



A HAND BOOK

PAST AND PRESENT SCENARIO OF INDIAN AGRICULTURE



JV'n Dr. Brij M. Upreti

JAYOTI VIDYAPEETH WOMEN'S UNIVERSITY, JAIPUR

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AGRICULTURE

Volume I

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PREFACE

Writing this book has been fascinating and extremely rewarding. Authors would like to thank a number of people who have contributed to the result in many different ways:

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Dated:

Authors

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CHAPTER 1:

AGRICULTURE HERITAGE IN INDIA

Our heritage is exclusive than the other civilization. As a subject of India, we have a tendency to should feel proud regarding our wealthy cultural heritage. Agriculture in India is not of recent origin, however contains a long history qualitative analysis back to New Stone Age of 7500-4000 B.C.

Building on native data and knowledge, these ingenious agricultural systems replicate the evolution of humanity, the range of its data, and its profound relationship with nature. These systems have resulted not solely in outstanding landscapes, maintenance and adaptation of worldwide important agricultural diverseness and resilient ecosystems, but, above all, within the sustained provision of multiple product and services, food and resource security for countless area people members and autochthonic peoples, well on the far side their borders

Need and importance for learning Agricultural Heritage:

1. Our agriculture has base of hereditary property practices passed from one generation to other generation.
2. Additionally agriculture in India is not associate occupation; it is the way of life for several Indian populations.
3. Hence the current day generation ought to bear in mind regarding our ancient and ancient agricultural systems and practices.
4. India has created tremendous progress in agriculture and its allied fields; however the stress on intensive use of inputs while not considering their adverse impact of future basis has created many issues associated with property of agriculture.
5. Irrational use of chemical fertilizers, pesticides and exploration of natural resources is threatening the agro eco systems.
6. Soil is obtaining impoverished, water associated air obtaining impure and there is an increasing erosion of plant and animal genetic resources. Therefore, attention in currently shifting to property type of agriculture.

7. The autochthonic technical data (ITK) provides insight into the property agriculture, as a result of these innovations are carried on from one generation to a different as a family technology.
9. It is imperative that we have a tendency to collect, document and analyze these technologies so the scientific principle/basis behind them may well be properly understood. Once this done, it will be easier for us to any refine and upgrade them by mixing them with the trendy scientific technology.

Our agriculture has base of hereditary property practices passed from one generation to different generation. And additionally agriculture in Republic of India isn't associate occupation; it is the way of life for several Indian populations. Therefore the current day generation ought to bear in mind regarding our ancient and ancient agricultural systems and practices. This can modify us to create the longer term analysis strategy additionally.

The autochthonic technical data (ITK) provides insights into the property agriculture, as a result of these innovations are carried on from one generation to a different as a family technology. There square measure many samples of valuable ancient technologies in Republic of India however sadly these little native systems square measure dying out. It is imperative that we have a tendency to collect, document and analyze these technologies so the scientific principle/basis behind them may well be properly understood. Once this done, it'll be easier for us to any refine and upgrade them by mixing them with the trendy scientific technology.

List of accessible Documents on agriculture throughout ancient and medieval amount:

1. Rigveda (c.3700 BC)
2. Atharvaveda (c. 2000 BC)
3. Ramayana (c.2000 BC)
4. Religious writing (c.1400 BC)
5. Krishi-Parashara (c.400 BC)
6. Kautilya's Artha-sastra (c.300 BC)
7. Sangam literature (Tamils) (200 BC-100 AD)
8. Chakrapani Mishra's Viswavallbha (c.1580 AD)

9. Dara Shikoh's Nuskha Dar Fanni-Falahat (c.1650 AD)
10. Caste Jaichand's farm (1658-1714 AD)
11. Anonymous Rajasthani Manuscript (1877 AD)
12. Watt's lexicon of Economic product of Republic of India (1889-1893 AD).

CHAPTER 2 :

ANCIENT AGRICULTURAL

Chronology of Agricultural technology development in India Agriculture is broadly classified in to five different periods before India's independence.

