INTRODUCTION

Agriculture is as old as human civilization and yet it is always in the process of transformation. But in spite of its dynamism many vestiges of the old forms still linger. The growth of industrial-commercial agriculture as in the modern societies has not completely obliterated the traditional ways of life. Such agricultural sophistication is not, however, uniform in our country. Spatial variations exist with the variations in science and technology. As the farmland areas of India have almost reached the saturation point, there is little scope for any substantial increase of her agricultural production through extension of cultivation and through increase of her per-unit productivity rate through intensive cultivation.

From early days till now Burdwan has been known to be the granary of West Bengal. There is every possibility and scope to produce a large amount of crop shares in West Bengal. Though the district enjoys variegated topography i.e. undulated land in the western part and flat land in the eastern, the district has been 'an important rice granary' since early days. Historically this district occupies a remarkable position in our country, where Burdwan Raj dynasty dominated the scene for decades. Though fallen from its pristine glory, the district is still one of the richest in West Bengal as one of the principal sources of food supply for the state.
The district of Burdwan, one of the western district of West Bengal, is situated between 22°56' N and 23°53' North latitude and between 86°48' E and 88°25' East longitude. In the map of India it is located at the eastern part. The district is bounded on the north by Santhal Parganas of Bihar; Birbhum and Murshidabad district on the east; by Nadia district, on the south by Hooghly, Midnapur and Bankura district and on the west by Purulia district. (Fig No. 1)

The total area of the district is 7028 sq. km. of which rural area is 6715 sq. km. and urban area is 313 sq. km. The total population of Burdwan was 3,916,174 among which 2,076,210 were males and 1,839,964 were females as per 1971 census. The total number of workers of Burdwan was 1,090,809 of which agricultural workers was 599,478 i.e. 27.40%, among which cultivators and agricultural labourers were respectively 24.23% and 30.58% according to 1971 census.

According to 1951 census, there were 24 police stations and according to 1971, there were 27 police stations. The additional three police stations Chittaranjan, Durgapur and Budbud were under Salanpur, Faridpur-Andal and Ausgram-Galsi police stations respectively. The following study has been made on the basis of the map of 27-police stations and only some on 24-police stations. The relevant data on soil, agricultural acreage-production etc. are collected on the basis of 24-police stations.
The object of this study is to focus attention on the influence of the topography, climates and unequal socio-economic conditions on the agricultural activities in the district of Burdwan. Since Independence, there has been considerable progress in agricultural production but the productivity per hectare has not shown any appreciable increase, as was expected. The district, however, occupies a remarkable position in agricultural production in India. Considerable opportunities exist for augmenting crop production in the district of Burdwan.

It is the district of Burdwan alone which was selected as an IADP (Intensive Agricultural District Programme) area in West Bengal during 1960-61, due to the favourable condition of topography (eastern part), drainage network, soil, climate and additionally greater agricultural production than that of other districts. As Burdwan was the richest food producer in West Bengal, where all the conditions of new package programme were present, the planners decided to initiate the Green Revolution in the district. During 1966-67, the new approach was initiated as strategy of agricultural development. Undoubtedly, it may be said that with undulated land at the western part and vast plain fertile land at the eastern part, Burdwan has been the main source of the food supply for the state of West Bengal from very early days.
So, importance was given to the growth of more production in Burdwan in terms of agriculture and hence several modern techniques and other necessary arrangements have been adopted. Therefore, it is an interesting study to analyse the spatial variation of acreage and production of crops in the district after Independence upto the present period. The question arises whether the trend-line of agricultural development in the district is increasing or decreasing or stagnant?

