

CBSE – DEPARTMENT OF SKILL EDUCATION

Agriculture (SUBJECT CODE: 808)

Marking Scheme

Class XII (Session 2019–2020)

Time: 3 Hours

Max. Marks: 70

General Instructions:

1. *This Question Paper consists of two parts viz. Part A: Employability Skills and Part B: Subject Skills.*
2. **Part A: Employability Skills (10 Marks)**
 - i. *Answer any 4 questions out of the given 6 questions of 1 mark each.*
 - ii. *Answer any 3 questions out of the given 5 questions of 2 marks each.*
3. **Part B: Subject Skills (60 Marks):**
 - i. *Answer any 10 questions out of the given 12 questions of 1 mark each.*
 - ii. *Answer any 7 questions from the given 9 questions of 2 marks each.*
 - iii. *Answer any 7 questions from the given 9 questions of 3 marks each.*
 - iv. *Answer any 3 questions from the given 5 questions of 5 marks each.*
4. ***This question paper contains 46 questions out of which 34 questions are to be answered.***
5. *All questions of a particular part/section must be attempted in the correct order.*
6. *The maximum time allowed is 3 hrs.*

PART A: EMPLOYABILITY SKILLS (10 MARKS)

Answer any 4 questions out of the given 6 questions of 1 mark each:

1.	Verbal and Non-verbal	(1)
2.	The act of mindfully hearing and attempting to comprehend the <i>meaning</i> of words spoken by another in a conversation or speech.	(1)
3.	Music is the language of the soul. A good inspiring piece touches everybody's heart and can help create miracles.	(1)
4.	CTRL+ C and CTRL + V	(1)
5.	Adapting to changing conditions is an essential part of running your life -- and your business. The business landscape changes all the time and you have to be ready for it. Without adaptability, you are going to find yourself in serious trouble.	(1)

6.	Green buildings use ecofriendly materials, benefit environment by conserving energy.	(1)
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Answer any 3 questions out of the given 5 questions of 2 marks each:

7.	It helps you truly understand what people are saying It can help build rapport with your interviewer. It can help reduce your nervousness during an interview. Student can write any 1	(2)
8.	Extraversion, Agreeableness, Conscientiousness, Emotional stability, Openness to experience Student can write any 2	(2)
9.	Built-in functions make calculations easier, faster, and more accurate. Large volumes of data can be easily handled and manipulated. Data can be exported to or imported from other software.	(2)
10.	Availability of funds is a major concern for starting a business. A delay in source of finance delay in starting or running business.	(2)
11.	Water treatment specialist, Water Auditor, Water policy Analyst, Water resource planning manager, Water Quality Monitoring, Water conservation Representative. Student can write any 2	(2)

PART B: SUBJECT SKILLS (60 MARKS)

Answer any 10 questions out of the given 12 questions:

12.	Soybean, Rapeseed & Mustard, Sunflower.	(1)
13.	Rice, wheat, maize.	(1)
14.	Shimla in Himachal Pradesh	(1)
15.	Iron (Fe), manganese (Mn), zinc (Zn), copper (Cu)	(1)
16.	Rice–wheat, Maize–wheat cropping system	(1)
17.	Chickpea, pigeonpea, mungbean	(1)

18.	Tomato sauce, tomato catch-up	(1)
19.	Honey bees	(1)
20.	Cabbage, cauliflower	(1)
21.	Ghaziabad (UP)	(1)
22.	<i>Eisenia foetida, Eudrilus euginae</i>	(1)
23.	Urea, Calcium Ammonium Nitrate (CAN)	(1)

Answer any 7 questions out of the given 9 questions of 2 marks each:

24.	Soil fertility: It refers to the ability of soil to sustain crop plant growth, i.e. to provide plant habitat and result in sustained and consistent yields of high quality.	(2)
25.	Crop rotation: Crop rotation is the practice of growing a series of dissimilar or different types of crops in the same area in sequenced seasons or in a year.	(2)
26.	Fruit jam: <ul style="list-style-type: none"> • Step 1 - Pick the fruits. • Step 2 - Wash the jars and lids. • Step 3 - Wash and hull the fruits. • Step 4 - Crush the fruits. • Step 5 - Add sugar. • Step 6 - Mix the fruits with the pectin and cook to a full boiling while stirring. • Step 7 - Cool the jam & pack the jars. • 	(2)
27.	Post-harvest management: It involves all kinds of operations/treatments after harvest of the economic produce. For example, the freshly harvested commodity/horticultural produce are made to undergo these treatments to minimize losses and increase its shelf-life, and add value to the product.	(2)
28.	Plant based bio-pesticides: These are the plant derived naturally occurring phyto-chemical pesticides that control pests by various mechanisms with less or no harm to human beings and crop plants.	(2)
29.	Beekeeping: Beekeeping (or apiculture) is the maintenance of honey-bee colonies/ hives for honey, beeswax, propolis and royal jelly, etc. besides to pollinate the crops/fruits.	(2)
30.	Integrated disease management: Integrated disease management is the integration of the various disease management practices to prevent and manage diseases in crops. It	(2)

	is the combination of preventative or curative measures that can be put in place to minimize the risk of disease infection and spread.	
31.	Principles of food preservation: Principles of food preservation comprise of the methods of food preservation that slows down or prevent altogether the action of the agents of spoilage. At the same time, during the process of food preservation, the food should not be damaged. The food preservation principles are: 1. Controlling microorganisms, 2. Controlling enzymes, 3. Controlling insects, rodents, birds and other physical causes of food deterioration.	(2)
32.	Organic farming: Organic farming is a system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, food additives etc) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection.	(2)

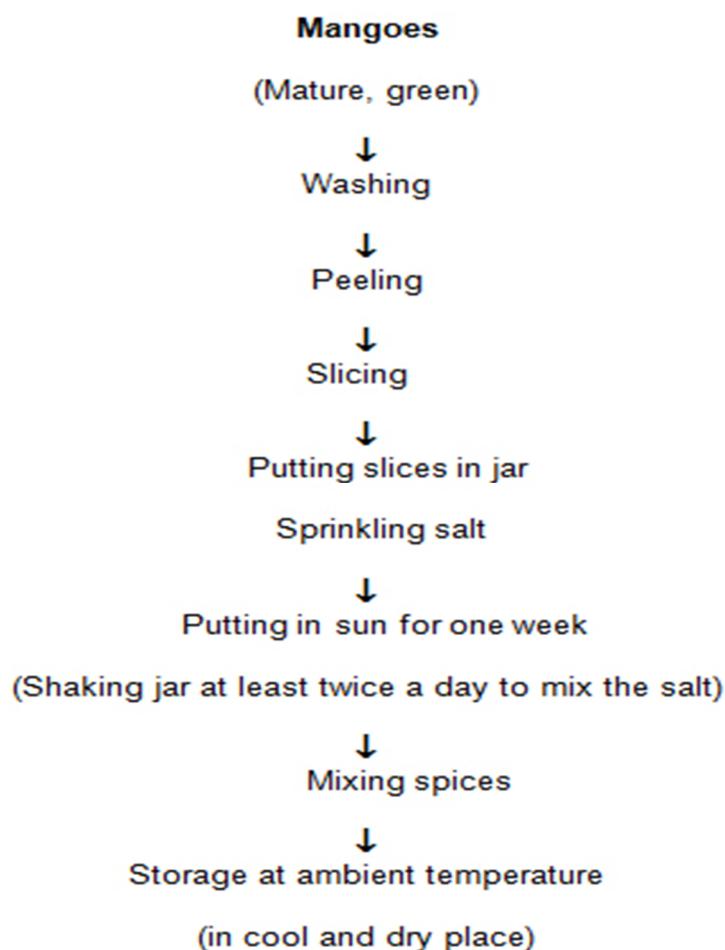
Answer any 7 questions out of the given 9 questions of 3 marks each:

33.	Concept of safe food and important food regulations: The Food Safety and Standards Authority of India (FSSAI) have been created under Food Safety and Standards Act, 2006; for laying down science based standards for articles of food and to regulate their manufacture, storage, distribution, sale and import to ensure availability of safe and wholesome food for human consumption. Food Safety and Standards Act (FSS), 2006 is the primary law for regulation of food products. This act also sets up the formulation and enforcement of food safety standards in India.	(3)
34.	Major post-harvest management steps of fruits and vegetables: <ul style="list-style-type: none"> • Pre-harvest treatment • Harvesting at maturity • Safe harvesting • Pre cooling & washing • Surface drying • Cool/cold storage • Safe transport • Safe handling 	(3)
35.	Role of food production in national economy and national food security <ul style="list-style-type: none"> • With a five-fold increase in food grain production from 50 million tonnes in 1950-51 to about 285 million tonnes in 2017-18, India has moved away from dependence on food aid to become a net food exporter. • Agriculture and food production sector play a vital role in the Indian economy. • India is the world's largest producer of pulses, rice, wheat, spices and spice products. • Over 70 per cent of the rural households depend on agriculture. • Agriculture is an important sector of Indian economy as it contributes about 17% to the total GDP and provides employment to over 60% of the population. • Since the Green Revolution in the 60s, India became self-sufficient in meeting national food and nutritional needs. • Currently, India is capable of feeding its growing population besides exporting 	(3)

surplus food which is an indicator of national food security.

36. **Flow chart for making mango pickle:**

(3)



37. **Three methods employed to dry the flowers and foliage:**

(3)

1. Hanging flowers and foliage to dry naturally:

This is a very easy method to dry flowers and in this method, flowers are dried by tying them into small bundles and hanging them upside down in a warm and ventilated place away from direct sunlight, that is, in a cool dark area.

2. Drying flowers and foliage in a drying chamber (hot air drying):

In this method, flowers and foliage are dried in a convection chamber that has a fan. The temperature should be maintained between 30 to 35 °C and this process takes many hours to a few days to dry the flowers. The flowers are placed into

	<p>slots in a wire mesh and placed in the chamber. The time for the drying process also depends on the amount of flowers being dried at one time within the chamber.</p> <p>3. Preserving or drying flowers and foliage using microwave: In this method, the flowers are placed between two kitchen towels and then dried in the microwave. Since an extra few seconds can burn the flowers, care needs to be taken on the number of seconds or minutes they are microwaved. After a minute of microwaving, it is best to check the flowers every few seconds in order to avoid burning them.</p>	
38.	<p>IPM: IPM is an ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques such as biological control, habitat manipulation, modification of cultural practices, and use of resistant varieties.</p> <p>Major components of IPM:</p> <ul style="list-style-type: none"> • Chemical practices: Use of chemical pesticides to keep the pest population below economic loss. • Cultural practices: Cultural methods of pest control consist of regular farm operations in such a way which either destroy the pests or prevent them from causing economic loss. • Mechanical practices: Removal and destruction of pest or its eggs, larvae, pupae through mechanical means. • Regulatory practices: In this process, regulatory rules framed by Govt. are brought into force under which seeds and infested plant materials are not allowed to enter the country or from one part to other parts of the country. These are known as quarantine methods and are of two types i.e. domestic and foreign quarantine. • Biological practices: Biological control of insect pests and diseases through biological means is most important component of IPM. In broader sense, biocontrol is use of living organisms to control unwanted living organisms (pests). In other words, deliberate use of parasitoids, predators and pathogens to maintain pest population at level below those causing economic loss either by introducing a new bio-agent into the environment of pest or by increasing effectiveness of those already present in the field. • Bio-pesticides: These are micro-organisms which infest and cause diseases in their hosts as a result of which hosts are killed. Major groups of pathogens are fungi, viruses and bacteria. Some nematodes also cause diseases in some insect pests. 	(3)
39.	<p>Various irrigation methods used in India: Irrigation method refers to the manner in which irrigation water is applied to the field. There are four principal methods of irrigation:</p> <ul style="list-style-type: none"> • Surface irrigation method • Sub-surface Irrigation method • Drip irrigation method • Sprinkler irrigation method <p>Drip irrigation: In this method, irrigation is given by using small diameter PVC</p>	(3)