1. Early history (Before 1500 BCE)
2. Vedic period – Post Maha Janapadas period (1500 BCE – 200 CE)
3. Early Common Era – High Middle Ages (200–1200 CE)
4. Late Middle Ages – Early Modern Era (1200–1757 CE)
5. Colonial British Era (1757–1947 CE)

[Note: BCE - short for "Before the Common Era", "Before the Christian Era", or "Before the Current Era". CE - Common Era, Current Era (Christian Era is, however, also abbreviated AD, for Anno Domini)]

Early history (Before 1500 BCE)

- 9000 BCE: Wheat and barley were domesticated within the Indian landmass. Domestication of horse, sheep and goat presently followed. This era conjointly saw the primary domestication of the elephant.
- 8000-6000 BCE: Barley and wheat cultivation, together with the domestication of oxen, primarily sheep and goat—was visible in Mehrgarh (Balochistan, currently in Pakistan). Agro pastoralism in Bharat enclosed separation, planting crops in rows—either of 2 or of six—and storing grain in granaries.
- 5000 BCE: Agricultural communities became widespread in geographic region.
- 5000-4000 BCE: Cotton was cultivated. The Indus cotton trade was well developed and a few strategies employed in cotton spinning and fabrication continued to be practiced until the fashionable industrial enterprise of Bharat. A range of tropical fruit like mango and muskmelon are native to the Indian sub-continent. The Indians conjointly domesticated hemp that they used for variety of applications together with

creating narcotics, fibre and oil. The farmers of the Indus vale grew peas, sesame, and dates. Sugarcane was originally from tropical South Asia and geographical area.

- 5440 BCE: Wild Oryza rice appeared within the Belan and Ganges River vale regions of northern Bharat. Rice was cultivated within the Indus vale civilization.
- 4500 BCE: Irrigation was developed within the Indus vale Civilization. The dimensions and prosperity of the Indus civilization grew as a result of this innovation, that eventually junction rectifier to a lot of planned settlements creating use of drain.
- 3000 BCE: refined irrigation and water storage systems were developed by the Indus vale civilization, together with artificial reservoirs at Girnar.
- 2600 BCE: associate degree early canal irrigation system from Circa.
- 2500 BCE: archaeological proof of associate degree animal-drawn plough within the Indus vale civilization
- 2000 BCE: Agricultural activity enclosed rice cultivation within the geographic region and Harrappan regions.

Vedic period -Post Maha Janapadas period (1500 BCE–200 CE)

- Gupta (2004) finds it seemingly that summer monsoons might are longer and will have contained wetness in excess than needed for traditional food production. One impact of this excessive wetness would to help the winter monsoon precipitation needed for winter crops.
- In India, each wheat and barley are control to be Rabi (winter) crops and—like alternative components of the world—would have mostly trusted winter monsoons before the irrigation became widespread. The expansion of the Kharif crops would have in all probability suffered as a result of excessive wetness.
- Jute was 1st cultivated in Bharat, wherever it absolutely was wont to create ropes and cordage.
- Some animals—thought by the Indians as being very important to their survival—came to be worshiped.
- Trees were conjointly domesticated, worshiped, and venerated—Pipal and Banyanin specific.
- Others came to be familiar for his or her healthful uses and located mention within the holistic medical system writing.

- 1000–500 BCE: There are recurrent references to iron. Cultivation of a good varieties of cereals, vegetables and fruits is delineated. Meat and milk product were a part of the diet; agriculture was vital. The soil was tilled many times. Seeds were broadcasted. Fallowing and an explicit sequence of cropping were counselled. Animals dung provided the manure. Irrigation was practiced.
- 322–185 BCE: The Mauryan Empire categorised soils and created meteorological observations for agricultural use. Alternative Mauryan facilitation enclosed construction and maintenance of dams, and provision of horse-drawn chariots—quicker than ancient bullock carts.
- 300 BCE: The Greek diplomat Megasthenes, in his book Indika— provides a laic witness account of Indian agriculture.

Early Common Era – High middle ages (200–1200 CE)

- The Tamil individuals cultivated a good vary of crops like rice, sugarcane, millets, black pepper, numerous grains, coconuts, beans, cotton, plantain, tamarind and wood. Jackfruit, coconut, palm, feather palm and plantain trees were conjointly familiar.
- Systematic ploughing, manuring, weeding, irrigation and crop protection was practiced for sustained agriculture. Water storage systems were designed throughout this era.
- Kallanai (1st-2nd century CE), a dam engineered on stream Kaveri throughout this era, is taken into account the jointly of the oldest water-regulation structures within the world still in use.
- Spice trade involving spices native to Bharat—including cinnamon and black pepper—gained momentum as India starts shipping spices to the Mediterranean.
- Roman trade with Bharat followed as elaborated by the archaeological record and therefore the Periplus of the Erythraean ocean.
- Chinese sericulture attracted Indian sailors throughout the first centuries of the epoch.
- 320-550 CE: Crystallized sugar was discovered by the time of the Guptas and therefore the earliest reference of candied sugar come back from Bharat.
- 647 CE: Chinese documents make sure a minimum of 2 missions to Bharat, initiated in, for getting technology for sugar-refining.
- 875-1279 atomic number 58 : Noboru Karashima's analysis of the rural society in South Bharat throughout the Chola Empire reveals that in the Chola rule land was

transferred and collective holding of land by a bunch of individuals slowly gave thanks to individual plots of land, every with their own irrigation system.

