

## A Study on the Collection, Processing, And Promotion of Bio-Seeds through SHGs for Manufacturing of Bio-Diesel in NIE CREST- Mysore, Karnataka

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### ABSTRACT

Due to the high growth in demand for the use of fossil fuel in today's world has left us with no choice but to look into alternative sources for coping with the demand and one such alternative is the Bio-Diesel, the use of Bio-Diesel not only helps in filling the gap to cope the growing demand but also it has a positive impact on the environment, the pollution can be reduced significantly. An attempt has been made by the NIE institution which is located in Mysore urban to educate the masses regarding the use of the Bio-Diesel. In this paper the researcher makes an attempt to understand the impact of training and awareness given to the particular group of women in the society called the SHG's. The SHG's (Self Help Group) was established with the intention to empower women in all directions namely social, economic, political, cultural and religion, by training the SHG's regarding the Bio-Diesel can make them economically empowered, has they can process the Bio-Diesel them self and sell them and make money. For the study purpose the researcher selects 2 SHG's out of 18 SHG's from 2 villages. The total number of respondent comes up to 16 collected within 2 SHG's, Researcher uses the questionnaire method to collect the data. Area of the study is conducted in Mysore district, K.R. Nagara Taluk in 2 villages namely Lallnahalli Shanboganahalli. After the analysis and finding, it has been noted that there is a significant contribution of NIE institution in training the SHG's members and the members are able to process Bio-Diesel by them self and with the help of the marketing hand SHG's members are empowered economically. As the training program is a success the researcher would recommend the

training program to be expanded world wide through various institutions to the masses to bring awareness and the significance of the use of Bio- Fuel and Bio-Diesel to make this Mother earth a better place to live in.

**Keywords:** Bio-Diesel, Self-help Groups, National Institute of Engineering, Transesterification.

### History of Bio-Diesel

The history of biodiesel actually started on the 10th of August 1893 in Germany. That was the day that Rudolph Diesel - the father of the Diesel engine - ran a Single Cylinder with a Flywheel at the bottom for the first time on its own Power. In the year 1902 Rudolph Diesel makes the Following Statement: "the use of Vegetable oil for engine fuels may seem insignificant today but such oils may become, in the course of time, as important as petroleum and coal tar products of present time. In the 1920's Diesel engine manufacturers alter their engines in such a way as to only use Petroleum diesel and not Vegetable oil. This is due to the lower viscosity of Petroleum diesel when compared to Straight Vegetable oil. During the 1920's and 30's there was a growing interest in the use of vegetable oils as fuel, even though Petroleum diesel was accepted and uses everywhere. Solutions were found to some of the problems associated with the use of Straight vegetable oil, like the choking of injectors and valves due to its higher viscosity. 1937 was a landmark year in the history of Biodiesel. In

this year a Patent was granted to G. Chavanne from the University of Brussels for the: "Procedure for the transformation of vegetable oils for their uses as fuels" "The patent describes the process of alcoholysis (also called transesterification) of vegetable oils using ethanol in order to separate the fatty acids from the glycerol by replacing the glycerol with short linear alcohols. In 1977 a Brazilian Scientist named Expedite Parented produced biodiesel using transesterification with ethanol and filed a patent for the process. This process is classified as biodiesel by international norms and set the standard for identity and quality. Between 1979 and 1983 South African Agricultural Engineers did research into the use of transesterified sunflower oil and refining it to diesel fuel standards. In 1983 the process for producing fuel quality, engine-tested biodiesel was completed and published internationally. 1987 and Austrian Company, after obtaining the technology from the South African Agricultural Engineers, erected the first biodiesel Pilot Plant. In 1989 this same company opened up the first Industrial scale Biodiesel plant capable of Processing 30,000 Tons of rapeseed per year. During the 1990's many biodiesel plants were opened throughout Europe and other parts of the world.

In Present Day Europe and America there are numerous fuel stations selling biodiesel blends and 100% biodiesel made by big corporates and also many individuals all over the world that are making this biodiesel at their own homes to use as fuel in their vehicles and generators.