	<p>tubing with devices called emitters or drippers at selected places near the base of plants. The losses by deep percolation and evaporation are minimum. This method is good for economizing water use.</p> <p>Advantages of drip irrigation method:</p> <ul style="list-style-type: none"> • No deep percolation losses. • Maintains optimum moisture. • Economize water use. • Fertilizer can also be applied along with irrigation water. <p>Disadvantages of drip irrigation method:</p> <ul style="list-style-type: none"> • High cost. • Rats and other animals may damage the system. • Dirty water cannot be used. • Does not work under very low pressure. 	
40.	<p>Gulkhand and rose water, two important processed products of rose:</p> <p>Gulkhand: Gulkhand is sun-cooked and cured over a long period with just Damask rose petals, candy sugar & assorted spices. Slow sun-cooking imparts depth & richness to the already concentrated floral, fruity and caramelized flavours of Gulkhand.</p> <p>Rose water: Rose water is flavoured water made by steeping rose petals in water. Additionally, it is the hydrosol portion of the distillate of rose petals, a by-product of the production of rose oil for use in perfume. It is used to flavour food, as a component in some cosmetic and medical preparations, and for religious purposes throughout Europe and Asia.</p>	(3)
41.	<p>Mushroom production technology: Mushrooms are the fruiting bodies of a fungus. Mushrooms grow on compost. Commercial mushroom cultivation is a process utilizing waste materials such as horse manure, chicken manure, pig manure, wheat straw, rice straw, corn cobs, wood bark, sawdust, and cottonseed hulls to produce a delicious and nutritious food.</p> <p>Mushroom production technology consists of six steps: Phase I composting, Phase II composting, spawning, casing, pinning, and cropping. These steps are described sequence-wise. Compost provides nutrients needed for mushrooms to grow.</p>	(3)

Answer any 3 questions out of the given 5 questions of 5 marks each:

42.	<p>Integrated nutrient management: Integrated nutrient management (INM) aims at achieving a harmony in the judicious and efficient use of chemical fertilizers in conjunction with organic manures, crop residues, green manures, legumes in cropping systems, use of bio-fertilizers and other locally available nutrient sources for sustaining soil health and environment as well as crop productivity on long term basis.</p> <p>Components of INM: Components of INM include judicious use of chemical fertilizers, organic manures, crop residues, green manures, legumes and bio-fertilizers.</p> <p>1. Chemical Fertilizers: Use of chemical fertilizers in balanced proportions and</p>	(5)
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recommended amounts is the quickest way of boosting crop production. Further, chemical fertilizers alone are unable to maintain and sustain the long term soil health

and crop productivity because they are unable to supply organic matter and micro-nutrients like organic manures. Hence, the integrated use of inorganic fertilizers with organics increases the efficiency of applied nutrients and soil health.

2. Organic Manures: The organic manures which are mainly prepared from animal's dung/urine and plant residues, are referred to as organic manures. FYM is the most important and commonly used organic manure in India. Common organic manures are FYM, compost from farm litter, night soil, sewage and sludge, green manure, poultry manure, vermicompost, biogas slurry, crop residues etc.

3. Legume Crops in Rotation: Legumes can form an important component of INM system when grown for grain or fodder in rice-wheat cropping system, intercropped with other non-legumes or when introduced as green manure crops. Legumes act as soil fertility restorers due to their ability to obtain N from the atmosphere in symbiosis with Rhizobium. It plays a vital role in N-fixation and economizing the N use.

4. Bio-Fertilizers: Bio-fertilizers are microbial inoculants of bacteria, algae, fungi alone or in combination and they augment the availability of nutrients to the plants. These microorganisms are used for the treatment of seeds, seedlings and application to soil or in composting to increase soil fertility and help in crop growth and high yield. *Rhizobium*, *Azotobacter* and Phospho-bacteria, BGA and Azolla are the major bio-fertilizers.

43. **Major Government Schemes for the food sector:**

(5)

- **Soil Health Card Scheme:** The scheme has been introduced to issue Soil Health Cards to all farmers in the country. The Soil Health Cards provide information to farmers on nutrient status of their soil along with recommendation on appropriate dosage of nutrients to be applied for improving soil health and its fertility.
- **National Mission for Sustainable Agriculture (NMSA):** It aims at promoting Sustainable Agriculture through climate change adaptation measures, enhancing agriculture productivity especially in rainfed areas focusing on integrated farming, soil health management, and synergizing resource conservation.
- **Pradhan Mantri Krishi Sinchai Yojana (PMKSY):** It was launched with the motto of 'Har Khet Ko Paani' for providing end-to end solutions in irrigation supply chain, viz. water sources, distribution network and farm level applications.
- **Paramparagat Krishi Vikas Yojana (PKVY):** It is implemented with a view to promote organic farming in the country.
- **National Agriculture Market (e-NAM):** It provides e-marketing platform at national level and support creation of infrastructure to enable e-marketing.
- **Micro Irrigation Fund (MIF):** The main objective of the fund is to facilitate the

