



# Dependence on Natural Resources for Livelihood and Saga of Increasing Vulnerability in South 24 Parganas District, West Bengal

**Dr. Mausumi Bandyopadhyay**

*Associate Professor, Department of Geography  
GMSM Mahavidyalaya, Bireswarpur, South 24 Parganas  
[banerjeemausumi73@gmail.com](mailto:banerjeemausumi73@gmail.com)*

**Abstract:** The district South 24 Parganas is located in the deltaic alluvial plain of river Ganga bordered by Bay of Bengal in the south. Luxuriant mangrove forest covers the southernmost islands intertwined by several estuaries. So natural resource endowment in terms of biotic and abiotic components is extensive. Obviously local people utilise these resources to fulfil their basic needs. Vast stretch of alluvial plain, brackish and fresh waterbodies, timber and non-timber forest products of this district provide livelihood of about Six million people. But utilisation of these resources is never optimum. Uncertainty and insecurity are the indispensable dimensions of their livelihood. Vulnerability of the inhabitants to the natural hazards along with bio-physical and socio-economic aspects are gradually increasing day by day.

In the context of such a vulnerable situation a comprehensive study has been conducted in this district to find out the extent of dependence on natural resource base and to detect the nature of vulnerability experienced by the local people. Various statistical techniques inclusive of Borda score have been computed for working out Vulnerability Index. Through analysis of data base it is evident that agriculture is not profitable at all; the profit earned out of inland and marine fishing goes to middlemen and income generated from forestry is full of uncertainty. But, the local people have no alternative option to choose any other livelihood in this industrially backward district. Various Government and non-government projects have been executed here. But, maintaining the balance between environmental sustainability and people's wellbeing in this fragile ecosystem is not an easy task, where the issue of carrying capacity often remains neglected.

**Key words:** *fragile ecosystem, awareness generation, vulnerability, alternative livelihood*

## I INTRODUCTION

Available Endowment on the Earth Surface for the Wellbeing of Mankind is known as Resources. Land, Soil, Water and Forest are the basic Natural Resources. Food, Fodder and Fuelwood are collected from the Natural Resource Pool. Land resources utilise for livelihood are agricultural land, permanent pastures, current fallows, permanent fallows, land with trees and groves, cultivable wasteland, barren and uncultivable land, embankment. Ponds, rivers, estuaries, shallow ocean basin. Timber and non-timber forest products.

## II OBJECTIVES

1. To find out the types of livelihood provided by the natural resources
2. To find out the utilisation pattern and extent of dependence on natural resources

3. To estimate the level of development and relationship with natural resources of the study area
4. To estimate the nature and extent of vulnerability

### III AREA UNDER STUDY

South 24 Parganas District of West Bengal has latitudinal extension between 21°29'N and 22°33' 45" N on one hand and longitudinal extension between 88° 3' 45"E and 89° 4' 50" E on the other. Area of the district is 9,960 sq. km. It has seven municipalities and 29 community development blocks. Bangladesh is located in the east of the District, East Medinipur and Haora District of West Bengal lie in the West, while Kolkata and North 24 Parganas District lie in the north and Bay of Bengal is in the south of the study area.

The district has rich endowment of natural, social, cultural and economic resources, but, the quality of life is in the phase of 'Struggle for existence'. Natural resource base includes soil, land, water and forest of the mainland and the island ecosystems. Sunderban Biosphere Reserve, located in the southernmost part of the District is a UNESCO world heritage site. Socio-economic resources include human resource, agricultural crops, fresh and saline water, fish, household industry products and range of infrastructure. Diversity and disparity prevail in between rural-urban and mainland-island environment. The major causes of backwardness of this district is underutilisation of resources and not scarcity of resources.

