Standing Committee Report Summary

Nano-Fertilizers for Sustainable Crop Production

- The Standing Committee on Chemicals and Fertilizers (Chair: Dr. Shashi Tharoor) presented its report on 'Nano-Fertilizers for Sustainable Crop Production and Maintaining Soil Health' on March 21, 2023. Key observations and recommendations of the Committee are:
- Agriculture faces several challenges such as stagnation in crop yields, nutrient deficiencies, and lower availability of arable land. Increase in food grain production must largely come from increase in productivity, as there is little scope of increasing area under cultivation. Fertilisers provide nutrients to ensure optimal crop productivity. However, fertiliser consumption in India is imbalanced and urea accounts for 82% of the nitrogenous fertilisers. Conventional fertilisers such as urea pollute the ecosystem during application.
- **Development of nano-fertilisers:** The Committee observed that Indian Farmers Fertilizer Cooperative Limited (IFFCO) has developed nano urea which attempts to address the imbalanced use of fertilisers. Nano urea was notified by the Ministry of Agriculture and Farmers Welfare as a nano fertiliser in February 2021. IFFCO has also developed nano fertiliser technology for other nutrients such as nano zinc, nano copper, and nano sulphur. Research trials on several crops have been conducted. The Committee recommended that the Department of Fertilizers and IFFCO expedite the process for commercial utilisation of nano fertilisers which have undergone sufficient field trials. It also recommended that other nano fertilisers be priced considerably cheaper than the prevailing price of conventional bulk fertilisers.
- **Benefits of nano-fertilisers:** The Committee observed that nano fertilisers cost less than subsidised conventional fertilisers. As per IFFCO field trials, a 500 ml bottle of nano urea (Rs 240) can replace a 45 kg bag of conventional urea (Rs 267). The Committee also observed that nano urea can reduce transportation and warehousing costs, and result in better crop productivity and higher income for farmers. Field trials have also found that the average yield was 8% higher due to the application of nano urea. However, as per the Department of Agricultural Research and Education, long term effects of nano fertilisers on the nutritional quality of various crops cannot be drawn as research trials have completed only one year. The Committee recommended that long term dedicated research be conducted to assess the benefits and side effects of nano fertilisers.
- **Challenges for adoption:** The Committee noted that the cost savings from nano urea will assist in doubling the income of farmers. However, it noted that small and marginal farmers pose a challenge for its adoption. The Department has taken several measures such as village level demonstrations and panel discussions on the radio to create awareness for nano urea. The Committee also noted that the cost of an agricultural sprayer (used to apply liquid fertilisers) ranges between Rs 1,200 to Rs 10,000 per sprayer, depending on its type. The Committee recommended that the Ministry speed up efforts for providing effective and cheaper means for spraying nano fertilisers.
- The Committee noted that drones are also used to spray nano fertilisers and that the Ministry of Civil Aviation has removed policy and procedural bottlenecks for manufacturing drones. However, it noted that an agricultural drone costs about Rs 10 lakh, which is difficult for small and marginal farmers (86% of farmers) to afford. It also noted that there are limited drone training centres for farmers to avail training facility. It recommended that the Department devise a plan to conduct regular training programmes for entrepreneurs and farmers about drone-based fertiliser sprayers.
- **Allocation of funds:** The Committee observed that the Department of Fertilizers has not allocated separate funds for nanotechnology. It recommended that the Ministry allocate a sizeable amount for nanotechnology-based research through fertiliser PSUs. It noted that development of varied nano fertilisers will help achieve self-reliance and save foreign exchange spent on increasing imports of fertilisers.
- **Imports:** The Committee noted that urea imports rose from 55 lakh metric tonne in 2016-17 to 98 lakh metric tonne in 2020-21. 26% of urea subsidy goes towards imports. In light of this, the Committee observed that judicious application of urea is necessary and nano fertilisers can reduce import dependency. It noted that the government can save Rs 25,000 crore in subsidies each year if nano fertilisers are used. The Committee noted that the Department establish long term import agreements and set up joint venture plants with buy back arrangements in countries that are rich in raw materials.
- The Committee noted that public and private sector companies who want to manufacture nano fertilisers must be supported by the government in every way possible. It recommended that the Department take up the matter with the Ministry of Finance to bring a production linked incentive (PLI) scheme for nano fertilisers to give a boost to the fertiliser industry.

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