	<p>States in mobilizing the resources for expanding coverage of Micro Irrigation.</p> <ul style="list-style-type: none"> ○ Agriculture Contingency Plan: Purpose is to tackle aberrant monsoon situations leading to drought and floods, extreme events (heat waves, cold waves, frost, hailstorms, cyclone) adversely affecting crops, livestock and fisheries (including horticulture). ○ Rainfed Area Development Programme (RADP): Implemented for Rainfed Area Development. ○ National Watershed Development Project for Rainfed Areas (NWDPA): The scheme was launched for twin concepts of integrated watershed management and sustainable farming systems. ○ Pradhan Mantri Fasal Bima Yojana (PMFBY): PMFBY objective is to facilitate prompt claims settlement on crop insurance. ○ Livestock insurance Scheme: It aims to provide protection mechanism to the farmers and cattle rearers against any eventual loss of animals due to death. ○ National Scheme on Welfare of Fishermen: This scheme provides financial assistance to fishers. ○ Scheme on Fisheries Training and Extension: It provides trainings for fishery sector. ○ Gramin Bhandaran Yojna. ○ National Horticulture Board (NHB) ○ National Horticulture Mission (NHM) ○ Small Farmer Agri-Business Consortium (SFAC) assistance to cold storage ○ Agricultural and Processed Food Products Export Development Authority (APEDA) assistance for cold chain ○ Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 	
44.	<p>Various biofertilizers used in Indian agriculture and their application methodology:</p> <p>Various biofertilizers used in Indian agriculture are:</p> <ul style="list-style-type: none"> • Nitrogen fixing biofertilizers: <i>Rhizobium</i>, <i>Azospirillum</i> and <i>Azotobacter</i> • Phosphorous solubilizing biofertilizers: <i>Bacillus</i>, <i>Pseudomonas</i> and <i>Aspergillus</i> • Phosphate mobilizing biofertilizers: <i>Mycorrhiza</i> • Plant growth promoting biofertilizers: <i>Pseudomonas sp.</i> <p><i>Rhizobium:</i> <i>Rhizobium</i> has ability to fix nitrogen in association with leguminous plants. <i>Rhizobium</i> inoculation ensures adequate N supply for legumes (cowpea, green gram, blackgram, pea, chickpea, groundnut, soybean, berseem, subabul) in place of N fertilizer and observed that <i>Rhizobium</i> can fix 50-300 kg N/ha.</p> <p><i>Azotobacter:</i> <i>Azotobacter</i> free-living bacteria that fix atmospheric nitrogen in cereal</p>	(5)

crops and do not need a specific host plant. *Azotobacter* helps in saving 10 to 20 kg N/ha and it produces growth promoting substances (vitamins of B groups, indole acetic acid and gibberellic acid) which improve seed germination and growth of extended root system. It is recommended for Rice, wheat, millets, other cereals, cotton, vegetable, sunflower, mustard, flowers, etc.

Azospirillum: The bacteria have been found to live within the root of sorghum, pearl millet and raga plants. They fix atmospheric nitrogen at the rate of 15-30 kg N/ha and secrete growth regulatory substances. It is recommended for paddy, maize, wheat, sorghum, sugarcane, etc.

Phosphate Solubilizing Microorganisms: Phosphorus is one of the most important essential plant nutrients. Large amounts of phosphorus are fixed in the soil. The solubilization effect of phospho-bacteria is generally due to the production of organic acids that lower the soil pH and bring about the dissolution of bound forms of phosphate which increase the availability of phosphate in soil. Phosphate solubilizing micro-organism includes efficient strain of bacteria, fungi, yeast and actinomycetes. It is recommended for all the crops.

Vesicular Arbuscular Mycorrhiza (VAM): VAM symbiosis refers to a mutualistic, symbiotic relationship formed between fungi and living roots of higher plants. The plant roots transmit substances to the fungi, and the fungi aid in transmitting nutrients and water to the plant roots. Further, VAM fungi solubilise inorganic forms of nutrients through release of low molecular weight organic acids.

Plant Growth Promoting Rhizobacteria (PGPR): Plant growth-promoting rhizobacteria (PGPR) are a group of free-living bacteria that colonize the rhizosphere and benefit the root growth. Bacteria of diverse genera were identified as PGPR of which *Bacillus* and *Pseudomonas* sp. are dominant.

