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Review Article

PRESENT AGRICULTURAL INFRASTRUCTURE OF WEST BENGAL IN THE WAY OF AGRICULTURAL DEVELOPOMENT

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A B S T R A C T

West Bengal ranks first in paddy and vegetable production in the country. It stands second in potato production (after Uttar Pradesh). It is also the leading producer of jute, pineapple, litchi, mango and loose flowers. Cultivation of pulses, oilseeds and maize is also picking up fast. The emerging issues of agriculture in West Bengal begin with the problem of agricultural and rural infrastructure. The problem of agricultural infrastructure includes problem of irrigation, soil conservation, and soil testing services. Besides, it also includes problem of land, labour, capital, modern agricultural inputs and preservation. The other major problems faced by the farmers of the State include environmental problem, and problem of production, production costs, problem of market infrastructure and price fluctuations. To meet these challenges a sound infrastructural condition is needed. In this respect, it is very essential to know what the existing agricultural infrastructural condition in the state is. Therefore, the objective of the present study was to focus and analysis on agricultural infrastructure condition of the state, West Bengal. According to the study the major agricultural infrastructures of the state are – (1) State agricultural universities i.e. BCKV and UBKV (2) West Bengal University of Animal and Fisheries Sciences (3) An institution of central university, Visva Bharati University (4) General universities with agricultural faculties-Calcutta University and Barasat Unniversity (5) IIT with faculty of agriculture-IIT, Karagpur (6) Private colleges with agriculture courses (7) Agricultural research institution under ICAR i.e. CIFRI, CRIJAF, NIRJAFT, ATARI (8) ICAR regional research stations (9) Agricultural research sub-station under ICAR institutes (10) All agricultural blocks of the states (total -335) –each block having agriculture development office (11) agriculture training institute of the state i.e. SAMETI, NSTIAM (12) all KVKs of the state (13) Public and private soil testing laboratories (14) Agricultural research station under state government (15) A school of agriculture management-i.e. TSRDAM (16) various crop boards i.e. tea, coconut etc. (17) State marketing board (18) Various sericulture entities (19) Infrastructure of watershed development (20) Seed testing laboratories (21) Various agricultural farms of state government (22) seed supplying institutions (23) Agriculture training centres (24) Infrastructure of state department of agriculture etc. Ongoing programs of respective departments need an integrated and well coordinated approach among the line departments; otherwise repetition of efforts ends up with wastage of money and energy. In this respect, the following key focus points will be-(1) Rejuvenation and restoration of natural resources (2) Increase productivity per unit of land. (3) Bridging marketing gap (4) Encourage agri – entrepreneurship (5) Create new agri– Infrastructure (6) Skill & awareness development.

INTRODUCTION

West Bengal is predominantly an agrarian State. Comprising of only 2.7% of India's geographical area, it supports nearly 8% of its population. There are 71.23 lakh farm families of whom 96% are small and marginal farmers. The average size of land holding is only 0.77 ha. However, the State is bestowed with diverse natural resources and varied agro-climatic conditions which support cultivation of a wide range of crops. The net cropped area is 52.05 lakh ha which comprises 68% of the geographical area and 92% of arable land. The cropping intensity is 184%. However, as the State is located in the humid tropic and the Bay of Bengal is close-by, it has to often face vagaries of nature like flood, cyclone, hailstorm etc. Though the State is has a surplus production of rice, vegetables and potato, a huge gap exists between the requirement and production of pulses, oilseeds and maize. Deterioration of soil health due to imbalance in the use of chemical fertilizers,

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paucity of suitable improved varieties of seed, inadequate farm mechanization, unorganized marketing structure etc. are major challenges to agricultural growth.The objective of the study was to focus and analysis on agricultural infrastructure condition of the state, West Bengal.

***Origin of State Agricultural Universities*:** West Bengal is essentially an agricultural state and 3/4th of its' population living in rural areas and depends on agriculture and allied occupations. Revered William Carey initiated agricultural research and other related activities in Bengal by establishing Agri-Horticultural Society during 1820. Agricultural education in Bengal was started in 1898 at Civil Engineering College, the forerunner of Bengal Engineering and Science University at Howrah. The Govt. of West Bengal established the state college of agriculture affiliated to the University of Calcutta in 1952, which was housed in a hired building popularly known as Ranikuthi. The college of agriculture was shifted to Haringhata in 1958 and came under the Jurisdiction of the Kalyani University in 1960. The State Agricultural University, Bidhan Chandra Krishi Viswavidyalaya (BCKV), the first of its kind in the State, came into existence in 1974 (separated from Kalyani University) with prime objective to deal with the multifaceted agricultural production constraints through generation of technologies and technical manpower resources. The North Bengal campus of the Viswavidyalaya got established at Pundibari, Cooch Behar at a distance of 700 KM from Mohanpur in 1979 comprising of one agricultural college and Regional Research station with similar objectives of generating improved technologies and imparting standard agricultural education befitting the ethnic, agro-climatic and socio-economic characteristics of this region.

***Bidhan Chandra Krishi Viswavidyalaya*:** The University established in 1974, has completed four decades of its existence as the pioneer institute of Agricultural Education, Research and Extension. The main objective of this Viswavidyalaya is to provide facilities for the study of Agriculture, Horticulture and Agricultural Engineering. It is also to conduct researches in these sciences and undertake the educational and extension programmes in agriculture among the rural clientele base, keeping in view the requirements of the state.

The Faculty of Agriculture: The Faculty of Agriculture consists of sixteen departments with specializations in teaching, research and extension for the development of agriculture in this state. The Departments under the Faculty are:- (1) Agronomy (2) Agricultural Biochemistry (3) Agricultural Chemicals (4) Agricultural Chemistry & Soil Science (5) Agricultural Entomology (6) Agricultural Economics (7) Agricultural Extension (8) Agricultural Meteorology & Physics (9) Agricultural Statistics (10) Animal Science (11) Agricultural Biotechnology (12) Genetics & Plant Breeding (13) Plant Pathology (14) Plant Physiology (15) Soil & Water Conservation (16) Seed Science & Technology.

***Faculty of Horticulture*:** The Faculty of Horticulture was established in 1996 with five departments namely, (1) the Department of Floriculture & Landscaping, (2) the Department of Fruits & Orchard Management, (3) the Department of Post Harvest Technology, (4) the Department of Spices & Plantation Crops, and (5) the Department of Vegetable Crops. The objective of creation of the faculty was to initiate education and training in horticulture, to conduct need based research for the development of horticulture in West Bengal and to disseminate the technology for growing horticultural crops and post harvest management of horticultural produce.

***Faculty of Agricultural Engineering*:** Agricultural Engineering plays a very great role in respect of further development of food productivity, agro-based industries, post-harvesting, food processing, Soil & Water Engineering, irrigation and Drainage etc. through the utilization of the software based latest technology. The Agricultural Engineers today are required to provide technology not only for increasing crop production but also for reducing post harvest losses and value additions through processing of produce. There are four Departments under this Faculty. The Departments are:- (1) Dept. of Farm Machinery and Power (2) Dept. of Soil and water Engineering (3) Dept. of Post-harvest Engineering (4) Dept. of Food Engineering.

***Directorate of Research*:** The Directorate of Research at Kalyani is the coordinating-monitoring headquarter of the research stations, sub-stations, units, sub-units and projects, spread over the jurisdiction of the Viswavidyalaya. A substantial number of research projects under various programmes and funding modes operate on farmers' fields (on-farm trials, FLD trials) at representative locations of three major agro-climatic regions of the State and also at other zones across West Bengal. Several experiments are conducted in a scientist-farmer participatory manner.

***Directorate of Extension Education*:** The Directorate of Extension Education in the BCKV, was created only in 1994 through upgradation of the "Field Extension Wing", which took care of mainly the farm advisory services among a few villages, surrounding the headquarter campus of the Viswavidyalaya. The upgradation attempt, though initiated quite late, was made in line with the mandate of the SAUs to organize 'first line extension" activities to complement their research. and educational role, as well as to strengthen the efforts of the state extension machinery towards transferring proven and tested technological options for increased production and productivity.

***Directorate of Farms*:** It functions in the realm of agricultural research, agricultural education and agricultural extension. The Directorate has 1340.6 acre of land distributed in 11 farms. These farms are-(1) Teaching Farm, Mohanpur (2) Central Research Farm, Gayeshpur (3) Kalyani "C" Block Farm, Kalyani (4) Kalyani District Seed Farm (ABC), Kalyani (5) Kalayani District Seed Farm (D) (6) Regional Research Sub - Station, Chakdah (7) Block Seed Farm, Canning (8) Regional Research Sub - Station, Sekhampur (9) Regional Research Sub- Station, Raghunathpur (10) Jhargram Farm, Sevayatan (11) Balindi Teaching and Research Complex, Mohanpur.

