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Green technology for sustainable agriculture development

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Green technology: Green technology (GT) is a broad term and a field of new innovative ways to make environmentally friendly changes in daily life. It is created and used in a way that conserves natural resources and the environment. It is meant as an alternative source of technology that reduces fossil fuels and demonstrates less damage to the human, animal and plant health, as well as damage to the world. The use of green technology is supposed to reduce the amount of waste and pollution that are created during production and consumption. It is also referred to as environmental technology and clean technology.

Green energy offers a promising alternative to traditional energy sources. The fact that renewable energy accounts for only a modest proportion in meeting the world's (commercial) energy demand means that there is a missing link in their potential and their implementation - the barriers in their implementation. These barriers (either financial or non-financial) need to be identified and addressed in order to design innovative policy approaches for the international and domestic financing or renewable energy technologies. The Earth Summit at Rio adopted Agenda 21 on June 14, 1992, which proposes various actions to be implemented from now and into the 21st century to accelerate sustainable development.The green technology policy to provide direction and motivation to continuously enjoy good quality and a healthy environment should be based on four pillars:

– **Energy:** Seek to attain energy independence and promote efficient utilization.

– **Environment:** Conserve and minimize the impact on the environment.

– **Economy:** Enhance the national economic development through the use of technology.

– **Social:** Improve the quality of life for all.

Applications of green technology:

Biogas technology: Biogas is a term produced by anaerobic digestion of organic waste comes from domestic and agriculture output by methanogenic bacteria. Biogas technology has been successfully fulfilling the constant energy needs for rural areas where about 70 per cent of India's population lives.

Biofuel: In India, the vast energy demand is currently derived from fossil fuels which are limited in stock, non-renewable and polluting resource. In this regard, biofuels (bio-ethanol and bio-diesel) are the alternative energy sources produced from agricultural crops and their residues, forest residues or other forms of plant-based biomass feedstock which is used as a substitute for fossil fuels like diesel and petrol.India being an agricultural country, has huge potentials for the development of biomass energy sector and this will pave the way to achieve sustainable development in the coming years.

Organic farming: Organic farming means the farming without using chemical fertilizers and pesticides. In this farming system the aim is to cultivate crops in such a way that increases the soil fertility without harming the environmental quality. This can be accomplished by using on-farm agronomic, biological and mechanical methods in exclusion of all synthetic off-farm inputs.

Permaculture: Permaculture uses the inherent properties of plants and animals combined with the natural characteristics of landscapes and structure to generate a life-supporting system for world by using the smallest practical area. It is a combination of 'permanent agriculture' and 'permanent culture' therefore gaining huge appreciation from agriculture sector.

Wind energy: Energy plays an important role in agriculture in terms of crop productivity and other applications such as agro-processing. The energy demand in the agricultural sector can be obtained from different renewable sources and wind is one of them. Wind energy contributes approx. 1 per cent of global electricity generation whereas India has total installed capacity of 67 per cent out of which it

produces upto 20 per cent for the overall contribution of the country.

Solar energy: In remote agricultural lands, the underground submersible solar photovoltaic water pump is economically viable and also environmentally-friendly option as compared to a diesel generator.

Future prospective of green technology for farmer's in India: Though the concept of sustainable development in agriculture is a new concept but it is the need of the hour. For an agricultural economy like India, sustainable approach towards agricultural practices will help to strike a balance between maximizing crop yield and economic growth. The application of green technology in the pursuit of sustainable agriculture can provide opportunities to increase yield, improving product quality, retention of soil fertility, and adoption of eco-friendly techniques. This will bring challenges and paradigm shift in the research field and related policies of the developing countries. Hence, there should be an integration of research, awareness and application of the green technologies in order to strive towards attaining sustainable development in the agricultural sector.

Fig. 1: Role of green technology in sustainable agriculture

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