Late middle ages – Early era (1200–1757 CE)

- The construction of water works and aspects of water technology in Bharat is delineated in Arabic and Persian works. The diffusion of Indian and Persian irrigation technologies gave rise to irrigation systems that brought regarding economic process and growth of fabric culture.
- Agricultural 'zones' were loosely divided into those manufacturing rice, wheat or millets.
- Rice production continued to dominate Gujarat and wheat dominated north and central Bharat.
- The Encyclopedia Britannica details the numerous crops introduced to Bharat throughout this era of in depth international discourse.
- 1556-1605 CE: Land management was notably robust throughout the regime of Akbar the good beneath whom scholar-bureaucrat Todar mal developed and enforced detailed strategies for agricultural management on a rational basis.

Indian crops—such as cotton, sugar, and acid fruits—spread visibly throughout geographic region, Muslim European nation, and also the geographic area.

Colonial British Era (1757–1947 CE)

- A made supply of the state of Indian agriculture within the early British era may be a report ready by a British engineer, Thomas Barnard, and his Indian guide, Raja Chengalvaraya Mudaliar, around 1774. This report contains knowledge of agricultural production in regarding 800 villages within the space around Madras within the years 1762 to 1766. This report is obtainable in Tamil within the kind of palm leaf manuscripts at Thanjavur Tamil University, and in English within the state Archives.
- 1871: Government of India created Department of Revenue, Agriculture and Commerce that shaped as base for Initiation of Agriculture in India.
- 1880: Famine Commission Report was submitted that was base for origination of Agricultural Department.
- 1881: Separate Department of Agriculture at Centre for Famine relief operations

- 1890 : Dr. J.A. Voelcker appointed as a consulting chemist from Royal Agricultural Society (England) - ordered foundation for agricultural analysis in India
- 1892 – 1903 - Appointment of Imperial Agricultural Chemist, Imperial individual} and Imperial animal scientist – Base for starting of inducting the scientist in Agriculture.
- 1901-05: to boost agricultural education, institution of Agricultural faculties at Pune, Kanpur, Sabour, Nagpur, Coimbatore and metropolis (Now in Pakistan).
- 1905 : institution of Imperial Agricultural analysis Institute (IARI) at Pusa (Bihar)•1929: supported Royal Commission on Agriculture's recommendation (1928), Imperial Council of Agricultural analysis (ICAR) was institution to conduct comprehensive analysis.
- 1931-47: Indian animal product Cess Committee, Indian Central Tobacco Committee, Indian Central Oilseeds Committee was shaped to boost analysis in numerous crops.

Republic of India (1947 onwards)

- The Grow additional Food Campaign (1940s) and also the Integrated Production Programme (1950s) targeted on food and money crops offer severally.
- 1957 : All India Coordinated Maize Improvement Project was initiated (First coordinated project) to take advantage of maize analysis (Specifically heterosis).
- Five-year plans of India—oriented towards agricultural development—soon followed
- 1963: Introduction of semi dwarf wheat varieties from Bhakra Dam (completed in 1963) is that the largest dam in India.
- 1966: Introduced semi-dwarf rice varieties TN1 & IR eight from Taiwan and Philippines Severally is created as base for revolution.
- Land reclamation, exploitation, mechanization, electrification, use of chemicals—fertilizers especially, and development of agriculture familiarized 'package approach' of taking a group of actions rather than promoting single side shortly followed underneath government supervising.
- 1979: National Agricultural {research project|scientific analysis|research} (NARP) was launched to strengthen the research capabilities of SAUs
- Following the economic reforms of 1991, vital growth was registered within the agricultural sector, that was by currently profiting from the sooner reforms and also the newer innovations of Agro-processing and Biotechnology.

