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# Lecture -12

## **HEIA, LEIA and LEISA and its techniques for sustainability**



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# Why sustainability?

- Man entered farming with the advancement of civilization
- He learned to cultivate through trial and error and accumulated lots of traditional knowledge
- This knowledge was transferred from generation to generation
- When he realized that the land he cultivated had become unfertile after several years of repeated cultivation he shifted to new land
- Now, with limited land availability such shifting was not possible



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# High External Input Agriculture (HEIA)

- Limitation in per capita land availability is due to increasing population
- To confront this pressure of world population explosion we are compelled to join a revolution **“Green revolution”**
- This revolution aims at
  - More harvest per unit area
  - Intensification of number of cultivation seasons



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# Green revolution practices

- Use High yielding hybrid seeds
- Susceptible to pests and diseases
- Increased use of synthetic pesticides and herbicides
- More use of nutrients
- Improved irrigation facilities
- Labour intensive
- Mechanization of Agriculture



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# Advantages of HEIA

- Agricultural production could be rapidly increased to meet the demand for food for increasing population
- Malnutrition problem was efficiently managed
- New improved varieties gave yields within a short period of time
- Mechanization solves the problem of labour shortage
- Income and profit margins of the products were increased
- Productivity of land increased
- Increased market facilities for production



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# Disadvantages of HEIA

- Collapse of environmental balance due to lack of bio-diversity by planting a few cash crops
- Increase in soil erosion due to constant furrowing by machinery
- Dependence on imported machinery, chemical fertilizer, pesticides, hybrid seeds and other inputs
- Extensive use of pesticides disturbed the natural mechanism of controlling pest and diseases as the artificial pesticides kill both pests and their natural enemies
- Although the need for high capital investment, large scale farmers benefited while small scale farmers who were short of capital ran into debt.
- Use of artificial agro-chemicals adversely affected the soil pH, CEC, soil structure, soil texture and soil organisms
- Traditional varieties of seeds and their genetic resources faced extinction due to introduction of hybrid varieties.



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# Low External Input Agriculture (LEIA)

- It is defined as a production activity that uses synthetic fertilizers or other agro-chemicals below rates commonly recommended
- It does not mean elimination of these materials but yields are maintained by greater emphasis on cultural practices, IPM and utilization of on-farm resources
- It includes maximum utilization of local resource with less dependency on external inputs for agricultural production



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# Low External Input and Sustainable Agriculture (LEISA)

- It relies mostly on the inputs from local farm, village or region and deliberate action is taken to ensure sustainability
- The objective of LEISA is to maintain the agricultural production at an optimum level using less external inputs in eco-friendly environment





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# Factors affecting LEISA

- Maintaining a living soil
- Creating Bio-diversity
- Recycling of resources
- Natural pest management



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# Differences between HEIA and LEIA

| HEIA  | LEIA   |
|---|--|
| Farming pattern depends heavily on external and chemical inputs                     | It relies on the optimal use of natural processes.   |
| Focus of agricultural development & research .                                      | Focus is on the sustainability of farming system.  |
| There is a great damage to the environment.   | Environmentally sound  |
| The rising costs of agricultural inputs have made farming increasingly unprofitable | Greater emphasis is on the long term sustenance & balance between the profit & livelihood. |
| HEIA depends on the higher production & profit.                                     | Sustainable ecological practices depends on local agro –ecological conditions.             |
| Lack of diversity in the farming practices.   | Maintaining diversity.   |
| Under HEIA system soil quality deteriorates.  | LEIA maintains a healthy soil.   |
| There is a lack of use of indigenous technologies.                                  | Best use of indigenous technologies  |



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**THANK YOU**