Reclamation of Wasteland in Sonitpur District, Assam

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Abstract:

Sonitpur District is experiencing high growth of population which is putting immense pressure on its limited land resources. Due to increasing population pressure, there is an excessive demand of land for agricultural and non- agricultural uses. This increasing demand along with absence of effective land management policy has resulted in creation of vast stretches of wastelands. For optimal utilization of available natural resources returning disturbed lands or wastelands to an improved state is a prerequisite. Reclamation of wastelands will help to use the wastelands for productive purposes which are presently lying unused or underused. In Sonitpur District, four different categories of wasteland are found i.e. land with or without scrub, under-utilised / degraded notified forest land, under-utilised / degraded notified forest land and sands (flood plain). Different wasteland reclamation methods have been suggested for all these categories of wasteland. Besides, strategies for overall development of wasteland of Sonitpur District of Assam have also been suggested.

Key words: Wasteland, reclamation, silvopasture, fodder, fuel wood reserves, bio-diesel

1. INTRODUCTION

Sonitpur is one of the backward districts of India with limited development of secondary and tertiary sectors of the economy

as vast majority of its people depend on agriculture for their livelihood. High growth of population is putting immense pressure on its limited land resources. For optimal utilization of limited land resources of Sonitpur District, returning disturbed lands or wastelands to an improved state is a prerequisite. Reclamation of wastelands will help to use the wastelands for productive purposes which are presently lying unused or underused. Keeping this point in view, an attempt has been made to suggest some of the commonly used measures/practices for controlling, reclaiming and managing different categories of wastelands that are found in the study area.

2. STUDY AREA

Sonitpur district is situated in the north-bank plain of the state of Assam. The district is sandwiched by the Brahmaputra River to the south and the Himalayan foothills of Arunachal Pradesh to its north. Sonitpur District is almost plain with the exception of its northern part. Northern part is hilly (highest elevation 456M): middle and southern part is almost plain although three isolated hillocks are present in the southern parts which are made up of Archean gneisses with a height varying from 80 to 172m above the mean sea level (Das, 2014). The district as a whole gently slopes from north-east to south-west with an average gradient of around 13 cm per km. In the district, numbers of wetlands, locally known as bhils are found. Most of them are abandoned river beds and get inundated every year. Above the bhils there are the fertile alluvial plains where mostly paddy is grown. The hilly tracts rise immediately after the alluvial plain where most of the tea gardens are situated. Several rivers flowing parallel to one another in a north-south trend dissect the district as they flow down the foothills to the Brahmaputra River. The total area of the Sonitpur District is 5324 km² and is extends between 26˚28' N and 27˚02́ N latitudes and 92˚17́ E and 93˚47́E longitudes. The Sonitpur District of Assam lies in the regime of monsoon climate of the

sub-tropical belt. Here, summers are hot and humid, with an average temperature of 29° C. According to Champion and Seth (1968), the forests in the study area are comprised primarily of subtropical evergreen, tropical semi-evergreen, tropical moist deciduous and riverain forest/grasslands. The District at present comprises three administrative subdivisions, namely Tezpur, Biswanath and Gohpur

3. WASTELAND RECLAMATION

The process of reforming wastelands approximately to its original topography and to bring about permanent self-sustaining vegetation is called reclamation (Deka, 2008). Wastelands will not become naturally reclaimed within the life time of man through natural process so artificial introduction of new alternatives should be adopted. In Sonitpur District, due to near absence of industrial sector, agricultural sector contributes the very base of its economy. With growing population, the demand for lands is increasing at such a fast rate that any attempt made in the direction of reclaiming unused, denuded and less productive areas for useful purposes is worthy of the time and money spent on it.

According to Das and Syiemlieh (2012) following types of wastelands are found in Sonitpur District of Assam.

Table -1 Category-wise Distribution of Wasteland in Sonitpur District

Types of Wasteland	Wasteland Index	Area under wasteland (km²)	% of area to total wasteland area
1. Land with scrub	1	0.04	0.01
2. Land without scrub	2	1.02	0.13
3.Waterlogged and marshy land (Permanent)	3	44.53	5.63
4.Waterlogged and marshy land (Seasonal)	4	7.23	0.91
5.Underutilized /degraded notified forest land	5	29.84	3.77
6.Underutilized / degraded notified forest land (Agri)	6	708.56	89.52
7. Sands-(Flood Plain)	7	0.29	0.04
Total		791.51	100

Source (Das and Syiemlieh, 2012)

As mentioned in Table-1, in Sonitpur District 791.51 km² or 14.87 per cent of its total geographical area has experienced different types of degradation and categorized as wasteland. This land degradation is mainly due to vegetation degradation, water erosion and water logging. Depending upon the nature, magnitude and extent of the problem, different types of wasteland, namely, water logged, eroded lands, degraded forests etc., require a set of reclamation and management practices in order to use them on a sustainable basis.

