Zero Budget Natural Farming(ZBNF)

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Manifest pedagogy:

The emphasis on sustainable agriculture and climate change are always key themes in UPSC prelims and mains examination. Also, this year due to the acute farmer distress and water stress alongside rapid changes in needs of the rural economy we need to relook at our policies governing agriculture, ZBNF being a case in point

***Source**: The Hindu*

In news:

- Recently Finance Minister Nirmala Sitharaman thrust zero budget farming into the spotlight in the first Budget speech of the 17th Lok Sabha.

Placing it in syllabus:

- Agriculture Inputs

Static Dimensions:

- Effects of green revolution
- Sustainable agriculture (SA)

Current dimensions:

- Climate sensitive agriculture
- ZBNF in india
- Organic farming and schemes

Content:

Effects of green revolution:

Green revolution during the mid-sixties was the new agricultural technique put into practice for the first time in India in the Kharif season of 1966 and was termed High yielding varieties programme (HYVP). This programme was introduced in the form of a package programme since it depends crucially on regular and adequate irrigation, fertilizers, high yielding varieties of seeds, pesticides, insecticides and improved machines and tools.

Positive effects of Green Revolution:

(i) Increase in Production and Productivity: food grains output substantially increased from 81.0 million tonnes in the Third Plan (annual average) to 203 million tonnes in the Ninth Plan (annual average) and further to 212. 0 million tonnes in 2003-04. HYVP was restricted to only five crops – wheat, rice jowar, bajra and maize. Therefore, non- food grains were excluded from the ambit of the new strategy.

(ii) Scientific Cultivation: It gave way to new and scientific practices. Instead of farm seeds, farmers are now using HYV seeds. Traditional fertilizers are replaced by chemical fertilizers.

(iii) Change in Cropping Pattern: The proportion of cereals in the food grains output has increased and the proportion of pulses has declined. The proportion of wheat cereals has increased while that of coarse grains has declined.

(iv) Development of Industries: Many industries producing agriculture, machinery, chemical fertilizers, pesticides, insecticides etc., have come up to meet the growing demand for these commodities.

(vi) Change in Attitudes: Our farmers have now begun to think that they can change their misfortunes by adopting new technology. Unlike past, they are now giving up traditional agricultural practices for scientific practices.

Negative effects of the Green Revolution:

(i) More inequality among farmers (Interpersonal inequalities): The new technology requires a huge amount of investment which can be only afforded by the big farmers. This increased inequality in rural India.

(ii) Regional inequality: Benefits of the new technology remained concentrated in wheat growing area since green revolution remained limited to wheat for a number of years. These were the regions of Punjab, Haryana and Western Uttar Pradesh.

(ii) The Question of Labour Absorption: The uneven regional growth was mainly responsible for the low absorption of labour within agriculture. The growth of output was also slow to generate adequate employment opportunities. The sudden rise in the demand for labour in these areas induced mechanisation and labour-saving practices in general.

(iv) Undesirable Social Consequences:

Many large farmers have evicted tenants as they now find it more profitable to cultivate land themselves using machinery.

Thus, a large number of tenants and share-croppers have lost their lands and have been forced to join the ranks of agricultural labourers.

(v) Health Hazards: Increased mechanization that has accompanied the modernisation of farm technology in green revolution areas carries with it the risk of incapacitation due to accidents.

Sustainable agriculture:

The goal of sustainable agriculture is to meet society’s food and textile needs in the present without compromising the ability of future generations to meet their own needs. Practitioners of sustainable agriculture seek to integrate

three main objectives into their work: a healthy environment, economic profitability, and social and economic equity

Sustainability rests on the principle that we must meet the needs of the present without compromising the ability of future generations to meet their own needs. Therefore, stewardship of both natural and human resources is of prime importance. Stewardship of human resources includes consideration of social responsibilities such as working and living conditions of laborers, the needs of rural communities, and consumer health and safety both in the present and the future. Stewardship of land and natural resources involves maintaining or enhancing this vital resource base for the long term.

