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SUSTAINABLE AGRICULTURAL DEVELOPMENT - INDIAN PERSPECTIVE

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Abstract

The MDGs have made a profound difference in people's lives. Global poverty has been halved five years ahead of the 2015 timeframe. The world is now fully engaged in discussions to define Sustainable Development Goals (SDGs), which will serve as the core of a universal post-2015 development agenda. Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). The major concern is that by irreversibly depleting the world's stock of natural wealth, today's development path will have detrimental implications for the well-being of future generations. Hence, moving towards a green economy must become a strategic economic policy agenda for achieving sustainable development. The greening of the agriculture sector is expected to generate a range of benefits including increased profits and income for farmers, gains at the macroeconomic level, enabling the sector to adapt to climate change and benefits for ecosystem services. Indian agricultural system is a model of sustainable agriculture, as it is predominantly a mixed crop-livestock farming system, with the livestock segment supplementing farm incomes by providing employment, draught animals, and manure.

Key words: Sustainable, Agriculture, Development, Green economy, Deforestation

Prologue

At the turn of the century, world leaders came together at the United Nations and agreed on a bold vision for the future through the Millennium Declaration. The Millennium Development Goals (MDGs) were to eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria, and other diseases, ensure environmental sustainability and develop a global partnership for development. The MDGs, with eight goals and a set of measurable time bound targets, established a blueprint for tackling the most pressing development challenges of our time.

The MDGs have made a profound difference in people's lives. Global poverty has been halved five years ahead of the 2015 timeframe. Ninety per cent of children in developing regions now enjoy primary education, and disparities between boys and girls in enrolment have narrowed. Remarkable gains have also been made in the fight against malaria and tuberculosis, along with improvements in all health indicators. The likelihood of a child dying before age five has been nearly cut in half over the last two decades. That means that about 17,000 children are saved every day. We also met the target of halving the proportion of people who lack access to improved sources of water. The concerted efforts of national governments, the international community, civil society and the private sector have helped expand hope and opportunity for people around the world. But more needs to be done to accelerate

progress. We need bolder and focused action where significant gaps and disparities exist. Member States are now fully engaged in discussions to define Sustainable Development Goals (SDGs), which will serve as the core of a universal post-2015 development agenda. Our efforts to achieve the MDGs are a critical building block towards establishing a stable foundation for our development efforts beyond 2015. (Ban Ki-moon, Secretary-General, United Nations)

The UN has also Goals and Targets on Sustainable Development for the Post 2015 Development Agenda. They realized that Poverty eradication is the greatest global challenge facing the world today and an indispensable requirement for sustainable development. UN committed to freeing humanity from poverty and hunger as a matter of urgency. Further UN recognizes that poverty eradication, changing unsustainable and promoting sustainable patterns of consumption and production and protecting and managing the natural resource base of economic and social development are the overarching objectives of essential requirements for sustainable development. Climate change is one of the greatest challenges of our time, and UN expresses profound alarm that emissions of greenhouse gases continue to rise globally. UN underscore that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate international response, with a view to accelerating the reduction of global greenhouse gas emissions.

In this context, Sustainable Agricultural Development gains momentum. Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (WCED 1987). The major concern is that by irreversibly depleting the world's stock of natural wealth, today's development path will have detrimental implications for the well-being of future generations. Hence, moving towards a green economy must become a strategic economic policy agenda for achieving sustainable development.

Green economy results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive (UNEP). Practically speaking, a green economy is one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services. These investments need to be catalyzed and supported by targeted public expenditure, policy reforms and regulation changes. This development path should maintain, enhance and, where necessary, rebuild natural capital as a critical economic asset and source of public benefits, especially for poor people whose livelihoods and security depend strongly on nature.

In this context I tried to review the relevant concepts to highlight the importance of green economy as a pathway to sustainable development and poverty eradication with special reference to India. This review is heavily depended on the UN publications and the author has only tried to present an edited abstract of relevant themes for discussion.

Agriculture

There are two predominant farming-practice paradigms, i.e. conventional (industrialized) agriculture systems and traditional (subsistence) smallholder agriculture. Conventional (industrial) agriculture is characterized by farming practices that rely on use of external farming inputs. Most of the large scale industrial farming is considered energy-intensive (using 10 calories of energy for every calorie of food produced), whose high productivity (kg/ha) relies on the extensive use of chemical fertilizers, herbicides, pesticides, fuel, water, and continuous new investment (e.g. in advanced seed varieties and machinery). Traditional (subsistence) smallholder agriculture typically relies on indigenous and traditional knowledge that is based on farming practices used for several generations, has limited or no use of

off-farm inputs, and results in low productivity, low value added per worker and primarily reliant on extracting soil nutrients with insufficient replenishment by either organic or inorganic fertilizers. Generally, it is susceptible to yield losses due to erratic rainfall, pest and weed infestations and other production related risks. It can trap already poor farmers in a downward spiral of growing poverty and social marginalization.