### IV MATERIALS AND METHODS

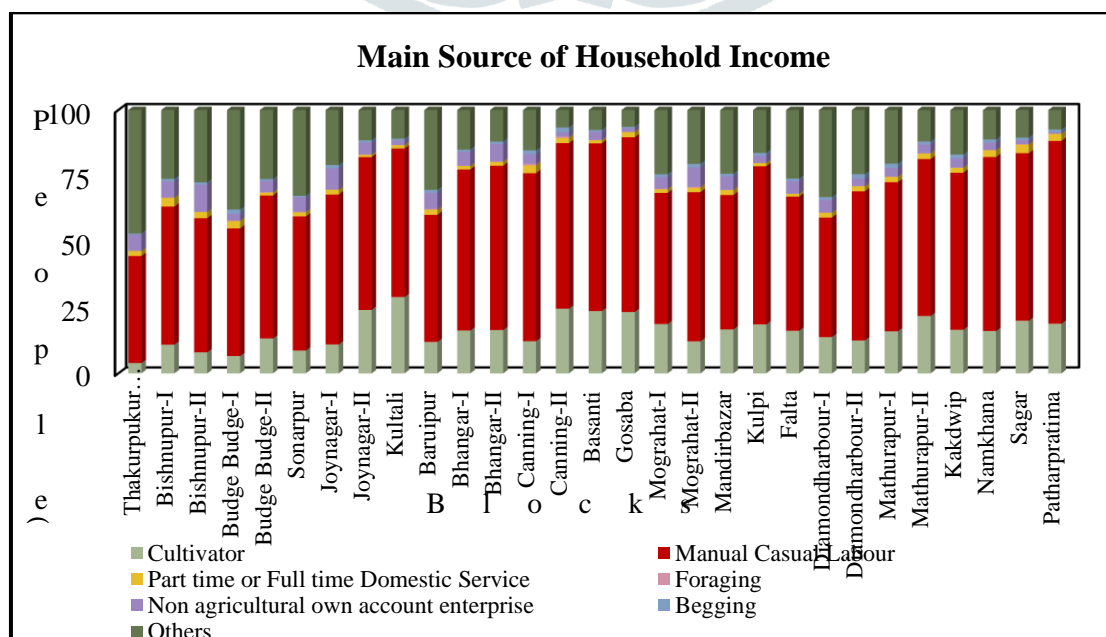
For the present study both primary and secondary data have been collected. Secondary data have been collected from District Statistical Handbook (2017), Census of India (2011), Socio-economic and Caste Census-2011, India Meteorological Department, State Water Investigation Department, and Central Ground Water Board.

Primary data for present study have been generated from 29 Community Development blocks and seven Municipalities on the basis of pre-designed questionnaire following the purposive method of sampling. Collected data have been tabulated, followed by necessary calculation and graphical representation.

### V RESULTS AND DISCUSSION

**Land Resource:** Land is the life sustaining resource for mankind. Most of the lands in this district are utilized for agriculture. Fertility of land depend on soil quality and in this district soil resource studies done by Soil and Land Use Survey of India. Using these data, land resource and soil resource have been categorized as these two resources are significantly inter-related. In case of land resource the controlling factors that have been considered are slope, drainage, land irritability, land capability, severity of erosion and management. On the other hand soil resources are categorised on the basis of soil irritability classes, hydrological soil groupings, texture and pH of the soil and management. Most formidable factor in case of soil quality is soil texture and soil pH. Clay content in soil is very high, waterlogging takes place in rainy season every year which makes delay in rice cultivation. On the other hand high soil salinity reduce productivity of the crops.