A systems perspective is essential to understanding sustainability. The system is envisioned in its broadest sense, from the individual farm, to the local ecosystem, and to communities affected by this farming system both locally and globally. A systems approach gives us the tools to explore the interconnections between farming and other aspects of our environment.

Everyone plays a role in creating a sustainable food system. It requires not only the input of researchers from various disciplines, but also farmers, farmworkers, consumers, policymakers and others. Making the transition to sustainable agriculture is a process. It is important to point out that reaching toward the goal of sustainable agriculture is the responsibility of all participants in the system, including farmers, laborers, policymakers, researchers, retailers, and consumers.

Growers may use methods to promote soil health, minimize water use, and lower pollution levels on the farm. Consumers and retailers concerned with sustainability can look for “values-

based" foods that are grown using methods promoting farmworker wellbeing, that are environmentally friendly, or that strengthen the local economy.

In addition to strategies for preserving natural resources and changing production practices, sustainable agriculture requires a commitment to changing public policies, economic institutions, and social values.

Climate sensitive agriculture:

Climate change is profoundly impacting the conditions in which agricultural activities are conducted. In every region of the world, plants, animals, and ecosystems are adapted to the prevailing climatic conditions.

Climate change projections for India for the 2050s suggest an increase in temperature by 2-4 degree Celsius. The expected changes in climate, especially rainfall, are also marked by significant regional variation, with the western and central parts witnessing a greater decrease in rainfall days compared to the other parts of the country.

The available evidence shows a significant drop in the yields of important cereal crops like rice and wheat under the changed climate conditions. However, the studies on the biophysical impacts on some important commercial crops like sugarcane, cotton and sunflower are not adequate.

With doubled carbon dioxide concentration levels in the latter half of the 21st century the gross domestic product would decline by 1.4 to 3 percentage points under various climate change scenarios, with adverse poverty effects. However higher carbon dioxide concentrations in the atmosphere under the climate change conditions could act like aerial fertilizers and boost crop growth. This phenomenon is called the **carbon fertilization effect.**

The non-implementation of the adaptation programmes to

achieve sustainable agriculture is detrimental to the farmers. The regional differences are significantly large with northern and central Indian districts along with the coastal districts bearing a relatively large impact.

The World Bank in 2008 analyzed the climate change impacts in the drought- and flood- affected areas of India. Arguing that present day development strategies must incorporate elements of climate risk management, it recommended a number of adaptation strategies that seamlessly merge with the overall development agenda.

Zero Budget Natural Farming:

- Zero budget natural farming (ZBNF) is a method of ***chemical-free agriculture*** drawing from traditional Indian practices.
- It was originally promoted by Maharashtrian agriculturist and Subhash Palekar, who developed it in the mid-1990s as ***an alternative to the Green Revolution's methods*** driven by chemical fertilizers and pesticides and intensive irrigation.
- He argued that the rising cost of these external inputs was a leading cause of indebtedness and suicide among farmers, while the impact of chemicals on the environment and on long-term fertility was devastating.
- Instead of commercially produced chemical inputs, the ZBNF promotes the application of ***jeevamrutha – a mixture of fresh desi cow dung and aged desi cow urine, jaggery, pulse flour, water and soil*** on farmland.
- This is a fermented microbial culture that adds nutrients to the soil, and acts as a catalytic agent to promote the activity of microorganisms and earthworms in the soil.
- About 200 litres of jeevamrutha should be sprayed twice a month per acre of land; after three years, the system is supposed to become self-sustaining.
- Only one local cow of Indian breed is needed for 30

acres of land,

- A similar mixture, called ***bijamrita***, is used to treat seeds, while concoctions using neem leaves and pulp, tobacco and green chillies are prepared for insect and pest management.
- The ZBNF method also promotes soil aeration, minimal watering, intercropping, bunds and topsoil mulching and discourages intensive irrigation and deep ploughing.
- ZBNF doesn't promote vermicomposting as it introduces the most common composting worm, the European red wiggler (Eisenia fetida) to Indian soils. It is claimed that these worms absorb toxic metals and poison groundwater and soil.
- In order to achieve "doubling farmers income by 2022", one aspect being considered is natural farming methods such as the ZBNF which reduce farmers' dependence on loans to purchase inputs they cannot afford.
- Meanwhile, inter-cropping allows for increased returns.