College of Agriculture, Burdwan (An Extended Campus Of Bckv): As a step forward towards the dream of modern agriculture training and education, one College of Agriculture (as an extended campus of BCKV) has been established at the Agriculture Farm, Gate No. 1, Kalna Road, Burdwan, W.B - 713101 and it has started functioning from 21st July, 2014, initially with the strength of 31 students, 7 teachers and 5 office staff. The college at present like a new baby of BCKV. It has started with only one faculty i.e., agriculture in regard to the studies at undergraduate level. Apart from teaching, the recruited teachers are also involved with need based research

and extension activities for transfer of technologies to the stakeholders and farmers.

College of Agriculture, Bankura (An Extended Campus of Bckv): College of Argiculture, Susunia, Bankura is an extended campus of Bidhan Chandra Krishi Viswavidyalaya has been established on 20th July, 2015. Beside education programme, the College has been established with view to make farmers field cultivable by providing technology, knowledge, training and planting materials. College of Agriculture has been established at Kara Daptor Land, ITI college, near B.D.O office, Chhatna, Bankura, Pin-722132 and it has started functioning from 21th July, 2015, initially with the strength of 27 students, 11 teachers and 2 office staff.

***Admission*:** Applications are invited for admission to 1st year B.Sc. (Ag.) Hons . course (4 years) for Mohanpur, Burdwan & Bankura and B.Sc. (Hort.) Hons. course (4 years) for Mohanpur Campus, Bidhan Chandra Krishi Viswavidyalaya. Candidates can only apply on-line through the University website (www.bckv.edu.in). Only single application shall cover for B.Sc.(Ag.)Hons. and B.Sc. (Hort.) Hons. courses of this Viswavidyalaya. Seat allotment pattern in general as well as in particular for the academic session 2017-2018 are indicated.

Allotment of seats in BCKV for admission in academic session 2017-2018 (table-1)

Table 1 Allotment of seats in BCKV for admission in academic session 2017-2018

Name of courses	Name of campus	Total
B.Sc. (Ag.) Hons .	Mohanpur	111
	Burdwan	32
	Susunia, Bankura	32
B.Sc. (Hort.) Hons.	Mohanpur	32
B.Tech. (Ag. Engg.) Hons.	Mohanpur	27

Admission to 1st year B.Tech. (Ag. Engg.) Hons.course under the Faculty of Agricultural Engineering is made through West Bengal Joint Entrance Examination. Additional 20 seats for B.Sc. (Ag.) Hons ., 6 seats for B.Sc. (Hort.) Hons. at Mohanpur are kept reserved for admission through All India Entrance Examination conducted by Indian Council of Agricultural Research(ICAR). Two (2) seats for B.Sc. (Ag.) Hons. for Mohanpur Campus are kept reserved for the students belonging to Hill Tribe Quota sponsored by Darjeeling Gorkha Hill Council, Darjeeling, West Bengal.

***Uttar Banga Krishi Viswavidyalaya*:** Uttar Banga Krishi Vishwavidyalaya is an agricultural university in Pundibari about 15 km northwest of Cooch Behar, West Bengal. It has faculties of horticulture, agriculture and agricultural engineering. The northern part of West Bengal is endowed with diverse natural resources like forest, economic plant resources, agro-ecosystem, etc., with extremely responsive rural communities. It comprises old alluvial, terai and hill zones distributed in six northern districts of West Bengal (Cooch Behar, Jalpaiguri, Darjeeling, Malda, Dakshin Dinajpur and Uttar Dinajpur). Keeping this perspective in view, the state government established a satellite campus of the State Agriculture University, Bidhan Chandra Krishi Viswavidyalaya at Pundibari, in Cooch Behar district in 1979. Later, the state government further strengthened this satellite campus of Bidhan Chandra Krishi Viswavidyalaya. They ultimately decided to upgrade the campus to a full-fledged state agricultural university in July 2000, covering all of North Bengal. The Uttar Banga Krishi Viswavidyalaya was established by West Bengal Act XX of 2000 and started functioning on 1 February 2001.

***Faculty of Agriculture*:**

The Faculty of Agriculture under the newly established University, Uttar Banga Krishi Viswavidyalaya started its journey with the aim to impart education on agriculture, to generate the knowledge through basic and applied research, to develop and socialize the location specific agricultural technologies by offering the degrees of B.Sc (Ag) Hons for four years, M.Sc(Ag) for two years and Ph.D. for 3 years, by complying the research mandates and extension mandates. The Departments are –(1) Agricultural Economics (2) Agricultural Entomology (3) Agricultural Extension (4) Agricultural Statistics (5) Agronomy (6) Biochemistry (7) Genetics and Plant Breeding (8) Plant Pathology (9) Soil Science and Agril. Chemistry (10) Seed Science & Technology.

Faculty of Horticulture: *The Faculty of Horticulture of UBKV consists of five academic departments. The departments are:- (1) Pomology and Post Harvest Technology (2) Vegetable and Spice Crops (3) Floriculture, Medicinal and Aromatic Plants (4) Plantation Crops and Processing (5) Forestry.*

Faculty of Technology (Faculty Of Agricultural Engineering): Agricultural Engineering education integrates engineering and agricultural science to improve production of agricultural and horticultural crops through efficient utilization of natural resources and conserving the same for future use. The U.G. courses of Agricultural Engineering comprises various disciplines like (1) Agricultural Science, (2) Basic Science and Humanities, (3) Computer Science, (4) Civil Engineering, (5) Mechanical Engineering, (6) Electrical Engineering, (7) Social Sciences, (8) Farm Power and Machinery, (9) Soil and Water Conservation Engineering, (10) Irrigation and Drainage Engineering, and (11) Process and Food Engineering.

***Directorate of Research*:** The primary goal of research in the University is to generate technologies for increasing agriculture productivity and farm returns in consistence with the requirement of the state befitting socio-economic conditions of the farming community in a sustainable manner. The University has a broad based research programme executred by the Regional Research Stations (RRS) and Sub-Stations (RRSS) spreaded over three agro-climatic zones where the scientists of various disciplines striving together to meet the research mandate. Regional Research System of the University: (1) RRS, Terai Zone, Pundibari (2) RRSS, Terai Zone, Kharibari (3) RRS, Hill Zone, Kalimpong (4) RRSS, Hill Zone, Pedong (5) RRS, Old Alluvial Zone, Majhian (6) RRSS, Old Alluvial Zone, Manikchak.

***Directorate of Extension Education*:** The University had owned the privilege to activate its extension function through one remandated Krishi Vigyan Kendra supported by the ICAR at main campus at Pundibari, Cooch Behar since its very inception. Accordingly, the Directorate of Extension Education was established since its inception in 2001 to cater the 'research & extension' need of the entire state with special emphasis on its Northern districts. The functioning of the directorate is administered by University Extension Education Council.

***Derectorate of Farm*:** The farm to an agricultural university is treated as laboratory to the scientists and students. The University farms, apart from regular teaching, research and extension activities, its vast remaining areas in 11 units distributed over North Bengal could have been utilized purposefully for farmers' service. University has been developed several infrastructure and procured a number of farm implements towards for modernization of its eleven no of farms. The total eleven farms are-A. Terai Zone (IV) (1) Terai Zone- Pundibari (2) Cooch Behar KVK - Pundibari (3) RRSS, Terai Zone- Kharibari (4) North Dinajpur KVK- Chopra B. Hill Zone (III) (5) RRS, Hill Zone- Kalimpong (6) RRSS, Hill Zone, Pedong (7) Darjeeling KVK- Dolopchand C. Old Alluvial Zone (IV) (8) RRS, OAZ- Majhian (9) South Dinajpur KVK- Majhian (10) RRSS, OAZ- Manikchak (11) Malda KVK- Ratua.

***College of Agriculture, Majiyan*: -** In the year 2014, an extended campus of Uttar Banga Krishi Viswavidyalaya has been established as College of Agriculture at Majhiyan, South Dinajpur.

Admission (table-2):- Application in prescribed forms are invited from candidates who have passed Higher Secondary (H. S.) or equivalent examination with Physics, Chemistry and Biology / Agriculture / Horticulture or Vocational Agriculture / Horticulture with above combination as elective subjects and securing at least 60% marks in aggregate of above mentioned three subjects combination for General & OBC candidates and 50% marks in the aggregate for SC/ST and PWD (Person with Disability) for admission to 4 years B.Sc.(Agriculture) Hons. and B.Sc.(Horticulture) Hons. Courses for UBKV Main Campus at Pundibari and College of Agriculture at Majhian, Dakshin Dinajpur under UBKV for the session 2017-2018. One common merit list will be prepared for admission at UBKV main campus at Pundibari and College of Agriculture, Majhian, Dakshin Dinajpur under UBKV. However, candidates from Vocational stream must secure at least 60% marks in aggregate of all his/her subjects in the H.S. level examination. The candidates must attain the age of 16 years or above as on 01.06.2017. Application Form has to submit online only on University website www.ubkv.ac.in. on payment of Rs.500.00 (Five hundred only) for general & OBC category and Rs. 125.00 (One hundred twenty five) for SC/ST candidates through online and offline mode. Only PWD candidates who's disability percentage are 40% or above, will be treated as exempted candidates and no fees will be required. Otherwise PWD candidates will be treated as General Category. However, no application form without deposition of fee within stipulated time will be considered. Detail information and admission related notifications are available in the University Website www.ubkv.ac.in.

