

Essence of Sustainable Agriculture and it's Stool

Jhanvi Bajpai¹, Anoop Badoni², Adarsh Dangwal³, Ashish Negi⁴ and Chandan Kumar⁵

¹Department of Agriculture,
Uttaranchal P.G. College of Biomedical Sciences and Hospital
^{2,3,4,5} PLANTICA- Indian Academy of Rural Development (IARD),
Dehradun, Uttarakhand

ARTICLE ID: 016

Introduction

“A Sustainable Agriculture is one which depletes neither the people nor the land ” (Wendell Berry). Agriculture meeting the needs of present as well as future generations, without exhausting the natural resources is called Sustainable Agriculture. Day by day natural resources are depleting due to various of reasons like overpopulation, overconsumption and non –biodegradable waste, Deforestation, Erosion, Pollution and many more. To replenish natural resources Sustainable Agriculture is today`s necessity.

Every Person involved in the food system from grower to waste managers can play their part of the act to establish Sustainable Agricultural System (Fig.-1). System is all about using ecologically sound farming methods in a precise way for crop and livestock production without causing any harm to human or natural systems. It involves Agroforestry, Crop Rotation , Cover crops , Integrated Pest Management , Hydroponics i.e. innovative farming technique to grow plant without soil in water by adding specialized nutrients , Intercropping , Biodynamic Agriculture which includes various pseudo-scientific and esoteric concepts ,Permaculture, Crop diversity enabling farmers and plant breeders to develop higher yielding , more productive varieties that have the improved quality characteristics required by farmers and desired by consumers , Aquaponics , Water Resource Management , Natural Farming and Rotational Grazing . Developing sustainable agricultural systems add to the sustainability of the human population (*Rockström Johan and et al. 2016*) .

“ If it can` t be reduced , reused , repaired , rebuilt , refurbished , refinished , resold , recycled or composted , then it should be restricted , designed or removed from production ”(Pete Seeger).Unlike convectional farming , sustainable farming focuses on strengthening environment and preserving natural resources by following natural cycles, recycling crop and

animal waste, recycling nutrients and water, while eliminating excessive use of agricultural toxins . For an example Crop residue and animal waste can be recycled into Organic fertilizers , Animal waste is used in making organic solutions like Beejamrit, Neemastra, Jeevamrita and Agniastra ,Crop residue like wheat straw is used for making mushroom compost , Residues like husks , seeds , bagasse , molasses and roots are used as animal fodder and soil amendment , Due to high carbohydrate content crop residues are used for biofuel production , Collection of rainwater i.e. rain water harvesting and using it for irrigation purpose , Using solar panels to store solar energy for running electric pumps , heaters and electrical fencing .

