

AMOGHVARTA

ISSN : 2583-3189



Agro biodiversity : A Case Study of Koderma District

ORIGINAL ARTICLE



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Abstract

The variety and variability of animals, plants and micro organisms that are used directly or indirectly for food and agriculture, including crops; livestock, forestry and fisheries is Agro biodiversity. Agro biodiversity can be divided into four components :- agricultural genetic diversity, agricultural species diversity, agro ecosystem diversity and agricultural landscape diversity. To meet rising demand, global food production must increase by 70%. Agro biodiversity is essential for this since genetic diversity can improve production capacity and field. This can be a game changer in the global food security crisis and is one of the most significant benefits of agricultural biodiversity. Land, soil, climate and water are vital natural resources for agro biodiversity. In the Koderma district there is great opportunity of agro Biodiversity through systematic appraisal of its natural resources. It is a well defined geographical unit and the location advantage, sub-tropical monsoon climate of this plateau is unique.

Key Words

Micro Organism, Genetic Diversity, Agricultural Species, Ecosystem, Soil, Land.

Introduction

Variation is the law of nature and the nature's beauty is not yet fully appreciated and tapped. Biodiversity is the variety of organism considered at all levels, from genetic variants belonging to the same species through arrays of species to arrays of general, families and still higher taxonomic levels includes the variety of ecosystems which comprise both the communities of organism within particular habitats and the physical conditions under which they live (cf. Wilson 1998).

Agro biodiversity focusses mainly on the that portion of the biodiversity that has undergone selection and modification over millennia by human civilization to serve human better needs (cf. Subramanian and Thirumeni, 2007). Agro biodiversity are just like two sides of a coin. One side with national emblem represents agro biodiversity, because natural biodiversity is the heritage of human community and societies a whole and is not generally priced. Another side giving its value can be assessed in terms of who depends on it and to what extent (Pratap 1998).

Food security to its inhabitants is one of the prime objectives of the present development. Although, the green revolution since 1960 provided the much needed security to the vast population of India. India vision

2021 says that to reduce insecurity and poverty, India will have to sustain agricultural growth rate of 5 to 5.5%. Koderma district is low productive potential region.

The interaction of these elements are studied in agro biodiversity which deals with study of crop distribution and production in relation to physiography, soil and climate factors. The types of land are defined in terms of major climate and growing periods, which is economically suitable for a certain range of crops and cultivation.

Objective

The main objective of the present study is to study agro biodiversity parameters with approach of regionalization on the basis of natural resources including physiography, landuse, soil, climate elements of koderma district. It is to aim to study characteristics of Agro biodiversity along with different growth of areal coverage and production of different crops.

Study Area

Koderma district lies between 24°28' 5.0736' North latitude to 85°35' 8644" East longitude. Koderma district is one of the twenty four district of Jharkhand. The total geographical area of Koderma district is 980 sq km and the total population is 716, 259, as per the census of 2011.

Geology and Relief

Koderma district is almost coterminous to the Koderma plateau. This plateau extends from the Barakar-Mohana divide in the west of the source region of the Kiul and the Ajay in the east, is the most representative section of the lower plateau with maximum width along the Koderma Bagodar line. The southern boundary is precisely defined by the steep face of the Hazaribagh plateau while the northern boundary consists of the precipices of the plateau edge. Although the region forms a continuous upland tract with the Chatra plateau in the west, it differs from the latter in geological characteristics and details of the topographical features.

From Koderma to Kharaspur Hills the plateau is flanked by the outcrops of the Dharwarian consisting of quartzite and schist which are frequently traversed by the Mica-pegmatite veins. The Dharwarian quartzite owing to the great resistance to erosion forms ranges of high hills which are characterized by sharp crests and almost vertical sides of bare rocks, while the schists have been eroded to lower level and gave rise to a rolling of undulating surface. In the southern part of the plateau; drained by the Barakar and Jamunia rivers, valley widening appears to have taken precedence over valley deepening and the valley slopes are marked by pronounced concavity (Prasad, 1965 49-50).

