

Food or Fuel: What Does India want to Secure?

Introduction

On September 25th 2015, countries adopted a set of seventeen goals to ensure prosperity for all as part of a new sustainable development, commonly known as SDG, over the next fifteen years. The second goal in the list is: Zero Hunger. This is not an easy target to achieve. A radical change of the agriculture system is needed to nourish today's 795 million hungry and the additional 2 billion people expected by 2050 [1]. India is no different. For India the challenge is its increasing population, limited land, degrading land and changing land use. Climate change is putting more pressure on the resources, impacts of climate change is visible; the majority of the agrarian community of the country, can no longer make ends meet on their land and are forced to migrate to cities in search of better opportunities. Renewable energy resources like solar and biomass have solution to many climate change issues; however they too call for critical and detailed analysis before policies are rolled out.

India's Bio fuel policy

Under the aegis of Ministry of New and Renewable Energy, Government of India, National Bio-fuel policy was formulated in year 2008. The idea was to create conducive environment to bring in more biofuels in the market to replace fossil fuel. The document had a roadmap to achieve 20% of transport fuel requirement from biomass by year 2017. Bio fuel policy, 2008, of India also says, "The Indian approach to biofuels, in particular, is somewhat different to the current international approaches which could lead to conflict with food security [2]. It is based solely on non-food feedstock's to be raised on degraded or wastelands that are not suited to agriculture, thus avoiding a possible conflict of fuel vs. food security". By and large, Biofuel policy is welcome change.

Ethanol as Biofuel

Bio fuel policy talked about producing ethanol from molasses, a by-product from sugar industry. India is the world second largest producer of sugarcane after Brazil (Figure 1).

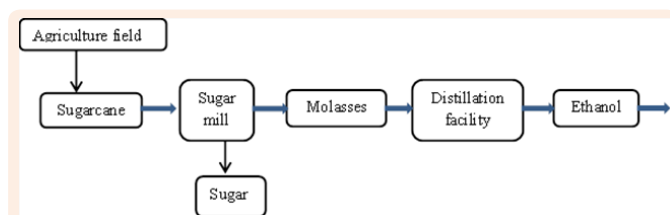


Figure 1: Process diagram for sugar to ethanol production.

Figure 1 shows the process flow diagram for Sugarcane to ethanol production route. As on date, 2229 Million litres of molasses were available in the Indian market [3]. This had a capacity to produce around 550 Million litres of ethanol which could meet around 8-10 % of transport fuel requirement. Ethanol has an established market in the country as shown in Fig.2. However the share of ethanol available in the market for fuel blending has increased to 23 % in recent years. This certainly is a

Conceptual

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positive development post bio fuel policy came into action (Figure 2).

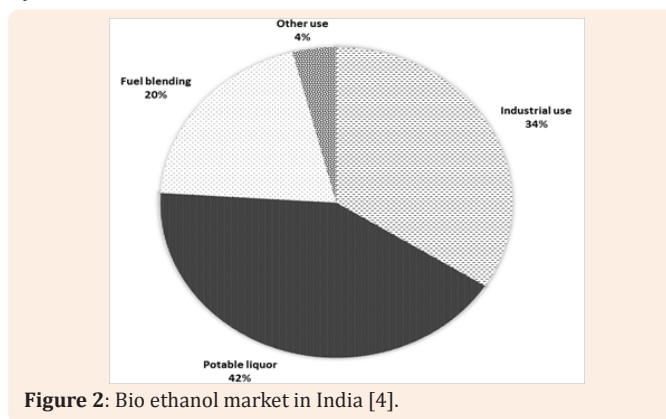


Figure 2: Bio ethanol market in India [4].

Concern in Biofuel policy

This policy talked about cultivation on a degraded land. The whole purpose to resolve the food vs fuel conflict is defeated, if not upfront certainly subtly, when India talks of growing non-food feedstock on a degraded land. The point is: if one can grow or cultivate a crop on a degraded land, it is still a production from the land, irrespective of whether the yield is food or for fuel. India is a struggling country. It is struggling to secure energy, struggling to secure food and struggling to reduce emission, struggling to maintain its economic growth rate etc. India's population is around 1.2 billion today which is growing at the rate of 1.19 % annually [5]. As on date, India holds 17 % of global human population and 21 % of global cattle population. However, India holds only about 2.5% of global land area [6]. Other realities are the following: In less than 15 years' time India will have to feed additional 210 million heads i.e. more than twice the German population today[7]. India cannot afford to cut a minuscule of forest to bring in more land for agriculture, study suggest that for India's environmental and ecological balance around 35 % of its land should be under forest/tree cover, however in reality it

is around 22-24% [8]. Therefore the challenge here is to ensure affordable food for all its citizens without disturbing the ecological balance.

Discussion

Globally the land use has reached a tipping point. Around three-quarters of the global land are under use for crops, livestock grazing and wood harvests. The remaining quarter gives services like clean water, biodiversity, stores carbon in trees etc. to support life on this planet [9]. Earth Overshoot Day (EOD) is the date on which humanity's resource consumption for the year exceeds Earth's capacity to regenerate those resources that year [10], (Table 1) chronicles the EOD for last ten years. What is alarming is that the Earth Overshoot Day is arriving earlier with each passing year. Last year, 2016, the world as a whole needed 1.6 earths to meet its requirement in a sustainable manner. It also means that we are over exploiting our planet. The problem will become more acute with rising population. Food security is a challenge, this is the reason "Zero Hunger" is one of the top goals of SDGs (Sustainable Development Goals), spearheaded by UN. Climate change has made the issue of food security more vulnerable. Climate change increases the frequency and intensity of some disasters such as droughts, floods and storms. This has an adverse impact on livelihoods and food security. Climate-related disasters have the potential to destroy crops. Hence there is a need to develop crop (seed) that are resistant to climate change. Biotechnology has to take the centre stage to develop climate resistant crop, reclaim degraded land for farming etc.

Conclusion

Sustainable development is the confluence of economic-development, environment and society. Therefore our action should bring in the positive change for the society and should ensure the protection of natural resources benefiting local and ultimately global ecosystem. Land is one of the most priceless commodities. Hence any action that can induce land use change has to be evaluated and scrutinized exhaustibly not just for short term benefit but also for long term impacts.

Table 1: Chronicles of the EOD.

Year	Earth Overshoot Day
2007	26-Oct
2008	23-Sep
2009	25-Sep
2010	21-Aug
2011	27-Aug
2012	22-Aug
2013	20-Aug
2014	19-Aug
2015	13-Aug
2016	8-Aug

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