3.1 Land with or without scrub:

This is the land which is generally prone to degradation and may or may not have scrub cover. Such land occupies relatively high topographic locations. Two sub classes were identified based on the vegetation present in such lands i.e. land with scrub and land without scrub. In Sonitpur District this category of wasteland occupies only 0.13 per cent of the total wasteland areas or 1.06 sq. km. of the study area.

Degraded rocky/stony and gravelly upland and shallow hardpan areas with very scanty and poor distribution of unpalatable shrubs and grasses as well as very low production potential, are recommended for development of silvipastures. The first and foremost requirement to establish such production system is to undertake improved soil and water conservation measures to minimize soil loss, spread the rainwater evenly and allow it to penetrate at lower depth and proper harvesting of rainwater. In Sonitpur District this category of wasteland i.e. Land with or without scrub covers only a small area, so intensive care can easily be taken and reclamation of this category of wasteland should be possible without any problem.

3.2 Water logged and marshy land:

Waterlogged land is that land where the water is at/or near the surface and water stands for most of the year. Marsh is a land which is permanently or periodically inundated by water and is characterized by vegetation which includes grasses and weeds.

Considering the duration of water logging period in a year two sub classes were delineated i.e. permanent and seasonal. In the study area this category of wasteland occupies 6.54 per cent of the wasteland areas or 51.76 sq. km.

In the study area problem of water logging is found mostly in low lying areas of active flood plain zone which are annually inundated during floods and where surface drainage is poor. The causes of water logging are many i.e. excessive rainfalls especially during monsoon season, flood, low- relief, proximity of water table near the surface and natural and manmade obstruction to sub-soil and surface out-flow which results in poor drainage. With rapidly increasing population in the district, haphazard growth of settlement is occurring all over the district resulting in obstruction of surface drainage which is ultimately contributing immensely towards the water logging condition in the study area.

To solve the problem of water logging excess water need to be removed by artificial drainage. The measures to alleviate the water logging may be grouped into preventive and curative measures. The preventive measures suggest judicious utilization of water resources in such a way as to prevent building high ground water table. This can be achieved by adopting efficient water application technology, proper irrigation system and adjustment of cropping pattern. The curative measures are those which affect to remedy the damage caused due to water logging. It can be achieved by adopting proper surface drainage and sub-surface drainage.

3.3 Under-utilised / degraded notified forest land:

Land, as notified under the forest act and those lands with various types of forest cover, in which vegetative cover is less than 20 per cent are classified as degraded land. In Sonitpur District this is the most important category of wasteland as it occupies 93.29 per cent of total wasteland areas or 738.4 sq. km.

Degraded forest areas should be developed by gap filling, reseeding and transplanting with suitable plant species using

proper soil and water conservation measures. The area should be properly protected through fencing so that seed nucleus already existing may germinate to improve the degraded condition of the forestland. The ground flora should be enriched by growing suitable shrub and grass species in contour furrows. Grazing should be restricted and properly regulated.

3.4 Sands (Flood Plain)

Sandy areas are those areas which have established accumulation of sand, in situ or transported, in riverine or inland areas. In Sonitpur District this category of wasteland occupies 0.04 per cent of the total wasteland areas or 0.29 sq. km.

For sanded areas reclamation is easy where sand layer is thin. Problem arises when layer of sand is very thick. In Sonitpur District, there are many areas where layer of sand is only few inches thick. In such areas deep plowing can be done which will thoroughly mix the sand with the soil and give a more uniform texture. The problem of how to get rid of the sand is a difficult one in those fields in which the covering is six inches to several feet in depth. When the sand is not more than six or eight inches deep, it may be possible to turn it under and bring up the good soil by plowing very deep. In case the covering of sand is too deep, it may be practicable to hold the sand and attempt to hasten the building of it into soil by means of soil-binding grasses and legumes so that it can gain sufficient fertility within a short period of time.

4.   STRATEGY FOR DEVELOPMENT OF WASTELAND

There is a need to formulate new strategy and strengthening the old ones so that afforestation becomes a people's movement and the requirement of the people especially in relation to fuel wood and fodder can be met.

4.1 Establish More Nurseries

For afforesting 791.51 km^2 it will need lakhs of saplings. Therefore as a first step lot of nurseries should be established that will ensure easy availability of saplings. Nurseries should be established in every nook and corner of the district that will ensure easy availability of saplings. Unemployed youth of the district should be encouraged to establish more nurseries. Horticulture department should help in this regard. Available evidence confirms that community involvement is related to the proximity of the nursery and the availability of desired species. Decentralized nurseries also serve as a natural extension, are cheaper, generate family employment and result in higher survival rate because of shorter distances (Gautam and Narayan, 1988).

4.2 Free sapling distribution

Free sapling distribution should be undertaken on a large scale. To have people's interest mostly desired species like fruit bearing species should be distributed free of cost to the common people. For the success of free sapling distribution, women's participation can be encouraged by appointing women motivators in rural areas of the study area. Women's participation will not only led to widespread sapling distribution but will also subsequently help in survivals of sapling planted by them.

