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## Bioenergy for sustainable development in india-environmental and social aspects

Seema Keshari

Department of Zoology, R.L.S.Y. College, Ranchi , Ranchi University, Ranchi

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**Abstract :** The agricultural sector in our country is dominated by subsistence farming with very low investment levels and yields. The development of modern bioenergy systems offers opportunities for investment and infrastructure improvements in agriculture with the promise to diversify agricultural production and thus to stimulate socio-economic development. In order to avoid potential negative environmental and socio-economic impacts, effective mechanisms to ensure sustainability need to be put in place. Several countries are currently engaged in the formulation of policies and development plans to guide the development and ensure the sustainability of the bioenergy sector.

**Keywords :** Sustainable Development, Bioenergy, Socio-Economic development, environment.

### INTRODUCTION

Traditional bio-energy in the form of fuel wood, charcoal and residues has been with humanity since the discovery of fire, but only in the past 100 years or so it has reappeared in a more advanced and modern version. The biomass gasifiers were used as fuel for vehicles for transport during war times in the 1920s and 1930s and peanut oil was first used as fuel in a car engine in 1893 by Rudolf Diesel. Even though bioenergy technological applications were being developed during those time cheap and ample reserves of fossil fuels in the form of oil and natural gas came into the picture and for over 80 years pushed biofuels to the back seat of energy development .

Bioenergy is a locally available energy source with the highest versatility among the renewable energies. It can be made available in solid , liquid or gaseous forms. No other energy source can open such new opportunities for agricultural and forest development, additional jobs and enhance rural infrastructure.

\*Corresponding author :

Phone: 9835379406

E-mail : seemakeshari@gmail.com

Now we are in a new era where fossil fuel are seeing their last decades of supremacy, where environmental and climate change issues are the high international agenda. There is also need of bioenergy for the people who are still energy poor and require more affordable , clean and sustainable energy.

Bioenergy can positively contribute to climate goals and rural livelihoods; however, if not implemented carefully, it could exacerbate degradation of land, water bodies, and ecosystems; reduce food security; and increase greenhouse gas (GHG) emissions. For large-scale commercial biofuels to contribute to sustainable development will require agriculturally sustainable methods and markets that provide enhanced livelihood opportunities and equitable terms of trade. The challenge lies in translating the opportunity into reality.

Sustainable development is defined as "**Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs**" (Kates, Parris & Leiserowitz, 2005). Sustainable development, as a concept, emerged in 1970s along with the development of industrialization. Especially in 1987, with the report entitled "Our Common

Future" (Brundtland Report) published by World Commission on Environment and Development, sustainable development concept which has the principle of development without disregarding environment has received a great deal of attention throughout the world. (Ercoskun, 2005).

#### **SUSTAINABLE DEVELOPMENT AND ENVIRONMENT**

Environment is not only a huge area in which we keep on living, but also a huge ecosystem in which millions of creatures live. Environment provides raw material for economy. This raw material gained through the production process turns out to be a consumption product. Then, these raw materials and the energy used in production return to the environment as pollution (Yucel 2004). Therefore, sustainability of environment is reasonably important in regards of economical development. In relation to environment, the first comprehensive arrangements concerning international cooperation have been considered in the early 1970s. In 1972 in Stockholm "United Nations Human Environment Declaration" (Stockholm Declaration), the first global evaluation of many countries whose socio-economic structures and development levels differ from one another, was accepted. Sustainable development concept was first defined in 1987 with the Brundtland Report, prepared by World Commission on Environment and Development and since then began to be widely used. (Agca, 2002). One of the important developments which supports the sustainable development vision has come into effect with the 1992 Rio Earth Summit. Rio Earth Summit, the largest meeting including 172 countries as well as Turkey, was an important meeting in which the said countries have approved of the economic and global issues to be achieved in accordance with the environmental values and sustainable development principles (Demirayak, 2002). At this summit conclusions regarding sustainable development were declared in a declaration called "Agenda 21". In spite of not being legally bounding, with this declaration the countries' political responsibilities about the environment are defined. In agenda 21, some basic principles about the sustainable development which focus on the environmental dimensions are:

- Humankind is on the center of the sustainable development. She/he has the right to have a healthy and efficient life in accordance with nature.

- On condition that they are not disturbing other countries' environment, all countries have the right to use their natural resources according to their own politics.
- A development right which meets the current and forthcoming generations' is necessary so that environment and development should be acknowledged.
- Environmental protection should be seen as a complementary part of development process.
- In terms of ecosystem protection and development, countries shall cooperate in global association spirit. In environmental protection countries have common but different levels of responsibility.
- National authorities, in terms of "the one who pollutes pays it" principle, should make the environmental costs international and the use of economic devices improved
- As to activities, which have effects beyond borders, the activist country should inform the related countries in time and provide them with necessary information.

Briefly, the living environment provided by sustainable development means using of water resources so carefully that current and forthcoming generations can benefit adequately, keeping the weather clean in order to breathe fresh air, making use of the benefaction of nature and living in good health today and in the future. (DPÖ, 2004).

Climate change is one of the most important global environmental challenges, with implications for food production, water supply, health, energy, etc.

The most effective way to address climate change is to adopt a sustainable development pathway by shifting to environmentally sustainable technologies and promotion of energy efficiency, renewable energy, forest conservation, reforestation, water conservation, etc. The issue of highest importance to developing countries is reducing the vulnerability of their natural and socio-economic systems to the projected climate change. India and other developing countries will face the challenge of promoting mitigation and adaptation strategies, bearing the cost of such an effort, and its implications for economic development.

## CONCLUSION

The environmental dimension of the sustainable development is necessary for the continuation of the living life on the earth. Therefore, all countries in the World should follow particular environmental policy. However, in this matter people should also be informed. Peoples' fulfilling of their responsibilities leads to a good deal of development by which the natural life is affected positively like decreasing of energy consumption and preventing environmental pollution. The thing which is necessary for peoples' awareness is to provide them as citizens who are environmentally aware, active and participant about environment beginning from primary school.

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