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Bihar Public

Service Commission

(BPSC Mains)

Optional Subject - Agriculture

Optional Subject: **AGRICULTURE**

Section- I

Ecology and its relevance to man, natural resources, their management and conservation. Physical and social environment as factors of crop distribution and production. Climatic elements as factors of crop growth, impact of changing environment on cropping pattern as indicators of environments. Environmental pollution and associated hazards to crops, animals and humans.

Agro-climatic Zones of Bihar; Cropping pattern in different agro-climatic zones of the country-with special reference to North Bihar, South Bihar, and Chotanagpur and Santhal Pargana plateau. Impact of high-yielding and short duration varieties on shifts in cropping patterns in Bihar. Concept of multiple cropping, mixed cropping, relay and inter-cropping and their importance in relation to food production. Package of practices for production of important cereals, pulses, oilseeds, fibre, sugar and commercial crops grown during kharif and rabi seasons in different regions of the country. Important spices crops of Bihar-chillies, ginger, turmeric and coriander.

Important features, scope and propagation of various types of forestry plantations, such as extension/social forestry, agro forestry and natural forests.

Weeds, their characteristics, dissemination and association with various crops, their multiplication; integrated weed management; cultural, biological and chemical control of weeds.

Processes and factors of soil formation, classification of Indian soils including modern concepts, Major soil types of Bihar; Mineral and organic constituents of soils and their role in maintaining soil productivity. Problem soils-extent and distribution in India; Problems of soil salinity, alkalinity and acidity and their management. Essential plant nutrients and other beneficial elements in soil and plants, their occurrence, factors affecting their distribution, functions and cycling in soils. Symbiotic and non-symbiotic nitrogen fixation, Principles of soil fertility and its evaluation for judicious fertilizer use; bio-fertilizers. Problems of Tal Diara and chour lands in Bihar, cropping system in such situations.

Soil conservation planning on water-shed basis, Erosion and runoff management in foot hills and valley lands; processes and factors affecting them Dry land agriculture and its problems. Technology for stabilising agriculture production in rainfed agriculture area.

Water use efficiency in relation to crop production criteria for scheduling irrigations, ways and means of reducing runoff losses of irrigation water. Drainage of Water-logged soils. Role of different command area Development Agencies in agricultural development of Bihar.

Farm management, scope, importance and characteristics. Farm planning and budgeting. Economics of different types of farming systems.

Marketing and pricing of agricultural inputs and outputs; price fluctuations, Types and systems of Farming and factors affecting them. Role of Co-operative marketing and credit in agricultural development of Bihar.

Trend of agricultural production during the last two decades in Bihar Pace of land reforms in Bihar and result out impact on agricultural productivity.

Agricultural extension, its importance and role, methods of evaluation of extension programmes; Important extension methods and media, rural leader ship, socio-economic survey and status of big, small and marginal farmers and landless agricultural labourers. Farm mechanization and its role in agricultural production and rural employment. Training programmes for extension workers. Krishi Vigyan Kendras, role of non-government organizations (N.G.Os) in extension.

Section- II

Genesis and growth of Agricultural research and education system in Bihar.

Application of principles of plant breeding to the improvement of major field crops, methods of breeding of self and cross-pollinated crops. Introduction selection, hybridization heterosis and its exploitation. Male sterility and self incompatibility, utilization of Mutation and polyploidy in breeding, use of biotechnology and tissue culture in agriculture.

Heredity and variation, Mendal's law of inheritance, chromosomal theory of inheritance, cytoplasmic inheritance, sex linked, sex influenced and sex limited characters. spontaneous and induced mutations. Quantitative characters.

Important recommended varieties of principal crops in Bihar. Origin and domestication of field crops. Morphology patterns of variation in varieties and related species of important field crops, causes and utilization of variation in crops improvement.

Seed Technology and its importance; production, processing and testing of seeds of crop plants. Role of National and State seed organization in production, processing and marketing of improved seed.

Physiology and its significance in agriculture, Nature, physical properties and chemical constitution of protoplasm, Imbibition, surface tension, diffusion and osmosis. Absorption and translocation of water, transpiration and water economy.

Enzymes and plant pigments photosynthesis, modern concepts and factors affecting the process, aerobic and anaerobic respiration.

Growth and development: photoperiodism and vernalization. Auxin, hormones and other plant regulators and their mechanism of action and importance in agriculture.

Climatic requirements and cultivation of major fruits and vegetables in Bihar; their recommended package of practices. Handling and marketing problems of fruits and vegetables; principal methods of preservation, important fruits and vegetable products. Processing techniques and equipments. Role of fruits and vegetables in human nutrition; landscape and floriculture including raising of ornamental plants and design and lay-out of lands and garden.

Diseases and pests of field, vegetable, orchard and plantation crops of Bihar and their causes and management. Classification of plant diseases; principles of plant diseases control including exclusion, eradication, immunization and protection. Biological control of pests and diseases. Integrated management of pests and diseases. Pesticides and their formulation. Plant quarantine.

Storage pests of cereals and pulses; hygiene of storage godown, preservation and remedial measures. Hazards of pesticides use and safety measures.

Status and scope of rearing beneficial insects in Bihar; honey bees, silk worm and lac insect. Rice fish culture in Bihar.

Recurrent menace of flood and drought in Bihar and contingency crop planning, food Production and consumption trends in India, in general and Bihar, in particular. National and International food policies, procurement, distribution, processing and production constraints, Relation of food production to national dietary pattern, major deficiencies of calorie and protein.