for green produce.
  7. Creation of Watershed Development Fund: At the National level for the improvement of Rainfed lands.
  8. Strengthening Agricultural Marketing: Greater consideration regarding be paid for advancement of a complete, effective and responsive showcasing framework for homegrown promoting just as fares by guaranteeing legitimate quality control and normalization.
  9. Seed Crop Insurance: A pilot conspire on Seed Crop Insurance has been dispatched which will cover the danger factor implied underway of seeds.

All these actions will prompt crop enhancement and increment the creation and usefulness of crops.

## CONCLUSIONS

India, being an immense nation of mainland measurements, presents wide varieties in agroclimatic conditions. Such varieties have prompted the advancement of territorial specialties for different crops. Truly, areas were frequently connected with the crops wherein they practice for different agronomic, climatic, hydro-land, and even, authentic reasons. However, in the consequence of mechanical changes including bio-substance and water system advances, the agronomic specialties are going through huge changes. With the coming of water system and new ranch innovations, the crop level of most crops particularly that of grains has seen a vertical shift making it conceivable to get a given degree of crop with decreased region or more crop with a given degree of region and making in this way the condition for between crop region shift (enhancement) absent a lot of unsettling influence in crop level. Moreover, as farming become dry spell verification and development become all the more territorially adjusted, there has been a decrease in the insecurity of agrarian crop. Not with standing these new changes including the accomplishment of food independence, the region shift that tended towards grains in the quick repercussions of the Green Revolution, has begun moving the other way, i.e., from cereals to non-cereals.

The region under business crops has nearly multiplied over the most recent thirty years. Among the foodgrain crops, the region under predominant cereals, i.e., rice and wheat, is expanding; while that of coarse cereals (millets) is on decrease. The region portion of jute and associated strands has likewise gone down significantly. Like some other economy, the portion of agribusiness in the GDP is additionally declining in India. Expansion in pay from the farming area, further development of non-crop sub-areas inside agribusiness; quicker development of non-food grain crops; and



quicker development of unrivaled cereals among the food grains are for the most part occurring, yet the speed of such change is very lethargic. A sped up speed of expansion to make positive import of higher pay, higher work and preservation and proficient utilization of normal assets underscores the requirement for productive approaches, particularly in mechanical turn of events, specific monetary changes and institutional change. A procedure of pivotal significance is development improving non-ranch exercises. This calls for interest in country foundation and ability upgradation and it additionally infers a cautious assessment and change of full scale strategies, which impact the general benefit of various exercises and thusly decide the nature and speed of broadening. To guarantee social value, approaches on underlying change and changes should give extraordinary consideration to the band of peripheral and little ranchers and rural workers.

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