- 1998: National Agricultural Technology Project (NATP) was initiated Strengthen the analysis on location specific issues Contract farming—which needs the farmers to supply crops for a corporation underneath contract—and high worth agricultural product exaggerated.
- 2006: National Agricultural Innovative Project (NAIP) was launched for finish to finish approach for determination issues.

CHAPTER 3 :

SCOPE OF AGRICULTURE

Agriculture can be expanded as:

A – Activities on the

G – Ground for

R – Raising

I – Intended

C – Crops for

U – Uplifting

L – Livelihood

T – Through the

U – Use of

R – Rechargeable

E – Energies

Agriculture is that the most vital enterprise within the world. Agriculture could be a production plant wherever the free gifts of nature like land, water, air; soil energy, etc. are used as inputs then born-again into one primary unit that's crop plants and their yield that are indispensable for men. Those primary units are consumed by animals and are born-again into secondary units like milk, meat, eggs, wool, honey, silk, etc.

- **Provides employment**

Agriculture has the contribution of 16% within the gross domestic product (GDP) of the country. The agricultural sector conjointly provides resource to simple fraction of the population. The agricultural sector is to blame for the utilization of fifty eight of country's personnel.

- **Significant contribution in country's exports**

This sector accounts for concerning 15 % of the overall export earnings and provides stuff to most the industries i.e. textiles, silk, rice, rubber, paper, flour mills, milk product industries.

- **An necessary supply of resource mobilization**

As the folks in rural areas aren't terribly made, it proves collectively of the most important markets for low-cost commodity.

- **Better Agriculture higher is that the Food Security of the country**

If the agricultural sector of a rustic is robust, it acts as-as a wall up maintaining food security and within the method, national security in addition.

- **Important allied sectors**

There are several allied sectors of agriculture like gardening, forestry, poultry, dairy, and fisheries. They need a awfully necessary role within the development the agricultural plenty. Therefore there is a desire for the balanced development of agriculture and allied sectors.

Scope of scientific discipline: Agronomy could be a dynamic discipline with the advancement of data and higher understanding of planet, atmosphere and agriculture. Scientific discipline science becomes imperative in Agriculture within the following areas.

- Identification of correct season for cultivation of big selection of crops is required that can be created potential solely by scientific discipline science.
- Correct ways of cultivation are required to scale back the value of cultivation and maximize the yield and economic returns.
- Availableness and application of chemical fertilizers has necessitated the generation of data to scale back the ill-effects thanks to excess application and yield losses thanks to the unscientific manner of application.
- Availableness of herbicides for management of weeds has light-emitting diode to development for huge information concerning property, time & methodology of its application.
- Water management practices play bigger role in gift day crisis of water demand and scientific discipline science answer to the queries 'how a lot of to

apply?’ and ‘when to apply?’ Intensive cropping is that they want of the day and correct time and house intensification not solely increase the assembly however conjointly reduces the environmental hazards.

- New technology to beat the impact of wet stress beneath land condition is explored by scientific discipline and future agriculture is depends on land agriculture.
- Packages of practices to explore full potential of recent styles of crops ar the foremost necessary aspects in crop production that can be created potential solely by scientific discipline science.
- Keeping farm implements in good condition and utilizing economical manner to nullify the current day labour crisis is any broadening the scope of scientific discipline.
- Care and disposal of farm and animal product like milk and eggs and correct maintenance of accounts of all transactions regarding farm business is governing principles of scientific discipline.

Career Opportunities in Agriculture Science & Technology Agricultural science involves analysis and development on production, processing, productivity of crops and finish product for customers. Major activities embrace up quality and amount of farming, up crop yield, minimizing labour, conservation of soil and water and gadfly management. Agriculture sector isn't solely concerning research project and development. It provides roles for college kids with business backgrounds in addition. The standard career opportunities are there in Government departments, analysis and education, nationalized banks, agri-inputs industry and Government and philosophy Agencies. The rising sectors embrace business, food process, monetary sector, retailing, rural promoting, international trade, rural credit and insurance, reposting & commodities, NGOs and KPOs. Virtually half all the professionals at intervals the agricultural sectors have gotten business connected roles. The key areas of Master in Business in Agri-Business are Agricultural promoting, Agricultural valuation, Agricultural Law, Agricultural commerce & mercantilism, Agricultural social science, Agricultural knowledge Analysis and Farm Management. The non-scientific roles embrace promoting, technical sales, mercantilism, economists, accountants, finance managers, goods traders, communication & education (social services).

