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LECTURE 5

ALLIED ENTERPRISES AND THEIR IMPORTANCE



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1. Crop production

Crop production is an integral part of farm activities in the country. Cropping systems based on climate, soil and water availability have to be evolved for realizing the potential production levels through efficient use of available resources.

Sequential Cropping Systems

- Rice-based cropping system
- Sorghum-based cropping system
- Pearl millet-based cropping system
- Wheat and gram-based cropping system



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2. Multitier cropping

- The practice of growing different crops of varying height, rooting pattern and duration is called ‘multi-tier cropping’ or multi-storied cropping.
- Multi-storied cropping is mostly prevalent in plantation crops like coconut and areca nut.



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2. Dairy Farming

Dairy farming is an important source of income to farmers. Besides producing milk and/or draft power, the dairy animals are also good source of farm yard manure, which is good source of organic matter for improving soil fertility. The farm byproducts in turn are gainfully utilized for feeding the animals.

Cattle Rearing: Cattle rearing in India is carried out under a variety of adverse climatic and environmental conditions. The cattle are broadly classified into three groups.



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- Dairy breeds
- Draft breeds
- Dual purpose
- Exotic breeds
- buffaloes
- Housing
- Breeding and maintenance
- Feeding
- Roughages
- Concentrates
- Vitamins and minerals



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3. Goat and Sheep Rearing:

Goat is mainly reared for meat, milk, hide and skin.

Goat meat is the preferred meat in the country. A goat on hoof (live goat) fetches a better price than a sheep on hoof.

- Housing
- Breeding and maintenance
- Feeding

Sheep Rearing

- Breeding and maintenance
- Feeding



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4. Piggery

Pigs are maintained for the production of pork. They are fed with inedible feeds, forages, certain grain byproducts obtained from mills, meat byproducts, damaged feeds and garbage. Most of these feeds are either not edible or not very palatable to human beings.

- **Breeds:** Imported breeds of Large White, Yorkshire and Landrace are being used widely.
- Housing
- Feeding
- Maintenance



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5. Poultry

- **Breeds:** Specific poultry stocks for egg and broiler production are available. Inbred lines of white Leghorn. To a limited extent, other breeds like Rhode Island Red, California Grey and Australop are used.
- Housing
- Feed
- maintenance



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6. Duck Rearing

Ducks are predominantly of indigenous type and reared for egg production on natural foraging. They have a production potential of about 130-140 eggs/bird/year. Ducks are quite hardy, more easily brooded and resistant to common avian diseases.

- **Breeds:** The important Indian breeds are Sylhet Mete and Nageswari, which are mostly found in the Eastern region of the country.
- Housing
- Feeding
- Maintenance



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7. Apiculture

Apiculture is the science and culture of honeybees and their management.

Apiculture is a subsidiary occupation and it is a additional source of income for farm families.

Species

Apis cerena

Apis mellifera

Management

Honeybee collection :



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Honey collection:

Honey is a sweet viscous fluid produced by honeybees mainly from the nectar of the flowers. Honey should have good quality to meet the national and international standards. Qualities such as aroma, colour, consistency and floral sources are important. Proper honey straining and processing are needed to improve the quality of the produce. Honey varies in the proportion of its constituents owing to the differences in the nectar produced by different plants. The nectar collected by bees is processed and placed in comb cells for ripening. During the ripening, sucrose is converted into glucose and fructose by an enzyme called invertase, which is added to it by the bees.



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8. Fishery

Ponds serve various useful purposes, viz., domestic requirement of water, supplementary irrigation source to adjoining crop fields and pisciculture.

Pond: The depth of the pond should be 1.5-2.0 m. This depth will help for effective photosynthesis and temperature maintenance for the growth of zoo and phytoplankton. Clay soils have higher water retention capacity and hence are best suited for fish rearing. Pond water should have appropriate proportion of nutrients, phosphate (0.2-0.4 ppm), nitrate (0.06-0.1 ppm) and dissolved oxygen (5.0-7.0 ppm). Organic manures such as FYM and poultry droppings may also be applied to promote the growth of phyto and zooplanktons.



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Species of fish:

- Among the Indian major carps, Catla (*Catla catla*) is the fast growing fish. It consumes a lot of vegetation and decomposing higher plants.
- Rohu (*Labeo rohita*) is a column feeder
- Calbasu (*Labeo calbasu*) is a bottom feeder on detritus.
- Silver carp (*Hypophthalmichthys molitrix*) is mainly a surface and phytoplankton-feeder and also feeds on micro-plants.
- Grass carp (*Ctenopharyngodon idella*) is a specialized feeder on aquatic plants, cut-grass and other vegetable matter.



