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Antioxidant-activity and Physicochemical Indices of the Rice Beer Used by the Bodo Community in North-East India

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Ethnic food beverages with heavy metal contents: Parameters for associated risk to human health, North-East India

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ABSTRACT

Food beverage consumption is a worldwide age-old practice. It is also a common run-through habit among the tribes of North Eastern parts of India. The food beverage group Jou is a traditionally fermented rice-based beverage by Bodo community of Assam, the largest plain tribe. It is not only consumed by Bodos on regular basis but also widely used in their socio-cultural activities. Joubidwi (JB, fermented product), Joufnai (JF, preserved product) and Jougwran (JG, distilled) are the three varieties of Jou. Herewith, it had been reported; the concentrations of metals such as Cd, Co, Cr, Cu, Fe, K, Mn, Na, Ni, Pb and Zn in the three varieties of Jou to make people aware about the possible health benefits as well as the risks associated with the consumption of Jou. The metal contents were estimated using ICP-OES after digesting the samples with 10:1 mixture of concentrated nitric and concentrated sulfuric acid. The estimated daily intakes (EDI) of metals from consumption of JB, JF and JG were also within the recommended daily allowances (RDA). From the estimated target hazard quotient (THQ) values, it was observed no health risk associated with the consumption of Jou; whereas total target hazard quotient (TTHQ) of Joufnai were associated with more health risks. Metal concentrations of all metals in Bodo beverages was lower in comparison with barely based and wheat based beverages.

1. Introduction

Metals in food beverages play a significant role on different aspects concerning the quality and acceptability of the beverages by consumers.¹ The metal content in beverages affects consumption and preservation. [1] Both positive and negative effects are possible. Dietary intake of minerals and removal of bad odour include positive effects but beer hazing, sensorial health consequences, toxicity from excessive intake of metals, etc. are some of the negative effects. [2,3] Brewing procedure, raw materials used, storage or aging, equipment/ utensils used are the main sources of metals which find their way into food beverages [4]. Essential metals like Ca, K, Cu, Zn, Co, Fe, Mn etc. have pivotal role in human biological system [5]. Copper and iron ions are required for metalloproteins synthesis [6,7]. However, excessive intake of Fe may lead to Parkinson's disease due to deposition of iron oxide [8]. Again, excessive intake of Cu may cause oxidative stress, diminished activity of antioxidant enzymes and subsequent tissue damage [9,10]. Even small amount of Cd and Pb are toxic. Cadmium accumulation in biological systems can cause hypertension and tumours [9,12]. Because of long biological half-life, longer accumulation of Cd may lead to kidney

damage [13]. Higher level of Pb is responsible for kidney and liver damage, mental retardation, impaired hearing and shortened gestation period [7,14,18]. Elevated intake of essential metals also produce toxic effects, for instance, excessive Zn is considered responsible for increased prevalence of obesity [5]. Heavy metals can enter the human body through ingestion, inhalation and dermal absorption [15]. For example, 15 % inorganic Pb is absorbed to human body as compared to 80 % of organic Pb by ingestion [15].

Food beverage production and consumption is a popular practice among tribal communities of North-East India. [14] Bodo community of North-East India also uses their traditional food beverage Jou for their livelihood. Consumption is highly acceptable in various socio-cultural activities. Despite of wide range of consumption among the community people, metal profile of Jou is not reported yet. The traditional manufacturing protocol is shown in Fig. 1. Herein, we are reporting the metal concentrations of Cd, Co, Cr, Cu, Fe, K, Mn, Na, Ni, Pb and Zn in all the three varieties of Jou. Provisional tolerable intakes are also estimated to assess the risk factors to human health from metal intake arising from the consumption of Jou. Target Hazard Quotients (THQ) provided by Environmental Protection Agency (EPA, Washington DC)

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Socio-Economy Status of Women in Vedic and Later Vedic Period

Dipamoni Ozah

Abstract:

According to Swami Vivekananda, "The best thermometer to the progress of nation is its treatment of women." In India's ancient culture women was very much honored. At the Vedic period the women were recognized by the term 'JANANI' (The Mother). In the Hindu scriptures, women are considered as 'Devi' and 'Shakti', the most unique symbol of love and creation. In the Vedic period women have given enormous freedom and they have easy access to education but in the later Vedic period some discrimination against women can be observed. Child marriage, Sati norms, lack of education are some of the major problem faced by women's in this period. If we compared the modern time with this ancient times the position of women can be seen as more deteriorated despite having modern technology based education and constitutional provisions against women's crime. This paper mainly tries to analyzed the socio-economic status of women during the Vedic and later Vedic period using some secondary data.

Keywords: Vedic, Norms, Scriptures, Women, Discrimination, Modern.

1. Introduction

Generally, women's status means her position in the network of social role structure, privileges, rights and duties. It also refers to her rights duties in family and social life. In a simple standard the status of a women is measured in the comparative amount of prestige and respect accorded to her with that of women. Women played an important role in the arch of Indian society. In Indian history, the Vedic period (1500-500 BCE) is the period in the past Bronze age and early Iron age, when the Vedas were formulated in the north Indian subcontinent between the end of the urban Indus valley civilization. The status enjoyed by the Indian women during the Vedic period cannot be easily evaluate. The literature on Indian history swarm with contradictory and conflicting views on the position of women. According to the obtainable literature, there was an environment where the integrity and dignity of

women was respected and women had the liberty to choose for their better position and because of which they played an important role to rise and formation of Vedic culture. During the medieval period due to several disturbance and influence of the Islamic culture especially women's situation became more deplorable in India. They became much vulnerable to various social customs such as the fashion of veil system and social interweave of women completely became a taboo. There are four Vedas in numbers, Rig Veda, Sama Veda, Yujur Veda and Athurva Veda from which the Vedic writings was acquired. It is Rig Veda, the oldest known literature in the whole world that contains 1,028 mantars written by a number of priestly families of which some were even contributed by 27 women called Brahmavadinis who enjoyed family life as well. The socio economy status of Indian women varies differently in different period. Through this paper, an analytical discuss can be made on status of Indian women during Vedic and later Vedic period.