Table 2 Seat allotment pattern in various entities of UBKV

Sl	Category	Faculty of Agriculture	Faculty of Horticulture	College of Agriculture, Majhian
1	WB General Stream	48	13	28
2	WB Vocational Stream	2	1	1
3	CBSE, ICSE & other boards	5	2	1
4	Hill Quota	1	1	0
5	ICAR Quota	10	3	0
	Total	66	20	30

West Bengal University of Animal & Fishery Sciences

West Bengal University of Animal & Fishery Sciences was established on 2nd January, 1995 vide West Bengal University of Animal & Fishery Sciences Act – 1995 to impart education, training and to conduct research in veterinary and animal sciences, dairy sciences and fishery sciences and also to cater the needs of the farming community of the State of West Bengal. There are three faculties in this University viz. (1) Faculty of Veterinary & Animal Sciences (B.V.Sc. & AH, M.V.Sc. & Ph.D. courses) (2) Faculty of Dairy Technology (B.Tech.(DT), M.Tech. (DT) and M.Sc. (Dairying) and Ph.D. courses) and (3) Faculty of Fishery Sciences (B.F.Sc., M.F.Sc. courses). The research, extension and farm activities of the University are organized through the Directorate of Research, Extension & Farms of the University.

Faculty of Veterinary & Animal Sciences

Located at 37, K.B. Sarani, Belgachia, Kolkata - 700 037 and Mohanpur, Nadia. The faculty has 19 academic departments:- 1. Veterinary Anatomy & Histology 2. Veterinary Pathology 3. Veterinary Parasitology 4. Veterinary Pharmacology & Toxicology 5. Veterinary Physiology 6. Veterinary Biochemistry 7. Veterinary Microbiology 8. Veterinary Public Health 9. Veterinary Epidemiology & Preventive Medicine 10. Veterinary Gynaecology & Obstetrics 11. Veterinary Surgery & Radiology 12. Veterinary & Animal Husbandry Extension Education 13. Veterinary Medicine, Ethics & Jurisprudence 14. Animal Genetics & Breeding 15. Animal Nutrition16. Livestock Production Management 17. Livestock Products Technology 18. Teaching Veterinary Clinical Complex 19. Instructional Livestock Farm Complex

Faculty of Dairy Technology: Located at Mohanpur, Nadia. The faculty has 4 academic departments:- 1. Dairy Chemistry 2. Dairy Microbiology 3. Dairy Engineering 4. Dairy Technology.

***Faculty of Fishery Sciences*:** Located at Chakgaria, Panchasayar, Kolkata - 700 094. The faculty has 8 academic departments:- 1.Aquatic Animal Health 2. Fishery Resource Management 3. Fishery Extension 4. Aquatic Environment Management 5. Fishery Economics & Statistics 6. Fishery Engineering 7. Aquaculture 8. Fish Processing Technology.

***Admission*-**Allotment of seats in diploma & UG programme:- Total number of seats for 4 courses :a) D.V.P. - 30 b) B.V.Sc. & A.H.- 83 c) B.Tech.(DT) – 44 d) B.F.Sc. -44: Out of total no. of seats 22% seats are reserved for SC and 6% for ST, 10 % for OBC-A and 7 % for OBC-B candidates. In B.V.Sc. & A.H. course, 15% seats (11nos.) are reserved for VCI nominees and 6 seats each of B.Tech.(DT) & B.F.Sc. courses are kept reserved for ICAR nominees. Besides 3% of seats of each courses are kept reserved for Person with disability (PWD) candidates on horizontal basis. Mode of admission is through counseling of the eligible candidates from the merit list of WBUAFS/WBJEEB ranks.

***Visva-Bharati University*:** Founded by the first non-European Nobel Laureate Rabindranath Tagore in 1921. The President of India is the Visitor of the University, the Governor of West Bengal is the Rector, and the Prime Minister of India acts as the Chancellor. The President of India appoints the Vice-chancellor of the University. In May 1951, Visva-Bharati was declared to be a Central University and "An Institution of

National Importance" by an Act of Parliament. It was granted the status of a unitary, teaching and residential university.

***Palli Siksha Bhavana*:** Palli-Siksha Bhavana (Institute of Agriculture) was established on September 1, 1963 as Palli-Siksha Sadana and later renamed as Palli Siksha Bhavana in the Visva-Bharati Act, as amended in1984. Palli-Siksha Bhavana imparts education in Agricultural Sciences both at undergraduate and post-graduate levels. It offers four-years (eight semesters) B. Sc.(Ag.) Honours Course and two-years M. Sc.(Ag.) courses in Agronomy, Plant Protection, Agricultural Extension, Soil Science & Agricultural Chemistry and Horticulture with semester system of examination. There are facilities for research leading to Ph.D. degree in all branches of Agricultural Sciences. Apart from teaching and research, Palli-Siksha Bhavana is also engaged in extension activities in the field of agriculture in the surrounding villages and elsewhere. Other academic support units are Agricultural Farm, Horticultural Farm, Dairy and Poultry Farm, Soil Testing Laboratory, Library and Rathindra Krishi Vigyan Kendra.

Admission (table-3):-Application forms of all courses of the university to be filled up through online mode. Candidate should keep a copy of the computer generated filled in application form for their own use.

Table 3 Seat allotment pattern for B.Sc. (Hons.) Agriculture in Palli Siksha Bhavana

Sl.	Categories	No. of seats
1	General /OBC/SC/ST	46
2	ICAR Quota	9
3	Integrated candidates from Visva-Bharati school system	5
	Total	60

(Date & Time to be given in the Visva-Bharati web site: www.visvabharati.ac.in & Bhavana Notice Board.)

***University of Calcutta*:** The Court of Directors of the East India Company sent a despatch in July, 1854 to the Governor-General of India in Council, suggesting the establishment of the Universities of Calcutta, Madras and Bombay. In pursuance of that despatch, the University of Calcutta was founded on January 24, 1857.The University adopted in the first instance, the pattern of the University of London and gradually introduced modifications in its constitution. Institute of Agriculture Science, University of Calcutta is offering courses on Agriculture for M.Sc. (Ag.) degree programme, with its six component departments came into being in April, 2002, upgrading the erstwhile Department of Agriculture established in April, 1954. Institute of Agricultural Science has the following departments-(1) Agricultural Chemistry & Soil Science (2) Agronomy (3) Genetics & Plant Breeding (4) Plant Physiology (5) Horticulture (6) Seed Science & Technology.

***West Bengal State University or Barasat University*:-**West Bengal State University (WBSU), also known as Barasat University, is a public university situated in Barasat, North 24 Paraganas, near the city of Kolkata. All the 59 colleges (including Undergraduate, Postgraduate and B.Ed) in the district of North 24 Parganas, which were formerly affiliated with the University of Calcutta, are affiliated to this university. Department of Agriculture and Rural Development with its multidisciplinary approach offer courses for M. Sc. and Ph. D. degree. Research areas of the Department includes Agriculture, Animal husbandry, Livelihood options, Health, SHGs, Climate change, Adoption strategy, Rural Entrepreneurship, Women and Gender issues, Information technology in rural development, Issues on Tribal Development etc.

***Indian Institute of Technology, Kharagpur*:**The Indian Institute of Technology Kharagpur is a public engineering institution established by the government of India in 1951. It was the first of the IITs to be established, and is recognized as an Institute of National Importance by the Government of India. As part of Nehru's dream for a free self-sufficient India, the institute was established to train scientists and engineers after India attained independence in 1947. It shares its organisational structure and undergraduate admission process with sister IITs. IIT Kharagpur has a 8.5 square kilometres (2,100 acres) campus is residence to about 22,000 inhabitants. One of departments of this institute is Agricultural and Food Engineering. The Agricultural and Food Engineering Department is unique of its kind in the IIT system. It has very talented faculty working in different disciplines of Agricultural Engineering and Sciences. The department offers UG/PG programme in the field of Farm Machinery and Power, Land and Water Resources Engineering, Food Process Engineering, Aquacultural Engineering, Agricultural Systems Management and Agricultural Biotechnology. The faculty have developed world class laboratories and have strong collaboration with several international organisations for high quality research and teaching.

Private Colleges with Agriculture Course

1. Gurunanak Institute of Technology:- 157/F ; Nilgunj Road, Panihati, North 24 Paraganas; Course offered-(1) B.Tech. (Agricultural Engineering) (2)B.Tech. (Food Technology).
2. Reverend Carey Institute of Horticulture:- 1, Alipore Road, Kolkata; Course offered-B.Sc. (Horticulture Science).
3. Sree Gopal Banerjee College:- Bagati, Magra, Hooghly, W.Bengal. (Department of Plant Protection is there).

