Lecture -12

HEIA, LEIA and LEISA and its techniques for sustainability
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
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
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
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
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.
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.
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
Factors affecting LEISA

- Maintaining a living soil
- Creating Bio-diversity
- Recycling of resources
- Natural pest management
## Differences between HEIA and LEIA

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