2. Objective

The main purpose of this paper is to provide a brief scenario of the socio economy status of women in the Vedic and later Vedic period.

3. Methodology

Both analytical and descriptive methods are used for preparing this paper. The method in determining the data are based on secondary data and data has been collected from various books, reports, journals and websites.

4. Literature Review

Many authors and researchers have given various view regarding the position of women in the ancient and Vedic period. It is evident from the works of earliest writer like Katyayana and Patanjali that women had given proper education in the early Vedic period. Women had also given freedom to select life partner for marriage. In ancient India, women enjoyed a position of respect and reverence (Jayapalar, 2001). According to Dr. Shashi Punam and Naina Sharma, the status of women in Southern India was better than



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অসম বেচম শিল্পৰ অৰ্থনৈতিক অৱস্থা আৰু ইয়াৰ সমস্যাসমূহ

□ দীপামণি গুজ্জা

সহকাৰী অধ্যাপক, অৰ্থনীতি বিভাগ, শিবসাগৰ ছোৱালী মহাবিদ্যালয়, শিবসাগৰ।

সংক্ষিপ্তসাৰ : উত্তৰ-পূৰ্ব ভাৰতৰ অন্যতম উল্লেখনীয় ৰাজ্য হৈছে অসম। অসমৰ বেচম শিল্প আৰু ইয়াৰ উৎপাদন প্ৰক্ৰিয়া পৃথিবীৰ বিভিন্ন স্থানত পৰিচিত। অসমৰ বেচম শিল্পই অসমৰ সভ্যতা সংস্কৃতিক এক উচ্চতম স্থানত অৱতীৰ্ণ কৰোৱাৰ লগতে অসমৰ অৰ্থনৈতিক উন্নয়নতো এক গুৰুত্বপূৰ্ণ ভূমিকা পালন কৰিছে। অসমত প্ৰাকৃতিক ভাৱে উৎপাদন হোৱা এই বেচম শিল্পক অসম বেচম নামেৰেও জনা যায়। ভাৰতৰ মুঠ বেচম শিল্প উৎপাদনৰ প্ৰায় ১৫ শতাংশ অসমে উৎপাদন কৰি ভাৰতৰ ভিতৰত তৃতীয় বেচম শিল্প উৎপাদক ৰাজ্য হিচাপে প্ৰতিষ্ঠা লাভ কৰিছে। এই গৱেষণা কাকতৰ জৰিয়তে অসমৰ বেচম শিল্পৰ অৰ্থনৈতিক অৱস্থাৰ বিষয়ে আলোকপাত কৰাৰ লগতে বৰ্তমান সময়ত অসমৰ বেচম শিল্পই সন্মুখীন হোৱা বিভিন্ন সমস্যা সমূহৰ বিষয়ে বিশ্লেষণ কৰিবলৈ চেষ্টা কৰা হৈছে।

বীজ শব্দ : বেচম শিল্প, উৎপাদন, প্ৰাকৃতিক, সভ্যতা, সংস্কৃতি।

০.১ আৰম্ভণি :

অসম এখন প্ৰাকৃতিক সম্পদেৰে ভৰপূৰ ৰাজ্য। অসমৰ অস্থিতীয় মৌচুমী জলবায়ু মাটিৰ গুণাগুণ আৰু ভৌগোলিক পৰিবেশে বিভিন্ন প্ৰকাৰৰ বেচম শিল্প উৎপাদনত সহায়ক ৰূপে পৰিগণিত হৈছে। ৰামায়ণ মহাভাৰতৰ যুগৰে পৰা অসম তথা কামৰূপ প্ৰকৃতিৰ অক্ষয় ভাণ্ডাৰ হিচাপে গণিমা অৰ্জন কৰি আহিছে। অতীত কালৰে পৰা অসম এখন কৃষিভিত্তিক ৰাজ্য আৰু অসমৰ প্ৰায় এক তৃতীয়াংশ লোকেই প্ৰত্যক্ষ আৰু পৰোক্ষভাৱে কৃষিৰ লগত জড়িত। বেচম শিল্প হৈছে পৌৰাণিক এক প্ৰকাৰৰ কৃষি নিৰ্ভৰশীল শিল্পকাৰ্য আৰু এই শিল্প সংস্কৃতি বিভিন্ন ধৰণৰ কাক কাৰ্যৰ লগত এক বৃহৎ পৰিমাণৰ অসমীয়া জনসাধাৰণ জড়িত হৈ আছে। সাধাৰণ অৰ্থত পাট-সূতা পাবলৈ পাটপলু প্ৰতিপালন কৰা বা পোহাক বেচম শিল্প বোলে। অসমৰ বেচম শিল্প প্ৰধানকৈ চাৰিটা ভাগত বিভক্ত কৰিব পাৰি; এই বোৰ হ'ল— মুগা, এৰী, নুনি আৰু টচৰ বেচম। এইসমূহৰ ভিতৰত মুগা আৰু এৰীপাট সূতাই অসমৰ বেচম শিল্প উদ্যোগত মুখ্য স্থান অধিকাৰ কৰি আহিছে। নুনি শিল্প প্ৰক্ৰিয়াও হৈছে অসমৰ এক পৌৰাণিক কলা-সংস্কৃতিক। আনহাতে টচ শিল্প হৈছে বৰ্তমান বেচম উদ্যোগত এক নতুন সংযোজন। গতিকে মুগা শিল্পৰ বিকল্প হিচাপে বৰ্তমান সময়ত এই শিল্প পৰিগণিত হৈছে যদিও উপযুক্ত আধুনিকতাৰ অভাৱত লঘু উদ্যোগ হিচাপে বিবেচিত হৈ আহিছে।

