INTRODUCTION
EYE is pre-eminently involved in vitamin A
deficiency and it is thought to be the most important cause
of childhood blindness in many underdeveloped countries like
India, Bangladesh, Pakistan and other countries of South -
East Asia. It is also endemic in countries like Lebanon,
Thailand, Brazil, Haiti, El Salvador and parts of Africa.
A globol survey carried out by WHO in 1962-63 confirmed that
vitamin A deficiency significantly contributes to the preva-
ience of blindness in these parts of the world. McLaren
(1970) estimated that blindness acquired due to hypovita-
miosis A was 100,000 per year throughout the whole world.
According to the estimate of the Government of India,
10,000 children become blind annually due to vitamin A defi-
ciency in India. But the First General Assembly of the Inter-
national Agency for the Prevention of Blindness (I.A.P.B.)
held in Oxford in July, 1978, said, 'The statement that
100,000 children will become blind from xerophthalmia each
year is now out of date in the light of new data which indi-
cates that the problem is far more serious. Latest figures
from Indonesia suggest that at least a quarter of a million
are likely to suffer blinding xerophthalmia'. Figures
from India also suggest that previous estimates were too
low and F.A.O. (Food and Nutrition 3, No.3, p.29, 1977)
reports an annual incidence of 300,000 children becoming
blind each year from xerophthalmia (Quoted from Xeroph. Club Bull. No. 16, Oct., 1978).

While these estimates are largely based on clinical impression, they have resulted in pilot or nationwide public health intervention programmes in at least half a dozen countries. The first step in any intervention programme should be a proper assessment of the severity and magnitude of the problem. Evidence from El Salvador (Sommer et al, 1975) suggest that reports of hospitalized keratomalacia case and surveys of serum vitamin A levels provide unreliable estimates of resultant corneal destruction and blindness in the community at large. Such data can be best acquired through careful regional or countrywide clinical prevalence surveys.

Xerophthalmia literally means 'dry eye' and in this restricted sense is a term used exclusively by ophthalmologist to describe the changes in the eye that occurs when the secretion of the paraoocular glands or of the goblet cells of the conjunctiva is less, leading to discontinuity of the fluid films usually present over the surface of the conjunctiva and cornea. This desiccation may result from a variety of clinical conditions, but the xerosis or dryness consequent upon vitamin A deficiency is far the most common and important cause. In a broader sense
and in a public health context, the term xerophthalmia was chosen to apply to the syndrome of severe vitamin A deficiency (McLaren, 1966). In our present study also, we have used this term synonymously with 'anterior segment ocular pathology due to vitamin A deficiency'.

**Significance of xerophthalmia due to vitamin A deficiency:**

In its relationship to the health of a population, a disease may be considered from four main points viz.: (1) Severity, (2) Morbidity, (3) Mortality and (4) Prevalence. On all these four counts vitamin A deficiency may be considered to have great public health significance and to merit high priority.

1. **Severity** - Blindness, either partial or complete which is usually irreversible, is the frequent outcome of xerophthalmia. The seriousness of this condition to the sufferer, to his parents, other close relatives and to the community at large, and its socio-economic consequences, are self evident. In many developing countries xerophthalmia is the most common single factor of blindness in infants and pre-school age children.

2. **Morbidity** - Blindness due to xerophthalmia almost invariably occurs in early childhood, resulting in disability of the individual and placing a heavy burden on the society. Available data suggests that 25% of the survivors of severe xerophthalmia ($X_3A + X_3B$) remains totally
blind; about 50-60% are partially blind, and only 15-25% escape with unimpaired sight (WHO Tech. Report Series, 590: p.9, 1976).

3. Mortality - Vitamin A deficiency is associated with high mortality; although it is rarely the sole cause of death, it is an important contributory cause when present. Most of the deaths associated with xerophthalmia occurs in infants and in children in the second year of life. In Denmark, during the First World War the fatality rate was 24% (Blegvad, 1924); several reports from Indonesia quote rates of about 35-40% (Doesschate, 1968); the fatality rate was 60% in Jordan (McLaren et al, 1965).

