A CASE STUDY:

Climate change and perspectives for Indian agriculture

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SUMMARY

The Earth's resources are degrading at an alarming rate, up to 1000 times faster than their natural rate of extinction. Similar situation holds good to tropical and subtropical countries including India. Since the civilization, the Indian agricultural production and monsoon seasons are correlating with each other. The study reveals that in many regions of the country there has been an increase of 1^0C rise in temperature in last 100 years. However, the interesting feature is that the temperatures were below normal (average of 100 years) till the middle of this century. The projections for climate change, particularly temperature and precipitation have undergone considerable change in the last 10-15 years. The most recent projections indicate an increase of 0.1 to 0.3 ^{0}C by 2010 and 0.4 to 2.0 ^{0}C by 2070. The precipitation in monsoon regions is expected to remain the same until 2010 and may become 0 to 10% deviation by 2070 in monsoon season. The SWOT of the rainfed agro-ecosystem reveals that wide spectrum of agro-ecological and edapho-climatic conditions are supporting the biodiversity and wider scope for diversified farming activities for increased productivity are being the strengths of the ecosystem. Poor soils, erratic rainfall, subsistence farming, poverty, illiteracy, inadequate HRD and inadequate rural infrastructure facilities are the major weaknesses of the system. Unabated land degradation, depletion of soil organic matter, global warming, shrinking water bodies and ground water and increased fragmentation of land are the important threats noticed in the rainfed agro-ecosystem. Apart from these there are many opportunities in the rainfed ecosystem like changing socio-economic conditions in rural areas, availability of frontier technologies like Remote Sensing (RS), Geographical Information System (GIS), Global Positioning System (GPS) and ICT (Information and Communication Technologies) for the scientific management of natural resources.

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It takes a century for a forest to grow, and a night of fire to destroy it'. The saying simply reflects the story of our planet 'Earth'. Over the past few thousand years, humankind, in its quest for better living conditions, has continued to move the wheel of development with increasing earnestness. In the name of development we have made our planet vulnerable than ever before. Development has taken its toll on the natural systems, be it on land, water or air. Burning issues like climate change, ozone depletion, deforestation, water scarcity, man-made disasters, health epidemics, energy crisis, species extinction, loss of natural habitats and declining agricultural production have become hot topics of research. In other words, we are precariously perched on the edge of a massive impending disaster of an apocalyptic nature - a disaster, which if not prevente soon, will spell doom for all life on earth.

The per capita land availability in rainfed areas is expected to fall from 0.28 ha (1990) to 0.12 ha by year 2020 (CRIDA, Vision 2020). However, the demand for food would continue to rise necessitating higher productivity from rainfed regions from the existing 1.0 t to 2.0 t/ha. The variability in climate and the demand for more food have put more pressure on the existing land resources, even the marginal lands of fragile nature have been brought under plough, thus exposed to greater risks of land degradation. In this communication, an attempt has been made to take stock of the agriculture production in relation to climate, conduct SWOT analysis and bring out issues responsible for lower food grain production and strategies