Agricultural Research Institutes Under Icar *(Table-4)*

Table 4 Agricultural research institutes under ICAR

Sl	Icar Institute	Abbreviation	Name of place
1	Central Inland Fisheries Research Institute	CIFRI	Barrackpore
2	Central Research Institute for Jute and Allied Fibres	CRIJAF	Barrackpore
3	National Institute of Research on Jute & Allied Fibre Technology	NIRJAFT	Kolkata

(Source: Telephone Directory-2017)

***CIFRI:* -** Recognizing the role of inland fisheries, Government of India established a Central Inland Fisheries Research Station at Calcutta on 17 March 1947. Later, in 1959, the Station was elevated to a full-fledged research institute, christened as "Central Inland Fisheries Research Institute". In 1967 it came under the administration of the Indian Council of Agricultural Research. The Institute strives for knowledge-based management of inland open waters for sustainable fisheries, conservation of aquatic biodiversity, integrity of ecological services and to derive social benefits from these waters. Headquarter of the Institute is located at Barrackpore,

West Bengal; the Regional Research Centers are located at Allahabad, Guwahati, Bangalore and Vadodara, with Research Centers at Kochi and Kolkata. Vision of the institute is sustainable fisheries from inland open waters for environmental integrity, livelihood and nutritional security. Mission of the institute is knowledge based management for enhanced fishery, conservation of biodiversity, integrity of ecological services and to derive social benefits from inland open waters.

***CRIJAF*:** Central Research Institute for Jute and Allied Fibres (CRIJAF) is a premier institute on jute & allied fibre crops of ICAR under Crop Science is situated at Nilganj, Barrackpore (6.0 Km from Barrackpore railway station). This institute mainly deals with 6 natural fibre crops viz., Jute, Sisal, Ramie, Sunnhemp, Mesta and Flax. The institute has four Research Stations viz., *Sunnhemp Research Station* located at Pratapgarh (Uttar Pradesh), *Ramie Research Station* located at Sorbhog (Assam), *Sisal Research Station* at Bamra (Odisha) and *Seed Research Station* at Budbud (West Bengal). Two KVK's under the administrative control of CRIJAF is located at Budbud in Burdwan district and one located at CRIJAF campus of West Bengal.

***ICAR-NIRJAFT*:** ICAR- National Institute of Research on Jute and Allied Fibre Technology situated in 12, Regent Park, Kolkata is a premier institute under Indian Council of Agricultural Research, New Delhi and dedicated to the research of jute and allied fibres leading to the diversified use and industrial growth since January. 1939. The institute is adequately equipped with the state of the art laboratories having sophisticated instruments, equipment, machinery, workshop, library, museum, pilot plant along with guest house on the adjoining campus of staff quarters. With the expansion of activities of the institute, the administrative control of the institute was centralized and went over to the Indian Council of Agricultural Research, New Delhi in 1965. Mandates of the institute are- (1) Basic and strategic research on processing jute & allied fibres and their agro-residues, development of value added products and quality assessment (2) Skill development and business incubation service on jute and allied fibre technologies.

Icar –Research Station

***Central Institute of Fisheries Education, Mumbai*:** Kolkata Centre became a part of CIFE in 1967 although it started out in 1947 as Inland Fisheries Training Centre under the Central Inland Fisheries Research Institute (CIFRI). The present establishment at Salt Lake, Kolkata was inaugurated in 1998 with the primary objective of conducting one year post-graduate certificate course in Inland Fisheries and need-based capsule courses in different aspects of fisheries. These include Carp Breeding and Nursery Management; Integrated Fish Farming; Ornamental Fish Culture and Soil and Water Management in Aquaculture.

Eastern Regional Station (Ers) of National Dairy Research Institute (Ndri) at Kalyani**:**The Eastern Regional Station (ERS) of National Dairy Research Institute (NDRI) was established in February 1964 at the Central Dairy in Calcutta. In September, 1965; a herd of 95 Red Sindhi cattle were transferred from NDRI, Karnal to ERS. These animals were initially stationed at the State Livestock Farm, Kalyani; and were then shifted to the Milk Colony, Haringhata in the year 1966. The office of the ERS was also shifted from Calcutta to Kalyani during 1966 and was located in the Administrative Building of Kalyani University. After a year, it was shifted to the newly established Bidhan Chandra Krishi Viswavidyalaya premises at Kalyani. Laboratory facilities were gradually developed there. The Regional Animal Nutrition Research Centre of the ICAR till then located at Haringhata was also merged with the ERS of NDRI with effect from 1st June, 1968.

***I.a.r.i. Regional Station, Kalimpong*:** The Station is one of the oldest regional stations of Indian Agricultural Research Institute. It was set up as the Co-ordinated Plant Virus Research Scheme, I.A.R.I., Eastern Zone, Kalimpong in February 1956 in a rented house named "Churchill Ville" at L. B. Road, Kalimpong. Regional Station, Kalimpong has taken a lead role in conducting research on virus and virus-like diseases affecting economically important plant species of Darjeeling and Sikkim hills. Since its inception in 1956, at least 25 virus and virus-like diseases of plants prevalent in this region were reported from this station. Over the time, the station has diversified its activities especially in the area of Horticulture research and Extension research. Mandates of the institutes are-(1) Identification of virus diseases of citrus, cardamom, orchids and production of virus free plants (2) Development of management practices for containing viral diseases in the north eastern hills.

***Canning Town, Rrs*:** The research station is geographically situated at about 46 km south –east of Kolkata. The station at canning Town was established in 1959 to cater the research and management needs of coastal salt affected soils, when it was under the administrative control of the then Central Rice Research Institute (CRRI), Cuttack. Later, after the establishment of CSSRI in 1969 the Research Station was brought under the aegis of CSSRI, Karnal in 1970 as its Regional Research station. This station has developed several technologies for enhancement of agricultural (agriculture + fisheries) productivity under degraded (saline) coastal soils and poor water (saline) qualities.

Table 5 Agricultural research sub-station under ICAR institute

Sl	Sub-station under icar institute	Name of place
1	Central Seed Research Station for Jute and Allied Fibres (CRIJAF), Barrackpore	Budbud, Burdwan
2	Regional station of Central Tobacco Research Institute (CTRI), Rajamundry, A.P.	Dinhata, Cooch Behar
3	Indian Agricultural Research Institute (IARI), New Delhi	Kalimpong,
4	Central Institute of Sub-Tropical Horticulture (CISH), Lucknow	Malda
5	Central Plantation Crop Research Institute (CPCRI), Kasargod, Kerala	Mohitnagar, Jalpaiguri
6	National Research Centre on Orchids (NRCO), Pakyong, Sikim	Darjeeling
7	Central Soil Salinity Research Institute (CSSRI), Karnal, Haryana	Canning
8	National Bureau of Soil Survey and Land Use Planning (NBSS&LUP), Nagpur	Salt Lake, Kolkata
9	Indian Veterinary Research Institute (IVRI), Izatnagar, Uttar Pradesh	Belgachia, kolkata
10	National Dairy Research Institute (NDRI), Karnal, Haryana	Kalyani, Nadia
11	Central Institute of Brackish Water Aquaculture (CIBWA), Chennai	Kakdwip
12	Central Institute of Fisheries Education (CIFE), Mumbai	Salt lake
13	Central Institute of Freshwater Aquaculture (CIFA), Bhubaneshwar	Rahara

Icar-Agricultural Technology Application Research Institute -Kolkata (Zone-II):- Agricultural Technology Application

Research Institutes (ATARIs) are looking after monitoring the KVK system in the state and district level. The Division of Agricultural Extension of ICAR is supported by eight erstwhile Zonal Project Directorates (now Agricultural Technology Application Research Institutes. The objective of the Institute is to plan, monitor, evaluate and guide and monitor the programmes of the KVK and judge the performance of KVKs time to time. The Zonal Project Directorate (erstwhile Zonal Coordinating Unit), Zone-II began its journey from the office premises located within the Directorate of Extension Education Complex of B.C.K.V., Mohanpur, Nadia, West Bengal. After ten years of its operation from B.C.K.V., the office of the then ZPD-II was shifted to Veterinary College Campus, Belgachia, Kolkata for required infrastructural facilities. However, conversion of Veterinary College in to West Bengal University of Animal and Fishery Sciences again necessitated the Unit to shift its office to NBSS&LUP Campus, Salt Lake, Kolkata in the year 1996. Finally, the Zonal Coordinating Unit has been upgraded to Zonal Project Directorate in the pattern of other Project Directorates / Institutes of ICAR including administrative and financial power since 2009. The Directorate moved to its new administrative building in Salt Lake, Kolkata in 2013. Since July 2015, this Directorate has been renamed as Agricultural Technology Application Research Institute, Kolkata.

