

**EVALUATION OF BUSINESS OPPORTUNITIES FOR A BIO-DIESEL
MANUFACTURING FIRM IN PRESENT SCENARIO OF INDIA**Shiv Kumar Sharma
Amity University Rajasthan, Jaipur, India**ABSTRACT**

With Second largest population in the world, India is a very big market for all the business firms. Present Scenario in India has so many opportunities for budding entrepreneurs if they can unlock market potential in a proper way. In this research paper, various business opportunities available for a biodiesel manufacturing firm have been investigated based on market trend and mindset of young generation and college going students. It was found that, business in Indian environment is really tough due to poor legal environment and bureaucracy, still modern day entrepreneurs are thinking in entirely different directions and they are emerging as new market leaders. They have left their own footprints and they have broken traditional lines of business practices. Ecological concerns, price fluctuations of crude oil and depleting hydrocarbon resources have opened a door for biodiesel manufactures.

Keywords:

Biodiesel, Entrepreneurship, Business, Market, Opportunities.

INTRODUCTION

Vehicular pollution has reached at its peak. This demon is one of the root causes of several problems like scarcity of oxygen contents in atmospheric air, acid rain, global warming and many more. Biofuels can be a promising substitute for conventional hydrocarbon fuels. New entrepreneurs are entering in the field of biodiesel manufacturing. Basically, Entrepreneurs is a person who observes the market carefully and identifies opportunities in the form of solution for a problem in the society and the market. On the other hand, Intrapreneurs also observe opportunities and take initiative to utilize resources; however they work in big organizations and contribute to the modernization of the firm. Intrapreneurs may turn into entrepreneurs. Even the oil companies in India need Intrapreneurs because they can play a key role in blending of biodiesel with petrol and diesel. According to Biofuel policy of India a blending of 20 % was to be achieved till 2017 and it is still a daydream for government of India (*Sharma S.K. et al 2017*).

An entrepreneur can run bio-diesel manufacturing plant on a small scale basis at any convenient place in India. On the other hand, one should choose a site where the chief raw materials like *Jatropha* oils are effortlessly available in abundance. For last few decades researchers are in constant search for alternate fuels for internal combustion engines owing to the rate of diminution of petroleum fuels. Mainly, the term Biofuel was used to characterize fuels that can be obtained from flora and fauna. Being a renewable fuel, Biofuels are gaining firm roots across the globe now-a-days.

In Present Scenario, several types of engines are being developed to run on a wide range of fuels like Petrol, diesel, CNG, LPG, Biofuels and other fuels. In these different types of engines, experimentally diesel engines were found to be most suitable to run on Biofuels. Moreover, biofuels have lot of similarity in composition with diesel fuel as shown in the table -1

| Property | Bio-diesel | Petro-Diesel | Testing Method |
|--------------------------------------|------------|--------------|-------------------|
| Density (at 15 °C) Kg/m ³ | 967 | 820-845 | IS 1448 Part - 1 |
| Kinematic Viscosity Centi Stoke | 4.25 | 2.228 | IS 1448 Part - 1 |
| Flash Point (Abel) in °C | 147 | 52-96 | IS 1448 Part - 1 |
| Pour Point in °C | 5.2 | 3 | IS 1448 Part - 1 |
| Heating Value kJ/Kg | 36504 | 44800 | Bomb Calorimeter |
| Cetane Index | 48.2 | 46 | D 4737 / ISO 4264 |
| Content of Sulphur in PPM | 5.7 | 350 | ISO 8754/ P:83 |

PRODUCTION OF BIODIESEL

Biodiesel can be produced by different methods and from different sources. Here, production of biodiesel from waste cooking oil by the process of transesterification is discussed. The production process of biodiesel from waste cooking oil mainly consists of 3 steps:

(i) Filtration of WCO: As waste cooking oil is full of impurities, so filtration of oil is required in beginning for removal of foreign particles, food sediments, and unburnt carbon particles. Paper filter of pore size 11 μm was taken into use for this purpose. 20 litre of waste cooking oil was filtered slowly over a period of 3-4 days by taking small quantities of 2 litres each.

(ii) Alcoholysis: First of all free fatty acid(FFA) test was conducted to find out suitability of waste cooking oil for single stage transesterification process. It was tested in lab and was found less than 0.5%. If Free Fatty Acid is less than 2.5 % then the oil is most suitable for conversion into biodiesel in a process of single step, otherwise 3-step process must be followed. 1 litre of WCO was heated up to a temperature of 58 $^{\circ}\text{C}$ with the help of an electric heater in chemistry lab, moreover simultaneously it was stirred. On the same time one more beaker was taken 300 ml anhydrous methanol was mixed with 200 ml of sodium hydroxide, which resulted in the formation of sodium methoxide. Later on this mixture was also mixed in the hot oil and stirred continuously using magnetic stirrer and process was continued for more than 70 minutes. Thereafter, it was left for overnight cooling



Figure -1: Waste Cooking Oil

(iii) Separation of components: Once chemical reaction of transesterification is over, then various by products formed like soap, traces of water glycerol and surplus alcohol are to be removed to meet the standards of biodiesel. Glycerol is the major byproduct which is heavier and denser than methyl ester, hence it settles down in the bottom of the container and it was drawn outward. Warm water was used for water washing of the biodiesel, it was repeated until pH value was in the range $6.5 < \text{pH} < 7$. Magnitude of pH Value provides at least an approximate measure of the progress of the chemical reaction used in the manufacturing of biodiesel [Clark, W.M., et al.].

