



SUSTAINABILITY AND INNOVATIONS IN AGRICULTURE AND RURAL DEVELOPMENT IN INDIA

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ABSTRACTS:

Sustainability is the ability to exist constantly. Innovation means the action or process of innovating or Innovation means a new method, idea, product, etc. Present research paper explains how innovative practices in agriculture and rural development of our country lead our country towards sustainable development. The paper also focuses on various innovations made in the field of agriculture and rural development. The researcher is of the opinion that there is a strong need of sustainable agriculture and rural development through proper innovations.

Key words: Sustainability, Innovations, Agriculture, Rural Development, environment.

INTRODUCTION:

Sustainability is the ability to exist constantly. Innovation means the action or process of innovating or Innovation means a new method, idea, product, etc. Present research paper explains how innovative practices in agriculture and rural development of our country lead our country towards sustainable development. The paper also focuses on various innovations made in the field of agriculture and rural development. The researcher is of the opinion that there is a strong need of sustainable agriculture and rural development through proper innovations.

OBJECTIVES OF THE STUDY:

1. To understand the concepts of Sustainability and Innovations
2. To study various innovations done in the field of agriculture and rural development
3. To study the need of sustainable agriculture and rural development through innovations

RESEARCH METHODOLOGY:

The primary source of data collection in this research paper is the secondary data. The available information on Sustainability and Innovations in Agriculture and Rural Development has been extensively used to complete the research paper. All the available Journals, Related books, Web, Articles, Publish and unpublished information and Papers provided necessary information to the finalize the research paper.

SIGNIFICANCE OF THE STUDY:

Present paper throws light on understanding the concepts of Sustainability and Innovations. Simple innovations or product made by using natural raw materials will not create any environmental pollution. Secondly this paper studies various innovations carried out in the field of agriculture and rural development. So this study will help to get knowledge about these different types of innovations. Thirdly this study points out the need for sustainable agriculture and rural development through

innovations. It also points out the dependency of sustainable development on innovations which never harm environment and helps to maintain ecological balance.

Definitions of Sustainability:

“Sustainability” means renewable fuel sources, reducing carbon emissions, protecting environments and a way of keeping the delicate ecosystems of our planet in balance. In short, sustainability looks to protect our natural environment, human and ecological health, while driving innovation and not compromising our way of life. The definition of “sustainability” is the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance.

Elements of Sustainability

In 2005, the World Summit on Social Development identified three core areas that contribute to the philosophy and social science of sustainable development. These “pillars” are:

1. ECONOMIC DEVELOPMENT

Economic development is about giving people what they want without compromising quality of life, especially in the developing world, and reducing the financial burden and unnecessary official rules and processions of doing the right thing.

2. SOCIAL DEVELOPMENT

Among many facets to this pillar, most important is awareness of and legislation protection of the health of people from pollution and other harmful activities of business and other organizations.

3. ENVIRONMENTAL PROTECTION

There is a need to protect the environment, by recycling, reducing our power consumption, by switching electronic devices off rather than using standby, by walking short journeys instead of taking the bus. Businesses should prevent pollution and should keep their own

carbon emissions low. There are incentives to installing renewable power sources in our homes and businesses. Environmental protection is the third pillar and to many, the primary concern of the future of humanity. It defines how we should study and protect ecosystems, air quality, integrity and sustainability of our resources and focusing on the elements that place stress on the environment

Primary Goals of Sustainability

In 2012, the United Nations Conference on Sustainable Development met to discuss and develop a set of goals:

- To make efforts towards end of poverty and hunger
- To maintain better standards of education and healthcare - particularly as it pertains to water quality and better sanitation
- To achieve gender equality
- To achieve sustainable economic growth while promoting jobs and stronger economies
- All of the above and more while tackling the effects of climate change, pollution and other environmental factors that can harm people's health, livelihoods and lives.
- To achieve sustainability to include health of the land, air and sea

A. Innovations in Indian agriculture:

Brainstorming Ways for Indian Agricultural Innovation

Policy reforms and experiments—from liberalizing input markets to guaranteeing employment for the rural poor—have influenced rural livelihoods and agricultural sector growth potential in many ways.