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- **Composite Fish Culture:** The phytophagous fish (Catla, Rohu and Mrigal) can be combined with omnivorous (Common carp), plankton-feed (Silver carp) and mud-eaters (Mrigal and Calbasu) in a composite fish culture system.
- **Management:** For higher productivity fish are to be provided with supplementary feeding with rice bran and oilseed cakes. This will enable faster growth and better yield. Each variety of carps could be stocked to 500 fingerlings with the total 5000-8000 per ha. This stocking density will enable to get a maximum yield of 2000 to 5000 kg/ha of fish annually under good management practices.



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9. sericulture

Sericulture is defined as a practice of combining mulberry cultivation, silkworm rearing and silk reeling.

- **Moriculture:** Cultivation of mulberry plants is called as 'moriculture'. There are about 20 species of mulberry, of which four are commonly cultivated. They are *Morus alba*, *M. indica*, *M. serrata* and *M. latifolia*. The crop can yield well for 12 years, after which they are pulled out and fresh planting is done. Yield of mulberry leaves is 30-40 t/ha/year.
- **Silk worm rearing:** There are four types of silk worm viz. (i) Mulberry silk worm – *Bombyx mori* (ii) Eri silk worm – *Philosamia ricini* (iii) Tassar silk worm – *Antheraea mylitta* (iv) Muga silk worm – *Antheraea assami*



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- **Rearing and Maintenance:**
- The fertilized moth is covered with an inverted funnel or cellulose and eggs are allowed to be laid over a cardboard.
- Parasites may be removed by brushing the egg masses with a fine brush.
- This will also enable to obtain a uniform hatch. In a bamboo tray rice husk is spread.
- Tender chopper mulberry leaves are added to the tray. The hatched out larvae are transferred to the leaves. Leaves are changed after every 2-3 hours during the first 2-3 days.
- The cocoon is constructed with a single reelable thread of silk. If the moths are allowed to emerge from the cocoons, the silk thread is cut into pieces.



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- Hence the pupa are killed 2-3 days before the emergence of moth and processed. The cocoons required for further rearing are kept separately and moths are allowed to emerge from them.



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10. Mushroom cultivation

Mushroom is an edible fungus with great diversity in shape, size and colour. Essentially mushroom is a vegetable that is cultivated in protected farms in a highly sanitized atmosphere. Just like other vegetables, mushroom contains 90% moisture with high in quality protein. Mushrooms are fairly good source of vitamin C and B complex.

Species: There are three types of mushrooms popularly cultivated in India. They are (i) Oyster mushroom – *Pleurotus* sp. (ii) Paddy straw mushroom – *Volvariella volvacea* (iii) White bottom mushroom – *Agaricus bisporus*



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Method of preparation is different for

- Oyster mushroom
- Paddy straw mushroom
- Button mushroom



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11. Agroforestry

- Agroforestry is a collective name for land use systems and technologies, in which woody perennials (trees, shrubs, palms, bamboos etc) are deliberately combined on the same land-management unit as agricultural crops and/or animals, either in some form of spatial arrangement or in a temporal sequence.

1. Agri-silvicultural Systems

2. Agri-horti-silviculture

3. Silvi-Pastoral system

4. Horti-Pastoral system

5. Agri-silvi-pasture:



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12. Biogas

- A biogas unit is an asset to a farming family. It produces good manure and clean fuel and improves sanitation. Biogas is a clean, unpolluted and cheap source of energy, which can be obtained by a simple mechanism and little investment.
- The gas is generated from the cow dung during anaerobic decomposition. Biogas generation is a complex biochemical process. The celluloitic material is broken down to methane and carbondioxide by different groups of microorganisms. It can be used for cooking purpose, burning lamps, running pumps etc.



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- **Selection of model**

- **Float dome type:** Different models are available in this category e.g., KVIC vertical and horizontal, Pragati model, Ganesh model.
- **Fixed dome type:** The gas plant is dome shaped underground construction. The masonry gasholder is an integral part of the digester called dome. The gas produced in the digester is collected in dome at vertical pressure by displacement of slurry in inlet and outlet. The entire construction is made of bricks and cement. The models available in this category are Janata and Deen-Bandhu.