Crop Diversification

Why in News

Recently, a top agriculture economist has suggested that the best chance of Crop **Diversification** is through **animal agriculture/animal husbandry.**

Key Points

- **About:**
  - Crop diversification refers to the **addition of new crops or cropping systems to agricultural production** on a particular farm taking into account the different returns from value- added crops with complementary marketing opportunities.
    - **Cropping System:** It refers to the crops, crop sequences and management techniques used on a particular agricultural field over a period of years.
    - **Types:** Major cropping systems in India are sequential-cropping, **monocropping**, **intercropping, relay Cropping, mixed-cropping** and alley cropping.
  - Many farmers also use the **mixed crop-livestock system** to increase their standards of living and income.
    - Animal husbandry or Animal Agriculture is the branch of science **dealing with the practice of breeding, farming and care of farm animals (livestocks)** such as cattle, dogs, sheep and horses by humans for advantages.
    - It refers to **livestock raising and selective breeding.** It is a **branch of agriculture.**
- **Types:**

Type of diversification	Nature of diversification	Potential benefit
Improved structural diversity	Makes crops within the field more structurally diverse	Pest suppression
Genetic diversification in monoculture	Cultivation of mixture of varieties of same species in a monoculture	Disease suppression, Increased production stability
Diversify field with fodder grasses	Growing fodder grasses alongside of food/pulse/oilseed/ vegetable etc.	Pest suppression, opportunity to livestock farming
Crop rotations	Temporal diversity through crop rotations (Sequential cropping)	Disease suppression, Increased production stability
Polyculture	Spatial and temporal diversity of crops (Growing two or more crop species within the field)	Insect, pest disease suppression, climate change buffering and increased production
Agroforestry	Growing crops and trees together (Spatial and temporal diversity)	Pest suppression and climate change buffering
Mixed landscapes	Development of larger-scale diversified landscapes through mixture of crops and cropping system with multiple ecosystems	Pest suppression and climate change buffering
Micro-watershed based diversification	Integration of crop with other farming components for year round income and employment generation, besides sustaining soil and environmental health	Insect, pest and disease suppression, climate change buffering and increased production, employment and income

- **Benefits:**
  - **Increase Income on Small Land Holding:**
    - At present, **70-80% farmers have land below 2 hectare.** To overcome this, existing cropping patterns must be diversified with high value crops such as maize, pulses, etc.
    - The Government of Haryana has also supported this by announcing that farmers switching to other alternate crops instead of paddy will be paid Rs. 7000 per acre incentive (**Mera Pani - Meri Virasat** Scheme).
  - **Economic Stability:**

    Crop diversification **can better tolerate the ups and downs in price of various farm products** and it may ensure economic stability of farming products.
  - **Mitigating Natural Calamities:**

    Sudden adverse weather conditions like erratic rainfall, drought, hail, incidence of insect and pest disease. Under this situation, **crop diversification through mixed cropping may be useful.**
  - **Balance Food Demand:**
    - Most of the Indian population suffers from **malnutrition.** Most of the girl children have **anemia.** Including crops like pulses, oilseed, **horticulture**, and vegetable crops can improve socio economic status by adding quality to the food basket and also improve soil health with the aim of food safety and nutritional security.
    - The Government of India has now targeted to increase the area under pulses and oilseeds through **National Food Security Mission (NFSM).**
  - **Conservation:**
    - Adoption of crop diversification **helps in conservation of natural resources like introduction of legume in rice-wheat cropping system,** which has the ability to fix atmospheric Nitrogen to help sustain soil fertility.
    - **Soil Health Card** (SHC) provides information to farmers on nutrient status of their soil along with recommendations on appropriate dosage of nutrients to be applied for improving soil health and its fertility.

- **Challenges:**
    - Majority cropped area in the country is completely **dependent on rainfall.**
    - Sub-optimal and **over-use of resources** like land and water resources, causing a negative impact on the environment and sustainability of agriculture.
        - **Animal agriculture** is the **second largest contributor** to human-made **Greenhouse Gas (GHG)** emissions after fossil fuels and is a leading cause of deforestation, water and air pollution and biodiversity loss.
    - **Inadequate supply of seeds and plants** of improved cultivars.
    - Fragmentation of land holding **less favouring modernization and mechanization of agriculture.**
    - **Poor basic infrastructure** like rural roads, power, transport, communications etc.
    - Inadequate post-harvest technologies and **inadequate infrastructure for post-harvest handling** of perishable horticultural produce.
    - Very **weak agro-based industry.**
    - Weak research - extension - farmer linkages.
    - **Inadequately trained human resources** together with persistent and large scale illiteracy amongst farmers.
    - Host of **diseases and pests** affecting most crop plants.
    - **Poor database** for horticultural crops.
    - **Decreased investments in the agricultural sector** over the years.
- **Other Related Initiatives:**
    - **Refrigeration System Pusa-FSF**
    - **Sub-Mission on Agroforestry Scheme**
    - **Pradhan Mantri Fasal Bima Yojana**
    - **Mega Food Parks**
    - **Seed-Hub Centres**

Way Forward

- Although there are challenges which can not be ignored, crop diversification provides an opportunity to **double farmers income** and create **food security** for the nation.
- Therefore, the **government must promote crop diversification** by purchasing crops produced other than wheat and rice at **Minimum Support Price**. This could also help conserve the dwindling supply of underground water.
- **Agricultural emissions can also be limited** through smarter livestock handling, technology-enabled monitoring of fertilizer application, simple changes in field layout and other, more efficient agricultural techniques.

Source:IE