The whole of this dissected belt is clear evidence of comparatively recent uplift. The streams and rivers dissecting this belt are carrying away an immense burden of sediments. Uplift has been in stages, alluvium deposited during earlier stage of uplift at the debauchments of the rivers has since deeply scoured left as high terraces and cliff faces, excellent examples of these can be seen east of Dabaur, Koderma-Patna road. The manner in which some of the larger streams now tend to deposit sediments immediately within their debauchments suggests that just at present, there is a reversal of movement, subsidence at the northern edge of the belt (Chaudhary, 1957, 4)

Koderma district lies in Chhota Nagpur plateau at 397 meter above the mean sea level. Most part of the district is occupied by Koderma plateau. The area exhibits undulating topography incorporating hills, hillocks, plains and mounds, This area has more shape which differentiates it from the Hazaribagh plateau which lies in the south. The northern scarps have deep slopes. Average elevation of the area ranges from 300 to 500 meters above mean sea level. Northern part of the district is occupied by "Koderma reserve forest" The highest peak is Debour Ghati (677 metre) which is the state boundary of Jharkhand and Bihar. The maximum area of Koderma district is covered by plateau 47.54% of total district area. After plateau is hilly area (44.12%), plain area is 4.60%, water body is 2.12% and valley is 1.54% of total area Minimum area is mine 0.14%.

Topography Table : Koderma District

Spatial distribution of General Topography		
Categories	Area (Sq.Km.)	Percentage.
Valley	25.512	1.50934
Plain	76.242	4.605048
Plateau	787.967	47.59347
Hill	730.556	44.1261
Mine/Qwarry	2.340	0.142063
River/Waterland	35.250	2.124059
Total	1655.610	100.000000

[Source: Department of Geology, Koderma, Jharkhand)]

Temperature of Koderma District

Temperature is the most important factor of climate. The meteorological records and temperature data available for district have direct significance in agro-biodiversity. General temperature of Koderma District. is much the same as the central part of Chhota nagpur plateau.

The temperature of district varies between mean, minimum temperature of 10°C in winter and mean maximum temperature of 40°C in summer. Temperature varies between 40°C to 46°C in general.

Annual Temperature of Koderma District

Month	Maximum (°C)	Minimum (°C)	Average (°C)
January	24	12	
February	28	15	
March	35	21	
April	40	26	
May	40	24	
June	38	30	
July	34	27	
August	33	27	
September	32	26	
October	31	22	
November	29	18	
December	25	14	

(Source: Meteorological Department)

Rainfall of Koderma District

Rainfall is the most important but is variable factor. This is essential to study the amount of rainfall and its related parameters for the agrobiodiversity of the koderma district. The area experiences annual rainfall of 112 cm (1210 mm). Nearly 40 percent of the rainfall is concentrated between 18 june to 9 October.

The wet seasons depend on the onset and withdrawal of monsoon rainfall. Radiation values drop during the rainy season (July-August)

Months	2012 Average	2013 Average	2014 Average	2015 Average	2016 Average	2017 Average	Total
January	42.85	0	22.63	12.86	18.73	0	16.1783
February	6.06	0	34.26	1.5	1.66	0	7.24667
March	1.76	0	18.06	13.75	4.8	0	6.495
April	12.00	8.30	0	38.06	0	0.4	9.91333
May	1.27	104.91	42.8	0.9	28.86	25.41	42.35873

June	125.03	102.33	102.63	136.51	101.03	60.66	104.698
July	245.71	66.71	477.76	302.11	247.36	343.73	288.1897
August	159.05	262.61	399.3	239.48	323.23	0	230.612
September	120.36	138.9	81.63	43.56	310.23	0	115.892
October	15.46	195.95	13.03	0	38.1	0	43.7567
November	30.81	0	0	0	0	0	0
December	0	0	0	0	0	0	0
Total	761.02	879.77	1242.7	788.73	1074.67	480.2	871.182

(Source: District Survey Report of Koderma District)

Humidity of Koderma District

The quantity of water present in the atmosphere in the form of water vapour is called humidity.

Average Relative humidity in koderma district by month.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Humidity Percentage	46	38	29	28	35	54	80	84	83	71	54	53

The above table shows the average amount of humidity in koderma district. In Koderma district the humidity is high between July to September and between February to May it is low and dry spell prevails.

