I N T R O D U C T I O N

Rural development has become a foremost objective of the planners and the leaders of India since, the long known remark of a Great Indian Leader-"India Lives in villages" - is still conspicuous in the landscape of the Indian economy; about four-fifths of the total population are concentrated in six lakh villages of India.

In accordance with this situation an outlay of Rs.1,754 crores (1978-79) has been stepped up to Rs.1,811 crores(1979-80) by the Govt. of India. In the latest budget (1979-80), a special provision of Rs. 250 crores has been allocated for the improvement of 2300 villages of India. Yet, the total picture of the Indian villages does not display a glowing look; instead, a sort of grim, dark patches are found to overshadow the existing gleaming effect of the picture.

In the world context also, the repurcussions of the grim look of India is well reflected. As we find despite India's progress and prosperity in green revolution, nuclear energy, construction of highest dam etc, she lags far behind the richer nations of the world in respect of her per capita income while keeping a pace only with those countries like Burma, Indonesia, Nigeria etc. which are neither resource-endowed nor technologically advanced.

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But India's problem has to be tackled resting on the Indian platfarm only. The country, riddled with the problem of population explosion, lack of irrigable water, inefficiency of marketing, trade and transport etc. is too much dependent on one of the important components of physical environment viz. the vagaries of monsoon. Even if we consider the horrible effect of the unprecedented flood of 1978 and the drought of 1979, the sweeping effect of the nature i.e. of the complex phenomenon of physical environment, proves to be a pivot discarding new efforts or stagnating economic growth. Therefore, a deduction becomes axiomatic that for the development of India, the understanding of the underlying physical reality is a must, especially when the base of the Indian economy is predominatly rural. In the 65th session of the Indian Science Congress held in the year of 1978, the need of the intimate study of the physical environment in relation to its role in rural development has been emphasised as a focal point of discussions in the section of Geography and Geology.

Drawing the attention towards West Bengal, which occupies 2.4 percent of the total land of India supporting 8 percent of the total population and where the present study area belongs to, the picture of economic development is extremely patchy. Reference may be made to a report surveyed by the Calcutta Metropolitan Planning Organisation(1967)

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on the rate of economic development in West Bengal. The findings indicate that out of the total 139 Police Stations about nine Police Stations represent 'very poor' development regarding land utilisation, cropping pattern, marketing, trade, education, hospital, agricultural produce, industry etc; although this low belt is garlanded by belt of more developed areas. Seeking into the causes responsible for the development of this secluded low belt, the preponderance of the backward classes in the composition of the population in these areas is one of the noteworthy concern. Even after 12 years of survey no substantial change has been brought in the face of these areas.

The study area involves portion of these 'very poor' belt of Police Stations i.e. Binpur Block II of Midnapur, Nainpur and Ranibundh in Bankura which are drained by an affluent tributary of the river Kangsabati, Tarafhini by name. The Landscape does not present the typical, well cultivated, smooth green view of West Bengal, rather a rugged bleak appearance imparted by rocky outcrops, iron-rich nodular soil, inclined boulder-strewn courses interspersed with the dense forest is the character of the terrain. It is the home of a population of about 115000, about 80 percent of which is composed of scheduled castes and scheduled tribes.

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Three pertinent problems are found to riddle this area :-

1) The rain-fed river Teraphini, responding to the rise of monsoon, never spills its banks, but due to the high gradient and incised courses, rushes towards its confluence with the river Kangsabati generating flood over there i.e. in the lower Kangsabati basin, while the drained area of the Teraphini suffers from the acute shortage of water during 'Rabi cultivation'.

2) The forest which is an age-old feature closely related to the soil of the area is under the grip of deforestation resulting in 'erosional' rampant' in the area and destroying reserves of economic forests.

3) The variegated and checkered history of landform evolution has produced mineral concentration in the area which could provide avenue of employment for the poverty-stricken villagers of the area.

The purpose of the present study is to find out whether the various components of the physical environment i.e. Lithology, Climate, Relief, Soil and Vegetation which form the skeleton of the entire landscape, can contribute its potential plus point to provide 'the basic means of attaining given ends' (Zimmerman 1972).

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The idea of selecting river basin-wise study is three fold:-

i) The river called as 'natural irrigator of the land surface' (Thompson 1949) possessing one of the vital inherent resource attributes i.e. water, can give clue to solve the prime problem of the present area.

ii) Since the study involves analysis of the physical environment it is desirable that it should be done with a convenient areal unit defined clearly in terms of natural resources. A river basin which is considered a 'fundamental' geomorphic unit, (Chorley 1969) displays an evolutionary character of landscape resulting in a systematic change in terrain character, hydro-meteorological situation and vegetation.

iii) The recurring feature of water surplus condition of West Bengal created by the devastating flood and dearth of water during drastic drought highlight the necessity of river-basin-wise planning especially in those areas which are suffering from the water shortage in agriculture.

