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Abstract: The idea of a sustainable agriculture has gained prominence since the publication of Brundtland report in 1987. The concept of sustainable agriculture is very vague and ambiguous in its meaning, which renders its use and implementation and extremely difficult. In this systematic review paper, we aim to advance understating of sustainable agriculture from a social science and governance perspective by identifying area of complementarity and concern between emerging definitions of sustainable agriculture, we begin by examining the multidimensional nature of sustainability, we generally understand in terms of 3 overarching dimensions environmental, social and economic.

Introduction What is sustainability

Is it something to achieve as a result; as it is a process, bringing people with different interests together, all looking for new approaches to make their ownlines and those of their children more valuable?

“Sustainable development which means the needs of the person without compromising the ability of future generations to meet their needs”

Need for Sustainable development framework

- Balance objectives, seek synergies, negotiate trade offs.
- Coordinate processes.
- Strengthen interrogation and coordination across the three p’s (people ,planet, perspective)
- Create a long term SD vision & a solid platform for leadership

Sustainable Agriculture

The word- sustain, from the Latin “sustinere” (sus:- “ From below’ and “tenereto hold), to keep in existence or maintain, implies long term support or permanence.

Sustainable describes farming systems that are – capable of maintaining their productivity and usefulness to society indefinitely.

(Dr. Pooja Goswami)College of agriculture, balaghat(mp)

Sustainable agriculture is the production of food, fiber on other plant or animal products using farming techniques that protect the environment, public health, human communities and animal welfare”.

Definition of sustainable Agriculture

“Sustainable agriculture refers to a range of strategies for addressing many problems that effect agriculture” (Lockentz, 1988)

The Successful management of resource for agricultural to satisfy changing humans needs while maintaining or enhancing the natural resource base and avoiding environment degradation (Tacc Gedr, 1988)

A Sustainable agriculture is a system of agriculture that is committed to maintain & preserve the agriculture base of.....

Characteristics of Sustainable development

- Biodiversity is maintained for being able to compensate. For losses while still keeping the system simple enough to manage (Istvan Feher, Professor) Hungary.
- Plant and animal together managed for systematic resilience.
- Avoid unnecessary use of external inputs.
- Harnesses agroecological processes such as nutrients cycling, biological, nitrogen fixation, Parasitism.
- Minimize use of technologies or practices that have adverse impact on the environment nad human health.
- Utilize crop varieties and livestock breeds with a high ratio of productivity to use of externally and internally derived inputs. (Pretty and Bharucha 2014).
- Yields from sustainable farms and generally lower than those of conventional systems.
- Rotating crop and embracing diversity.
- Planting cover crops and perennials.
- Reducing or eliminating tillage
- Applying integrated pest management (IPM)
- Applying agroforestry practices.
- Managing whole systems and landscapes (Union of concerned scientists 2017).
- Reducing agriculture runoff
- Preventing pollution of lakes and rivers.
- Natural maintaining soil fertility by recycling nutrient on farms.

Methods of Sustainable Agriculture

(Conserve Energy Future)

1. **Crop Rotation:** It is one of the most powerful techniques of sustainable agriculture. Its purpose is to avoid the consequences that come with planting the same crops in

the same soil for years in a row. It helps tackle pest problems, as many pests prefer specific crops. If the pest have a steady food supply, they can greatly increase their population size.

2. **Permaculture:** It is a food production system with intention, design & smart farming to reduce waste of resources and create increased production efficiency. Permaculture include growing grain without tillage, herbs & plants spirals or contour to hold water high on the landscape
3. **Soil enrichment:** Soil is a central component of agriculture ecosystem. Healthy soils full of life, good soil can increase yields as well as helps create more robust crops.
4. **Bio Intensive Integrated pest Management:** Integrated pest Management (IPM) is an approach which essentially relies on biologicals as opposed to chemical methods. IPM also emphasizes the importance of crop rotation to combat pest management.
5. **Better Water Management:** First step in water management is the selection of the right crops. Crops that do not demand too much water chosen.

Sustainable Agriculture Practices

1. **Hydroponics Agriculture Practices:**
 - Hydroponics system crops grown with the roots directly in a mineral solution or with the roots in an inert medium like gravel or perlite.
 - Aquaponics combines the raising of aquatic animals with the growing of hydroponics crops. In aquaponics system the water containing the waste material from the aquaculture fish used to nourish hydroponic plants.
2. **Urban Agriculture:** Today many innovative & sustainable growing techniques are already being used in cities, including backyard farms & gardens, community gardens, roof tops farms, growing crops in green houses.
3. **Mulching, ground covers & manual weed control:** To reduce the growth of weeds and conserve soil moisture by covering the soil around their plants through the use of mulching & ground covers and the most stubborn weeds that appears from time to time can be easily controlled.
4. **Agro forestry & Food Forestry:** Involves the growth of trees & shrubs amongst crops or grazing land. Agro forestry systems can combine both agriculture & forestry practices for long lasting, productive & diverse land use.

Disadvantages of Sustainable agriculture

1. **Limited use of land:** Limited use of land which make it difficult to produce large quantities of food. Therefore mass production is not possible.
2. **It takes more work:** Since the use of machines is minimal or eliminated, it takes more time and people to successfully produce plants, which slows down the production.
3. **Shorten shelf life:** Decomposing occurs faster in food that is produce sustainably causing it to have a shorten shelf life. If a shipment gets delayed, there is a big chance that it will never get to the supermarket because it will already be spoiled.
4. **Less Fertile land:** It is quite hard to increase the fertility of land just by rotating

crops & without the use of fertilizers and other chemicals.

5. **Lower Income:** Because the land is used sparingly, the income that is generated from farming is very limited.
6. It limits the proper use of land.
7. It also hinders the full exploitation of land, labor & capital.
8. It is also hard to maintain the fertility of soil by simply rotating crops.

Conclusion: Agriculture is not sustainable, if its resource base declines, or if it has an adverse impact on the environment leads to economic hardship for farmers especially for farmers with limited resources and landless tenant cultivators.

To overcome such problems organic farming receives the top priority in sustainable agriculture. There is an urgent need to involve more & more scientists to identify the upthrust area of researchers for the development of eco-friendly production technology.

Reference: Dr. Pooja Goswami (College of Agricultural Balaghat MP)

- Lockertz – 1988
- Tacc Giar -1988
- Gracet-1990
- Istvan Fehar , Professor Hungary
- Preetly & Bharucha, 2014
- Union of Concerned Scientist 2017
- Conserve Energy Future