Fig-1

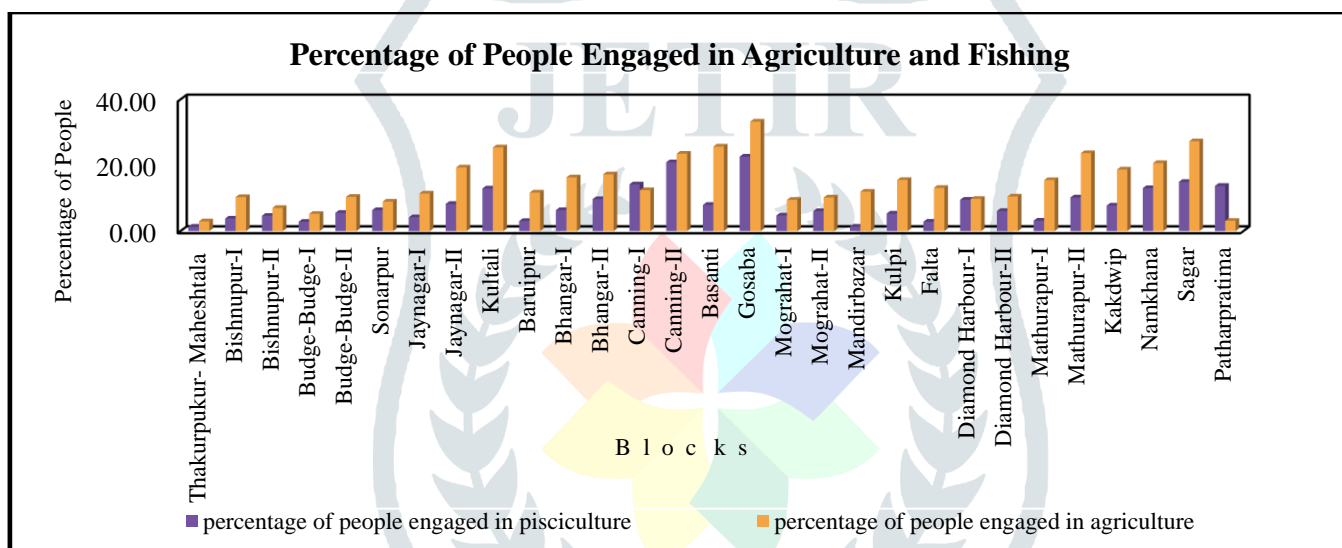


Source: Census of India, 2011 Socio-economic and Caste Census, 2011

**Dependence on Land:** Analyzing Fig 1 it is very clear that manual casual labour are main working force here. Most of the period in a year they engaged in agricultural activities as this district provide no other profitable livelihood option. Vulnerability of the people increases in the year of cyclone or flood, when agricultural activities totally stopped. It has been seen that migration to other states are increased in the year of severe cyclonic storm such as *Aila* and *Amphan*.

**Water Resource:** Water is the basic need for life and livelihood. The entire biotic kingdom depends on water for existence. Its availability at the right place and at the right time maintains environmental balance (Park C, 1997). Despite the fact, the district South 24 Parganas experiences average annual rainfall of more than 1,600 mm and is drained by so many rivers, canals and estuaries, it suffers from acute water scarcity. So the quantity and quality of surface and ground water are major concerns in this district. Generally the upper group of aquifers contain saline water at a depth of 20 to 168m and fresh water bearing aquifer is occurring within 160 to 360 m below ground level. Exception has been observed in the paleo-channels as well as and in Bhangar-I and Bhangar-II blocks while the uppermost aquifer is fresh in nature with a depth of 50 m below the ground level. Salinity in these aquifers is due to NaCl concentration derived from sea water ingress and salt water entrapped in the sediments under marine conditions in late Pleistocene to early quaternary period when shallow marine condition prevailed in the deeper parts of the Bengal Basin. The salinity gradually decreases from the coastal areas to the inland ones. (Bhu-Jal News, 2009). The district is enriched in precipitation, runoff and groundwater replenishment of water, but due to brackish nature the ground water cannot be utilised in large scale.