One third of Indian farmers are rapid adopters of technology, another third of them are slow-

going, and the rest are not likely to use modern technology at all.

This insight is courtesy of Mark Kahn, who runs the agri-business fund Omnivore Partners. The company has invested in a number of startups that are innovating for the Indian farmer.

India's Department of Agriculture says the pace of farm mechanization has been poor, seeing only 2% annualized growth in the decade from 2001 to 2010. The need for greater mechanization and higher productivity is a sorely felt in the sector. Agriculture accounts for only 14% of India's GDP, even though it contributes nearly half of all jobs.

Here are some notable innovations some startup companies have produced:

1. The Venus flytrap

Kundal Mallareddy, a farmer in Karnataka's Bidar district, uses 50% less pesticide than he did until three months ago, when he switched to pest-control traps produced by Barrix Agro Sciences. Instead of pesticides, the Bangalore-based startup makes traps that use pheromones to attract crop-damaging pests and flies.

2. The Discovery

Sagar Bhansali, a Mumbai-based entrepreneur, set up Anulekh Agrotech, which sells a product called Biosat to farmers in Maharashtra and Gujarat in 50 kg bags. The product, is made using biochar, a soil additive, to improve fertility, thereby reducing reliance on chemical fertilizers. "The product itself is not an innovation. It's more of a discovery. He says that the Amazonians used [this] technique that helped them get better crops and also says that similar products were available elsewhere but they innovated on the side of supply chain and business model to make it more affordable for Indian farmers.

3. Fruits of Innovation

In Maharashtra, Nashik-based startup Mitra is improving mechanization at horticulture farms. The company has developed sprayers for vineyards and for pomegranate farms. "Sprayers are used for adding hormones that help the growth of crops amongst other things," says founder Devneet Bajaj, previously a principal at a private equity firm specializing in agribusiness. "Farmers would otherwise have to use a process of manual dipping that needs a lot of labor."

4. Crop Control

In 2010, Bangalore software engineer Krishna Kumar set up a farming technology solutions startup called CropIn Technology Solutions. The technology is a cloud-based platform, integrated with a mobile app for Android, that allows large food companies to track the growth of crops on farms around the country. The software tags what is grown in the fields and the conditions in which the crops are grown at the farm level and enables companies to remotely monitor farms, ensure the farmers adopt better agricultural practices and make every crop traceable.

5. Fishing it out

Eruvaka Technologies, based in the coastal Indian city of Vijayawada in Andhra Pradesh, has also developed technology to track farm conditions remotely, but specifically for aquaculture farmers. "The solution allows farmers to measure the water quality, the levels of dissolved oxygen and the PH level remotely on a Smartphone" explains Sriram Raavi, founder of Eruvaka Technologies. The device Eruvaka has developed, Floating Sensor Buoy, is placed in the farm and has sensors measuring the parameters that allow the maintenance of a healthy environment for growing fish and shrimp. The device has a battery and solar panel, as well as wireless

connectivity through a SIM Card mounted on the buoy, and can alert the farmer of a drop in any parameter through a text or phone call.

6. Sky met

Skymet is India's largest weather monitoring and agri-risk solutions company. According to their website, they are the experts in measuring, predicting, and limiting climate risk to agriculture, thus reducing losses incurred due to bad weather conditions.

Product: Launched to aid farmers, Skymet's weather website offers services such as weather forecast, crop insurance and agri-risk management. Prediction of weather conditions can help prepare a farmers for a drought or heavy unseasonal rainfall and help them take appropriate preventive measures, they say and claim to accurately measure and predict yield at the village level for any crop.

7. Ekgaon Flickr CC Ananth BS

A Gujarat-based venture started in 2001, Ekgaon Technologies is an IT based network integrator that provides a technology platform and offers a range of services to farmers in rural areas including financial, agricultural inputs and government assistance.

