

Original Research Article

Lotus Cultivation under Wetland: A Case Study of Farmers Innovation in Chhattisgarh, India

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ABSTRACT

An attractive aquatic plant, Lotus (*Nelumbo nucifera* Gaertn.) also called Kamal has a lot of uses from its economical, aesthetic, spiritual and medicinal uses. District Dhamtari with about 6.08% (27966 hectare) of vast wetland potential to be utilized by aquatic crop like Lotus. Lotus is generally grown by Dheemar community of the district who are mainly involved in Fishing, for their rhizome production which is commonly known as Dhais in Chhattisgarh, it is a very popular and high value vegetable crop. Apart from this other part of Lotus like Leaf, seed, Lotus fresh pod, and flower are also economically used. Economic analysis of Lotus is taken from farmer's field based on primary data collection and Mandi prize of Lotus parts in three different season viz- Rainy, winter and summer season crop, they incurred net monetary benefit of Rupees 88,855.00 per hectare per annum. Also about 14 sites had being explored within the district boundary which needs to be conserved with joint effort of villagers and characterized for its crop improvements. Thus, the lotus field deserve to be recognised as an important agricultural land similar to other land used for horticultural and agricultural crop cultivation and need to 'wise use' of such type of wetlands with integrating fish cultivation for doubling the income of farmers.

Keywords

Nelumbo nucifera,
Chhattisgarh
wetland, Package
of practices

Introduction

Wetlands are the places where water in abundance governs the kinds and life of organisms. Such Habitat known as sar, sarovar, taal, jheel etc. or lake, pond, marsh and swamp laid the foundation of human civilizations, and have been an integral part of our socio- cultural ethos in India.

The multiple benefit of these habitats recognized in recent decades ranges from provision of water and food and support the biodiversity for regulation of climate, mitigation of water related disasters and supporting livelihood.

The fertile plains of Chhattisgarh have extensive wetland –mostly paddy fields. Among them human managed. In Dhamtari city Lotus is cultivated in approximately 150 acres in wetlands of Dhamtari, where lotus is grown and managed as a crop in a relatively shallow and permanently flooded land.

Wetlands are preferred for cultivating Lotus because of their higher monetary return, about 50 Farm families of Dheemar community livelihood is totally dependent on Lotus cultivation.

District Profile

District Dhamtari is the fertile plains of Chhattisgarh from 81° 00' 23" 17" to 82° 00' 10' 35" E longitude and 20° 00' 02" 30" to 21° 00' 01' 32" N latitude has extensive wetlands mostly belongs to paddy fields. The district experiences subtropical climate with an annual rainfall of about 1100 mm over 65 days during June to October. The fertility of land in Dhamtari may be attributed to river Mahanadi and its tributaries Sendur, Paury, Sondur, Jonk, Kharun, and Sheonath.

District comprises 191 wetlands accounting for 26909 ha, this includes the small wetlands (<2.25 ha), which are 1134 ha. In terms of area, these small wetlands constitute a significant fraction of the wetland extent (4.21%) assuming that each wetland would be an average of 1 hectare in extent. Area under aquatic vegetation is very less, around 52 hectares during post monsoon and 2981 hectare during pre-monsoon.

Study Area

Location Map of Hatkesar and Ratnabandha ward

Hatkeshwar Ward, Dhamtari: Lies between 20°43'11.28" N to 20°43'13.9152" N longitude and 81°32' 15.1044" E to 81°31'59.0484" E latitude.

Ratnabandha ward, Dhamtari: Lies on GPS Points of 20°43'04.7424" N & 81°31' 42.33" E latitude.

Problems Identified

Unutilized potential of natural wetlands, which accounts 6.08% of total geographical area of district. (Wetland Atlas of Chhattisgarh 2010)

Rice- Rice cropping system in District.

Round the year

Cultivation

The area is human managed wetland of Dhamtari, where lotus is grown and managed as a crop. Relatively shallow and permanently flooded wetlands are preferred for cultivating lotus because of their higher monetary returns.

Dheemar community people of the district are usually wetland condition in about 150 acres area of Hatkesar and Ratnabandha ward of Dhamtari city which is considered as waste, unused for paddy and vegetable cultivation involved in its cultivation.

The people of this community are mainly involved in fishing and they are habitual to work under waterlogged condition for 7-8 hrs per day, they come to know the economic importance of Lotus rhizome, but under pond condition the digging of Rhizome is not possible under Rainy and winter condition due to high water level under pond condition although the market prize is very high up to Rs.120-150 /Kg.

So they selected waterlogged area of the district which are considered as waste land due to round the year waterlogged condition, land owners considered it as waste and not use for growing any crop, that land is hired by fishing community and started Lotus cultivation.

Lotus is naturally grown under pond condition and villagers normally uproot the rhizome for only their consumption purpose, not for marketing but market prize of Dhais is very high ranging from minimum Rs. 20/Kg to 150/ Kg vary from season to season.