Indian agricultural sector is facing some serious challenges as well. The challenges mean there are quite enough opportunities. several Agri-Tech Social Enterprises in |Asian nation

providing jobs like DuPont India, Rallies Bharat Ltd, Nuziveedu Seeds Ltd, Lemken Bharat Agro instrumentality Pvt Ltd, Advanta Ltd, Monsanto Bharat, Poabs Organic Estates, National Agro trade, Godrej Agro-vet Ltd, Rasi Seeds. Many start-ups and entrepreneurs are turning out at intervals the agricultural sector. The four Major Areas of Agri-Tech Start-ups are un-wellness and gadfly management, timely irrigation and soil health, aerial survey to observe anomalies, and packaging and transportation. Hence, persons from science and/or business background wish to try to one thing smart for the society, and have gotten the entrepreneurial creature, and then agricultural sector is for them.

CHAPTER 4 :

CROP SIGNIFICANCE AND CLASSIFICATION

Though trade has been playing a vital role in Indian economy, still the contribution of agriculture within the development of Indian economy cannot be denied. This may be measured and gauged by the subsequent facts and figures:

1. Agricultural influence on national income

The contribution of agriculture throughout the primary 20 years towards the gross domestic product ranged between 48 to 60%. Within the year 2001-2002, this contribution declined to solely concerning twenty sixth.

2. Agriculture plays important role in generating employment

In Asian nation a minimum of simple fraction of the operating population earn their living through agricultural works. In Asian nation different sectors have unsuccessful generate a lot of employment chance the growing operating populations.

3. Agriculture makes provision for food for the ever increasing population

Due to the excessive pressure of population labour surplus economies like Asian nation and fast increase within the demand for food, food production will increase at a quick rate. The prevailing levels of food consumption within these countries are terribly low and with a touch increase in the capita financial gain, the demand for food rise steeply (in different words it is expressed that the financial gain physical property of demand for food is extremely high in developing countries).

Therefore, unless agriculture is in a position to incessantly increase it marketed surplus of food grains, a crisis is preferred to emerge. Several developing countries are passing through this part and during a bid to ma the increasing food necessities agriculture has been developed.

4. Contribution to capital formation

There is general agreement on the requirement capital formation. Since agriculture happens be the most important trade in developing country like Asian nation, it will and should play a vital role in pushing up the speed of capital formation. If it fails to try to thus, the total method economic development can suffer a reverse.

To extract surplus from agriculture the subsequent policies are taken

- (i) Transfer of labour and capital from farm non-farm activities.
- (ii) Taxation of agriculture ought to be in such how that the burden on agriculture is bigger than the govt services provided to agriculture. Therefore, generation of surplus from agriculture can ultimately rely upon increasing the agricultural productivity significantly.

5. Provider of stuff to agro-based industries

Agriculture provides raw materials to varied agro-based industries like sugar, jute, cotton textile and vanaspati industries. Food process industries are equally captivated with agriculture. thus the event of those industries entirely relies on agriculture.

6. Market place for industrial products

Increase in rural buying power is extremely necessary for industrial development as two- thirds of Indian population sleep in villages. When revolution the buying power of the massive farmers accrued because of their increased financial gain and negligible tax burden.

7. Influence on internal and external trade and commerce

Indian agriculture plays a significant role in internal and external trade of the country. Internal interchange food-grains and different agricultural merchandise helps within the growth of service sector.

8. Contribution in government budget

Right from the primary 5 Year set up agriculture is taken into account because the prime revenue collection sector for the each central and state budgets. However, the governments earn large revenue from agriculture and its allied activities like husbandry, poultry farming, fishing etc. Indian railway together with the state transport system conjointly earn revenue as freight charges for agricultural merchandise, both-semi finished and finished ones.

9. Need of labour force

A large range of proficient and skilled labourers are needed for the development works and in different fields. This labour is equipped by Indian agriculture.

10. Greater competitive advantages

Indian agriculture encompasses a price advantage in many agricultural commodities within the export sector as a result of low labour prices and self-sufficiency in input provide.