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০.২ অধ্যয়ন পদ্ধতি :

এই প্ৰবন্ধটি প্ৰস্তুত কৰোঁতে বৰ্ণনাত্মক আৰু বিশ্লেষণাত্মক দুয়োটা পদ্ধতিৰে সহায় লোৱা হৈছে। প্ৰবন্ধটিৰ বাবে প্ৰয়োজনীয় গৌণ উৎসৰাজি বিষয়বস্তুৰ লগত সংযোজিত বিভিন্ন গ্ৰন্থ তথা ইণ্টাৰনেটৰ পৰা সংগ্ৰহ কৰা হৈছে।

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VALUE ADDITION TRAITS OF NOVEL MINOR FRUITS OF ASSAM - NAGATENGA (*Rhus semialata*) AND LETEKU (*Baccaurea sapida*)

Syeda Nishat Firdusi¹, Ruma Bhattacharyya, Mridula Saikia Barooah, Pranati Das and Ananta Saikia

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ABSTRACT

The *Rhus semialata* (Nagatenga) fruit is small, round in shape and less than one inch in size and the fruit of *Baccaurea sapida* (Leteku) is yellowish and velvety, 2-3 cm in diameter with leathery pericarp. The shelf life of the fruits *Rhus semialata* and *Baccaurea sapida* is 1-2 days and upto 7 days, respectively under room temperature. These fruits can be considered as super foods as the study reveals that the fruits are accumulated with well-balanced nutrients and health protective compounds such as minerals, vitamins and phytochemicals. The physical and quality characteristics (edible portion, juice content, pulp content, acidity, TSS, pH, pectin) of the fruits reveals that they are suitable for producing various value-added products like beverages, sauce, pickle, jelly, etc. According to these characteristics, *Rhus semialata* fruits can be considered for making squash, sauce, pickle and chutney. *Baccaurea sapida* fruits due to being highly juicy with less pulpy characteristics are more suitable for beverage making; even good wine can be produced from this fruit. These minor fruits could be made available throughout the year and to the areas far from their site of yield by minimizing their post-harvest losses by extending the shelf life by processing them to different value-added products.

Keywords: *Baccaurea sapida* (Leteku), Minor fruits, Nutrients, Phytochemicals, *Rhus semialata* (Nagatenga), Value-addition.

Assam is a land of fruit crops either cultivated widely or grown as minor fruits, many of which are loaded with nutraceuticals and health protective compounds. Despite having desired level of fruit crop production, the fruit requirement per person per day still remains insufficient, as the fruits are highly perishable. The post-harvest losses of these perishable fruits are a serious problem and fruits fail to reach the market in fresh state resulting in price losses which are unremunerative. The high level of fruit losses from farm to consumer level demands for techniques to enhance the shelf-life of these fruits to overcome the fruit waste (Food and Agriculture Organization, 2019). Processing and preserving fruits into value added products can play an important role in utilizing the fruits with minimum wastage and magnifying farmers earning. *Rhus semialata* and *Baccaurea sapida* are two such perishable minor fruits of Assam. *Rhus semialata* is a small, round fruit with less than one inch in size. The fruit is deep green when tender and light green to dull green when fully ripe. The fruit is sour and juicy in nature but gives a sweet taste when fully ripe and requires 100-120 days from fruit set to maturity. The fruit of *Baccaurea sapida* is yellowish and velvety, 2-3 cm in diameter with leathery pericarp, three to four seeded arillus embedded in pinkish white pulp and the fruit becomes mature at approximately 85 days after fruit set. The shelf-life of the fruit of *Rhus*

semialata and *Baccaurea sapida* is about 1 to 2 days and 7 days respectively, under ambient temperature.

Traditionally, the people of Assam, process *Rhus semialata* into chutney and pickle (Patni and Borah, 2007). Apart from preserving, they also use the fresh fruits to control diarrhoea and dysentery (Rout *et al.*, 2012). *Baccaurea sapida* fruit is considered as health protective fruit as it contains high amount of vitamin C, protein and iron. The juice of the fruit is used to cure constipation. The fruit, if fermented develops into wine and vinegar (Goyal *et al.*, 2013). Considering the importance of these fruits, the present research work elaborates the nutritional and health protective properties along with their suitability to develop value-added products.

