**ADAPTATION AND MITIGATION IN SUSTAINABLE AGRICULTURE RELATED TO CLIMATE CHANGE.**

Mitigation is the technological change and substitution that reduce resource inputs and emissions per unit of output, with respect

to climate change, mitigation means implementing policies to reduce GHG emissions.

**Mitigation technologies in agriculture:**

1. Improved crop and grazing land management to increase soil carbon storage.
2. Improved rice cultivation techniques and livestock and manure management to reduce CH4 emissions.
3. Dedicated energy crops to replace fossil fuel use.
4. Biomass from agricultural residues and dedicated energy crops can be an important bio energy feedstock.
5. 50% of mitigation potential of the total could be achieved by reducing emissions from deforestation.

**ADAPTATION STRATEGIES TO CLIMATE CHANGE:**

There are several adaptation measures that the agricultural sector can undertake to cope with future climate change.

– Changing planting dates;

– Planting different varieties or crop species;

– Development and promotion of alternative crops;

– Developing new drought and heat-resistant varieties;

– More use of intercropping;

– Using sustainable fertilizer and tillage practices (improving soil

drainage, no-till, etc)

– Improved crop residue and weed management;

– More use of water harvesting techniques,

– Better pest and disease control for crops;

– Implementing new or improving existing irrigation systems

(Reducing water leakage, soil moisture conservation - mulching).

**Need for Integration of Mitigation and Adaptation Frameworks into Sustainable Development Planning:**

• Reducing both loss of natural habitat and deforestation can have significant biodiversity, soil and water conservation benefits, and can be implemented in a socially and economically sustainable manner.

• Making development more sustainable can enhance both mitigative and adaptive capacity, and reduce emissions and vulnerability to climate change.

• It is essential to develop a portfolio of strategies that includes adaptation, mitigation, technological development and research (climate science, impacts, adaptation and mitigation) to combat climate change.

•It is imperative on countries to take a proactive role in planning national and regional programmes on adaptation to climate variability and climate change.

**FARMING SYSTEM AND ENVIRONMENT:**

Farming system is the most favourable agricultural production system from an environmental perspective because the waste products of one enterprise (crop residues), which would otherwise be loaded on to the natural resource base, are used by the other enterprise, which returns its own waste products (manure) back to the first enterprise. Because it provides many opportunities for recycling and organic farming and for a varied, more attractive landscape, farming system is the favourite system of many agriculturalists and environmentalists.

Environmentally, farming systems:

• maintain soil fertility by recycling soil nutrients and allowing the introduction and use of rotations between various crops and forage legumes and trees, or for land to remain fallow and grasses and shrubs to become reestablished.

• maintain soil biodiversity, minimize soil erosion, help to conserve water and provide suitable habitats for birds.

• make the best use of crop residues.

• allow intensified farming, with less dependence on natural resources and preserving more biodiversity.

• utilizes wastes as resources, we not only eliminate wastes but we also ensure overall increase in productivity for the whole agricultural systems.

• Agro-ecological conditions strongly define the nature and scope of livestock-environment interactions in grazing systems, where the waste product (manure) is used within the system and does not

present a burden on the environment.

• Resources use in farming system is often highly self-reliant as nutrients and energy flow from crops to livestock and back, such a closed system offers positive incentives to compensate for environmental effects making them less damaging or more beneficial to natural resource base.