CROP CLASSIFICATION

Field crops are non-woody plants grown up in cultivated fields below additional or less in depth system of culture. Agronomical classification of various field crops is given as below

ACCORDING TO BIOLOGY ASPECTS

(A) Monocotyledons: A plant having only 1 cotyledon or seed leaf in every of its seed. Such plants have a shallow roots, slender leaves and tillering ability. e.g., Families:

- (1) Poaceae: e.g. Cereals i.e. paddy, wheat, sorghum, cereal, maize, sugarcane, etc.
- (2) Zingiberaceae: e.g. Ginger
- (3) Lily family: e.g. Onion

Dicotyledons : A plant having 2 cotyledon or cotyledons in every of its seed. Such plants have a deep taproots, broad leaves and branching ability. e.g., Families

- (1) Malvaceae: e.g. cotton, okra
- (2) Cruciferae family : e.g. cabbage, mustard
- (3) Solanaceae: e.g. tobacco, potato, brinjal
- (4) Leguminosae: e.g. groundnut, pigeon pea, gram, pea, mung bean, urd bean
- (5) Tiliaceae: e.g. jute, sun hemp
- (6) Linaceae: eg. linseed
- (7) Euphorbiaceae : e.g. castor
- (8) Composite : e.g. sunflower
- (9) Chenopodiaceae: e.g. sugar beet

ACCORDING TO SEASON OF GROWTH

(A) Kharif or Monsoon: Crops are grown up within the month of Gregorian calendar month - Gregorian calendar month. e.g. Paddy, pigeon pea, groundnut, sorghum, etc.

- (B) Rabi or winter: Crops are grown up within the month of Gregorian calendar month - November. e.g. wheat, gram, mustard, cumin, fenugreek, onion etc.
- (C) Summer or Hot weather: Crops are grown up within the month of February - Gregorian calendar month. e.g., paddy, green gram, black gram, cowpea, etc.

ACCORDING TO LIFE PERIOD

- (A) Annuals: A plant that grows from seed, complete its life cycle and dies throughout the season or same year. e.g. cereal crops.
- (B) Biennials: A plant that completes its life cycle in 2 seasons or year. Throughout initial season/year, they complete its vegetative growth and through second season/year they complete its procreative growth. eg. Sugarcane, sugar beet, banana, onion.
- (C) Perennial: A plant that completes its life cycle in additional than 2 seasons/years. e.g., agave, elephant foot.

ACCORDING TO CULTURAL PRACTICES

- (A) Irrigated crops: e.g. Sugarcane, paddy, banana etc.
- (B) Dry farming crops; the crop that square measure fully grown underneath natural precipitation. e.g. sorghum, bajra, groundnut, nagli, etc.
- (C) Sole crops: One crop selection fully grown alone in pure stands at traditional density.
- (D) Monocropping: The repetitive growing of identical crops on identical piece of land. e.g. groundnut in Saurashtra region.
- (E) Intercropping: Growing 2 or a lot of crops at the same time on identical piece of land in numerous rows e.g., sorghum + black gram, pigeon pea + ground nut, sugarcane + onion, etc.
- (F) Mixed cropping: Growing 2 or a lot of crops at the same time on identical land without/ no matter to definite row pattern. e.g. sorghum + inexperienced gram+ black gram.

ACCORDING TO SCIENCE OR ECONOMICAL ASPECTS

(A) Food crops

- (i) Cereals : e.g. paddy, wheat, maize, sorghum, bajra, nagli, etc.

- (ii) Pulses : e.g. gram, green gram, black gram, pigeon pea, cowpea, indian bean, moth bean.
- (iii) Legumes : e.g. groundnut, soybean, legume
- (iv) Edible oil seeds : e.g. groundnut, seasamum, sunflower, mustard, safflower
- (v) Fruit crops : mango, banana, sapota, guava, papaya, ber, grape citrus crop, etc.
- (vi) Vegetable crops :
 - (a) bifoliate : cabbage, fenugreek, palak
 - (b) Fruit : tomato, okra, brinjal
 - (c) Root : radish, carrot
 - (d) Tuber/Stem : potato, sweet potato, ginger, turmeric
 - (e) Bulb : onion, garlic
 - (f) Flower : cauliflower
 - (g) Pod : haricots verts, pigeon pea, cowpea, Indian bean

(B) Non-food crops

- (i) Forage/fodder : Medicago sativa, berseem, hybrid nappier grass
- (ii) Fibre crop : cotton, jute, sun hemp
- (iii) Non edible oilseeds : castor, linseed
- (iv) Sugar crop : sugarcane, sugar beet
- (v) Dyes : false saffron, indigo
- (vi) Narcotics : tobacco, coffee, tea, opium, poppy, chicory
- (vii) Drugs/ medicative : isabgul, jethimadh, senna, kariyatu
- (viii) Spices & condiments: cardamom, cumin, black pepper, coriander, fennel, fenugreek

(C) Special purpose crops

- (i) Row crops: Crops that square measure fully grown in rows with uniform spacing throughout the sector. e. g. cotton, castor, sorghum, etc.