8. Digital Green

Digital Green is a not-for-profit international development organisation that focuses on training farmers to make and show short videos where they record their problems, share solutions and highlight success stories as community engagement to improve lives of rural communities across South Asia and Sub-Saharan Africa.

Products:

It uses technology-enabled behaviour change communication that is cost-effective, scalable and brings together researchers, development practitioners, and rural communities to produce

and share locally relevant information through video.

9. Frontal Rain Technologies

The Bangalore-based agri-tech startup seeks to deliver affordable advanced technology solutions for emerging companies and take technology to remote corners of the country.

Product:

The company's offering Rain+, according to their website, is a comprehensive suite of products on the cloud for food and agribusinesses. Rain+ can help companies at every stage of the value chain starting from growing, processing, logistics, wholesale trade, retail trade and exports. This technology, accessible through desktop, tablet and mobile devices, is used by companies dealing with commodities like spices, herbs, basmati rice, seeds, animal feed, sea food, dairy and edible oil.

10. Agro Star

A Pune-based 'direct to farmer' m-commerce platform, Agrostar strives to provide quality agro inputs at the farmers' doorstep.

Product:

Agro Star enables farmers to procure a range of agricultural goods such as seeds, crop nutrition, crop protection and agri-hardware products by simply giving a missed call on the company's 1800 number or through their mobile app to eliminate unavailability of products, substandard products, duplication and adulteration.

B. Some innovations for rural India

1. Eco-Cooler: It has the ability to reduce indoor temperatures as much as 5 degrees Celsius, which is on par with what an electric centrally installed air conditioning system can do. In some instances the Eco Cooler can reduce indoor temperatures from a sweltering 86F (30C) to a comfortable 77F (25C).

It is reportedly the world's first-ever zero electricity air conditioner, and its inventor wanted to get the concept out there to help as many people as possible.

2. A whirling toy (button spinner) This is a **centrifuge**. A centrifuge is an instrument that makes use of the principle of centrifugal force. Centrifugal force is essentially an outward pushing force that is felt by bodies moving in a circular motion.

This force that is felt by the bodies in circular motion is due to the inertia and inward pushing external force. The centrifugal device makes use of this theory while spinning samples at high speeds.

Applications of a Medical Centrifuge- Blood Sample Separat...

3. Water wheel

Ashvin Maliya, got Possess Learning License In Farming, invented

Water wheel, a cylindrical drum with capacity over 45 liters.

“Water wheel can be rolled on the ground, eliminating the physical strain of carrying water containers”

4. Help Desk: Aarambh, a Mumbai based NGO came up with an idea of portable Study table cum School Bag and that too in a most economical and efficient manner. They collected discarded carton from retailers, corporate houses and retail outlets. Making use of a stencil design, the cartons were then folded to form a portable writing desk, which also doubles up as a school bag. They named this wonder as ‘Help Desk’, and were able to achieve their ‘most economical’ target by making it in less than Rs 10 (\$20 cents).

Innovative Ideas for Rural Development in India:

1. Utilization of Local Resources: For example: If there are water resources like rivers and

tanks near by the villages, in summer itself, arrangements must be made to tap this resource by removing slit in the tanks, constructing new reservoirs, bunds, canals and simultaneously strengthening the existing ones, so that the water cannot go waste.

Similarly, if there are any mines like iron, coal and granites, they should be excavated so that local population can be provided employment.

2. Establishment of Rural Industries: All the village industries come under the following broad categories:

- a). Agro Based Industries: Sugar industries, Jaggery, Oil processing from oil seeds, Pickles, Fruit juice, Spices, Dairy products etc.
- b). Forest Based Industries: Wood products, Bamboo products, Honey, Coir industry, making eating plates from leaves.

3. Services: There are a wide range of services including mobile repair, agriculture machinery servicing, etc which are being undertaken under this category.