## INTRODUCTION

At Present, the biodiesel is being used very largely across the globe due to two main reasons, one is to potentially reduce the dependence on imported petroleum products and second one is to mitigate the possible negative impacts of global climate change by lowering net CO<sub>2</sub> emissions from the transesterification sector. As we aware that Carbon dioxide is a colorless, odorless gas found in our

atmosphere. Its chemical formula is CO<sub>2</sub>, which means it is one carbon atom bonded to two oxygen atoms. It is a waste product in our bodies, and is also produced by burning fossil fuels; hence this has to be control in the environment by utilizing the alternative petroleum products like Biodiesel. Biodiesel production is the process of producing the bio fuel, biodiesel, through the chemical reactions trans esterification and esterification. This involves vegetable or animal fats and oils being reacted with short-chain alcohols (typically methanol or ethanol). The alcohols used should be of low molecular weight, ethanol being one of the most used for its low cost. However, greater conversions into biodiesel can be reached using methanol. Although the transesterification reaction can be catalyzed by either acids or bases the most common means of production is base-catalyzed transesterification. This path has lower reaction times and catalyst cost than those posed by acid catalysis. However, alkaline catalysis has the disadvantage of its high sensitivity to both water and free fatty acids present in the oils.

### Self Help Group (SHG):

SHGs are unique and pioneering organizational setup in India for the overall welfare and upliftment of women. All women in India are given chance to join any one of the SHGs for training and development, so as to be prospective entrepreneur and skilled worker. The SHGs are promoted by the Government as if women in India may not be resourceful enough to be entrepreneurs. When the SHGs arrange training facilities to carry out certain kind of work which are suitable for women in India, bank must arrange financial assistance to carry out manufacturing and trading activities, arranging marketing facilities while the Governments will procure the product of SHGs, arrange for enhancing the capacity of women in terms of leadership quality and arranging for the management of SHGs by themselves so as to have administrative capacity. As a social movement with government support, SHGs

become more or less a part and parcel of the society.

Entrepreneurship development among the women can be considered as a possible approach to economic empowerment of women. The participation of women income generating activities for the family has been increasing over time. Female work participation not only improves the family income but also bring economic independence among women in the households. There is greater opportunity to rural women to establish and run micro enterprises. Government is facilitated money (making biodiesel machines) to self-help group to make micro enterprise. NGOs are Self Help Promotion Institutions (SHPI) with a special task of promoting, nurturing, strengthening and monitoring the SHGs.

#### **Objectives of SHGs**

- Basically the SHGs are economic organization. Small funds are raised for day today needs. The saving groups when transformed to earning groups not only increase the productivity of women but the credibility also.
- Doors are wide open to women to understand and gain knowledge about Banking, Gram Panchayats, Zilla Parishad, Law and Judiciary etc.
- As economical solutions are available, the family structure is maintained.
- SHG is a good way to stop the exploitation of consumers.
- Broadening of view is a major gain. The ascending order of family, group, village, Tehsil, Zilla, Zone, State, Nation, World, makes the vision global.
- Development of self-confidence is achieved.
- A common platform is available for a dialogue and sharing of views.

**About NIE – CREST** (National Institute of Engineering - Centre for Renewable Energy & Sustainable Technologies)

The National Institute of Engineering (regd.) at Mysore owes its existence to the untiring efforts and extraordinary vision of its founders Sri S Ramaswamy, Sri D V Narasimha Rao and Sri T Rama Rao. With the humble beginning in 1946 the institute has now grown into an institute of technological excellence. Today, NIE is running NIE Engineering College, NIE IT College, and NIE–College of Science, NIE– Industrial Training Institute, NIE Pre-University College& various Centers of excellence.

NIE-CREST is one of the centres of excellence at NIE, Mysore. The centre is involved in the area of Renewable Energy and Sustainable Technologies. NIE-CREST has made many technological interventions to provide Renewable and Sustainable Technologies to meet most of the energy needs locally and sustainably. The centre has been providing consultancy services, implementation, conducting training programmes/ workshops/ awareness programmes, R&D and dissemination of Renewable Energy based efficient Devices/Systems to the people in and around the region.

#### **Objectives of NIE**

- To function as a center of Excellence in developing qualified personals in the field of Renewable Energy.
- To promote widespread use of Renewable Energy Devices and Systems.
- Promote widespread use of Renewable Energy Systems for Decentralized and Grid connected Energy and Power generation.
- Design and development of Renewable Energy Systems with a view to bring out marketable products in shortest possible time which meet users requirements in terms of quality, price, operation ease, maintainability, etc.
- Provide comprehensive and cost effective Renewable Energy

solutions through Project and Consultancy Services.

- Work for the cause of Society and for Green & Sustainable Technologies

### Services Offered

- The Centre undertakes projects, consultancy and field level support pertaining to establishing of Systems related to the above systems.
- Conducts awareness programs, training programs, workshops in the field of Renewable and Sustainable Technologies.