Fig-2



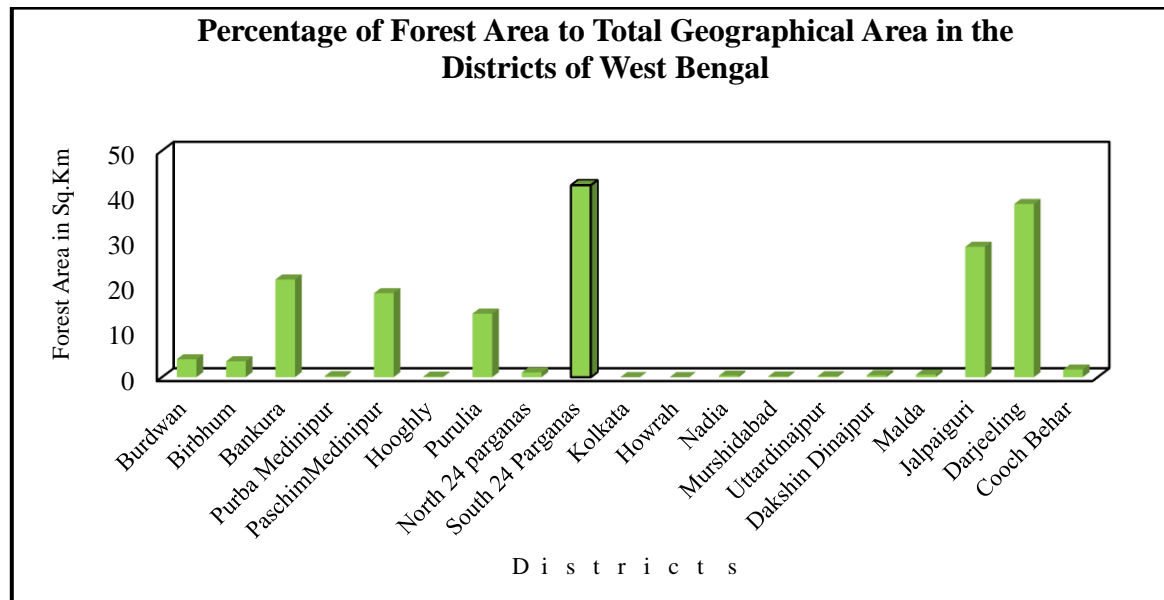
Source: District Statistical Handbook, 2017

**Problems related with dependence on water resource:** Ground water quality is major concern here, as quality of water is not suitable for farming. Agriculture is possible in rainy season, but cultivators have to depend on groundwater which is brackish in nature in shallow depth in winter or summer. Fresh ground water is available in the depth over 150 metre. So in winter and summer season agricultural land lying vacant most of the cases.

People who are depended on fishing face different problems of cyclonic disturbances, attack of river pirates, unavailability of scientific fishing net, long term procedures to get government license to catch fish, unavailability of fish etc.

**Forest Resource:** Before the advent of the British rule, forested area of this district were extended up to Kolkata. Deforestation started by colonial rulers way back in 1781 for expansion of agriculture and human settlements (Basu, 2013). The forest cover area of 3,967 Sq.km in 1883 turned into 2179.05 Sq. km in 2010. Presently the district South 24 Parganas is endowed with a large forested area of 4,263 sq. km. which is highest among the districts in West Bengal in terms of percentage of forested area to the total geographical area. The forested area in this district of West Bengal is known as Sunderban Biosphere Reserve.

Fig-3



*Source: Environment and Forestry Statistics of West Bengal, 2015*

**Dependence on Forest Resources and related problems:** Important forest resources collected by local people are fuelwood, honey, wax, and timber. The problems they face to enter into forests are: i) Tiger and crocodile attack, ii) cyclonic disturbances, iii) river pirates, iv) delay to get government licenses, v) lack of improved tools used in lumbering etc. Social forestry and participatory forest management are not successful in all blocks, so dependence on forests is not profitable and reliable for livelihood for whole year. It is impossible to enter in the forests in rainy season, so working as agricultural labourer is the only option.

**Types of Vulnerability:** Two types of vulnerability present in this district: 1) Physical Vulnerability 2) Socio-economic Vulnerability

**Physical vulnerability** can be categorised as: a) Physiographic, b) Edaphic, c) Hydrologic and d) Climatic

**Physiographic Vulnerability:** Land subsidence and instability of land are categorised in this type.

**Hydrologic Vulnerability:** Marine erosion, Impeded Drainage Condition, Salinity of Water, Arsenic Contamination are listed in this type.

**Edaphic Vulnerability:** It is related with soil. Soil Erosion, Soil Salinity and Alkalinity, Low Soil Fertility are major types.