***Few of Important Information of West Bengal*: (a)** Total number of districts=23 (b) Newly created districts (Year 2014 onwards)=4 (Aliporeduar, Kalimpong, Jhargram, West Burdwan) (c) Total number of agricultural districts=22 (d) Area of the State=88752 km^2 (e) Cropping intensity=184% (f) Forest area=13.71% (g) Net cropped area=52.05 lakh hectare (h) Percentage area under cultivation in respect of total area of the State=68% (i) River irrigation projects- Damodar irrigation project, Mayurakshi irrigation project, Tista irrigation project, Kangsavati irrigation project (j)Total number of blocks=342 (k) Total number of agricultural blocks=335 and each agricultural block has agricultural block office.

District-wise Agricultural Blocks of West Bengal

***North Bengal Districts and their blocks*: Alipurduar (6):-** Madarihat–Birpara, Alipurduar–I, Alipurduar–II, Falakata, Kalchini and Kumargram. **Coochbehar (12):-** Cooch Behar I, Cooch Behar II, Dinhata I, Dinhata II, Haldibari, Mathabhanga I, Mathabhanga II, Mekliganj, Sitai, Sitalkuchi, Tufanganj I, Tufanganj II; **Jalpaiguri (7):-** Jalpaiguri, Dhupguri, Rajganj, Maynaguri, Mal, Nagrakata, Matiali; **Kalimpong (3):-** Kalimpong I, Kalimpong II, Gorubathan; **Darjeeling (9):-** Darjeeling Pulbazar, Jorebunglow Sukiapokhri, Kharibari, Kurseong, Matigara, Mirik, Naxalbari, Phansidewa, Rangli Ranglio

***Middle Bengal Districts and their blocks*:-North Dinajpur (9):-** Chopra, Goalpokhar I , Goalpokhar II, Hemtabad, Islampur, Itahar, Kaliaganj, Karandighi, Raiganj **South Dinajpur (8)-** Balurghat, Bansihari, Gangarampur, Harirampur ,Hili block, Kumarganj, Kushmandi, Tapan **Maldah (15):-** Bamongola ,Chanchal I , Chanchal II, English Bazar, Gazole, Habibpur, Harishchandrapur I, Harishchandrapur II, Kaliachak I, Kaliachak II, kaliachak III, Malda old, Manikchak, Ratua I, Ratua II. **Murshidabad (26):-** Beldanga I, Beldanga II, Berhampore ,Bhagawangola II, Bhagobangola I ,Bharatpur I ,Bharatpur II, Burwan ,Domkal, Farakka ,Hariharpara ,Jalangi ,Kandi ,Khargram, Lalgola, Murshidabad-Jiagunj, Nabagram, Nawda, Raghunathganj I, Raghunathganj II, Raninagar I, Raninagar II, Sagardighi, Shamsherganj, Suti I, Suti II **Birbhum (19):-** Bolpur Sriniketan, Dubrajpur ,Illambazar ,Khoyrasol, Labpur ,Mayureswar I, Mayureswar II ,Mohammad bazar, Murarai I ,Murarai II ,Nalhati I, Nalhati II ,Nanoor, Rajnagar, Rampurhat I ,Rampurhat II, Sainthia, Suri I ,Suri II

***South Bengal Districts and their blocks*:-West Burdwan (9):-** Asansol Kulti Township (EU), Barabani, Faridpur Durgapur, Jamuria, Kanksa, Ondal, Pandabeswar, Raniganj, Salanpur. **Bankura (22):-** Bankura I ,Bankura II ,Barjora ,Bishnupur ,Chhatna, Gangajal Ghati, Hirbandh ,Indpur, Indus ,Jaypur, Khatra ,Kotulpur, Mejhia, Onda, Patrasayer, Raipur, Ranibundh, Saltora, Sarenga ,Simlapal ,Sonamukhi, Taldangra .**Purulia (20):-** Arsha, Bagmundi ,Balarampur , Barabazar, Bundwan, Hura, Jaipur , Jhalda I ,Jhalda II ,Kashipur, Manbazar I, Manbazar II, Neturia ,Para ,Puncha, Purulia I ,Purulia II ,Raghunathpur I ,Raghunathpur II, Santuri.**Jhargram (8):-** Jhargram, Binpur I, Binpur II, Jamboni, Nayagram, Sankrail, Gopiballavpur I, Gopiballavpur II **West Midnapur (21):-** Dantan I, Dantan II ,Pingla,Kharagpur I ,Kharagpur II, Sabang ,Mohanpur ,Narayangarh, Keshiari ,Debra ,Midnapore Sadar, Garhbeta I ,Garhbeta II,Garhbeta III,Keshpur, Salboni, Chandrakona I, Chandrakona II, Daspur I, Daspur II, Ghatal **East Midnapur (25):-** (1) Contai I (2)Deshapran (3) Contai III (4) Khejuri I (5) Khejuri II (6) Ramnagar I (7) Ramnagar II (8) Bhagabanpur II (9) Bhagabanpur I (10)Egra I (11) Egra II (12) Patashpur I (13) Patashpur II (14) Mahishadal (15) Nandigram I (16) Nandigram II (17) Sutahata (18) Haldia (19) Nandakumar (20) Moyna (21)Tamluk (22) Sahid Matangini (23) Panskura (24) Kolaghat (25)Chandipur **South 24 Paraganas (29):-** Baruipur, Basanti, Bhangar I, Bhangar II, Bishnupur I, Bishnupur II, Budge Budge I, Budge Budge II, Canning I, Canning II, Diamond Harbour I, Diamond Harbour II ,Falta, Gosaba ,Jaynagar I, Jaynagar II, Kakdwip, Kulpi ,Kultali ,Magrahat I, Magrahat II, Mandirbazar, Mathurapur I, Mathurapur II, Namkhana, Pathar Pratima, Sagar, Sonarpur, Thakurpukur Mahestola **North 24Paraganas(22):**Amdanga,Baduria,Bagdah,Bangaon,BarasatI,BarasatII,BarrackporeI,BarrackporeII,BasirhatI,BasirhatII,Deganga,Gaighata,HabraI,HabraII,Haroa,Hasnabad,Hingalganj, Minakha,Rajarhat,SandeshkhaliI,Sandeshkhali-II,Swarupnagar.**Nadia(17):-**Chakdah, Chapra, Hanskhali, Haringhata, Kaliganj, Karimpur 1,Karimpur II, Krishnaganj, Krishnagar I, Krishnagar II, Nabadwip, Nakashipara, Ranaghat I, Ranaghat II, Santipur, Tehatta I, Tehatta II **Burdwan East(23):-** Ausgram I ,Ausgram II, Bhatar ,Burdwan I ,Burdwan II ,Galsi I ,Galsi II ,Jamalpur, Kalna I ,Kalna II ,Katwa I ,Katwa II ,Ketugram I, Ketugram II ,Khandaghosh ,Mangolkote, Manteswar, Memari I, Memari II, Purbasthali I ,Purbasthali II ,Raina I ,Raina II **Hooghly (18):-** Arambag, Balagarh, Chanditala I ,Chanditala II ,Chinsurah Magra ,Dhaniakhali ,Goghat II, Goghat I,Haripal, Jangipara ,Khanakul I, Khanakul II, Pandua, Polba Dadpur, Pursura, Serampur Uttarpara, Singur, Tarakeswar. **Howrah (14):-** Amta I,Amta II, Bagnan I, Bagnan II ,Bally Jagacha, Domjur, Jagatballavpur, Panchla, Sankrail, Shyampur I ,Shyampur II, Udaynarayanpur, Uluberia I, Uluberia II

State Agricultural Management And Extension Training Institute (Sameti):-The Institute for the State of West Bengal,

started its activity from May 2005. Basically it is a Govt. sponsored Agricultural Training Centre (ATC) run by Ramakrishna Mission Ashrama, Narendrapur and is nominated as SAMETI by State and Central Government for its efficient, sincere and significant services for the development of Agriculture and Rural Development as a whole since 1960s. With the onset of the "Centrally Sponsored Scheme for 'Support to State Extension Programme for Extension Reforms' at every state a State level Human Resource Development Institute is established for capacity building of the stake holders of development of Agriculture, Animal Husbandry, Horticulture, Fishery and all allied sectors.