MATERIALS AND METHODS

Fruit collection and sample preparation

The mature fruit of *Rhus semialata* (Nagatenga) was collected from Morioni, Jorhat district, Assam during April 2015 (Fig. 1). Mature fruit of *Baccaurea sapida* (Leteku) was collected from Golaghat district Assam during June-July 2015 (Fig. 2). The maturity of the fruits was determined as per the day from fruit set and the practical knowledge of the local people who had the idea of the right harvesting period. The physical parameters of the selected mature fruits were studied on the day of harvesting using standard methods. The

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श्री लक्ष्मी

Indian Silk



Dyeing of silk with natural dyes: An eco-friendly approach



Cochin goroka plant

Considering the growing importance of natural colourants all over the world, the study was undertaken with an aim to develop the dyeing conditions of the bark of *Garcinia xanthochymus* Hook. f. locally known as tapor tenga on mulberry silk yarn. Brilliant golden yellow shades are obtained from the selected dye. Fastness grade of the dyed samples are found to be good irrespective of sunlight, washing, perspiration and rubbing. Hence, the dye is an ideal and natural source for dyeing of mulberry silk yarn.

Natural dyes have been a part of man's life, since time immemorial. The age-old art of dyeing with natural dyes was common in India. These dyes are obtained from natural sources such as vegetable matter, minerals and insects. Early efforts of colouring fabrics were hampered by the fact that some of the dyes were not very colourfast. Eventually, scientists found that this defect could be partially overcome by the use of mordants. The natural colouring substances are now developing trends for their use all over the world because of health hazards and toxicity problems created by the synthetic dyes.

Objective

The present work was undertaken with an aim to develop the dyeing conditions of select natural dyes on mulberry silk yarn. The bark of *Garcinia xanthochymus* Hook. f. locally known (in Assam) as tapor tenga (Common name: Cochin goroka) belonging to the family of Guttiferae/Clusiaceae was used to extract the required dye material.

Selection of mordant

Mordant acts as the link between dyestuff and fibre. It allows the dye with no affinity for the fibre to be fixed.

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Among the mordant used for fixing natural dyes, metallic mordants are most common. The mordant used in the research work is Aluminium potassium sulphate (alum) which is considered as eco-friendly.

The amount of mordants used in dyeing plays an important role. After much preliminary work, the mordant concentration was determined which was mainly based on the percentage of absorption of the dye and visual assessment of the shade. Three mordant percentages were used and the observations were made at three levels i.e., 5, 10 and 15% concentrations.

Mordanting method

Pre-mordanting method was used for this study. In this method, the yarns were mordanted in the first stage and then dyed. First optical density of the extracted dye liquor was recorded. 5, 10, and 15% solution of alum were prepared by dissolving in water. Yarn samples were then

Table 1: Optimized dye material extraction time by determining optical density

Dye yielding plant - <i>G. Xanthochymus</i>	
Extraction time (min.)	60
Wave length (nm)	500
Optical density	0.376

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**INTERROGATING THE NATURE/CULTURE DICHOTOMY: A POSTSTRUCTURALIST
READING OF SELECT MISING FOLK TALES'**

Shiva Prasad Mili

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Abstract

During the 19th century, there were attempts to find hidden meanings in tales generally based upon the theory that they were broken-down myths and had lost their original meanings through linguistic misunderstanding. The result was that this "original meaning" was always found to be some conflict between weather or seasonal phenomena (winter, summer; clouds, sunshine; etc.). This type of interpretation is now out of fashion and has given place sometimes to explanations based upon ancient rituals or to some variety of psychoanalytic treatments. By the early 20th century, theories on analyzing literary texts have gained momentum with help from a variety of disciplines, including and not limited to linguistics, anthropology, psychology, economics, biology, sociology, and the humanities. Vladimir Propp might have elucidated the inner structure or pattern of the folktale, whereas Claude Levi-Strauss provides grounds for why it is structured the way it is and how to possibly interpret it. Both, however, fall short of providing a thorough understanding of why humans think as they posit. However, for this paper, the poststructuralist mode of interrogating the Nature/Culture dichotomy has been adopted in the analysis of select Mising Folk tales. Like all other tribal folklore, Mising folklore owes its origin to the Mising people's imagination, their ideas and thought and particularly, their social consciousness and bears the distinct evidence of heroism and immortal love. Mising folk tales abound in numbers of tales about brother-sister, religious rites and rituals and natural calamities. The tales were embellished with the attitude of the ancient Mising people to life concerning nature. Noticeably, there is excessive use of totemism, mana and taboo in Mising Folk tales. Mising folk tales were but the natural consequences of their fear of the ancient people's unable to explain the causes of natural calamities and different aspects of nature.

Keywords: Mising, Folktales, Nature / Culture dichotomy.

Introduction

Folk tales are the earliest form of traditional imaginative literature that is oral literature that has come down to us from generation to generation through the lips of the common people of any land. True folk tales are by nature anonymous because no one wrote them, they evolved off the nature of man to tell and listen to tales. They comprise unwritten fiction of early man, unsophisticated people in all parts of the world. They enlighten us on the human imagination in our childhood, the attempts of our ancestors to convey their understanding of the world, their ideas and their beliefs, their customs and manners of living in the garb of memorable narrative. Folk tales are very much older than their name of study.

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Studies on nutraceutical properties of *Flacourtia jangomas* fruits in Assam, India

Bimal Dutta and Nayanmoni Borah

Abstract

Searching of nutraceutical properties of fruits has in recent years received much attention in different parts of the world owing to its relevance in discovery of health beneficial foods. *Flacourtia jangomas*, a semi-cultivated fruit plant, having some medicinal as well as economic value, is found frequently in the Brahmaputra valley of Assam and adjoining areas in the northeastern parts of India. The present study has been carried out to make a survey for bioactive compounds, like, alkaloids, flavonoids, phenols, terpenoids, tannins and saponins, and to determine the total phenol and flavonoid contents in the ripe fruits of *F. jangomas*. It has found that the methanol extract of the fruits contains most of the searching bioactive compounds and the total phenol and flavonoid contents are 20 mg/g and 2mg/g respectively. Findings of the study have provided the evidences that the fruits of *F. jangomas* have the nutraceutical potency.