**Climatic Vulnerability:** Rising Sea Level, Thermal Change, Erratic Rainfall, Frequent Floods, Devastating Tropical Cyclone, Storm Surge, Tidal Bore and Drought are listed in this group.

**Socio-economic vulnerability** are categorised into six. Such as:

**Land related:** Landlessness, high dependence on agriculture, mono-cropped land included in this group.

**Water related:** Paucity of fresh water, contamination of water, waterborne diseases are main impediments which affect local people most.

**Institutional related:** Institutional rules to collect forest product, failure of participatory management of Forest, failure of Man and Biosphere Programme etc. are institutional related constraints.

**Human induced vulnerability:** Different types of human induced constraints people face are demographic constraints, low human, economic and social development, low female work participation, low technical efficiency, and menace of pirates etc.

**Social vulnerability:** Lack of social security, child trafficking, child labour, crime against women are social constraints which people face day to day in their locality.

**Economic vulnerability:** Poverty and hunger, malnutrition, unemployment, high time distance are economic constraints which people can't avoid.

## VI MAJOR FINDINGS

1. Excessive Dependence on Land for agriculture and water for fishing is the cause of poverty in all blocks.
2. Landless Agricultural Labourer dominate the percentage of working population and it is the most vulnerable section of the society.
3. Mono-cropped agriculture is the root cause behind seasonal migration of workforce.
4. Breach in embankment and tidal ingress is a regular phenomenon in Sunderban area and main reason for crop failure.
5. Mainland agricultural area suffer from waterlogging frequently and main reason of food insecurity in the central part of the district.
6. Inland fishing fulfil the need of domestic purpose and commercial fishing is affected by tidal bore, breach in embankment and tropical cyclone.
7. Institutional rules and regulations, tiger and crocodile attack, river pirates are the major constraints of non-timber forest product collection.
8. Usage of fuelwood and pond water for domestic purposes as well as prawn seed collection for earnings are the reasons behind ill-health and vulnerability of the women.
9. Animal husbandry is affected due to higher cost of fodder and lack of fodder in common land resource.
10. Climatic hazard mainly tropical cyclone and flood affect the district under study mostly.

## VII CONCLUSION

Excessive dependence on agriculture can be reduced by exploring alternative livelihood like commercial fishing in case of both inland and marine aquatic ecosystems. Marine fishing can be improved by easy issuance of boat license certificate, improved technology for fish preservation, and satellite based telecommunication for weather forecasting and early cyclone warning. Storage and marketing of non-timber forest products should be more professional. Animal husbandry has a scope to flourish in this district. Due to poor transport network, milk and other perishable products cannot reach the municipal towns where demand is maximum. Finally it may be said that Women's SHGs are performing well in the creation of alternative livelihood in this district both in mainland and island area. In the forest fringe blocks participatory joint forest management is now successful in resource creation and forest management with the help of forest protection committees and eco development committees. People in this district have adjusted themselves with harsh climatic condition; so various mitigation measures have been taken up by administration to reduce vulnerability.

## References

1. Basu, R. (2013). Constraints of Biodiversity Conservation in the Fragile Ecosystems: The Case of Sunderban Region in Ganga delta of India. *The SIJ Transactions on Advances in Space research & Earth Exploration (ASREE)*, 1(1), 26-31
2. Bandyopadhyay, M. & Basu, R. (2017). Crisis of fresh water in south 24 District of West Bengal: Causes and Consequences. *IOSR Journal of Humanities and Social Science*, 22(6), 4-15.
3. Chakraborty, S. (2006). *Natural Hazards and Disaster Management*. Kolkata: Pragatishil Prokashak.
4. Council for Social Development. (2010). *India Social Development Report 2010*. New Delhi: Oxford University Press.
5. Misra, A.K. & Nag, S.K. (2009). Aquifer Characteristics in South 24 Parganas and Kolkata Municipal Corporation (KMC) Area, West Bengal. *Bhu Jal News*, 24(1) 28-36.
6. Park, C. (1997). *The Environment, Principles and Applications*. UK: Blackwell Publishers. Co.