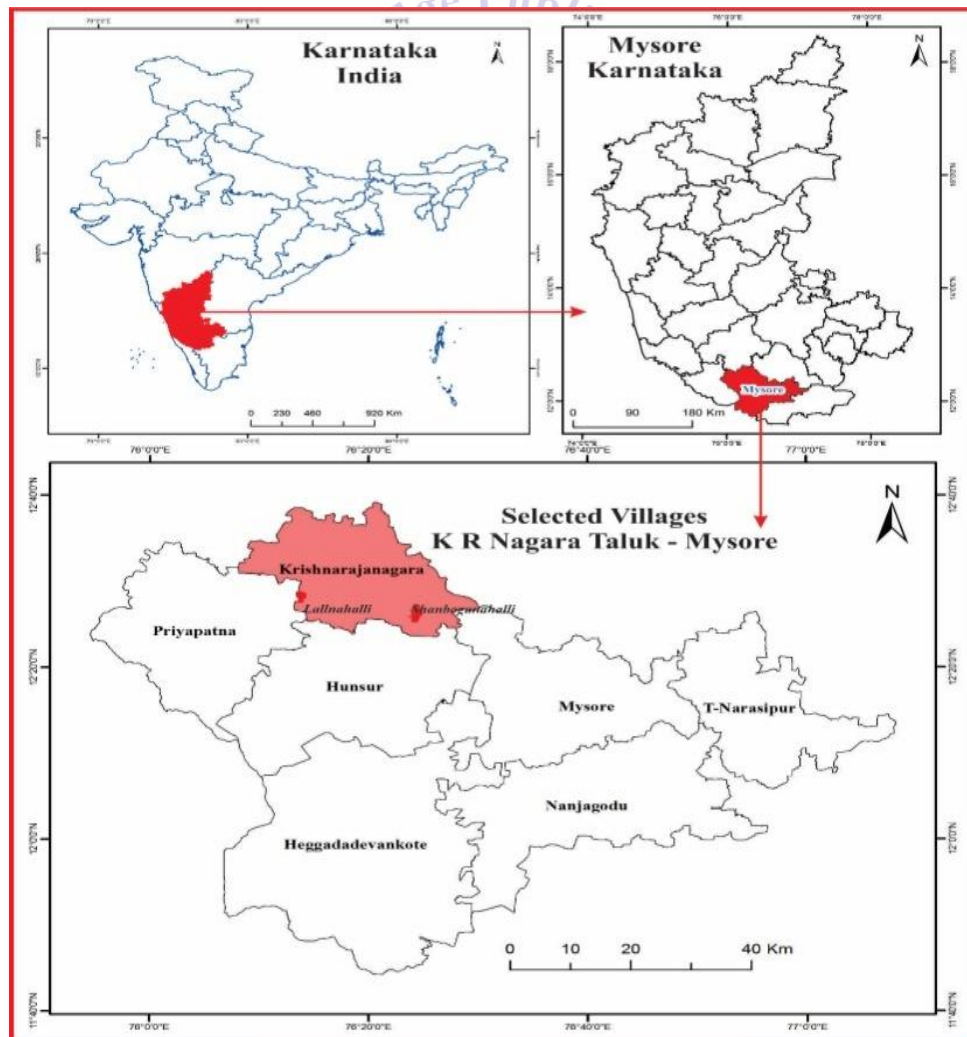
Apart from this, The NIE CREST is also focusing on the SHG groups for the development of rural people. Self Help Groups members will participate in the activities of the groups and finally they will take a decision on seeds procurement,

processing, installation of oil expellers and extraction of oil activities.

### Significance of the study

Due to increased energy demand, India must import energy to meet current demand. There is potential for bio fuels to leverage indigenous sources of inputs, potentially increasing income and opportunities in rural areas. Yet the development of a bio fuel sector could increase staple food prices and increase food insecurity for poor consumers.

Currently, bio fuel production is minimal, accounting for only one percent of global production. Supporting a future bio energy sector will likely require policy support (such as stimulus packages), community and local interest, technological breakthroughs, and cost-effective feedstock production.





The selected villages are located in K. R. Nagara Taluk of Mysore district, that shown on the map above.

**Objectives of the study**

- To know the effectiveness of training given to the SHG’S members by NIE-CREST
- To understand the strategies of collection of the Bio-seeds.
- To understand the biodiesel manufacturing training effectiveness to the SHG’s members.
- To know the manufacturing process of biodiesel done by SHG’s.

**Research methodology**

For this study the methodology used was primary and secondary sources of data,

primary data was collect by questionnaires survey, the questionnaire survey was conducted to the 2 SHG’s group members consisting of 8 members respectively and the 2 groups were selected from 2 different villages (Lallnahalli and Shanboganahalli-K.R. Nagar Taluk) to get a broader view in the existing scenario of the overall knowledge to the SHG’s members. Also to get the overall picture of the scenario FGD and questionnaire survey (Closed & opened) was also conducted to the NIE trainers to know their perception on the training. The secondary data was collected from the concerned departments like the NIE-CREST and some Bio-Fuel processing Firms.

