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Jatropha
The Green Gold

We are aware of the importance of Black Gold that we dig out from the earth as we often get shocks of inflation in prices of fuels like petrol-diesel obtained from this crude oil. But, we also know that invention is the mother of necessity and the energy technology is currently moving from 'Below the earth' to `Above the earth'. Researchers have explored the possibility of obtaining bio-diesel from plants like Jatropha and its cultivation is in progress all over on gigantic scale. This versatile plant can be called as Green Gold as it will not only provide bio-fuel in abundance but also will help us to protect our environment in future besides its medical and other applications.

Jatropha is a combination of two Greek words, namely Jatros meaning 'Doctor' and Trophe meaning 'nutritious', indicating the medical usefulness of the plant. Additionally, bio-diesel is going to be now, new produce along with glycerol which is used for making soaps and seed-cake which can be used as natural manure.

This plant that was brought in India initially by Portuguese from North America has been known by different names:
In Marathi, it is known as Erand, Vanerand, Moglierand, Ranerand, Chandrajyoti, Chandri etc ('grown like erand' is a phrase in Marathi indicating unworthy growth and jyoti means light, so these different names speak for the properties of the plant.). Varli community staying in the remote forests of Maharashtra calls this plant as

'Diweli' which is significant as they pierce its seeds to a stick which continuously burn to give light.' Jepal' and 'Kaderandi' are other names in some area of this state.
In Gujarati, it is known as Ratanjyot, Jamalgota, Parsierand, Kalaerand.
In Telgu, it called as Nepalamu, Paddanepalamu, Adaveeyamidamu.
In Tamil, it is Kadalamanukku, Ratamannukku.
In Kannad, it is addressed as Adalubaralu, Bettadaharalu, Marahalu, Karnochchi.
In Oriya, Jahanzigaba, Kattavannakka, Kadhalvannakka.
In Assamee, Bongalibhotora.
In Punjabi, like Gujarati, is named as Jamalgota and Kalaerand.
In English, it is Physicnut (Jatropha curcas is the botanical name)

Today, the world is facing shortage of petroleum crude and tentacles of pollution are covering the planet when this plant is rendering a helping hand to the mankind. An international conference was held in Managva (in Nikaragva) in Feb. 1997 on the subject 'Jatropha-97' to discuss and explore possibility of usage of bio-diesel that can be produced from its seeds. We get about 25 to 30 % non-edible oil from Jatropha seeds which in certain areas used as lamp oil and fuel for pumps. In African countries, it is used in stove in place of Kerosene as well as kitchen fuel. Besides, many more chemicals are produced that can be used to make useful items like candles, fertilizers, dyes, medicines, insecticides, manures, etc.

Jatropha is a shrub type plant which has brown bark that gives white latex on cutting. Its average height is between 3 to 5 metres, exceptionally, some plants grow up to 8 to 10 metres. It grows leaves like five figured shape of a hand and flowers of 6 to 23 millimeters length. As the plant grows, number and size of flowers increase. In winter, it drops its leaves and flowers turn into fruits which are green initially and slowly turn yellow as they mature. A flower turns into fruit in 2 to 4 months time. In a land with abundant water, the plants flowers 3 to 4 times in a year and produce fruits which arrive in a bunch of 10 to 12 at a place. Moreover, these plants grow in arid as well as stony lands. When its leaves drop on ground, earthworms grow on them, consequently improving the quality of soil.

Though hot climate in India is most suitable for growth of this plant, it can also grow in forests of cold region of the north India.

Black coloured seeds of Jatropha contain 25 to 30 % oil and seed-coat contains even more oil to the extent of 50 to 60 %.Due to a poisonous constituent in it, the oil is non-edible. However, a chemical by name Jatrophine obtained from the latex of this plant is used in treatment of cancers. This latex is also used for massage as it heals joint pains. The tiny plant stems are used for brushing teeth in villages. Not only its leaves are used for treatment of piles but its roots are used for treating snake bites, as well. The bark produces blue dye which is used for dying clothes as well as fishing nets. After squeezing oil from its seeds, a cake remains which is highly rich with nitrate, phosphorus and potassium and hence, acts as a good manure. High quality silk threads are obtained from silk-worms that live on leaves of this plant and honey-bees prefer this plant for making combs containing one of the best honey. An insecticide is sprayed out by this plant making itself and surrounding area pest-proof.

The plant starts producing seeds after two years of plantation, and keeps giving crop for 10 to 12 years. In agricultural land, it produces 100 kg seeds per acre which increases up to 5000 kg after 10 years, whereas in arid land we get 100kg seeds after 2 years and 3000 kg at the end of the decade.
Generally, seedlings are planted at a distance of 2 feet so that 2500 plants are accommodated in a hectare area.

Many rich people buy lands these days in rural areas as investment which lies barren. Plantation of Jatropha will not only give them monetary returns but also that will be an act of fulfilling social obligation as these plantation help to protect our nature from deterioration. We can conserve petroleum crude as Jatropha seeds start supplying bio-diesel which again lessens pollution owing to its inheritant properties. Besides, these plants absorb CO2 from air and carbon credits will be an additional benefit and also creation of opportunities of employment in rural areas.

By a chemical process of esterification, oil from Jatropha seeds is converted into FAME (fatty acid methyl ether) which is bio-diesel and it is easily miscible in petroleum diesel. Bio-diesel possesses good lubricity that protects engine from wear and tear. As it contains 10% oxygen, its burning causes lesser pollution.

As a part of Jatropha cultivation, 200 districts have been located in 19 states of our country. Fertility of soil, water supply, unemployment is some of criteria for this selection. State governments are offering subsidies for encouraging farmers for taking up cultivation of this versatile crop which can definitely help in reduction of frustration among farmers, in view of certain tragic ends in this community by suicides. In future, there could be factories on co-operative basis for production of bio-diesel. One such factory can be associated with cultivation of Jatropha in 5000 hectares where one crore plants can be grown at the rate of 2500 trees per hectare. This crop will produce about 7200 ton oil per year, ultimately giving yield of 7500 kilolitre of bio-diesel at the rate of 1050 liter per ton of seeds. Such activity will engage 2500 workers in various capacities.

Initially, production of bio-diesel will be costly, but if we take into consideration the rise in petroleum oil prices, bio-diesel will play vital and profitable role when crude prices reach to $65 to 70 per barrel.
All over the world, south India possesses 50% of suitable land for Jatropha cultivation, besides availability of ample manpower over there. Countries in Europe and North America will look bio-diesel from India who will be able to fulfill 50% of world demand.

The changing time will reveal the growing importance of this green gold, won't it?

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