- (ii) Support crops: certain fast growing crops work as supporter to vine crops. e.g. castor, shevri in betel vine, sorghum in cowpea/bean.
- (iii) Wind break crops: Crops that square measure fully grown on boundaries to safeguard the sector crops from wind.
- (iv) Cover crops: cowl crops square measure fully grown primarily to hide the soil and to cut back the lost of wetness and erosion by wind and water. e.g. groundnut, urinary organ bean, cowpea, mung bean.
- (v) Silage crops: Crop that square measure preserved in a very succulent condition by partial fermentation in a very tight silo pit. e.g. maize, sorghum, bajra.
- (vi) Cash crops: crop fully grown available and brings cash at once. e.g. cotton, tobacco, potato, sugarcane.
- (vii) Manure crops: Any crop that square measure fully grown and buried into the soil for raising the soil condition by the addition of organic matter. e.g. sun hemp, dhaincha, glyricidia.
- (viii) Pasture crops: differing types of vegetation found on pastures or piece of ground space that sometimes grow. e.g. dharo, zinzvo.
- (ix) Catch crops: Crop that is fully grown as substitute for the most crop that has unsuccessful on account of unfavourable condition. e.g. cowpea, sesame, green gram.
- (x) Trape crops: Crop that is fully grown on boundary of the sector for defence against cuss, insect, disease.
- (xi) Nurse crops: Crop that is employed to safeguard or nurse the opposite crops in their young stage. e.g. legume in ginger, sun hemp in sugarcane.
- (xii) Companion crops: Two crops are taken together with the aim that they are benefited to each other. e.g. maize and green gram.
- (xiii) Two or more than two crops are grown together on the same piece of land at the same time. e.g. bajra + cowpea + green gram.

CHAPTER 5 :

NATIONAL AGRICULTURAL SETUP IN INDIA

Agriculture has continually been a wanted career among students. Several of them additionally continue with the analysis add agriculture. The history of agricultural education in Asian nation are often copied back to medieval amount once study of agriculture was enclosed within the curricula of Nalanda and Takshashila Universities as a crucial subject. However, formalised courses in agricultural education began solely at the start of 20th Century once six agricultural schools were established at Kanpur, Lyalpur (now in Pakistan), Coimbatore and Nagpur in 1905, at Pune in 1907 and at Sabour in 1908 beneath the overall Universities. When the independence, the govt of Asian nation initiated an intensive coming up with method. to confirm orderly growth, the Indian Council of Agricultural analysis (ICAR), that is that the apex body for coordinative, guiding, and managing analysis and education in agriculture within the entire country, took the lead and written the primary Model Act for Agricultural Universities in Asian nation in 1966 and inspired the putting in place of exclusive State Agricultural Universities for research, extension and education support.

- Central Agricultural analysis Institute, Port Blair: CARI is remitted to supply a search base to enhance the productivity of vital agri-horticulture, farm animal and fisheries of Andaman and Nicobar Islands through adjustive and basic analysis for attaining economic independency.
- Central Arid Zone analysis Institute, Jodhpur, Rajasthan: a singular multidisciplinary analysis organization in South and South-East Asia having analysis facilities for over thirty totally different disciplines.
- Central vertebrate analysis Institute, Izat nagar, Uttar Pradesh: A premier institute within the field of poultry analysis, education, extension and coaching in Asian nation.
- Central Institute for Cotton analysis, Nagpur, Maharashtra: Its mission is to enhance production, productivity and quality of cotton through the event of ecologies for various agro climatic regions.
- Central Institute for analysis on Goats, Farah, Uttar Pradesh: A pioneer institute dedicated to the event of goats in Asian nation.

