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## **LECTURE 10**

# **SUSTAINABLE AGRICULTURE-PROBLEMS AND ITS IMPACT ON AGRICULTURE, INDICATORS OF SUSTAINABILITY, ADAPTATION AND MITIGATION**



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## **Sustain is derived from a latin word**

- **“Sus”** means **“from below”**
- **“Tenere”** means **“To hold”**

- **First rule:** Align with natural forces or at least not try to defy them
- **Maintain productivity-** Management of resources
- **Useful to the society-**Satisfy human needs



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## DEFINATION

*According to CGIAR*

- Sustainable Agriculture is the successful management of resources for agriculture to satisfy the changing human needs, while maintaining or enhancing the quality of environment and conserving natural resources



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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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## **Problems and impact on agriculture**

- Decline in agricultural growth rate
- Static or decline in food production
- Increasing malnutrition
- Shrinkage in net cultivated area
- Increasing environmental pollution
- Depleting groundwater table
- Increase cost of production
- Low farm income
- Increasing unemployment



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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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# Challenges of Indian agriculture

- Need for more food (310 Mt by 2050)
- Stagnated net sown area ( $140 \pm 2$  M ha since 1970)
- Land share under fallow (38 % increase since 1951)
- Per capita land availability ( from 0.91 ha in 1951 to 0.32 ha in 2001)
- Per capita net sown area (0.33 ha in 1951 to 0.14 ha in 2001)





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## Indicators of agricultural sustainability

- Indicators help us to identify, quantify and evaluate the effects of agriculture.
- They provide us a means of measuring the economic, social and environmental impacts of agriculture and to help assess the effectiveness of policies and sustainability of the sector.
- **Biological factors-** Soil macro/micro flora and fauna, animal health, plant health, pests etc.





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- **Farm Management Skills-** Understanding a good indicator would be the understanding of the farmers of their own technical system
- **Productivity, yield and quality-** Water use efficiency, pasture composition, maintenance of genetic base



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## Key dimensions for adaptation and mitigation

- Mitigation is a technological change and substitution that reduce resource inputs and emissions per unit of output

### **Four functional areas:**

- Research and development
- Technology and practices
- Infrastructure
- Capacity building



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## **Ten key dimensions addressing adaptation and mitigation (NMSA, 2010)**

- Improved crop seeds, livestock and fish cultures
- Water use efficiency
- Pest management
- Improved agronomic practices
- Nutrient management
- Agricultural insurance
- Credit support
- Markets
- Access to Information
- Livelihood diversification