Whereas farming practices and technologies that are instrumental in greening agriculture include:

- restoring and enhancing soil fertility through the increased use of naturally and sustainably produced nutrient inputs; diversified crop rotations; and livestock and crop integration;
- reducing soil erosion and improving the efficiency of water use by applying minimum tillage and cover crop cultivation techniques;
- reducing chemical pesticide and herbicide use by implementing integrated and other environmental friendly biological pest and weed management practices; and
- Reducing food spoilage and loss by expanding the use of post-harvest storage and processing facilities.

The greening of the agriculture sector is expected to generate a range of benefits including increased profits and income for farmers, gains at the macroeconomic level, enabling the sector to adapt to climate change and benefits for ecosystem services.

Status of Indian Agriculture

The share of agriculture and allied sector in gross domestic product (GDP) declined to 15.2 per cent during the Eleventh Plan and further to 13.9 per cent in 2013-14. While it still accounts for about 54.6 per cent of total employment (Census 2011), there has been a decline in the absolute number of cultivators, which is unprecedented, from 127.3 million (Census 2001) to 118.7 million (Census 2011). Substantial progress in acreage and production are recorded for 2013-14. As per the 3rd Advance Estimates the acreage under food grains production has increased to about 126.2 million ha; and to 28.2 million ha under oilseeds. Record production of food grains at 264.4 million tonnes (mt) and oilseeds at 32.4 mt is estimated. The report feels proud to announce that the increased fertilizer usage has played a significant role in improving agricultural productivity. Urea, which is the main source of nitrogen (N), constitutes around 50 per cent of total fertilizer consumption. India meets 80 per cent of urea requirement through indigenous production, but is largely import dependent for its potassic (K) and phosphatic (P) fertilizer requirements

Animal Husbandry

Cattle have held a very special role in human history ever since their domestication some 10,500 years ago in the ancient Fertile Crescent. They are raised for their meat, dairy products, leather and hides and are also used as draft animals in farming for pulling ploughs, and in transport for pulling wagons and carts. More than 1.4 billion cattle are kept worldwide today, of which 159 million (11 percent) in Europe and Central Asia.

Indian agricultural system is a model of sustainable agriculture, as it is predominantly a mixed crop-livestock farming system, with the livestock segment supplementing farm incomes by providing employment, draught animals, and manure. India ranks first in milk production, accounting for 17 per cent of world production. During 2012-13, milk production peaked at 132.43 mt, thus becoming an important secondary source of income for 70 million rural households engaged in dairying and for 70 per cent of the workforce that comprised women. Government's focus, besides framing conducive policies for commercial poultry production, is on strengthening the family poultry system, which addresses livelihood issues. Egg production was around 69.73 billion in 2013, while poultry meat production is estimated at 2.68 mt.

Fisheries

There is widespread agreement that the world's fisheries are currently operating at overcapacity. Advances in technology have made it possible for a much smaller global fleet to catch the maximum sustainable yield, but the global fishing capacity keeps on growing owing to the common property nature of fisheries and the provision of fishing subsidies by many maritime countries of the world. Also, the use of sometimes damaging fishing methods such as bottom-trawling, unselective fishing, pollution and human-induced variations in climate has changed the productivity of many aquatic environments. The total catch from the world's marine capture fisheries rose from 16.7 million tonnes in 1950 to 80.2 million tonnes in 2005. It reached a peak of 85.3 million tonnes in 1994. Illegal, unreported and unregulated (IUU) fishing continues to threaten the long-term sustainable management of world fisheries. Many problems persist with high levels of unwanted and often unreported by catch and discards in many fisheries. Our concern is also on mortality of threatened species, like turtles, dolphins and seabirds, and the consequences of killing and discarding huge quantities of juveniles of economically valuable fish species. Greening the fisheries sector by rebuilding depleted stocks and implementing effective management could increase the overall marine fisheries catch, and raise the economic contribution of

ocean fish populations to the global economy. In order to achieve sustainable levels of fishing from an economic, ecological and social point of view, a serious reduction in current excessive capacity is required. Given the wide difference in the catching power, the job creation potential, and the livelihood implications of large-scale versus small-scale fishing vessels, it appears that a reduction effort focused on large-scale vessels could reduce overcapacity at lower socio-economic costs to society.

Fisheries in India

Fisheries are an important source of livelihood and fish, are an important source of protein. There are 14.4 million fishermen in the country. India ranks second in world fish production, contributing about 5.4 per cent of global fish production. It is also a major producer of fish through aquaculture. Total fish production during 2013-14 is estimated at 9.45 mt with 6.10 mt coming from the inland sector and 3.35 mt from the marine sector. The sector contributes about 1 per cent to overall GDP and represents 4.6 per cent of agriculture GDP.

Water

Access to the world's water resources is heavily dependent upon the nature of the water cycle. While a massive amount of water reaches the earth's land surface, much less, around 40 per cent, makes its way into creeks, rivers, aquifers, wetlands, lakes and reservoirs, before cycling back into the atmosphere. Of the water that is extracted for human purposes, on average, approximately:

- 70 per cent is used for agricultural purposes;
- 20 per cent is used by industry (including power generation); and
- 10 per cent is used for direct human consumption.