Application Methodologies of Biofertilizers:

Application method for seed, soil & planting materials	Procedure
Seed treatment with biofertilizers	<p>Seed inoculation of cereals, oilseeds and pulses with culture one packet (200 g) is sufficient to treat 10-12 kg seed. Use of the respective inoculum properly and instant sowing of the inoculated seeds with minimal waiting period between treatment and sowing are necessary for greater effectiveness. The recommended rates/dosage is to be mixed with sufficient quantity of sticking agent/water to form slurry. Seeds are treated with the slurry of the culture in a manner that all the seeds are coated with culture slurry properly. The seeds are then shade dried and sown with minimal waiting period.</p> <ul style="list-style-type: none"> • Prepare culture suspension by mixing one packet bio-fertilizer in about 400 ml water in 1:2 ratio • Spread culture suspension on the heap of the seeds and mix by hand so coating is uniformly applied to the seeds. • Spread the seeds under shade for some time for drying and then sow.
Seedling treatment	Sufficient quantity of water and organic fertilizer or field soil to form slurry and the seedling roots are immersed in

	<p>this slurry for about 30 minutes before planting so that the roots are well drenched with the slurry.</p>	
	<p>Sugarcane sett treatment</p> <p>Biofertilizers is mixed with sufficient quantity of water and organic fertilizer and sugarcane sets are soaked in the mix of biofertilizers + water + organic fertilizer for about an hour and planted in the fields.</p>	
	<p>Soil application</p> <p>This method varies crop to crop depending on its duration. Generally, for a short duration (less than 6 months), 10-15 packets (each of 200 g) are mixed with 40-60 kg of well decomposed cattle manure or with 40-60 kg soil for one acre land. Mixture of bio-fertilizer and cattle manure sprinkled with water is then broadcasted into soil at time of sowing. For long duration crop 20-30 packets of bio-fertilizer (each containing 200 g) are mixed with 80-120 kg manure/acre.</p>	
45.	<p>Commercial cultivation of marigold:</p> <p>Soil: Marigold can be cultivated in a wide variety of soils. A deep fertile, friable soil having good water holding capacity and aeration is suitable for its cultivation. Sandy loam soil with a pH of 7.0-7.5 having good drainage is most preferred.</p> <p>Climate: The environmental conditions markedly influence the growth and flowering of marigold. Mild temperature during growing period greatly improved flowering.</p> <p>Varieties: Pusa Narangi Gaiinda, Pusa Basanti Gaiinda, Pusa Arpita, Bidhan Marigold-1, Bidhan Marigold-2 etc.</p> <p>Propagation method: Mostly through seeds and in some varieties by cuttings.</p> <p>Planting distance: Generally distance between rows is kept 45-60 cm and from plant to plant it is 30-45 cm.</p> <p>Insect pests: Red spider mite, hairy caterpillars and leaf hoppers</p> <p>Diseases: Damping off, Leaf spots and blight, flower bud rot and viral diseases.</p>	(5)
46.	<p>Major Government Schemes for promotion of organic farming:</p> <p>1. Paramparagat Krishi Vikas Yojna (PKVY): Paramparagat Krishi Vikas Yojana (PKVY), a sub-component of Soil Health Management (SHM) scheme under National Mission of Sustainable Agriculture (NMSA) aims at development of models of excellence in organic farming through a mix of traditional wisdom and modern science in value chain mode to install sustainability, ensure long term soil fertility build-up, resource conservation and to offer safe and healthy food grown through organic practices without the use of agro- chemicals. PKVY also aims at empowering farmers through institutional development through clusters for not only in farm practices management, input production, quality assurance but also in value addition and direct marketing through innovative means. Participatory Guarantee System under PGS-India programme will be the key approach for quality assurance under the PKVY.</p> <p>2. Mission Organic Value Chain Development for North Eastern Region:</p>	(5)

	<p>Realizing the potential of organic farming in the North-Eastern Region of the country, Ministry of Agriculture and Farmer Welfare has launched a Central Sector Scheme entitled "Mission Organic Value Chain Development for North Eastern Region" for implementation in the states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, during the 12th plan period. The scheme aims at development of certified organic production in a value chain mode to link growers with consumers and to support the development of entire value chain starting from inputs, seeds, certification, the creation of facilities for collection, aggregation, processing marketing and brand building initiative.</p>	
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