4. Prevalence - Vitamin A deficiency is widely prevalent in the densely populated countries of the Southern and Eastern Asia and also in parts of Africa, the Middle East and Latin America among the low income-group people with large sized family and poor living conditions.

It has also got a seasonal variation, particularly more prevalent in summer season which turns worse if associated with natural calamities like floods, famine, earthquakes etc.

Background of the present study:

The state of Assam has a composite geographical situation. It is surrounded by hills. It is gifted with several turbulent rivers which inundate large areas of the
state in the summer causing widespread damage to the crops and vegetables. This is most often followed by epidemics viz. gastroenterities and other deficiency diseases. The state has got a large tea-industry, oil fields and few collieries where thousands of poor labourers earn their livelihood. The valleys are inhabited mainly by the large masses of rural population, 80% of whom depend solely on agriculture. There are also the hill tribal people with very poor economic conditions. In the urban areas the slum-dwellers are exposed to various deficiency diseases. The joint family system in Assam is usually associated with poverty. Therefore, they are very prone to deficiency diseases. Children below 12 years of age constitute about 40% of the whole population of Assam.

Several studies were conducted on deficiency disease-pattern in children in Assam by different workers; out of them the studies of Gilroy (1951), Dutta(1962), and of Dutta et al (1971), are worth mentioning. Gilroy in 1951, observed xerophthalmia in 250 out of 4191 children examined, in 44 tea-estates of Assam. In 1962, a study of 'Pattern of eye diseases' amongst children attending the eye out patient department of Assam Medical College Hospital, Dibrugarh, revealed that vitamin A deficiency manifestations are present in 11.41% of children attending the Out patient department (Dutta,1962). Since 1962, about 30-40 cases of
keratomalacia have been admitted annually in the Eye Department of Gauhati Medical College Hospital and hospital statistics showed that the number of various degrees of xerophthalmia cases attending the out patient department varies from 100 to 150 per year. The incidence of keratomalacia is found to be more during monsoon.

In a hospital based study in Gauhati Medical College (Dutta et al, 1971), it has been found that the xerophthalmia occurs more commonly in families having six or more family members and in families with poor socio-economic status. It was found that male children were more affected (71.8%) than female children (28.1%). 78.1% of the children with keratomalacia were found to have intestinal helminthiasis and 87.5% suffered from gastroenteritis prior to development of keratomalacia. In this study vitamin A concentration in children with keratomalacia was 20 micro-gm.% (Normal control group, 55 micro-gm.% ) and the mean concentration of total protein was 7.31 Gm.. In addition to the above factors, it was suggested that poor diet played a key role in producing keratomalacia.

General nutritional status of the tea-garden labourers is usually poor. In a study of 19 control and 32 cases of xerophthalmia amongst the children of two tea-gardens in Upper Assam by a separate group of workers (Thesis for M.S., Ophth. Exam., Dibrugarh University, 1971) the mean vitamin A
concentration of the control (normal) group was found to be 21.9 micro-gm.% and in keratomalacia it was 8.2% micro-gm.%; the corresponding values for total protein being 6.4 and 5.7 Gm.%.

Aims of the present study:

Though, different studies were undertaken previously on vitamin A deficiency diseases in Assam, most of them were done in hospitals and tea-gardens. The present study relates to a field study covering a wide range of children in various localities viz. rural, urban, and tea-garden areas of Assam. The aims and objectives of the study are to:

1. Determine the prevalence and estimate the magnitude of anterior segment ocular pathology and blindness due to vitamin A deficiency in Assam and its relationship to the child's age, sex, nutritional and socio-economic status.

2. Determine the prevalence of various grades of xerophthalmia amongst the children examined.

3. Determine the geographical distribution of corneal destruction and xerophthalmia in urban, rural and tea-garden areas and to identify the regional factors responsible for this variations.

4. Determine the seasonal variation of the disease.

5. As due to frequent floods and poor socio-economic status, keratomalacia is the commonest cause of blindness.
in children of Assam, it is hoped that the results of the present study will be helpful in planning prophylactic public health programmes in prevention of blindness in Assam.