4.3 Creation of tea gardens

Tea gardens should be set up all over the study area. It will not only increase green cover but will also provide lot of employment opportunities.

4.4 Fodder Development

Fodder development should be given top priority as it will help reducing over- dependence of cattle and goats on pastures and forest areas of the study area. In the study area, it is observed that number of cattle and goats are very high. Huge number of

cattle and goats often results in overgrazing of pastures and forests, causing soil erosion and ecological destruction. These animals pose a major problem while bringing wastelands under forestry.

So there is an urgent need to give high priority on fodder development to meet the requirement of the huge livestock number. To improve the quality and quantity of fodder, high yielding varieties of grasses and legumes can be introduced which will substantially increase the availability of fodder in the study area.

4.5 Creation of fuel wood reserves

Wastelands can be utilized for fuel wood plantation to meet the fuel wood needs of people. Wood is one of the most commonly used sources of energy in the rural areas of the district. Lakhs of people have been depending upon forests since time immemorial. To think of any such strategy aimed at completely excluding these pressures from the forests, would be short-lived and most likely may be counterproductive to the very idea of involving people in the task of wastelands afforestation. The lasting solution to this gigantic task there lies in creating fuel wood forests (Prasad 1988). In the absence of such a policy, the poor will continue to cut forests for selling fuel wood and earning a livelihood and in the process destroy forest

So, on all barren forest lands plantation of grasses, legumes, shrubs and bushes should be done which will yield fuel wood and fodder in the shortest possible time. An immediate identification of quick growing shrubs with high calorific value, with their retention in the forest to serve fuel requirements, the development of pastures, and the development of massive fuel wood plantations around centers of high consumption and encouragement of silviculturally sensible exploitation of fuel wood species must be considered.

Forest-based industries will need wastelands to grow their own raw materials. A phased programme should be jointly worked out by the Ministry of Industry, Department of Forests

and the National Wasteland Development Broad for such industries. License should only be given when appropriate wastelands have been identified (Gautam and Narayan, 1988).

Industries should be encouraged to raise captive plantations by afforesting wastelands to develop effective alternative sources of raw material required by forest based industries. In addition, industrial sector should also be encouraged to undertake plantations on wastelands to supply fuel wood and fodder needs of the rural community.

> Now-a-days bio-diesel has got attention worldwide as a viable alternative to petro-diesel, particularly in the face of its diminishing supply and the resulting steep increase in price. Production of biodiesel also supplements the general economic growth by way of wasteland utilization, employment generation, entrepreneurship development, augmentation of additional sources of power, increasing share of organic manure in agriculture etc. Wastelands of Sonitpur District can be perfectly utilized for production of biodiesel which will give many benefits. First of all it will help exploit wastelands by planting *Jatropa* and other succulent plants. Thousands of acres of wasteland can be exploited for economic development. Secondly, it will reduce unemployment and hence generate breadwinners.

In North –East India, NEDFI has done survey and found that North-East India has immense potential for production of biodiesel. From the study it is found North East India is suitable for three energy crops. They are- *Jatropha curcas* (Bhotera in Assamese, *Ratanjot*/Jangli erenda in Hindi), *Pongamia pinnata* (Karanj / Karach) and *Mesua ferea* (http://biodiesel.nedfi.com/pages/introduction.php).

Sonitpur District of Assam has large area of land that is currently classified as wasteland. As its geo-environment condition is very much suitable for *jatropha curcas,* so it has tremendous potentiality to emerge as a very important producer of jatropha curcas. Wastelands of Sonitpur District can profitably be utilized for the production of jatropha curcas.

Sonitpur District can derive numerous benefits from biofuel production such as wasteland reclamation and restoration, increase in soil nutrients, increased employment and improved social well-being (Das and Syiemlieh, 2010). With help and support from the Central, State and District administration, more and more farmers can be attracted towards the cultivation of *jatropha curcas* and economic condition of the region can be changed beyond imagination.

5. CONCLUSION

Agriculture is the mainstay of the economy of Sonitpur District. As industrial sector is very much backward, majority of its people depends upon agriculture for their livelihood. Unfortunately in the study area vast tracts of land are wasteland whose productivity are very low and people owning them are also poor. So, it is important to undertake large scale wasteland reclamation measures so that wastelands of the district can be turned into productive land which will act as a powerful tool of attacking the issues of poverty and backwardness in the study area. Besides, there is an urgent need to control the generation of more wastelands in the district through proper planning.

In a predominantly agrarian state like Assam, where availability of land is limited and pressure of population on land is high, we can no longer afford to keep lands unproductive or underproductive. It is therefore extremely important to undertake various land reclamation measures so as to redress the wastelands. The above mentioned strategies if followed properly can very well help the development of wastelands of Sonitpur District of Assam and ultimately help in its economic development.

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