The organisation of the work consists of three phases. The first phase includes description of the various components of the physical environment, the second phase is concerned with the evaluation of the physical environment in terms of the resource appraisal and the third phase proposes a guideline for the future development of the area.

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The arrangement of the chapters is as follows :

PART ONE

Chapter 1 : General characteristics of the study area :

Location—— Historical Background—— Geological Layout Relief—— Climate—— Drainage—— Soil—— Vegetation Landuse—— Population—— Infra-Structural Facilities.

Chapter 11 : Geological framework :

Distribution Of Stratigraphic Units—— Composition. Distribution Of Lithologic Units—— Geological Structure, Precise History Of Tectonic Evolution.

Chapter 111: Climatic characteristics :

Characteristics Of Temparature—— Rainfall—— Evaporation Seasonal Distribution Of Climatic Parameters—— Nature And Frequency Of Drought, Flood .

Chapter IV : Relief and drainage characteristics:

Account of Relief And Drainage—— Quantitative Analysis Of Relief And Drainage With Practical Application—— Ground Water Study.

contd.....7.

Chapter V : Soil characteristics :

Main Soil Types—— Morphological Description and Analysis Of Selected Soil Profiles—— Agricultural Significance.

Chapter VI : Vegetation characteristics:

Type Of Vegetation—— Soil-Vegetation Relationship Distribution And Density Of Different Types Of Vegetation.

PART TWO

Chapter VII : Potentiality of water resource:

Existing Pattern Of Water Utilisation—— Problem Of Water Requirement—— Water-Balance Situation Study Of The Main Stream.

Chapter VIII : Potentiality of forest resource:

Role In Nature Conservation—— Wild Life—— Afforestation—— Distribution And Classification Of Economic Forests.

contd.....8.

Chapter IX : Potentiality of mineral resources:

Description, Mode Of Formation And Location Of Minerals Under Exploitation At Present —— Description And Location Of Potential Minerals For Future Exploitation.

PART THREE

Chapter X : Conclusion : a prelude for development planning:

Resource Endowments —— Relevant Problems Physical Environmental Approach To Provide Guide Lines For Development Plans.

Methodology : The entire work is planned in the following manner:-

Pre-field investigation:

i) Study of existing data, (Census hand-books of Bankura and Midnapur District(1971, the latest one), annual research reports of Forest Department of West Bengal(1975-1978), reports on tribal development projects of Tribal welfare department of West Bengal, climatological tables of Indian Meteorological Department(1967-77), reports of soil survey from Fertilizer Corporation of India,

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Agriculture Department of West Bengal, Presidency College, Calcutta, Soil Survey and Landuse Planning Department of India, working plans of Forest department of West Bengal(1966-1976).

ii) Interpretation of available air-photographs No. 7-51, 7-52, 7-53, 8-49, 8-51, 8-55, 8-59, 9-41, 9-43, 10-1, 10-2, 11G1, 11G2, (Scale 1:50,000)

iii) Anlysis of topographical maps published by the Survey of India No. $73/\frac{J}{9}/\frac{J}{10}/\frac{J}{11}/\frac{J}{13}/\frac{J}{14}/\frac{N}{2}$

Application of quantitative techniques e.g. Mean Elevation, Slope, Relative Relief, Dissection Index etc.

IV) Planning and design of field survey by noting down conspicuous points or sites obtained so far from different study, analysis and mapping. Preparation of a field questionnaire (Appendix)

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Field investigation :

i) Survey through questionnaire (Appendix) c. 7.

ii) Collection of soil samples, rock samples, river sediments.

iii) Scrutiny of data obtained by pre-field study.

Post-field activities :

i) Comparison of pre-field observations with field observation.

ii) Laboratory analysis of soil, rock and river sediments(Preliminary survey by the authoress herself and later authenticated by various recognised Govt. institutions)

iii) Study of the results obtained from Laboratory analysis of soil, rock, river sediments.

iv) Presentation of the thesis.

Problem Encountered During Survey: The area is not endowed with enough transportation routes and not properly developed; although in the Western part where forest is dense, road links are relatively better, the extreme remoteness of villages spaced even more than 1 km apart makes the fieldwork very difficult. The tribal people, were very co-operative and rendered all sorts of assistance, yet in certain localities their timidness and shyness, stood on the way of getting an acquitance with them.