Keywords: *Flacourtia jangomas*, nutraceuticals, secondary metabolites

1. Introduction

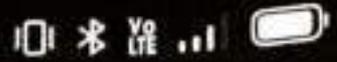
Nutraceutical, comparatively a newer term in the food science research, is used to describe any product derived from food sources that provides extra health benefits, i.e., able to decrease the risk of disease, in addition to the basic nutritional value found in food. The term nutraceutical is a hybrid of nutrition and pharmaceutical, coined in 1989 by Stephen Defelice [1]. Searching of the nutraceutical properties of foods has in recent years received much attention in different part of the world owing to its relevance in discovery of health beneficial foods. Fruits have been recognized as one of the most valuable sources of nutraceuticals due to presence of bioactive compounds like alkaloids, terpenoids, tannins, saponins and polyphenols. The most commonly occurred polyphenol in food are flavonoid and phenolic acid [2]. These bioactive compounds are produced through secondary metabolism in different plants. The nutraceutical value of these substances lies because they have definite physiological action on the human body [3].

Assam, a state in the North-Eastern region of India, is one of the richest biodiversity hotspot of the world due to diverse topography, climate and agro-ecological conditions. A number of plant species including fruits have their origin in this region, many of which are still grown in wild or semi-wild states. Despite the vast genetic diversity of these fruits, only a few have been grown as commercial crops for their economic, social and religious importance. However, a number of fruits remained confined in semi-wild or semi-domesticated conditions and are rarely known in other parts of the country. These underutilized fruits have multipurpose uses and therefore play significant role, especially, for the wellbeing of rural people by providing nutrition, household income and employment. Many of these fruits have been used as traditional medicinal plants and some have found important place in the Indian system of Medicine and Unani since time immemorial. Moreover, these plant species are good tools for scientific investigations as well as important genetic resources of the country. *Flacourtia jangomas* (Lour.) Raeusch (family: Flacourtiaceae), locally known as 'Panial', is a semi-cultivated fruit plant found frequently in the Brahmaputra valley of Assam and adjoining areas in the northeastern parts of India. The plant has some medicinal as well as economic values. It is mainly cultivated for its edible fruit and hard wood. The fruits are dark red or purple when ripe (Photo-plate 1) and eaten raw or used for making jams and preserves [4-5]. Different plant parts are also pharmaceutically used for the treatment of asthma, pre- and post-natal blood purification [6]. The fruits are used in bilious conditions and in diarrhea [7]. In the line of phytochemical analysis, however, works have been found to be scanty [8].

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Study of Secondary Metabolites of *Aristolochia roxburghiana* Klotzsch in Assam, India

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ABSTRACT

The present study was aimed to evaluate the presence of major secondary metabolites as well as to determine the total phenols, flavonoids and alkaloids contents in *Aristolochia roxburghiana* Klotzsch, an ethnomedicinal plant of Assam, India. Methanol extracts of leaves, stem and roots contain all studied compounds. The total alkaloid content (range from 220 to 400 mg/g) was found to be higher in comparison to phenols (ranging 4.48 to 16.65 mg/g) and flavonoids (2.19 to 6.68 mg/g), which is impressive and indicates the potential of the plant species to act as sources of wide range of drugs.

Keywords: *Aristolochia roxburghiana*; Ethnomedicinal plants; Phenols; Flavonoids; Alkaloids

INTRODUCTION

Secondary metabolites, a group of organic substances comprising compounds like alkaloids, terpenoids, phenols, flavonoids, tannins, saponins, etc., having wide range of pharmacological activities, are produced through secondary metabolism in different plants. Phytochemical analysis of ethnomedicinal plants has been increased dramatically in the last few years owing to its relevance of the discovery of therapeutic agents and providing clues for less known plants or for new sources of bioactive compounds. *Aristolochia roxburghiana* Klotzsch, locally known as 'Nilokantha', belonging to family Aristolochiaceae, is a shrubby twining plant found in Assam; India. The plant has several ethno-medicinal applications. A paste, prepared from the roots, is kept in mouth for few minutes in tonsillitis. A decoction prepared from the whole plant (50 g) in about one liter of water, is given orally twice a day in malaria fever. Leaf-paste is applied locally in insect stings. Leaf-infusion is given orally in intermittent fever. Root is used as antidote to snake bite [1]. Thus, there is an ample scope to explore the pharmacological potential of the plant species. However, information regarding the phytochemical analysis of the plant species has been found to be limited. Thus, with an objective to evaluate the presence of major phytoconstituents, viz., phenols, flavonoids, alkaloids, tannins, saponins as well as to determine the total alkaloids, flavonoids and phenols contents in leaves, stem and root extracts of *Aristolochia roxburghiana*, the present study has been conducted (Figures 1 and 2).

MATERIALS AND METHODS

Collection of Plant Material

Leaves, stems and roots of the plant are obtained freshly from the homestead garden. Plant species was identified with the help of regional floras and monographs [2-4]. Voucher specimen (Accession No. B.D. 1045) is submitted in the Herbarium of Sibsagar Girls College, Sivasagar, Assam and India.