The name of Burdwan is suggestive in that it comes from the original word 'Vardhamana', which means 'increasing or prospering'. This is justified from agricultural point of view. Burdwan had so highly flourished agriculturally that there was no other district in India which could stand comparison with it. The agricultural operations adopted in it were considerably dependent upon nature. During ancient times the whole of the district was under Mughal emperors. In the mediæval period, the Zamindar was all in all, i.e. the landed property was under his control and he collected revenue from the public. During zamindari era the agricultural situation in Burdwan declined. The main causes of agricultural decline were natural calamities (flood, drought, cyclone, earthquake) and socio-economic condition of our country. In the middle of the eighteenth century Burdwan was under East India
Company and towards the end of this century Lord Cornwallis created the Zamindari system. In the past cultivation was made widely over the eastern part and in patches over the central part because the western part was covered by forests. The extension of cultivation horizontally was made throughout the district from the later part of nineteenth century. There was no regular system of rotation of crops in the period preceding twentieth century. In the western and central part the people were more attracted towards mining, factories than cultivated fields. After Independence, in the year 1950, the Fifth Plan programme was launched. During the first plan (1950-51), the highest priority was given to increase of agricultural production both horizontally and vertically for which there was very great scope in the district.

Physiography is the basic concept, its role in the veriegation of areal agricultural complex is primary and undeniable. The district of Burdwan is one of the largest districts of West Bengal with an elongated shape, "club or hammer shaped" from the river Bhagirathi in the eastern border to the border of the state of Bihar in the west. The relief of the district merges in the west with the periphery of the Archaean complex of the Chhoto Nagpur plateau.
and the Gondwana series in the form of a through extending from the coalfield region of Ranigunj to the Asansol-Barakar coalfield. The rest of the area is occupied by the deltaic formations drained by the rivers Damodar, Ajay and a number of other short non-perennial streams. The Ajay and the Damodar form for a considerable part the northern and southern boundary of the district respectively. The relief is characterised by a slow gradient from the northwest to the southeast, which is apparent from the direction of flow of the rivers with a drainage network. Topographically from west to east the district may be sub-divided into plateau fringe area, zone of degradation and zone of aggradation. The natural vegetation also depends upon topographical characteristics, climatic and soil conditions of the area. The important natural vegetations are Sāl, Babla, Banyan, Him, Palas etc.

Climate is the principal aspect of the physical environment affecting agriculture. The soil is the product of present and past climates and the vegetation has flourished on the soil. The uncertainties of weather have significant impacts on agricultural strategy and it is a constant source of fluctuation in production and quality of crops. From agricultural point of view, rainfall is the most important climatic factor and other factors are temperature, sun-shine,
wind etc. The climatic conditions differ in the district of Burdwan from west to east. The production of crop depends primarily on rainfall during monsoonal period (June-September) and in winter and summer the production of crop depends directly on the water of canal, deep-tubewell, well, and indirectly on rainfall. It is quite natural that late arrival and early retreat of the monsoon seriously hampers the growth of paddy. The temperature of the western part of the district is of extreme nature, i.e. very hot during summer and very cold during winter season. The variation of total annual rainfall of different parts of the district is not very remarkable, rather spatial variation of monthly rainfall is one of the principal factors for agricultural variability in the district. It may be said that dry area of the western part and wet area of the eastern part of the district have different potentiality of agricultural production.

Soil plays a very significant role in the development of economic condition of a region. One soil can be distinguished from another according to the variations in the nature of horizons in soil profiles. Fertility of soil seems to exert significant influence on the spatial distribution of cultivated land, spatial differences in the intensity of agricultural activities and also production of crops in the district of
Burdwan. Soil characteristics in a place result from the combined influence of climate and living matter, acting upon the parent rock material, as conditioned by relief over periods of time, including the effects of cultural environments and man's use of the soil. The western portion consists of lateritic and laterite soils and red soils and the eastern portion consists of Vindhya alluvium and gangetic alluvium. The alluvial area is very fertile, suitable for production of crops which consists of old alluvium and new deltaic alluvium. For the determination of soil productivity, it is necessary to analyse the physical and chemical properties of soil. Soil erosion by wind and water takes place throughout the district, though it is greater over the western part due to undulated topography. Due to inadequacy of surface water, sub-soil water are of considerable importance to agriculture. The depth to reach the sub-soil water spatially varies, it gradually decreases from west to east.