PRESENT SCENERIO

The biofuel industry in India is estimated to grow over ₹50,000 crore by 2022, based on the present consumption of petroleum products in the country. At present, the bio-diesel and ethanol trade in India has a worth ₹6,000 crore. Nevertheless, it is mainly driven by the procurement of ethanol So far sugar year (October 2015-September 2016) is concerned; public sector oil marketing companies could supply only 4% of ethanol blended petroleum after the procurement of more than 100 crore litres of biofuel. Procurement of Bio-diesel was started in the year of 2014 and later on in August 2015, a pilot programme was also started. Thereafter it was now expanded to 6 States of India. If 5% biodiesel blending is done, then by year 2022 requirement of biodiesel may cross 700 crore litres it means business size will be approximately of 28000 crore Indian rupees. So far ethanol is concerned, if it is blended by 10% in petrol then requirement will be around 500 crore litres and it will result a business size over 20000 crore Indian rupees. It can be estimated that if petrol diesel car do not become obsolete and demand keeps on rising as per previous trends, then by 2035 biofuels industry in India will cross 1 lakh crore business size. It is expected that Biodiesel industry should focus on manufacturing maximum amount of fuel. It can generate from waste cooking oil which is generated in quantities of several metric tonnes every

year. Government of India in December 2014 fixed the price for procurement of biofuels in the range of Rs.48 to Rs. 50, which was more than the cost of producing petrol, so there is need for biofuel industry to have market linked price.

Pollution in the cities like Delhi has reached at its peak, affecting health and quality of life of a normal citizen of such big cities. In the last winter, schools and offices were closed for couple of days in Delhi. It means, we have to work seriously on greener and cleaner fuels otherwise future generation will be breathing in gas chamber like atmosphere. High court has scolded government over this issue. To resolve such a serious issue, Biofuel industry has to grow and take full advantages of such a situation.

BIOFUEL RESOURCES IN INDIA

In India, consumption of energy is increasing at a rate more than 6% every year and petroleum reservoirs are decreasing day by day and a day will come when these reserves will be exhausted. We have a share of more than 3 % global consumption of petroleum products and crude oil production is approximately 1%. This gap can be bridged up by biofuel industry [2]. In India, A Small numbers of governemnet and private companies are working in the field of biofuel manufacturing and its distribution. Still, according to expansion potential of market, many more companies should enter in this field. It will be win-win situation for all the stake holders like government, oil companies and new entrant as well. Multiple feedstocks with different oil yield are available for manufacturing of biofuels ranging from microalgae to waste cooking oil. India is a developing nation, a large population of which is living under poverty line. Therefore use of edible sources and edible oils is not advisable for manufacturing of biofuels. Various feed stocks available for biofuel production are sunflower, cottonseed, mahua oil, rapeseed, mustard oil, palm seed, neem oil, animal fats, waste cooking oil etc.,. Generally, Palm oil and animal fats can have a high content of free fatty acids, which may result in soap formation affecting processing and yield of production adversely [1]. The thorough farming biofuel potential of India is expected and shown in table-1

| S.N. | Source | Oil yield (Kilo litre/ha) | S.N. | Source | Oil yield (Kilo litre/ha) |
|------|------------|---------------------------|------|-----------|---------------------------|
| 1 | Microalgae | 47 - 145 | 5 | Rapeseed | 1.25 |
| 2 | Palm Oil | 6.0 | 6 | Sunflower | 1.0 |
| 3 | Jatropha | 2.0 | 7 | Soybean | 0.5 |
| 4 | Canola | 1.3 | 8 | Corn | 0.2 |

CONCLUSION

Biodiesel production industry is expanding and it is the need of hour. We have witnessed smog in Delhi few months back. To get rid of such situation, Government of India is also focusing a lot on alternate fuels or green fuels like biofuels. Presently, cost of petroleum products is increasing rapidly. So, it has opened opportunity for biodiesel manufacturers because most of the manufactures are selling it at a rate of INR 50-55 /litre. Biodiesel can also be manufacture from waste cooking oils and waste engine oils. Moreover, byproduct of biodiesel is glycerin which can be sold in soap, chemical, film and cosmetic industries. Even this glycerol can be used for producing biofuels. That will further reduce cost of biodiesel. This is the right time to enter for an entrepreneur to enter in this field so that full advantage of this growing field can be exploited.

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