Table 6 Krishi Vigyan Kendras in West Bengal

Sl	Address of Krishi Vigyan Kendras	Host Organization	Year of Sanction	Type
1.	Krishi Vigyan Kendra,Village Milebasa,PO.Kalukhali, P.S. Bhagwangola,Distt. Murshidabad-742135	WBUA&FS	2006	SAU
2.	Krishi Vigyan Kendra, Block Seed Farm, Chopra, Distt. Uttar Dinajpur-733216	UBKV	2005	SAU
3.	Krishi Vigyan Kendra, PO.Jagatballavpur,Distt.Howrah-711408	BCKV	2005	SAU
4.	Krishi Vigyan Kendra,PO.Chinsurah,Distt. Hooghly-712101	BCKV	2005	SAU
5.	Krishi Vigyan Kendra,812/1-Ashoknagar, Distt. North 24 Parganas-743222	WBUA&FS	2005	SAU
6.	Krishi Vigyan Kendra,Central Research Inst. For Jute & Allied Fibre Bud Bud, Distt. Bardhaman-713 403	CRIJAF	2005	ICAR
7.	Krishi Vigyan Kendra,Pundibari,Distt. Coochbehar-736165	UBKV	2004	SAU
8.	Krishi Vigyan Kendra,Block Seed Farm, PO.Ratua (Manik Chowk) Distt. Malda-732 205	UBKV	2004	SAU
9.	Krishi Vigyan Kendra,Regional Research Station,Majhihan, Patiram Distt. Dakshin Dinajpur-733 133	UBKV	2004	SAU
10.	Krishi Vigyan Kendra,PO.Gayeshpur,Distt. Nadia-741 234	BCKV	2004	SAU
11.	Rathindra Krishi Vigyan Kendra, Palli Siksha Bhavan, (Institute of Agriculture),PO.Sriniketan, Distt. Birbhum-731236	Vishwa Bharti	1994	CU
12.	Krishi Vigyan Kendra,Kalimpong,Distt. Darjeeling-734301	UBKV	1992	SAU
13.	Krishi Vigyan Kendra,Kalayan, Vill-Bongabari, Vivekananda Nagar,Distt. Purulia-723 147	Kalyan	1992	NGO
14.	Krishi Vigyan Kendra,PO.Ramsha via Lataguri,Distt. Jalpaiguri-735219	WBUA&FS	1983	SAU
15.	Krishi Vigyan Kendra, WBCADC, Sonamukhi, Distt. Bankura-722207	WBCADC	1983	PSU
16.	Krishi Vigyan Kendra,C/O.Sri Ramkrishna Ashram, PO. Nimpith Ashram, Distt. South 24-Parganas-743338	Sri Ramkrishna Ashram,	1979	NGO
17.	Krishi Vigyan Kendra, Seva Bharati, Kapgari, Distt. West Medinipur-721505	Sewa Bharti	1976	NGO
18.	Krishi Vigyan Kendra,Vill.-Arapanch, Mouza-Natagachi and Vill.-Narendrapur, Mouza-Ukhilapaikpara,South 24 Parganas Distt. (West Bengal).	RMVU	2013	DU
19.	Krishi Vigyan Kendra,Malda(West Bengal).	ICAR-CISH	2016	ICAR
20.	Krishi Vigyan Kendra, North 24 Pargana(West Bengal)	ICAR-CRIJAF	2016	ICAR
21.	Krishi Vigyan Kendra, North Farm of the ICAR-CRIJAF,North 24 Paraganas,Distt. Of West Bengal.	ICAR-CRIJAF	2016	ICAR
22.	Krishi Vigyan Kendra, Eastern Regionsl Station (NDRI). Kalyani Distt. Nadia	ICAR-NDRI	2016	ICAR

(CU=Central University, SAU=State Agricultural University, PSU=Public Sector Undertaking, WBCADC= West Bengal Comprehensive Area Development Corporation, DU=Deemed University, RMVU=Ramkrishna Mission Vivekananda University)

State Dept. of Agriculture, soil testing laboratories (11)

1. STL,Tollygunge 2. STL, Kalimpong , 3. STL, Coochbehar, 4. STL, Raiganj,5. STL, Malda, 6. STL, Berhampore,7. STL, Purulia, 8. STL, Bankura 9. STL, Burdwan 10. STL, Paschim Medinipur, 11. STL, Hooghly (new).

Other Soil Testing Entities

1. **Hindusthan Fertilizers Corporation Ltd.—**(a) Durgapur (b) Siliguri (c) Midnapur (d) Berhampore (e) Kolkata
2. **Indo-German Fertilizer Training project:-** (a) Burdwan (b) Siliguri (c) Raiganj (d) Krishnanagar (e) Midnapur
3. **Phosphate Company Limited: -** Rishra (Hooghly).

***Netaji Subhas Training Institute of Agricultural Marketing*:** Netaji Subhas Training Institute of Agricultural Marketing Sasmal para; Baidyabati; Hooghly, the training institute of West Bengal State marketing Board under Department of Agricultural Marketing, Govt. of West Bengal hereinafter referred to as AWARDER, invites applications for Expression for Interest (EOI) from interested Training Providers (TPs) (hereafter referred to as APPLICANTS) for providing skills among Young Members of the Farm Families on Market-led production, post-harvest management, value addition and direct marketing of produces, aiming at achieving maximum share in consumers' price and development of

entrepreneurship & marketing chain, selected from different Districts of West Bengal.

Table 7 Agricultural Research Station under State Government, West Bengal

Sl.	Districts	Name of place	Name of Research Station
1	Midnapur (West)	Midnapur, Abas	Soil Conservation Research Station
2	Purulia	Hathoyara	Zonal Drought Resistant Paddy Research Station
3	Bankura	Bankura	Dryland Res. Station
4	Burdwan	Burdwan	Field Crop Research Station
5	Murshidabad	Baharampur	Pulse and Oilseed Research Station
6	Maldah	Maldah	Mango Research Station
7	Kalingpang	Kalingpang	Vegetable Research Station
8	Jalpaiguri	Mohitnagar	Pineapple Research Station
9	Nadia	Bethuadahari	Sugarcane Research Station
10	Nadia	Krishnanagar	Zonal Adaptive Research Station (Gangetic Alluvium Zone)
11	Nadia	Ranaghat	Water Management Research Station
12	Hooghly	Chinsura	Rice Research Station
13	Jalpaiguri	Mohitnagar	Zonal Adaptive Research Station (Terai Zone)
14	Darjeeling	Dalapchand	Temperate and Sub-tropical Fruit Tree Research Centre
15	Midnapur (West)	Anandapur	Potato Seed Multiplication Centre
16	Bankura	Barajora	Vegetable Seed Multiplication Centre
17	Hooghly	Chinsura	Banana Research Station
18	Birbhum	Rajnagar	Ramie and Sisal Research Station
19	South 24 Paraganas	Gosaba	Salt and Flood Resistant Paddy Research Station
20	Midnapur (West)	Midnapur	Potato and Maize Research Station
21	Bankura	Bankura	Rice Research Station
22	Birbhum	Nalhati	Zonal Adaptive Research Station (Red & Laterite zone)
23	Nadia	Krishnanagar	Zonal Adaptive Research Station (Gangetic Alluvium Zone)

Tagore School of Rural Development & Agriculture Management (Tsrdam)

TSRDAM (Estd. in 2010) is a new born Institute under "Tagore Education & Rural Develpoment Trust" . This is the first private agriculture institute in West Bengal situated at Kalyani. It provides all the facilities for learning to enable the students to acquire knowledge, skill and ability to face the emerging trends in agricultural sector. TSRDAM is affiliated to University of Kalyani, Kalyani. Presently, TSRDAM is offering 4 diploma courses, namely –1. 2 Years Diploma in Seed & Nursery Management 2. 2 Years Diploma in Soil & Plant Health Management 3. 2 Years Diploma in Plant Protection 4. 2 Years Diploma in Finance & Agri-Business Management. Mandates of the institute are- (1)To teach agricultural subjects at under graduate diploma levels (2) To serve as a centre of academic excellence in Agricultural education (3) To bring innovations in agricultural research and technologies (4) To carry out research projects whose findings will benefit the farming community (5) To evolve new varieties and concepts (6) To carry out extension activities viz, to train the farmers, entrepreneurs and staff of state agricultural department.

Tea Board of India-The Tea Board of India (14, BTM Sarani, BBD Bagh, Kolkata) is a state agency of the Government of India established to promote the cultivation, processing, and domestic trade as well as export of tea from India. The Tea Board India is responsible for the assignment of certification numbers to exports of certain tea merchants. The Tea Board India's tasks include endorsement of the diverse production and productivity of tea, financial support of research organisations and the monitoring of advances in tea packaging as it relates to health beneficial aspects. It coordinates research institutes, the tea trade and government bodies, ensuring the technical support of the tea trade in the global industry.

Coconut Development Board (Cdb): For the integrated development of coconut cultivation and industry in the country with focus on productivity increase and product diversification. The Board which came into existence on 12th January 1981, functions under the administrative control of the Ministry of Agriculture and Farmers Welfare, Government of India, with its Headquarters at Kochi in Kerala and Regional Offices at Bangalore in Karnataka**,** Chennai in Tamil Nadu, Guwahati in Assam and Patna in Bihar. There are five State Centres situated at Pitapally in Odissa, Kolkata in West Bengal, Thane in Maharashtra, Vijayawada in Andhra Pradesh and Port Blair in the Union Territory of Andaman & Nicobar Islands.