The total cropped area in the district increases with the increase in the area sown more than once and decreases in the fallow area. During the first two plan periods through irrigational facilities increased more or less, the relative positions of agricultural land use and production did not undergo any substantial change. In the eastern part most of
the lands are occupied by agricultural fields, about 70 per cent, whereas in the western part large portions of lands are occupied by factory and mining areas. Area under agricultural crops does not remain constant for all the year. In years with unfavourable weather conditions the cropped area decreases. The irrigated areas under kharif crops are more than those under Rabi crops. Size of holding varies over space and time in the district. Fragmentation of land is more pronounced in the western part than in the other parts of the district. Fragmentation of holding hinders agricultural progress and it interferes with the full utilization of land. The cultivation of double or triple crops is limited within a few police stations due to lack of water.

Due to the diversity in physiography, soil, climate, economic and social setup, the district of Burdwan produces a large number of crops. Cropping pattern means both the time and space sequence of crops. The cropping pattern changes with the improvement in technology and economic factors. Paddy is the principal crop in Burdwan. Due to the greatest importance of paddy among the crops in the district, secondary crops, i.e. wheat, potato, pulses, jute, sugarcane, oilseeds etc. occupy a proportionately lower percentage of the net sown area. Monthly rainfall is unevenly distributed in time
and space, being excessive in one part of the district and insufficient in the other, which hampers the pattern of crop. There is need for wise planning of our cropping pattern with due regard to the climatic limitations. The maximum area of land is used for the cultivation of Aman paddy. The high yielding variety paddy gives better yields as compared to local varieties. The acreage and productivity of HYV paddy is better in Rabi than in Kharif season. The area under double cropping is low in the western part, and high in the eastern part of the district though there exists to some extent spatial variations. Among the secondary crops, only pulses and oilseeds are grown in the western part of the district because of scarcity of water. With irrigation facilities, multiple cropping can be adopted all over the district, specially the dry crops (pulses, Ragi, Jowar, Bajra, vegetables etc.) at the western part.

Revolution, as applied to agriculture, means in effect, a transformation from old and lower level of production to new and higher level. In short, 'Green Revolution' brings about a large increase in agricultural production — and such production takes place in a short space and time by means of high yielding varieties of seeds and new methods of cultivation. The core of the new technology consists of new-researched HYV-seeds with optimum inputs, such as irrigation,
fertilizer and pesticides under new agricultural practices, i.e. use of scientific implements and techniques. Although the change in agricultural production has taken place during last two decades in the district, yet it varies spatially. Such spatial variation of agricultural production in its turn is also directly or indirectly related to physiography, inadequate inputs (irrigation, fertilizer, pesticide, scientific implements, credit etc.) and socio-economic condition of the farmers. These HYV seed require regulated application of water with good drainage facilities at the same time. Unfortunately, the timing for irrigation, which is the essence for optimum yield, is a vexed problem in this district because of vagaries of weather. A major part of the district still follows the traditional pattern of agricultural practices. So it is necessary to train and guide the farmers along the right line by district agricultural department.

It is possible to provide full picture of the agricultural geography of Burdwan by collecting information, as available in statistical form, from other sources like the reports of administrators, agricultural officers, soil survey office, meteorological office, and personal investigation in different fields-data information with technical observations that may be helpful in planning for agricultural development of the district. Different types of methodology has been applied
in the following chapters to illustrate and express the agricultural condition of the district.

The first chapter deals with the historical aspect of the development of agriculture in the district. The second chapter deals with the physiography and its relationship with agriculture in the district. The third chapter is about the climatic and agricultural instability in the district and the fourth chapter is about soils and their characteristics and influence on agriculture. The fifth, sixth and seventh deal with changes in land utilisation and trends in agricultural production in the district, cropping pattern in Burdwan and impact of Green Revolution on agriculture in the district of Burdwan.