Fig.1 Lotus Flower (A), Field View(B),Mature Field(C), Harvesting of Lotus Rhizome (D), Washing and Grading of Product (E), Bundling of Products(F), Transportation(G), Marketing of product(H)

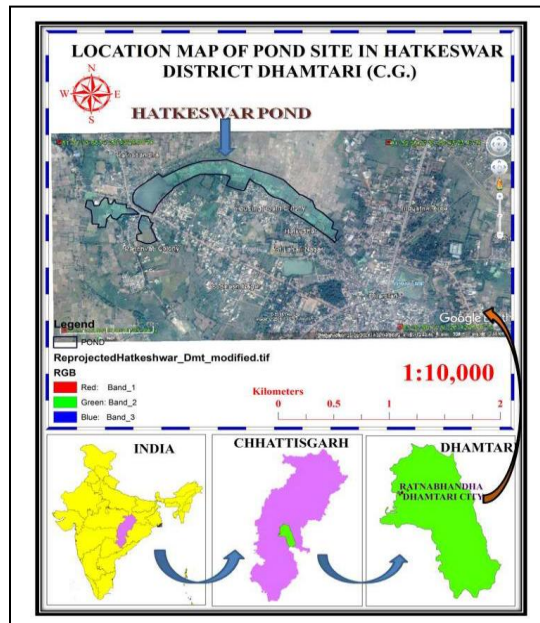


Table.1 Economic analysis of Lotus cultivation under waterlogged field.

Name of item	Rate per unit	Total cost
Input Cost (Rs/ha)		
Rent of land for one year	15,000	15,000.00
Field Preparation	2000.00	2000.00
Rhizome(100 kg)	5.00	5000.00
Transplanting	2000.0/acre	5000.00
Weeding (40 labours)	182.00	7280.00
Fertilizer application @NPK 100:60:40, FYM 15t/ha	-	8615.00
Insecticide and fungicide		1000.00
Digging of crop	300.00per day (140man day)	42,000.00
Transportation charges	1000.0	3000.00
Miscellaneous	2000.0	2000.00
Total cost of Input		90,895.00
Output		
Average Rhizome yield @ 50 q/ha	@35.00 per kg	1,75,000.00
Lotus pod (500 pod)	@1.5 Per piece*	750.00
Lotus seed (5 Kg/ha)	@500/kg*	2500.00
Lotus flower (1000/ha)	@1.5/piece*	1500.00
Net Monetary return (Rs./ha)		88,855.00

Source: - Primary survey Data at Farmers field, Mandi Rate of Different parts of Lotus at different districts of Chhattisgarh in three season mainly Rainy, Winter and summer crop.

Location Map of Hatkesar and Ratnabandha ward



Result of Study

Ethno medicinal Use

These rooted hydrophytes are commonly grown in the wetlands of the Chhattisgarh for various economic purposes. In Chhattisgarh all the part of lotus are used for various purposes:

Root:-Roots is called as 'Dhais' in Chhattisgarhi, it is very popular and high priced vegetable crop, to prepare pickles, or used as a raw for salad making by cutting and slicing.

Fruit:-Fruits are edible and eaten raw to cure many diseases, and normalize blood sugar level.

Flower: -Flowers are used to make garland and there is heavy demand of flower during Navratri and Diwali festival for worshipping purpose.

Leaf Lamina:-It is used to serve food by many communities. Tender leaf, petiole and flowers are also edible and used medicinally to remove intestinal worms, better urination, vomiting and dizziness by local healers.

Dry Seed:-Dry seed is used to prepare Ayurvedic medicines by local healers and also used in Hawans by Hindu in religious ceremony.

Advantages and scability of innovation

To evaluate economics of Lotus cultivation resource extraction pattern was estimated from field observation and discussion with user group for three different seasons – Rainy, winter and summer. The quantity of lotus part extracted was estimated through questionnaire with user group and physical verification in the field. The market prize of

various parts of lotus recorded from mandi of Dhamtari, Kurud, Raipur and Durg. The rhizomes are sold in per kg basis, flower and petiole on number of stick basis, and also fruit on no. basis. A total of Rs. 30,000/ha was estimated net income from one season, so that in one year they earn Rs. 80000-90,000/ha.

Socio Economic and Environmental impact

Lotus has many other uses apart from its rhizome for its vegetable purpose, being sacred, the flower is offered to God and Goddess in temples during religious festivals. The buds are used for making floral arrangements and the dried torus is used in floral decoration. Various part of the lotus plant are edible and are said to rejuvenate the human body.

Enviromentally growing of Lotus is very safer because it can tolerate acidic and alkaline water in pond. In some research it is proved that lotus can absorb heavy metals and may be recommended for plantation in the ponds used for discharging the industrial waste for water purification in most natural manner

Scientific cultivation and harvesting can definitely enhances the productivity and hence can generate more income. The restoration of wetland and their resources and their biodiversity for future, the research and information exchange can conserve activities through joint and effective research orient programme with the participation of local community especially fishing community who are involved in Lotus cultivation.

Also there is immense need to participate public sector to support the farmers to minimize the prize difference at wholesale

and retail level which vary from Rs. 15 at farmers' field but the same product when sold at market, the prize hike upto Rs.150 per Kg.

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