4. Startups: They are entrepreneurial ventures, which are newly emerged businesses aims to meet market place need, want or problem by developing a viable business model around products, services, processes or platforms. For example: Agriculture, Supply Chain, Trading in Agricultural produce, Processing Agricultural produces, Fisheries- Both Culture and Trading, Rural Micro Finance, Rural Health - Rural Primary Health Cared and Rural Education etc.

5. Computer & Internet Services: Providing Computer Training and Repairing Services,

Internet based business-like E-Commerce, Rail & Bus Ticket booking, Digital Marketing Agency – Examples: Social Media Marketing, Email Marketing etc.

6. Encourage Rural Entrepreneurship:

They may be of the following types:

- a). Individual Entrepreneurship - It is basically single ownership of the enterprise.
- b). Group Entrepreneurship - It mainly covers partnership, private limited company and public limited company.
- c). Cluster Formation Entrepreneurship - It covers NGOs, VOs, CBOs, SHGs and even networking of these groups. These also cover formal and non-formal association of a group of individuals on the basis of caste, occupation, income, etc.
- d). Cooperative Entrepreneurship - It is an autonomous association of persons united

Government Schemes for Rural Entrepreneurship in India:

- a. Entrepreneurship Development Institution Scheme
- b. Rajiv Gandhi Udyami Mitra Yojana (RGUMY)
- c. Performance and Credit Rating Scheme (Implemented through NSIC)
- d. Product Development, Design Intervention and Packaging (PRODIP)
- e. Khadi Karigar Janashree Bima Yojana for Khadi Artisans
- f. Marketing Assistance Scheme
- g. Provision of Urban Amenities to Rural Areas (PURA)

CONCLUSION:

Rural entrepreneurship plays a vital role in the economic development of India, particularly in the rural economy. It helps in generating employment opportunities in the rural areas with low capital, raising the real income of the people, contributing to the

development of agriculture by reducing disguised unemployment, underemployment, unemployment, poverty, migration and economic disparity. The rural development programs should combine infrastructure development, education, health services, investment in agriculture and the promotion of rural non-farm activities in which women and rural population can engage themselves. Rural development and rural entrepreneurship is the way of converting developing country into developed nation. Promotion of rural entrepreneurship is extremely important in the context of producing gainful employment and reducing the widening disparities between the rural and urban.

Monitoring rural development programmers by supplying right information at the right time, providing timely and adequate credit and continuous motivation of bankers, Panchayat union leaders and voluntary service organizations will lead to the development of rural entrepreneurship and in turn rural development.

SUGGESTIONS:

1. **Labour Intensive Techniques:** As there is disguised unemployment in our agriculture sector, labour intensive techniques should be adopted in rural industrial units.
2. **Offer finance with low rate of interest:** Financial institutions like ICICI, SIDBI, IDBI, IFCI, and SFC should provide finance to rural entrepreneurs with low rate of interest and limited collateral security with liberal terms and conditions.
3. **Government Role:** Government should take steps to provide infrastructure, warehousing facilities, offer assistance to marketing and to

export the goods of rural entrepreneurs to foreign countries.

4. Exploitation of Village resources: For example, where ever there is scope for wind and solar energy, can be fully exploited for rural electrification.

5. NRIs and wealthy people of their respective villages should establish/assist rural industries

REFERENCES:

Advantages of rural entrepreneurs (n.d)
www.thehindu.com/...entrepreneurs...rural-india/article

Narang Ashok (2006), "Indian Rural Problems", Murari Lal and Sons, New Delhi

Keyne, J. (2000), "Rural Entrepreneurship Initiative", Kauffman Centre for Entrepreneurial Leadership, September.

Report of the All-India Rural Credit Committee, New Delhi, 2003.

Nandanwar Kalpana P. (2011), Role of Rural Entrepreneurship in Rural Development, International Referred Research Journal, ISSN- 0974-2832, Vol. II, ISSUE-26, March

Kumar A. "Rural industrialization in India: a strategy for rural development" Mittal Publications, Delhi, 1989.

Mehta, A. (2011), "Rural Entrepreneurship – A Conceptual Understanding with Special Reference to Small Business in Rural India", Elixir Marketing, Vol. 36