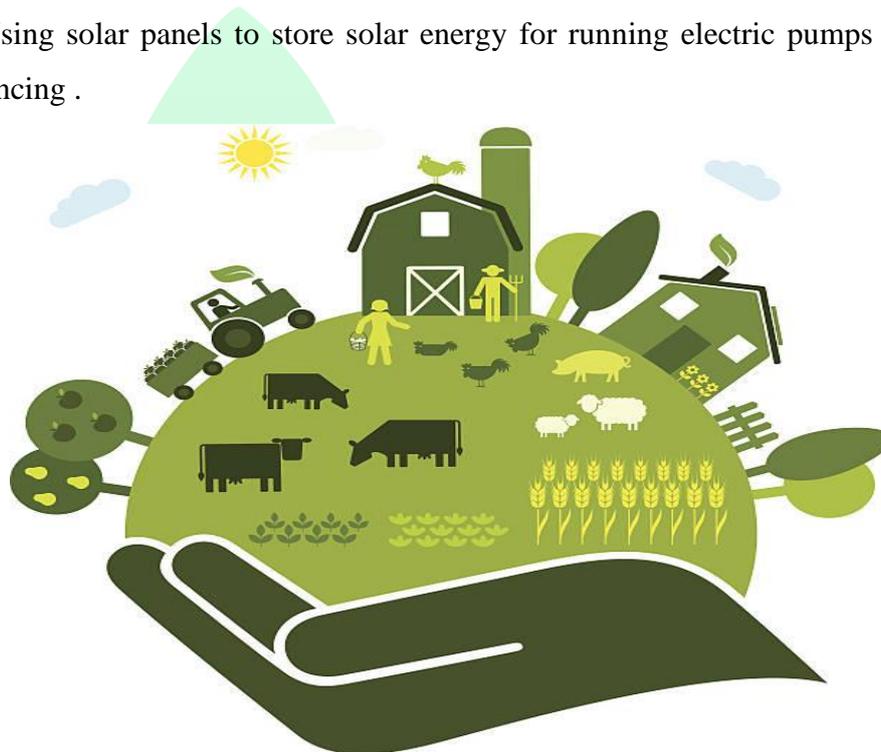


Fig.1. Sustainable Agricultural system*

Sustainable Agriculture lies on three dimensions The Social , Economic and Environmental components (Fig.- 3) often referred as three leg`s of sustainability stool . If any of the one leg is missing then sustainability stool will not be able to balance. All three dimensions have association with one another the economic exists within the social and both existing within the environment. Every component has its own part to play, its own contribution to intensify the Sustainable Agriculture. In 2015, the United Nations published “Transforming our world: the 2030 Agenda for Sustainable Development ” , “a plan of action for people , planet and prosperity ”. The publication outlines 17 Sustainable Development

Goals (Fig. - 2) and 169 targets and pays emphasis to the 15 year agenda that balances “the three dimensions of sustainable development: the economic, social and environmental”.



Fig.2. Sustainable Development Goals

The Social pillar

The Social pillar is to meet the needs of People, to make sure that there is enough food for all without compromising its nutritive value. To provide nutrient rich food for farmers, farm families and to create vital community. Social sustainability promotes equity, justice and a high quality of life. It tends to improve well being of labourers, the needs of rural communities, quality of life in rural areas, consumer health and safety both in the present and future. Wages for farm labor are so low in most industrialized countries that their Agricultural sectors rely considerably on migratory labor from poorer nations, leaving farmers unsatisfactory and weak. Labor are generally low paid and posses low standard of living. In 2007, the United Nations reported on “Organic Agriculture and Food Security in Africa”, stating that sustainable agriculture could be a tool in reaching global food security without expanding land usage and reducing environmental impacts. The social scientist Charles Kellog has stated that, “In a final effort, exploited people pass their suffering to the land”. Social component of Sustainable Agriculture has ability to permanently and continuously feed its constituent populations.

The Economic pillar

The Economic pillar of Sustainability refers to Protecting the economic feasibility of farms and supporting the enduring of their business, including the ability to re-invest. More than 40% of the world's population is below the poverty line and is unable to produce the minimum possible income required for living their livelihoods, directly affecting the individual and national development. For increment in the economic well-being of the countries, there is a need to structure the quality and quantity of manufacturing the products in sustainable ways. In economic sustainability all the resolutions must be taken with respect to long term benefits rather than just focusing on short term benefits. Economic development concerns about the urban and rural development with industrial development along with keeping other components of sustainability in balance and harmony with the environment.

The Ecological pillar

The Ecological pillar of sustainability is concern about efficient use of resources and integrated approaches that minimize waste and negative impacts on both the natural and physical environment. Sustainable Environment is an ecosystem which maintains and enhances its population, bio-diversity, land and natural resources and overall functionality for a long term. The sustainable development goals by the United Nations aims at “Developing a better world for future generations so that they can live in a peaceful and ecologically sound environment and meet their own needs”.



Fig.3. The Social , Economic and Environmental components



For every decision to be taken for development its environmental impact and outcomes must be priority for decision making. For example - If any regulation benefits Economy but imparts negative effect on environment then this is not a sustainable way of Sustainable Agriculture. When agricultural operations are sustainably managed, they preserve and restore critical habitats, protect watersheds and enhance soil health and water quality. But unsustainable practices directly and indirectly exploit people and the environment. Hence, the ecological component refers to the precise use of renewable natural resources and endurance of the scarce natural resources as our earth is the only planet that is blessed with life and various of natural resources as an environmental heritage.

Finally, Sustainable Agriculture is not a single, well defined end goal . Scientific understanding about various sustainable methods are evolving with respect to Social, Economical and Ecological dimensions as they are closely intertwined and necessary components for creating a sustainable agriculture. As a global citizen, we have to recognize that our actions directly as well as indirectly are exploiting the ecosystem that we live in and we immediately need to stop this at present moment . “Man is both creature and moulder of his environment , which gives him physical sustenance and affords him the opportunity for intellectual , moral , social and spiritual growth . In the long and tortuous evolution of the human race on this planet , a stage has been reached when through rapid acceleration of science and technology , man has acquired the power to transform his environment in countless ways and on unprecedented scale . Both aspects of man`s environment, the natural and man-made, are essential to his wellbeing and to the enjoyment of basic human rights-even the right to life itself” (Stockholm Declaration , 1972).