- Central Institute for analysis on Cotton Technology, Mumbai, Maharashtra: associate degree Institute engaged in analysis and development activities in cotton technology in Asian nation.
- Central Institute of Agricultural Engineering, Bhopal, Madhya Pradesh: It aims to develop applicable instrumentality and processes for modernization of agriculture utilizing animate and mechanical power sources, develop technology for reducing post harvest losses and add price to agro-produce through process.
- Central Institute for analysis on Buffaloes, Hissar, Haryana : The Institute carries out analysis on numerous aspects of buffalo improvement together with conservation of germplasm, development of optimum diets and feeding systems, improvement of fruitful potency and health management practices for augmenting milk, meat and draught.
- Central Institute of Brackishwater cultivation, Chennai, Tamilnadu: Mandated to conduct analysis for development of techno-economically viable and property culture system for fin fish and shellfish in brackish water.
- Central Institute of fresh cultivation, Bhubaneswar, Orissa: Premier analysis Institute on fresh cultivation in Asian nation
- Central Institute of Post Harvest Engineering & Technology, Ludhiana, Punjab: A nodal institute for lead researches within the space of post harvest engineering and technology applicable to the agricultural production catchments, agro-processing industries, pilot plants, industrial liaison, technology transfer and national and international cooperation to fulfill national desires.
- Central Marine Fisheries analysis Institute, Kochin, Kerala: The Premier analysis Institute dedicated to Marine Fisheries analysis.
- Central Plantation Crops analysis Institute, Kasaragod, Kerala: Mandated to develop applicable production, protection and process technologies for coconut, arecanut and cocoa through basic and applied analysis.
- Central Potato analysis Institute, Shimla, Himachal Pradesh: Mandated to undertake basic and strategic analysis for developing technologies to reinforce productivity and activity of potato in Asian nation

- Central analysis Institute for Jute and Allied Fiber, Barrackpore, West Bengal Mandated to the development of jute (*C.Capsularis* and *C.olitorius*) and allied fibre crops like mesta (*H.Cannabinus* and *H.Sabdariffa*), sunnhemp, (*Crotalaria Juncea*), China grass (*Boehmeria nivea*) sisal (*Agave sisalana*) and flax (*Linum usitatissimum*) for yield and quality.
- Central Rice analysis Institute, Cuttack, Orissa: Its main objective is to hold out analysis on basic and applied aspects altogether disciplines of rice culture so as to plan ways in which and suggests that of optimising square measure yields of rice.
- Central Soil Salinity analysis Institute, Karnal, Haryana: Its mission is to get new information and understanding of the processes of reclamation and develop technologies for rising and sustaining the productivity of salty lands and waters.
- Central Tuber Crops analysis Institute, Thiruvananthapuram, Kerala: Mandated to undertake basic, strategic and applied analysis for generating technologies to reinforce productivity and utilization potential of tuber crops (other than potato).

rising challenges in agriculture sector Presently, agriculture faces several challenges like (i) Low productivity (averaging to hr of world average), (ii) decreasing gain in farming, (iii) rising quality aggressiveness beneath the pressure of economic process, (iv) poor linkage of farms with the market, (v) Low information of input agriculture, (vi) wide gap between work and land experiments, (vii) low level of mechanization and price addition(viii) provide Chain Management and products Lifecycle Management, (xi) Lack of qualified hands to deal with the new and rising challenges and deliver at grassroots level, (x) mounting threat to property arising from depleting quality of natural resources, organic phenomenon and abiotic stresses and inefficient use of agro-inputs and (xi) poorly coordinated natural disaster management system.

BIBLIOGRAPHY

Ayachit, S.M. (Tr) 2002. Kashyapiya Krishisukti (A treatise on Agriculture by Kashyapa). Agri – History Billetin No. 4. Asian – Agri History foundation, Secundrabad.

Choudhary, S.L., Sharma, G.S. and Nene, Y.L. 2000. Ancient and medievel history of Indian agriculture and its relevance to sustainable agriculture in the 21st century. Proceedings of the sumemr school held from 28 May to 17 June 1999. Rajasthan College of Agriculture, Udaipur, India

Nene, Y.L. and Choudhary, S.L. 2002. Agricultural heritage of India. Asian Agri – History foundation, Secundrabad.

Randhawa, M.S., 1980 – 86. A histroy of Agriculture in India. Vol. I, II, III and IV. Indian council of Agricultural Research, New Delhi.

Raychaudhuri, S.P. 1964. Agriculture in ancient India. Indian council of Agricultural Research, New Delhi.

Razia Akbar (Tr) 2000. Muskha Dar Fauni – Falahat (The art of agriculture). Agri – History Bulletin No. 3. Asian Agri. History foundation, Secundrabad.

Sadhale Nalini (Tr) 1996. Surapala's Vrikshayurveda (The science of plant life). Asian. History Bulletin No. 1. Asian – Agri – History foundation, Secundrabad.

Sadhale, Nalini Tr) 1999. Krishi – Parashara (Agriculture by Parashara). Agri-Histroy Bulletin No. 2. Asian Agri – History foundation, Secundrabad, India.



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