Preparation of Extract of Plant Material

The plant materials (leaves, stem and roots) were washed with running tap water and air dried under shade. The complete drying materials were grained in mixer. Plant extracts were prepared using methanol as extracting

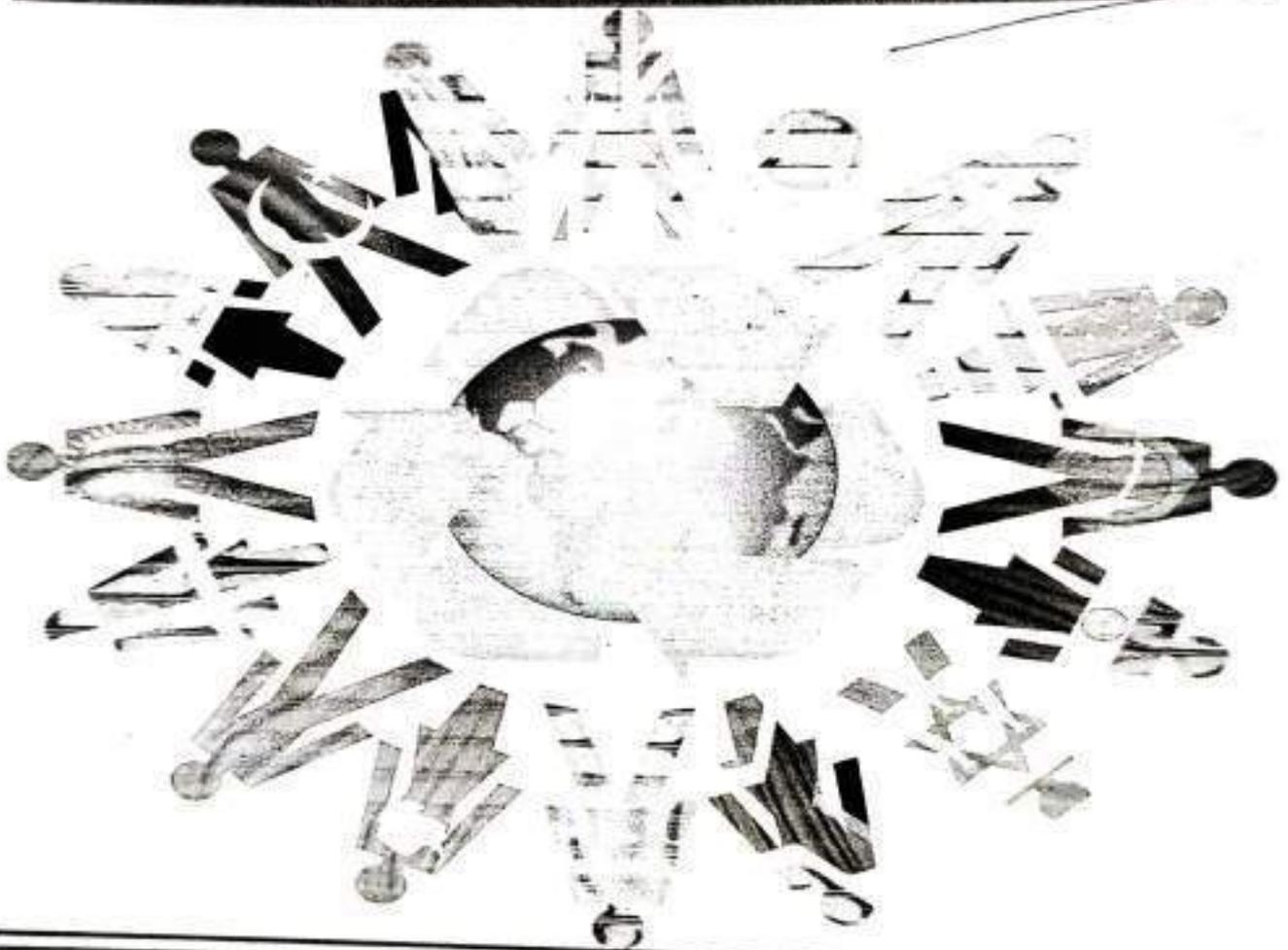
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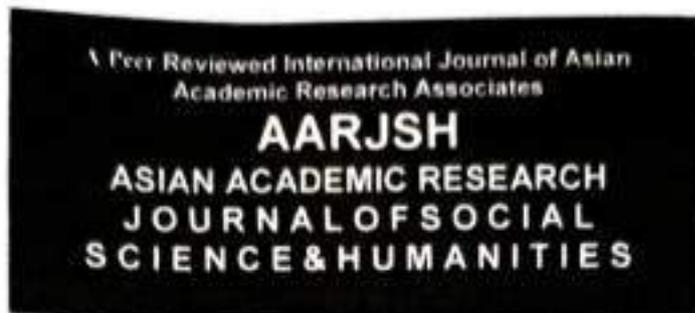
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LINKAGE BETWEEN RURAL-URBAN MIGRATION AND URBAN INFORMAL SECTOR EMPLOYMENT: EVIDENCE FROM ASSAM

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Abstract

Informal sector plays a very important role in a labour surplus economy. It has acquired great significance over the years as an alternative strategy for generating employment and reducing poverty. The rural-urban migration due to impoverishment and lack of income generating sources in rural areas coupled with natural increment of urban population has caused a significant increase in urban work force. In this context, the urban informal sector has emerged as an important segment of the economy of Assam in terms of employment to the growing labour force. The present study is an attempt to analyze the linkage between rural-urban migration and urban informal sector employment in Assam. Based on secondary data this study tries to explain the temporal as well as spatial growth and spread of employment in the urban informal sector. The study reveals that inter-state rural-urban migration in Assam increased from 27.2% in 1991 to 34.87% in 2001 whereas intra-state rural-urban migration was 1.92% in 1991 to 46.48% in 2001. During the period of 1993-1994 urban informal sector employment was 51.94 % for India and 47.62% for Assam and there was a 2.84% increase in urban informal sector employment in Assam over the period from 1993-94 to 1999-2000.

