

Role of HEIA and LEISA in Conservation Agriculture

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Introduction

High external input Agriculture (HEIA) are technologies that utilize high external inputs such as inorganic or chemical fertilizers to increase nutrient depletion from the soil, pesticides to control pests and diseases, herbicides to control weeds and irrigation facilities for water management in the farms. These technologies are often beyond the financial reach of the small - holder farmers.

Advantages of high external input agriculture (HEIA)

1. Agricultural Production could be rapidly increased to meet the demand for food for the increasing population.
2. As a result of availability of adequate food stuffs many problems related to diseases caused by mal-nutrition and deficiency were prevented or reduced.
3. New improved varieties gave yields within a short period of time.
4. Mechanization solves the problem of labour shortage.
5. Income and profit margins of the products were increased.
6. Productivity of land increased.
7. Increased market facilities for production.

Disadvantages of HEIA

1. Collapse of environmental balance due to lack of biodiversity by planting a few cash crops.
2. Increase in soil erosion due to constant furrowing by machinery.
3. Dependence on imported machinery, chemical fertilizer, pesticides, hybrid seeds and other inputs.
4. Extensive use of pesticides disturbed the natural mechanism of controlling pest and diseases as the artificial pesticides kill both pests and their natural enemies.

5. Use of artificial agro-chemicals adversely affected the soil pH, cation exchange capacity, soil structure, soil texture and soil organisms. Consequently the microbial activities of the soil tend to reduce forming dead soil.

Low-external input sustainable agriculture (LEISA)

Low-External Input Sustainable Agriculture (LEISA) is a series of practices which serve to reinforce ecological principles that are in line with local ecosystems.

Practices such as recycling of plant nutrients (nitrogen and others), minimizing crop losses due to insects and pests, and securing favourable soil conditions for plant growth are just the tip of the hat.

An integral component of LEISA is in ensuring that this environmental awareness remains connected to the daily lives, needs and concerns of farmers who rely on these ecosystems for their livelihoods.

The LEISA relies mostly on the inputs from the local farm, village or region and deliberate action is taken to ensure sustainability.

The principles are:

1. Securing favourable soil conditions for plant growth particularly managing organic matter and enhancing soil life.
2. Optimizing the nutrient availability and balancing the nutrient flow, particularly by means of nitrogen fixation, nutrient acquisition and complementary use of external fertilizers.
3. Minimizing the losses due to plant and animal pests by means of prevention and safety treatment.
4. Minimizing losses due to flows of solar radiation, air, water by way of microclimate management, water management and erosion control.