***West Bengal Bio-Diversity Board*:** The important functions undertaken by the Board include- making people aware of the biodiversity and its importance in human well being, constitution of Biodiversity Management Committees (BMC) in the Panchayat samitiy and Municipality level.

West Bengal Agrimarketing Board: Objectives are:-1. To obtain remunerative price of agricultural produce for the farmers and building effective and integrated three tire marketing infrastructure for marketing of agricultural produce.2. To avoid distress sale by disseminating market information of adjacent markets and temporary storage in cool chambers, arrangements for storage & pack house. 3. To use the market infrastructure assets effectively.

***Central Sericultural Research and Training Institute*:** CSR&TI, Berhampore is a premier research station established during early 1943 to provide the research and development support for promotion of silk industry in the Eastern and North-eastern region. Presently, it functions under the administrative control of Central Silk Board, a statutory body under the ministry of textiles, Govt. of India. The institute is located in the historic district of Murshidabad in West Bengal, where the silk industry has bloomed, flourished and reached its pinnacle. The city is 200 km away from Kolkata and well connected by both Rail and Road.

***Sericulture Research & Development Council*:Vision**:-To provide necessary framework for advancing goals and prioritizing strategies for the development of sericulture & silk industry to become a major silk producing country. Mission of this council are (1)Promotion & development of sericulture & silk industry which is a priority industry because of its being an environment friendly, an effective socioeconomic tool for employment generation in rural areas (2)Infrastructural and technical support for production of saplings of silkworm food plant and its plantation and silkworm seed (3)Promotion of appropriate & latest technology of sapling raising & plantation of silkworm food plants, silkworm seed, silkworm rearing, silk spinning and silk reeling (4)Facilitate marketing of sericulture produces at the optimum market price.

Banga Resham Shilpi Samabaya Mahasangha Ltd. :-The Paschim Banga Resham Shilpi Samabaya Mahasangha Ltd.

(PBRSSM) was founded in 1956 under the West Bengal Cooperative Societies Act and the West Bengal Cooperative Societies Rules with the object of: (1) Improving traditional rural silk industry of West Bengal and promoting silkworm rearing, silk reeling, weaving of silk fabrics (2) Dyeing and printing of silk fabrics procured through member societies with the aid and guidance of various organizations connected with promotion and development of silk industry (3) Organizing and developing market for silk goods and handicrafts within or outside the state and abroad The PBRSSM Ltd has at present 7(seven) retail outlets of which 5(five) are in Kolkata and 2(two) in the districts at North 24 Pargana (Barasat), and Burdwan West (Durgapur).

Table 8 Watershed development project infrastructure in West Bengal

State level	State Watershed Programme Implementation and Review Committee
District level	District Watershed Development Advisory Committee
Block level	Project Implementation Committee & Watershed Development Team
Village panchayat level	Watershed Association
Watershed area level	Watershed committee, Mitra Kisan Mandal &Utilizing Group +Self-Help Group

Table 9 Seed testing laboratories of West Bengal

Sl.	Name of Laboratory	Place of function
1	Seed Testing Laboratory, Kolkata	238, N.S.C. Bose Road, Kol-40
2	Seed Testing Laboratory, Burdwan	Agricultural Farm, Kalna Road, Burdwan
3	Seed Testing Laboratory, Maldah	Maldah

Table 10 Agricultural farms under government of West Bengal

Sl.	Types of Agricultural Farms	Numbers
1	Sub-Divisional Agricultural Research Farm (SARF)	43
2	District Seed Farm (DSF)	10
3	Block Seed Farm (BSF)	110
4	State Agricultural Farm (SAF)	4
5	State Research Centre Farm (SRCF)	13
6	Other Types of Farm (Model Farm, Jute Seed Multiplication Farm, etc.)	20
	Total number of farms under Government of West Bengal	200

Table 11 Some of good quality seed supplying institutions in West Bengal

Sl.	Name of Institution	Place of function
1	National Seeds Corporation Ltd.	6, Marquis Street, Kol-16
2	West Bengal State Seed Corporation	4, Gangadharbabu Lane, Kol.-12
3	Bharat Nursery Private Ltd.	60A, Arbinda Sarani, Kol-5
4	Pallishree Private Ltd.	7, Indian Mirror Street, Kol.-13
5	Pasupati Das and Sons Private Ltd.	37A, S.N. Banerjee Road, Kol.-14
6	The Agri-Horticultural Society of India	1, Alipore Road, Kol.-27
7	Saton and Sons (India) Private Ltd.	13D, Russel Street, Kol.-71
8	Indo-American Hybrids	53, Sayeed Amir Ali Avenue, Kol.-19
9	Maharashtra Hybrids Seeds Company Ltd.	2/6, Sarat Basu Road, Kol.-20
10	Nath Seeds Limited	29, Rosa Road, East Second Lane, Kol.-33
11	Nagarjuna Seeds	BE-97. Sector-1, Salt Lake, Kol.-64
12	Annapurna Seeds	2, Sagar Estate, Clive Ghat Street, Kol.-1
13	Duncans Biotech Limited	41, Sexpere Sarani, Kol.-27
14	B.K. Roy Private Ltd.	4, Bankshal Street, Kol.-1
15	Bankimprasad Ghosh and Co.	Belur Station Road, Bally, Howrah
16	Bankim Giri and Co.	Habra, North 24 Paragana
17	Amulya Agro-industries Co. Private Ltd.	Murshidabad-742149
18	Tista Fruit and Vegetable Processing Ltd.	Bidhannagar, Kol.-91

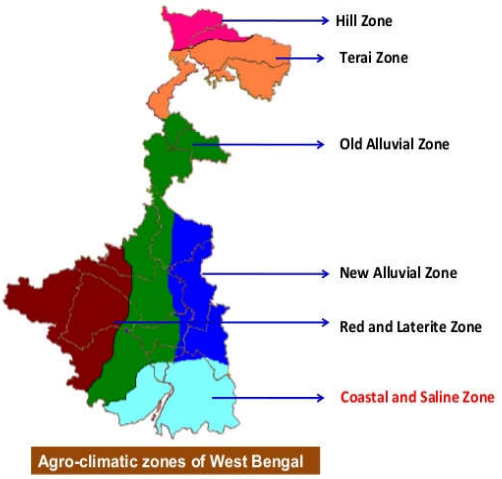
Agricultural Training Center (Atc): The agricultural training centres under Govt. of West Bengal are the followings :- (1) Chinsurah, Hooghly (2) Agricultural Farm, Burdwan (3)Narendrapur, South 24 Paraganas (4) Phulia, Nadia (5) Maldah (6) Balurghat, South Dinajpur (7) Coochbehar (8) Kalimpong. There is also an agricultural training centre at Abas, West Midnapur where training is given only on soil conservation matters. The Agricultural Training Center (ATC), under Ramakrishna Mission Ashrama, Narendrapur, erstwhile the 'Gram Sevak Training Centre' is one of the eight (8) ATCs run by Government of West Bengal. Main responsibilities of these ATCs are to pertain Pre-service Training (6 months) and In-service Training (6 months) of grass root level extension workers (Krishi Prajukti Sahayak- K.P.S.), recruited by Department of Agriculture, Govt. of West Bengal. The responsibilities provided to ATC, Narendrapur and carried out by the centre.

Table 12 Agricultural infrastructure of State Department of Agriculture, West Bengal

	Present Infrastructural Condition Of The State Department Of Agriculture, West Bengal		
	Ministry of Agriculture		
	Directorate of Agriculture		Secretariat of Agriculture
	Director of Agriculture and Secretary (Promoted)		
	Research Section	**Administrative Section**	**Evaluation Section**
State Level	A.D.A. (Research)	A.D.A. (General/Special /Oilseed/Administration/ Commercial crops/North Bengal)	A.D.A. (Evaluation)
	J.D. A. (Rice/Pulses & Oilseed/Chemical/Research/Equivalent)	J.D. A. (Range/Planning /Extension/Crop Protection/World Bank Projects/ Equivalent)	J.D. A. (Evaluation)
District Level	D.D.A. (Promoted)	P.A.O./ D.D.A.	D.D. A. (Evaluation)
Sub-division Level	W.B.A.S. (Research)	W.B.A.S. (Administration) /S.A.O./S.M.S.	W.B.A.S. (Evaluation)
Block Level	W.B. J.A.S. (Research)	W.B.A.S. (Administration) /A.D.O. W.B. J.A.S. (Administration) /A.E.O. and A.A.E.O./S.A.S.-II	W.B. J.A.S. (Evaluation)
Village Level	S.A.S.-II &III	S.A.S.-III K.P.S.	S.A.S.-II &III

Full form of abbreviations used:- (a) A.D.A. – Additional Director of Agriculture (b) J.D.A. -Joint Director of

Agriculture (c) D.D.A.-Deputy Director of Agriculture (d) P.A.O.-Principal Agriculture Officer (e)S.A.O. Sub-divisional Agriculture Officer (f) S.M.S. Subject Matter Specialist (g) A.E.O. Agricultural Extension Officer (h) A. A.E.O. Assistant Agricultural Extension Officer (i) K.P.S.-Krishi Prayukti Sahayak (j) W.B.A.S. –West Bengal Agricultural Service(k)W.B.J.A.S.-West Bengal Junior Agricultural Service (l)S.A.S.-Sub-ordinate Agricultural Service(m) A.D.O. Agricultural Development Officer (Recently A.D.O. has changed to A.D.A.-Assistant Director of Agriculture).