Key Words: Rural-urban Migration, Urban Informal Sector Employment, Compound annual growth rate.

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MIGRATION AND URBAN INFORMAL SECTOR WORKERS IN ASSAM - A CASE STUDY IN JORHAT DISTRICT

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ABSTRACT

The literature on development economics indicates that migration takes from low productive to high productive areas, from areas of low levels of wages to higher wages and from poor and backward to more rich and prosperous areas. One of the important explanations for the origin of informal sector is found in the framework of rural-urban migration (Changkery, 2012). That is why sincere analysis is required to understand the dynamics of migration of workers in informal sector. The study has identified factors responsible for migration of urban informal sector worker based on 187 sample respondents of Jorhat district of Assam. The findings of the study reveal that the push factors prevailing in the area of origin compels the informal sector workers to migrate to urban areas.

KEYWORDS: Migration, Urban Informal sector workers.

1. INTRODUCTION:

Migration in India is predominantly to short distances, with around 60 percent of the migrants changing their residence within their district of birth and 20 percent within their state, while the rest move across the state boundaries (Thorat, et al, 2011). The NSSO (2012, p. ii) document finds that in 2009-10 in the non-agriculture sector, nearly 71% of the workers in rural areas and 67% in the urban areas worked in the informal sector. It finds that the informal sector activities are concentrated mainly in the manufacturing, construction, wholesale and retail trades, transport, storage and communication industries. The migrants primarily start work in the informal sector in cities as they do not possess adequate skills required to get jobs in formal sector.

The most prominent theory that explains the relationship between migration and informal sector is the Harris-Todaro theory of rural-urban migration. According to this theory the informal sector acts as a temporary transit point for the workers before entering into the formal sector. This model assumes the existence of dual sectors in the economy i.e. the rural sector and the modern urban sector. Within the modern sector there consist of two sub-sectors: (i) modern sector, and (ii) traditional sector. The traditional sector consists of all the workers who are not employed in the modern sector. This theory describes that decision to migrate depends on the expected income rather than actual urban-rural real wage differential and the probability of obtaining an urban job (Todaro, 1969).

Research studies have confirmed that migration is an important source of livelihood for poor people all around the globe. A substantial part of the increased labour force, due to migration, in the modern sector is likely to be absorbed in the informal work in the unorganized sector where people create their own employment opportunities to the extent that their capital and skills allow. In such circumstances, people who join workforce often end up earning lower than the minimum wage (Kunda & Sarangi, 2007). Migrants usually take up jobs in factories, agro-processing plants, or working as porters, domestic servants, bus conductors, rickshaw pullers, street hawkers, petty traders, and construction workers (Khandekar, 2005). Majority of the migrants are from rural poor families who do not have any option but to take up such kind of jobs even though wages are minimal.

1.1 Objectives of the study

The present study seeks to study

- i. The demography of urban informal sector workers in Assam.
- ii. The level of living of urban informal sector workers.
- iii. The factors responsible for migration of workers in urban informal sector.

1.2 Research question of the study

- i. Whether the push factors prevailing in the area of origin compels the workers to migrate?

1.3 Delimitations of the study

The present study is primary data based. Primary data may not be free from limitations. As such, pre-testing of the schedules was undertaken. The information relating to income was collected after data on level of consumption were collected to get reliable information on income. A large number of respondents were either hesitant or reluctant to give information regarding their incomes, thinking that such information may prevent them to get title deeds to their dwellings. The

study is limited only to those migrant workers engaged in transport, trading and manufacturing sectors.

2. DATA AND METHODOLOGY:

2.1 Method:

In the present study the researcher has defined informal sector units in the urban informal sector are all those units in the private sector owned and operated by one single member of a household or with the help of paid and unpaid family members with and without having any hired labourer. The total number of persons, including the owner operator, hired labourers, family workers for the enterprise should be less than 10. The work is essentially primary data based. In this study only three sub sectors mainly trade, transport and manufacturing were selected purposefully among various categories of informal sub sectors operating in Jorhat district. This is because the number of workers engaged in these three subsectors is more as compared to others. In transport category the business types were rickshaw and cart pulling, trade sector comprising of vending garments, grocery shops, pan shops, selling sweet, fruits, juice, posters and tea and biscuits and manufacturing sub sector consist of carpentry, tailoring and bamboo and cane works.

2.2 Universe and sample of the study:

The universe of Urban Informal Sector units with employment size of less than 10 was derived by pulling together the list of such transport, trading and manufacturing units provided by Jorhat Municipal Board and street counting. On the basis of such pulling together exercise, it was found that the Universe consisted of about 2852 units. In these three sub-sector total number of worker engaged is 227 out of which 187 were migrants and 40 were natives. All migrant workers are taken as sample for the study. Out of these 187 migrant workers manufacturing sector comprise of 74 numbers of migrant workers followed by trading sector with 63 numbers and 50 numbers in transport sector. The data pertained to the year 2014-15.

2.3 Tools:

Primary data in respect of urban informal sector units have been collected from the sample respondents by administering a schedule-cum-questionnaire through personal interview method. The analysis and presentation of field data have been done with the help of tables, simple percentages and correlation coefficient analysis.