However, water, as a basic necessity for sustaining life, goes undelivered to many of the world's poor. International Water Management Institute (IWMI) has identified two types of water scarcity namely physical scarcity and economic scarcity. In regions where there is physical scarcity, the sustainable supply limit has been reached and little opportunity to construct more dams remains. In regions where the scarcity is economic, however, it is possible to increase supplies, if the financial resources necessary to build a new dam can be found. The International Water Management Institute (IWMI) is of the view that economic scarcity is widespread in sub-Saharan Africa and in parts of South and South-East Asia. David Molden in his book entitled 'A Comprehensive Assessment of Water Management in Agriculture' suggested eight policy initiatives to manage the water in the world such as change the way

we think about water and agriculture, Fight poverty by improving access to agricultural water and its use, Manage agriculture to enhance ecosystem services, Increase the productivity of water, Upgrade rain fed systems—a little water can go a long way, Adapt yesterday's irrigation to tomorrow's needs, Reform the reform process—targeting state institutions, Deal with tradeoffs and make difficult choices.

Water Situation in India

Since independence, India has made significant progress in developing its water resources and supporting infrastructure. Post-independence years have witnessed large-scale investments in water storage structures which have contributed considerably in making India a self-sustaining economy. Some of the crucial issues faced by the water sector in India include (a) erratic distribution of rainfall, often leading to floods and droughts in various areas; (b) water use inefficiency; (c) unregulated groundwater extraction; (d) water pollution; and (e) decreasing water quality due to poor waste management laws, inter-state river disputes, growing financial crunch for development of resources and scarce safe drinking water. Water is the most critical input for agriculture. Currently 63 million ha, or 45 per cent of net cropped area, is irrigated. Under the Accelerated Irrigation Benefit Programme (AIBP), Rs. 64,228 crore of central loan assistance (CLA)/grant had been released up to 31 December 2013. An irrigation potential of 8054.61 thousand ha is estimated to have been created by states from major/ medium/minor irrigation projects under the AIBP till March 2012. Overexploitation of water resources is leading to alarming reduction in the water table in the 'rice bowl of India.

Forests

Forest goods and services support the economic livelihoods of over 1 billion people, most of whom are in developing countries and are poor. While timber, paper and fiber products yield only a small fraction of global GDP, public goods derived from forest ecosystems have substantial economic value estimated in the trillions of dollars. Forests sustain more than 50 per cent of terrestrial species, they regulate global climate through carbon storage and protect watersheds. The products of forest industries are valuable, not least because they are renewable, recyclable and biodegradable. Thus, forests are a fundamental part of the earth's ecological infrastructure and forest goods and services are important components of a green economy.

The forests cover 31% of total land area in the earth. The world's total forest area is just over 4 billion hectares, which corresponds to an average of 0.6 ha

per capita. The five most forest-rich countries (the Russian Federation, Brazil, Canada, the United States of America and China) account for more than half of the total forest area. Ten countries or areas have no forest at all and an additional 54 have forest on less than 10 percent of their total land area. India State of Forests-2013 Report published by the Forest Survey of India states that forest cover of the country is 697,898 sq.km (69.79 million ha) which is 21.23 percent of the geographical area of the country. The tree cover of the country is estimated to be 91,266 sq.km (9.13 million ha) which is 2.78 percent of the geographical area. The total forest and tree cover of the country is 789,164 sq.km (78.92 million ha) which is 24.01 percent of the geographical area of the country. There is an increase of 5,871 sq.km in the forest cover of the country, in comparison to 2011 assessment.

Epilogue

There are many other issues such as waste management, carbon emission from the manufacturing sector, creation of concrete jungles, transport related problems, tourism and its impact on the life of local people, urbanization and its impact are discussed in the sustainable development model. The ultimate aim is to ensure better living condition to the people without exploiting the mother earth. The reviewer here consolidates the recommendation of the world green economists for the sustainable development:

1. A green economy recognizes the value of, and invests in, natural capital such as forests, lakes, wetlands and river basins.
2. Reducing deforestation and increasing reforestation also support agriculture and rural livelihood.
3. Sustainable agriculture with proper soil fertility management, integrated nutrient management, pest management, water harvesting, livestock integration, more efficient and sustainable water use, crop and livestock diversification, biological plant and animal health management, and appropriate farm level mechanization.
4. Sustainable levels of fishing by reducing the current fishing capacity and finding alternative jobs for the dependents.
5. Ensuring equitable access of food, sanitation, clean water for the hungry.
6. Renewable energy can play a cost effective role in a strategy to eliminate energy poverty.
7. Tourism development when well designed can support the local economy and reduce poverty.

8. Promotion of Producers organizations to increase productivity, maintain sustainability and ensure equity. In this regard, government of India took initiative to start producer companies as an alternative to cooperative of form organizations.

Government of India has taken steps in this line and working towards sustainable development of Indian agriculture by allotting more funds to the sector. Many of our state governments are trying it level best to preserve the natural capital. Particularly Tamilnadu state is ahead of many states barring one or two states, and performing better in natural resources management, water harvesting and power generation through renewable sources of energy, organic farming, and distribution of food grains to the poor to ensure food security.

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