According to the Economic Survey, a 2017 study in Andhra Pradesh claimed a sharp decline in input costs and improvement in yields. More than 1.6 lakh farmers are practising the ZBNF in almost 1,000 villages using some form of state support.

The original pioneer was Karnataka, where the ZBNF was adopted as a movement by a State farmers' association, the Karnataka Rajya Raitha Sangha. Large-scale training camps were organised to educate farmers in the method. According to a survey carried out in those early years, ZBNF farmers all owned small plots of land, had some access to irrigation and owned at least one cow of their own.

In June 2018, Andhra Pradesh rolled out an ambitious plan to become India's first State to practise 100% natural farming by 2024. It aims to phase out chemical farming over 80 lakh hectares of land, converting the State's 60 lakh farmers to ZBNF methods.

NITI Aayog has been among the foremost promoters of the ZBNF method. However, its experts have warned that multi-location studies are needed to scientifically validate the long-term impact and viability of the model before it can be scaled up and promoted country-wide.

Organic farming:

Organic farming is a system which avoids or largely excludes the use of synthetic inputs (such as fertilizers, pesticides, hormones, feed additives etc) and to the maximum extent feasible rely upon crop rotations, crop residues, animal manures, off-farm organic waste, mineral grade rock additives and biological system of nutrient mobilization and plant protection.

With the increase in population our compulsion would be not only to stabilize agricultural production but to increase it further in sustainable manner. The scientists have realized that the 'Green Revolution' with high input use has reached saturation and is now sustained with diminishing returns of falling dividends. Thus, a natural balance needs to be maintained at all cost for the existence of life and property

Key characteristics of organic farming:

- Protecting the long term fertility of soils by maintaining organic matter levels, encouraging soil biological activity, and careful mechanical intervention.
- Providing crop nutrients indirectly using relatively insoluble nutrient sources which are made available to the plant by the action of soil microorganisms.
- Nitrogen self-sufficiency through the use of legumes and biological nitrogen fixation, as well as effective recycling of organic materials including crop residues

and livestock manures.

- Weed, disease and pest control relying primarily on crop rotations, natural predators, diversity, organic manuring, resistant varieties and limited (preferably minimal) thermal, biological and chemical intervention.
- The extensive management of livestock, paying full regard to animal welfare issues with respect to nutrition, housing, health, breeding and rearing.
- Careful attention to the impact of the farming system on the wider environment and the conservation of wildlife and natural habitats

Government of India has implemented the National Programme for Organic Production (NPOP) in the year 2001. The national programme involves the accreditation programme for certification agencies, norms for organic production, promotion of organic farming etc

Government is promoting organic farming through various schemes/ programmes under National Mission for Sustainable Agriculture (NMSA)/ Paramapragat Krishi Vikas Yojana (PKVY), Rashtriya Krishi Vikas Yojana (RKVY), Mission for Integrated Development of Horticulture (MIDH), National Mission on Oilseeds & Oil Palm (NMOOP), Network Project on Organic Farming of ICAR

In addition to this, Government is implementing a Cluster based programme to encourage the farmers for promoting organic farming called ***Paramparagat Krishi Vikas Yojana (PKVY)***:

1. Groups of farmers would be motivated to take up organic farming under PKVY. Fifty or more farmers will form a cluster having 50 acre land to take up the organic farming under the scheme.
2. In this way during three years 10,000 clusters will be formed covering 5.0 lakh acre area under organic farming. There will be no liability on the farmers for

expenditure on certification.

3. Every farmer will be provided Rs. 20,000 per acre in three years for seeds to harvesting of crops and to transport produce to the market.
4. Organic farming will be promoted by using traditional resources and the organic products will be linked with the market.
5. It will increase domestic production and certification of organic produce by involving farmers