JOJOBA Plantation: A Boon for Tribal Population of Jharkhand

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Abstract

Plants play an important role in socioeconomic development of any geographical region. Selection of crop for mass scale cultivation is an important aspect and it requires many considerations like, climatic condition of area, soil profile of area, selection of species economic feasibility etc. Jojoba is an important underexploited species which has shown promising result in preliminary studies. Its mass scale propagation may prove to be beneficial for Jharkhand.

Key words – Jojoba, mass scale propagation, socioeconomic development

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Introduction

Socio economic development of tribal population is still dependent upon ecosystem functions and biodiversity. This fact has become more significant in recent past because large industrial project have created some serious problems like displacement, widened gap between poor and rich, change in land use pattern and fast erosion of biodiversity. Without denying importance of industrialization, it is now stressed that a model of development specially tailored for this state is urgently needed and that model must be agrocentric and targeting rural population. Another equally important fact is that Jharkhand state has approximately 73.43 lakh ha area out of which 68.48 lakh area is wasteland/ upland upland which not much suitable for conventional agriculture [1]. Gumla, Singhbhoom west, Hazaribag, Giridih etc. are some districts which have very high proportion of non agricultural l fallow land. It is proposed to utilize such lands for socioeconomic upliftment of rural people of Jharkhand and for that one underutilized plant Jojoba

(*Simmondsia chinensis*) can be a promising tool.

Jojoba – The promising plant

Jojoba (pronounces as ho ho ba) is a native plant of South Africa and its botanical name is *Simmondsia chinensis.* The plant grows naturally in Arizona, California and Mexico. Although, aboriginal people of these regions used to cultivate this plant and utilise its various products, it is still not very popular in modern botanical world. The plant is a shrub or medium sized tree and its height ranges from 2.5 to 3.0 meters. Profusely branched stem has large number of leaves. Leaves are oval to lanceolate in shape and deep green in colour. The root system is well developed and grows downward up to a depth of 15 meters. The fruit is green in colour, capsule and bears three brown coloured seeds.[2]

Jojoba products

Jojoba seeds contain 45 to 65 % essential oil and oil content is more than most oil seeds. Chemically the oil is an ester and the molecule is a straight chain. Because of its chemical nature, the oil is not oxidised easily and acts as anti oxidants. Jojoba oil is very much similar to Spermaceti which is obtained from s rare animal – sperm whale. The oil has wide use as – lubricant, in cosmetic industry, medical field and in automobile. The oil is also used as insulator in electric appliances, heating oil and as fire retarder.

Nutrients in Jojoba oil

Jojoba oil contains up to 65% un saturated oil. The oil is a good source of Vitamin E and can be taken as anti oxidant and as anti aging agent. It is also applied on skin as it calm irritation and retard accumulation of melanin. Hence, Jojoba oil is a good skin care product, Jojoba oil also contains Vitamin B hence it protect moisture and prevent dryness of skin. Jojoba oil also contains ferulic acid which protects skin from ultra violet rays. As the self life of this oil is very high so it can be stored for a long period. Presence of Tocopherol makes it durable.

In addition to Vitamins, Jojoba oil also contains some minerals which make the oil further valuable. It contains silica which keeps hair follicles smooth and strong. It also contains iodine which helps in combating with bacterial and fungal diseases. Oil also contains Zinc and Copper.

Cultivation of Jojoba

Jojoba is a very hardy plant and can tolerate harsh climatic condition. It can withstand high temp up to 50 degree Celsius. Water requirement is also less and the plant can grow in area with 400mm annual rain fall. However for commercial production, area receiving 600 mm rain fall is suitable. Jharkhand receiving 1400 mm. Annual rain fall provides good climatic condition. Water logging however, is highly unfavourable for this plant. Most part of Jharkhand is plateau hence chances of water logging in those areas is remote. The plant favours sandy and rocky soil. This condition is also found in Jharkhand. Te plant grows well in Ph range 5 to 8. It is clear therefore that our state is suitable for cultivation of Jojoba. Gujrat and Rajsthan is already cultivation this plant in large scale.[3]

Germination of seed is a bottle neck which can be removed by raisin germling in nursery and then transferring it in field. The nursery can be grown in the months of March and October. Using fresh seed is advised because its germination is over 90%. With time, percentage of germination decreases. 100 to 120 days old germlings are transferred in field. Polythene bags of 30x10 cm and having 300 gauge thicknesses is used in nursery. Polythene bags are punctured at the bottom to avoid retention of water. Sandy soil and manure in 3:1 ratio is filled in bags. 4% endosulfan should also be mixed because most areas of Jharkhand are prone to termites. Germination starts in 10 days and completes in nearly 25 days. Very low temperature however is not favourable for germination.[4]

Economics of Jojoba Plantation

Jojoba plantation starts providing yield from third year. Plantation can survive for 100 years. Hence after one time investment, annual maintenance cost is negligible. Production cost of Jojoba in India is approximately Rs 40. Kg whereas its production cost in US is $2.5(Rs.175) and in Israel $ 1.3(Rs. 90). In this way chance of success in Jojoba Plantation is very high for us. Detail economics of Jojoba plantation is presented in Table – 1. Cost benefit study of plantation is prepared keeping the present price of Jojoba oil Rs. 750/ in mind. Establishment cost is approximately Rs. 3.50 lakh in initial two years[5]. Recurring cost is nearly Rs. 30,000 per annum from third year. Setting of fruits and production of oil starts from third year. Hence actual income also starts from third year. In third year an income of Rs. 3.45 lakh is generated and the establishment cost is recovered. Fourth

yar, fifth year and sixth year can fetch Rs. 5,70 lakh, 7.20 lakh and 10.95 lakh respectively. Further every year an income of 14.70 lakh per ha. is estimated. The projections are highly lucrative and support the idea of Jojoba plantation in Jharkhand.

Table 1. Costs benefit analysis of Jojoba Plantation.

Year	0	1	2	3	4	5	6	7	8
Yield Kg/ha	--	--	--	500	800	1000	1500	2000	2000
Price Rs/kg	750	750	750	750	750	750	750	750	750
Annual Revenue				3.75 Lakh.	6.00 Lakh.	7.50 Lakh.	11.25 Lakh	15.00 Lakh	15.00 Lakh.
Estt. Cost (Rs.)	2.50 Lakh.	1.00 Lakh	--	--	--	--	--	--	--
Operationl Cost (Rs.)	--	--	--	20,000	20,000	20,000	20,000	20,000	20,000
Overhead (Rs.)	--	--	--	10,000	10,000	10,000	10,000	10,000	10,000
Net cash flow	_ 2.50 Lakh.	_1.00 Lakh.	00	3.45 Lakh.	5.70 Lakh	7.20 Lakh.	10.95 Lakh.	14.70 Lakh.	14.70 Lakh.

Source: Based on authors own calculation

On the basis of botanical descriptions of Jojoba, its physiological demand, importance of oil obtained from it and economic feasibility, there is need to support larger scale Jojoba plantation in Jharkhand. Such endeavour has got success in Bikaner and Jodhpur districts of Rajasthan and some other pockets of Gujrat.

Figure: Mature Jojoba plant
Source: Authors own source

Figure: Seeds of Jojoba
Source: Authors own source

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