Soil of Koderma District

Soil is most important factor of agro-biodiversity. Soil represents the loose and unconsolidated materials derived through the breaking of unconsolidated materials derived through the beaking of the rocks.

In Koderma district red soil, sandy Soil, balther soil and micacious soil is found.

Agrobiodiversity of Koderma District

Koderma wildlife sanctuary is one of the protected area of Jharkhand state. It was notified as a wildlife sanctuary in the year 1981. The Sanctuary lies between 25°25' -24°38'N and 85° 25' – 85° 40'E and spread over an area of 150.62sq. km. It falls in the bio-geographical region of Deccan peninsula in Chota Nagpur plateau province. The wildlife sanctuary supports two major types of forests, namely Northern tropical dry deciduous forest or dry peninsular sal forest and northern dry mixed deciduous forest.

The dry peninsular Sal forest predominantly consists of sal, both in the plains as well as in hilly tract of the sanctuary. Northern dry mixed deciduous forest is found in the moist region of the sanctuary where the annual rainfall ranges from 800 to 1200 mm and the average temperature ranges between 25° and 27°C with considerable relative humidity.

Found diversity of koderma wildlife sanctuary

Sl. No.	Life-form	Total Number of Area	%
1	Climber	57	13
2	Grasses	33	8
3	Herbs	175	41
4	Rushes	1	0.2
5	Sedges	21	5
6	Tree	40	21
7	Undershrubs	7	2
	Total	424	100

(Source: Forest Department Koderma District)

On analysis on the life form composition of the flora reveals that there are 175 herbaceous. taxa that constitute 41% of flora, followed by 90 tree. taxa (21%), 57 taxa of climber (13%), 45 taxa of shrubs (10%), 33 taxa of grasses (8%), 21 taxa of sedges (5%), and 1 texon of rush (0.2%)

Significance of Agrobiodiversity

Agro-biodiversity constitute a significant natural resource of a region. They produce a large variety of woods, which are used as fuel, timber, food and industrial raw-materials. These are major agro-biodiversity whereas minor agro-biodiversity products includes grasses, bamboos and cones, oils, fibres, drugs, spices, and poisons, animal products, tans and dyes, gums, leaves and edible products. It provides leaves for animals, shelter for birds and shade for the people.

Other indirect benefits of natural vegetation are protection and control of soil erosion, flood control, increase in soil fertility, effect on climate. They ameliorate the extremes of climate by reducing the heat in summer and cold in winter. Besides they also affect the amount of rainfall by lowering the temperature of moisture laden winds (by condensation) and increase the relative humidity of the air by the process of transpiration. Further, they reduce the surface velocity of wind and check the process of erosion.

Conclusion

The present study therefore is an attempt to discuss agro-biodiversity of Koderma district. Our country is signatory to the Convention on International trade in Endangered species of wild fauna. Under this export and import of endangered species and their products is subject to state control. Commercial exploitation of such species is prohibited. The Central Government extends to the state Government financial and technical assistance for development and improvement of Agro-biodiversity.

References

1. Chaudhary, P.C. Roy (1957) *Bihar District Gazateer Hazaribagh*, Secretariat press, Bihar, Patna. p. 4
2. Khullar D.R (2008) *India – A Comprehensive Geography*, Kalyani publishers, New Delhi. p. 113
3. Mandal R.B. (1979), *Dimensions of Geography*, Concept Publishing company. New Delhi. p. 8
4. Moshin Y.K. (1983). 'Agricultural development planning and policies in the ESCAP Region' in economic and social commission for Asia and pacific, 1983, Experiences in Agricultural development planning in selected countries of Asia Bangkok, p. 15-28.
5. Prasad, Ayodhya (1905), *The Physical Landscape of Chotanagpur : A study in Regional physiography in Geographical outlook*, Vol. IV, 1965, Deptt. of Geography, Ranchi University, Ranchi p. 41-62.
6. Shafi, M (2006) *Agricultural Geography*. p. 371-374, Pearson publicatin, Noida, U.P.
7. Singh, Sunil Kumar (2020) *Inside Jharkhand*, Crown publications, Ranchi p.146

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