**Process of Bio-Diesel:**



- Collection of seeds
- Removing of outer shells of the biodiesel seeds through dehusking.
- Extraction of bio diesel through expeller biodiesel and wastage has separated at this.
- Filtration of biodiesel and measuring the patty acid content.
- Based on fatty acid content in the bio diesel processing is done to remove the pre fatty acid.
- Glycerin or glycerol is removed through a process by which the crude bio diesel is heated at 60% temperature and 30 gram methanol, 7 and half gram sodium hydro acid added for one liter of biodiesel ethanol and glycerin diesel.
- Separated and collected in different contentedness.
- The extracted diesel is collected in a vessel and heated 110% and pure biodiesel is produced.

**Details of Bio-Seeds and its uses**

Bio fuel plant species in Karnataka	Pongamia	Simarouba	Neem	Mahua	Jatropha
Uses	Bio fuel, manufacture of soap, Lather training, oil cake manure, medicine, Bio pesticide.	Bio fuel, medicine, Edible oil, Bio- Pesticide oil cake manure.	Bio fuel, medicine, Bio- pesticide, oil cake manure, agricultural equipment.	Bio fuel, medicine, oil cake manure, agricultural equipment.	Bio fuel, medicine, Bio- pesticide,
Starts yielding	5-6 years	5-6 years	5-6 years	10 years	3 years
Yields of seeds	15-40	10-25	10-25	10-40	1-2
Oil content	30-35	40-50	28-35	30-35	30-35
Cost ( seeds /kg)	Rs10-15	Rs08-12	Rs03-08	Rs06-10	Rs05-06

**Necessary machines and its gauge for making Biodiesel**

S.I	Machineries	Detail
1	Decorticator( removal of seeds waste)	Per hour 30 to 40 kg capacity
2	Oil exalter ( machine of grinding the seeds)	Per hour 25 to 30 kg capacity
3	Bio-Diesel unit	Per day 40 litter Biodiesel production machinery
4	Laboratory	Bio diesel quality testing lab
5	Quality text	BIS ( ISI5607:2005)

## Analysis and interpretation

### Questionnaires

#### 1) Total number in your group?

##### SHG-1

S.I	SHG total member	Respondents
SHG 1	5-8	8
	8-14	
	14-20	
<b>Total</b>		<b>8</b>

##### SHG-2

S.I	Total member	Respondents
SHG 2	5-8	8
	8-14	
	14-20	
<b>Total</b>		<b>8</b>

From the above table it can be noted that in 2 SHG's group the total members come up to 16 members and therefore the following questions were asked to these 16 members regarding the training given to the SHG's members by the NIE trainers regarding the importance and processing of BIO-Diesel.

#### 2) Do you get any training? Where?

S.I	Got any training	Total respondents
1	Yes	12
2	No	4
	<b>Total</b>	<b>16</b>

From the above table it can be noted that 12 respondent said that they got training in NIE CREST, 4 respondents said that they didn't get any training. The reason for the 4 members not getting training is, due to not attending the training program on the day the program was conducted, trainees not been aware about the training program or even they are new to the NIE campus on the day the interview was conducted.

#### 3) About what you got training?

S.I	About training	Number of respondents
1	Agriculture	0
2	Biodiesel	12
3	Sell the biodiesel	
4	No any training	4
	<b>Total</b>	<b>16</b>

From the above table it can be noted that Out of 16 members 12 members got training in NIE CREST about the biodiesel and the remaining 4 did not get any kind of training. But some women are interested in selling the biodiesel, collection and make biodiesel, the main reason for people for not making biodiesel is because after the

training the NIE people are not following up the SHG women.

#### 4) Duration of the training?

S.I	Training duration	Number of respondents
1	1Day	12
2	6Days	0
3	10Days	0
4	ignorant	4
	<b>Total</b>	<b>16</b>

From the above table it is noted that 12 respondents are attending the 1days training, other 4 respondent are not participating in any training.

The Duration of the training is one day because the NIE was focusing more on the rural backward people to improve the standard of life. More than one daytraining the people are not interested to participate in the training. So the people are not attending more than one day because the most of the village area people a depending on agriculture.

#### 5) Does the training help you?

S.I	Really helps to SHG	Number of respondents
1	Yes	12
2	No	4
	<b>Total</b>	<b>16</b>

From the above table it is noted that 12 respondent said that training really help and other respondent said not helpful. After training they spend the message about the biodiesel.

