

What is Sustainable farming?

Sustainable farming is the production of food, fibre, or other plant or animal products using farming techniques that protect the environment, public health, human communities and their traditional knowledge. While, intensive agriculture is characterised by high input of capital and resources sustainable agriculture is characterised by low external input including input cost. Interestingly, traditional farming methods are both organic and sustainable.

Benefits of sustainable farming

- A. Low input cost
- B. Organic
- C.Reduces dependence on chemical fertilizers and pesticides
- D.Farmers can make their own fertilizers and pesticides using materials available on the field itself
- E. Maintains soil health ensuring soil fertility in the long term
- F. Builds soil carbon thus, sequestering carbon
- G.Uses simple low cost mechanical agriculture implements to reduce labour cost instead of heavy machinery that leads to soil compaction and pollution
- H.Conserves local seed varieties that are best adapted to the climate and weather anomalies
- I. Helps in climate change resilience

INTACH Natural Heritage Series # 1

Natural Heritage Division of INTACH advocates sustainable use of natural resources. Proposes innovative eco-friendly solutions to various issues including technical interventions to social engineering. The focus has been on a vast and complex subject inextricably linked with issues of human survival.

Land is our natural heritage - it is a living entity. It is a non-renewable resource. It harbours soils, water and vegetation on which we survive. Our food, water, shelter, recreation, our whole lives depend on land and yet we think so little about it and do far less. Healthy soil is the foundation of food system. Conventional agriculture has resulted in soil erosion, loss of soil fertility, water depletion, , excess nutrients in ecosystems causing pollution of water and soil resources, biodiversity loss and global warming. Traditional agricultural focuses on maintaining soil health through various practises like composting, crop rotation, inter cropping and multi-cropping. Adapting these practise in present times is important to ensure future food security and sustainability. Reviving agricultural heritage is thus closely linked with environment conservation.

Our heritage knowledge provides us the solution to modern problems of economy, ecology and global warming.



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INDIAN NATIONAL TRUST FOR ART AND CULTURAL HERITAGE

Dedicated to Conservation



Sustainable Farming
Low external input
Conserves soil and water
Minimizes dependence on chemical fertilizers & pesticides
Minimizes dependence on externally procured seeds
Cost effective
Conserves biodiversity
Self reliance in farming
Carbon sequestration
Climate change resilience

5 steps to sustainability

Several simple steps need to be taken to achieve self reliance and sustainability in farming. There are five primary components of sustainable farming, these are:

- I. **Soil conservation & health—Composting, mulching**
- II. **Crop rotation & mixed cropping**
- III. **Seed treatment and conservation**
- IV. **Water conservation**
- V. **Crop protection**

In addition to these basic steps we can adopt several other techniques that are based on principles of sustainability. On such cropping system is called System of Root Intensification (SRI). This available for rice, mustard, wheat, maize, ragi, vegetables etc. Mustard has been successfully tested in Chhatarpur, wheat and rice in Panna.

Soil conservation & health—Composting, mulching

Soil has been affected by overuse of chemical fertilizers, pesticides and herbicides. It has been compacted by these and use of heavy machinery. To reverse the damage and erosion we need to go back to traditional method of managing soil health by adding organic matter (OM) in the soil. Composting is integral to soil conservation and soil health, it not only adds OM but also ensures microorganism population in the soil. Microorganism make the nutrients available to plant for absorption. Composting improves soil texture, its water holding capacity, water infiltration, root development and root mass thus helping the plants in better surviving in floods and droughts.

This was observed in a field where sustainable farming was adopted, where the field not treated with compost was flooded.



Field in foreground treated with compost shows better infiltration than the field in back that was flooded.

Mulching is covering the soil surface with dry biomass. It prevents water loss through evaporation, is significant as more than half the water of irrigation is lost via evaporation. Mulch maintains consistent soil moisture and temperature. It reduces soil erosion.

Crop rotation & mixed cropping

Crop rotation is the practice of growing a series of different types of crops in the same area in sequenced seasons. It is done so that the soil of farms is not used to only one type of nutrient. It helps in reducing soil erosion and increases soil fertility and crop yield. Traditionally millets—pulses crop rotation was followed. Pulse crop fixed nitrogen for the next crop to use. Thus maintaining soil fertility. An example of crop rotation is as follows:

1- Khad Kharif- Urad Rabi- Gehu	2. Kharif- Moong Rabi- Jwa
3. Kharif- Til Rabi- Rai	4. Only Rabi- Chana

Mixed cropping involves planting two or more of plants simultaneously in the same field. Different plants utilise resources in varying amounts, thus, ensuring that soil is not depleted of any one resource or nutrient. Traditionally, single crops were never grown, usually multi year *arhar* was grown along with *moong*, *urd*, *til* and millets. On field bunds and edges castor and fibre crop *patsan* was commonly grown.

Seed Treatment and conservation

To raise healthy crops and increase yields, it is important to choose good quality seeds and treat these. Crops are prone to various diseases that are carried as spores in the seed itself, particularly fungal diseases. Seed treatment with substances like cow urine and lime is effective in killing these spores thus making crops disease free.

Water conservation

Vagaries of monsoon is a constant stress for farmers across India. For this reason it is important to make the soil drought and flood proof. First this should be achieved by composting and mulching, particularly, on small farms. Water harvesting should be done in farm ponds and by creation of contour trenches.

Crop Protection

Crops are subject to various infections and pests. For this reason conventionally pesticides and insecticides are used to protect crops. Various organic pesticides prepared from cow urine, plant extracts like Neem, calotropis, garlic, turmeric and many other bitter herbs commonly available in the farms are used as pesticides without poisoning either the farmer or his crops and fields.