Certain Concerns in Agriculture of West Bengal

1. Population of West Bengal was 9.14 crore at the end of 2011-12 and is going to be 10.16 crore at the end of 2019-20.
2. Per day requirement of nutrition especially BPL category people is not meeting the requirement.
3. Climate Change and its effect on agriculture.
4. Soil heath is going to deteriorate first unless urgent attention is paid.
5. Shortage of water for agriculture and nothing much have been done on rain water harvesting.
6. Socio–economic condition of the farmers is not satisfactory because of low per capita income and not so developed rural infrastructure.
7. Farmers are required to be associated with value addition process of their produce and claim a more share of the value chain to improve their present socio-economic condition.
8. Present production and productivity status of different crops and vegetables needs improvement.
9. Present position of post harvest technology of crops and value addition is not up to the mark in comparison to any developed country.
10. Ongoing programs of respective departments need an integrated and well coordinated approach among the line departments; otherwise repetition of efforts ends up with wastage of money and energy.
11. Different stimulus offered for the farming community by State and Central Govt. not reaching to the target beneficiaries.

Strategic Focus Point

1. Promote application of ICT for strengthening rural market network.
2. Improve farm mechanization drive for small and marginal farmers.
3. Emphasis has to given on Dairy & other Animal Resource development. Cow dung & excreta should be use for gas generates & organic manure.
4. Enhance the possibility of alternate Green/ Bio energy generation in villages to meet the local demand.
5. Remodelling SHG's/ Farmer's club functioning by proving proper training and market linkages.
6. Crop Insurance need immediate attention to save farmers from extreme weather fluctuation.
7. Skill development of all section of farming community & extension officers.

***Few Milestones of Agricultural Development Of West Bengal*:** (1) Community Development Programme -1952 (2) National Extension Service -1953 (3) Development of Small Irrigation (4) Vana Mahatsava Scheme (5) Fertilizer Distribution Scheme (6) Seed Saturation Scheme (7) Japanese Method of Paddy Cultivation (8) Green Manure Scheme (9) Plant Protection Scheme (10) Intensive Agricultural District Programme -1960 (11) Intensive Agricultural Area Programme -1964 (12) High Yielding Variety Programme-1966-67 (13) Minikit Programme (14) Multiple cropping Programme (15) West Bengal Agro-Industries Corporation established-1968 (16) Cotton Development Scheme for Sundarban Areas (17) Creation of Minor Irrigation Corporation-1974 (18) Accelerated Food Production Programme (19) Drought Prone Area Programme -1970-71 (20) Small Farmers Development Agency -1970-71 (21) Marginal Farmers and Agricultural Labourers Agency -1970-71 (22) Hill Affairs Scheme (23) Sundarban Area Development Programme-1970 (24) Comprehensive Area Development Programme -1974 (25) Command Area Development Programme (26) Training and Visit System-1974 (27) Integrated Rural Development Programme -1978-79 (28) Training of Rural Youth for Self-Employment -1979 (29) National Agricultural Extension Project -1983 (30) Crop Insurance Scheme -1985 (31) Establishment of West Bengal State Seed Corporation-1980 (32) Special Rice Production Programme -1985 (33) Special Food Production Programme-1987-88 (34) National Oilseed Development Project -1986-87 (35) Oilseeds Production Thrust Programme-1986-87 (36) Special Jute Development Programme -1987-88 (37) Oil Seed Development Programme -1986-87 (38) National Pulses Development Project-1986-87 (39) National Watershed Development Programme for Rainfed Areas-1990-91 and others.

CONCLUSION

In spite of the several challenges, agriculture has been the way of life and continues to be the single most important livelihood of the rural masses in West Bengal. So, the Agriculture Department, Government of West Bengal is working in a mission mode for development of Agriculture and Allied sector in a holistic manner. But West Bengal goes far beyond just rice and potato when it comes to agriculture, maize, jute, sugarcane wheat, barley and a whole gamut of vegetables are also grown here, and to good effect, since they are produced in quite sizeable proportions, which makes West Bengal a very friendly place for farmers. The agriculture department is concerned with activities relating to policy decisions on

agricultural production and productivity, and its extension through technology generation, transfer of technology, ensuring availability and timely distribution of agriculture inputs specially seeds, fertilisers, subsidy, credit etc. alongwith support service through soil testing, soil conservations, water conservations, seed testing, seed certification, quality control of fertilisers and pesticides etc. The Agriculture Department is working closely with the agri-allied departments viz. Animal Resources Development, Fisheries, Agri. Marketing, Horticulture, Cooperation, Water Resources Investigation Development, Irrigation & Waterways, Forest, Sericulture, Food & Supplies and WBCADC under the Panchayats & Rural Development Department to achieve the above objectives. Certain measures are there, those are to be considered deeply for further development of agriculture, these are :- (1) The staple food of Bengal is rice. Therefore, rice production and consumption in this state has maximum level. Rice cultivation is the pivotal of agriculture here, though here national level rice research institute is absent. Groundnut production maximum in state of Gujarat-there is Directorate of Groundnut Research at Junagadh, cotton production maximum in state of Maharashtra –there is Central Institute of Cotton Research at Nagpur, tuber crop production is maximum in Kerala, there is Central Tuber Crops Research Institute at Trivandrum, similarly spices production is maximum in this state –there is Indian Institute of Spices Research at Calicut, sugarcane production is maximum in state Uttar Pradesh, there is Indian Institute of Sugarcane Research at Lucknow etc. Therefore, to boost the agriculture condition of the state, a national level rice research institute is need of the hour. (2) In inland fish production West Bengal is first, though here no fisheries university is present, either state level or national level. Tamil Nadu govt. has established Tamil Nadu Fisheries University at Nagapattinam.

Fish is integral part of Bengali food, therefore, fish food having a everlasting demand in this state. There is a gap in sufficient production of fish, hence fish is brought from the state Andhra Pradesh. So, enhance the production and maintaining everlasting demand of fish to set a Fisheries University is need of the hour. (3)West Bengal university of Animal & Fisheries Science will be changed to West Bengal University of Animal & Dairy Science. Animal & Dairy Science development will secure availability of eggs, meat and milk those are most important components of nutritional security of every unit of society. (4) According to the United Nations Development Programme, upto 40 percent of the food produced in India is wasted. Food loss is also nutritional loss, productivity loss and therefore, GDP loss. Therefore, establishment of cold storage to prevent food wastage is need of the hour. (5) Now-a-days production happens more or less, therefore, production is not a problem so much but the main problem is marketing that products. Govt. can do two main work in this respect—(1) establishment of market and develop demand of products in the markets those are accessible by farmers or (2) connect village road with state highway, national highway of rail road, so farmers can reach by their own efforts to those markets where demand of products are there. (6) Now-a-days doctors without blood report, urine report etc. do not prescribe medicine, but our farmers are applying fertilizers in soil without knowing the soil nutrient status. Hence, it is a blind practice, it must be stopped immediately and for this purpose, soil testing facilities should be provided to farmers. (7) Still we have developed irrigation infrastructure upto 35-40% level but remaining 60 percent is rainfed. Agriculture in India depends on vagaries of weather hence agriculture is unstable, to make agriculture stable development of irrigation infrastructure is foremost important compare to providing subsidy/compensation to farmers. (8) KVK is considered the lighthouse of agriculture where derived technologies are disseminated to farmers through training and practical demonstration. Therefore, establishment of KVK in each district atleast one is need of the hour. (9) Each district must have a agriculture training centre (ATC) where farmers will come and get training on various aspects of agriculture. A country where maximum illiterate farmers in the world are residing, there this type of training centre is need of the hour to literate farmers agriculturally. There are several other agricultural activities those are needed to perform properly through proper development of agricultural infrastructure –(1) crop diversification (2) Farming diversification (3) Releasing fish seedling in govt. water bodies –a very good idea (4) Inclusion of fruit plant in social forestry (5)More emphasis will be given on marketing (6) All technologies should be channelized through KVK (7) Fallow land of Bankura, Purulia and West Midnapur and Jhargram should be covered by fruit plants (8) Organic farming etc.

"Everything else can wait, but not agriculture" Jawaharlal Nehru

Reference

1. Anonymous (2017) Telephone Directory; Indian Council of Agricultural Research, Krishi Bhavana, New Delhi; P-59-109, 113-122, 173-178, 221-224
2. Nayban, G. (2001) Sahaj Kathay Bigyanbhittik Chasbas, Ghosh Publication, Kolkata, P:168-208.

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