#### 6) What is the area of your interest?

S.I	Interest area	Number of respondents
1	Beady making	4
2	Agarbhathi making	8
3	Bio-Diesel making	
4	Agriculture	4
	<b>Total</b>	<b>16</b>

Among the 16 respondents, 4 members are interest in beedi making, 8 members are interest in agarbhathi making and reaming 4 member's interest in agriculture. After the biodiesel training the people are not satisfied so the people are take training in other company and get training, so most of the women are making agarbhathi.

#### 7) What is the reason for attending bio fuel training?

### Easy to make money

The women are thinking that biodiesel training is an easy way to make money so they join the training. The reason for this is that people are more depending on the agriculture; they can grow the biodiesel seeds in their field.

### 8) Did you really know the significance/uses of bio fuel seeds via, honge, jatropha, neem etc?

S.I	Significance and uses of bio fuels	Number of respondents
1	know	7
2	Don't No	9
	<b>Total</b>	<b>16</b>

From the above table it is noted that, Out of 16 respondents 7 respondents knows the significance and uses of bio fuel seeds, and other 9 members didn't know about the bio fuel seeds uses and significance. Some women know about the bio fuel like it benefited and economic benefits. It can be easily made out of vegetable oil and animal fats.

### 9) Are you interested to take up plantation of biodiesel raw-products in your land?

S.I	Interested to take the biodiesel plantation	Number of respondents
1	Yes	4
2	No	12
	<b>Total</b>	<b>16</b>

From the above table it is noted that 12 respondents are not interested to take up the biodiesel plantation. Some women are interested to take up the biodiesel plantation some are not because the people depend on agriculture; some women are attracted the biodiesel plantation but these women are not doing the biodiesel plantation.

### 10) Are you interested to set up the bio diesel industry?

S.I	Set up a bio industry	Number of respondents
1	Yes	0
2	No	16
	<b>Total</b>	<b>16</b>

From the above it is noted that out of 16 respondents no one interested to set up the industry. The women are not interested to do the biodiesel industry because the people don't have enough money. The

government is giving the biodiesel mission but the people are not aware about that.

### 11) Are you interested in training the people/ creating awareness on bio fuel among the people in your village/locality? If yes, what is the help that you need/ expect from Centre, Mysore?

S.I	Interested to creating awareness on bio fuels	Number of respondents
1	Yes	09
2	No	7
	<b>Total</b>	<b>16</b>

From the above table it is noted that among the 16 respondents 7 respondents are not interested to conduct the training/ creating awareness about the bio fuels. The remaining SHG women are interested to creating awareness about the bio fuel. The remaining SHG's women don't have time to crating awareness among the people because they are engaged in the domestic activities.

### 12) Are you interested in marketing the bio fuel products and by products viz, Biodiesel, oil, seed cake, Glycerol etc?

S.I	Interested to marketing the bio fuels products	Number of respondents
1	Yes	13
2	No	3
	<b>Total</b>	<b>16</b>

Among the 16 respondents, 13 members are interested in marketing the bio fuel product; other 3 respondents are not interested to marketing the bio fuels. The reason for most women to be interested in marketing the biodiesels product is because the NIE is providing salary for the marketing activity. It's easy to grow, and per 1 kg honge seeds 18 rupees, jatropha 10 rupees, simarouba 22 rupees.

### Findings

1. From the 2 groups the total members comes up to 16 members
2. Only 12 members got training out of 16 members
3. The NIE-CREST only concentrated to give training on Bio-Diesel only
4. The training was conducted only for a day cause of logistic problems

5. The main mottoes of the SHG's members were to make money.
6. No SHG's members were ready to set up the Bio-diesel plant due to financial problems. But were interested in sales and marketing.

#### Suggestions:

- 1 NIE-CREST should take up other regions apart from K. R. Nagar
- 2 Government should take up initiatives to take up such programmes all over Karnataka, and build awareness.
- 3 To provide financial assistance to build plants and produce seeds by government, NIE-CREST.
- 4 To encourage the framers to cultivate the Bio-seeds. The forest and agriculture waste land can be converted to Bio-seeds areas.
- 5 the existing Karnataka state bio-seeds development corporations has to a vital role in production of by-products.

#### CONCLUSION

After making a good study about the mentioned topic it has come to the notice of the researcher that the production of Bio-diesel has a positive impact on the trainers, beneficiaries, government, environment and overall development of the country. This is the need for the study of the hour has it plays a vital role in alternative use a Fossil fuel.

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