3. RESULTS AND DISCUSSIONS:

3.1 Demography of Sample Migrant Workers:

The composition of sample workers presented in Table 1 revealed that the workers in transport and manufacturing sector were highly dominated by male workers. This indicates the fact that the participation of female workers is negligible in these business activities. Only a small proportion of female workers was involved in trading sector and among this majority was found to be owners of small pan shops located in the waysides.

Table No-1 Demography of Sample Migrant workers

Particulars	Urban Informal Sub-Sector		
	Transport	Trading	Manufacturing
A. Composition of workers			
(i) Male	50(100)	49(77.78)	55(74.32)
(ii) Female	0	14(22.22)	19(25.67)

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6. জেহিকল হছেইনৰ চুটিগল্পত শ্ৰমজীৱী লোকৰ জীৱনৰ চিত্ৰ নৰ সিপাৰে, প্ৰবাল ছীপৰ সভ্যতা, ইজ্জত আৰু ভেটি গল্পৰ বিশেষ উল্লেখনেৰে)।

কাকলি সোণোৱাল

সহকাৰী অধ্যাপিকা, শিৱসাগৰ ছোৱালী কলেজ

সাৰপত্ৰ

জেহিকল হছেইন অসমীয়া সাহিত্যৰ প্ৰগতিশীল ধাৰাৰ এগৰাকী অন্যতম শক্তিশালী লেখক ৰূপে পৰিচিত। তেওঁ চাৰবাৰৰ দ্বাৰা পৰিপুষ্ট হৈ এখন শ্ৰেণী বৈষম্যহীন তথা সাম্যবাদী সমাজৰ কথা কল্পনা কৰিছিল। জেহিকল হছেইনে শ্ৰমজীৱী সমাজৰ নিম্নবৰ্গীয় তথা শ্ৰমজীৱী লোকৰ দুৰ্দশাগ্ৰস্ত ছবিখন প্ৰত্যক্ষ কৰি ক্ষোভিত হৈ পৰিছিল। যাবলৈ তেওঁৰ বিদ্বেষমূহে শোষণ আৰু শাসনৰ বিৰুদ্ধে প্ৰতিবাদী কঠকপে থিয় দিছে। জেহিকল হছেইনৰ এনে বৈশিষ্ট্যপূৰ্ণ গল্প সদৃশ ৩ মেলাৰ সিপাৰে, প্ৰবাল ছীপৰ সভ্যতা, ইজ্জত আৰু ভেটি গল্প অন্যতম। এই গল্প কেইটাত প্ৰকাশিত হোৱা অন্যান্য, ২ শোষণ-নিষ্পেষণ আদিৰ বিৰুদ্ধে গল্পকাৰৰ ক্ৰোধ আৰু ঘৃণা প্ৰকাশ পাইছে। আনহাতে নিম্নবৰ্গীয় তথা শ্ৰমজীৱী। সততা, উদাৰতা প্ৰকাশ পোৱাৰ লগতে তেওঁলোকৰ প্ৰতি গল্পকাৰৰ সহমৰ্মিতা প্ৰকাশ পাইছে। সমাজৰ অসহায়, দৰিত্ৰ, বিত, শোষিত, বঞ্চিত আদি লোকৰ জীৱন পৰিৱৰ্তনৰ আক্ষাংকই এই গল্পকেইটাৰ প্ৰধান উপজীব্য। শ্ৰমজীৱী লোকৰ লগত ছবিখনৰ লগতে সামাজিক অন্যায়ে-দুৰ্নীতি তথা শোষণ-নিষ্পেষণৰ ছবিখন কিদৰে প্ৰতিফলিত হৈছে। উক্ত নিশাটোকে আলোচনাৰ জৰিয়তে পোহৰলৈ অনাৰ প্ৰয়াস কৰা হৈছে।

প্ৰস্তাৱনা

জেহিকল হছেইন অসমীয়া সাহিত্য জগতৰ এটি উল্লেখযোগ্য নাম। তেওঁ বিশেষকৈ শ্ৰমজীৱী লোকসকলে জীয়াই ৰ বাবে কৰি অহা জীৱন সংগ্ৰামৰ বাস্তৱ ছবিখনক লৈ ভালমান গল্প ৰচনা কৰিছে। সমাজৰ নিম্নস্তৰত বসবাস কৰা এই লোকৰ প্ৰতি তেওঁৰ অগাধ সহানুভূতি আৰু ভালপোৱা প্ৰকাশ পাইছে। তাৰ বিপৰীতে এই শ্ৰেণীৰ লোকে বিভিন্ন। সদুৰ্থীন হৈ অহা শোষণ-নিষ্পেষণ তথা লাঞ্ছনা বঞ্চনাৰ প্ৰতি তেওঁৰ তীব্ৰ ক্ষোভ আৰু ক্ৰোধ প্ৰকাশিত হৈছে। সমাজ। এই লেখক গৰাকীয়ে নিচেই কাষৰে পৰা দৰিদ্ৰতাই জুৰুলা কৰা এই শ্ৰমজীৱী লোকসকলৰ দুখ-দুৰ্দশা আৰু যত্নপৰ। প্ৰত্যক্ষ কৰিছে। যাৰ ফলত তেওঁ এই শ্ৰেণীৰ লোকৰ অন্তৰত পুঞ্জীভূত হৈ থকা ক্ষোভ আৰু প্ৰতিবাদৰ ছবিখন বাস্তৱ। অঙ্কন কৰিবলৈ সক্ষম হৈছে।

সাম্প্ৰতিক কালত সাহিত্য ক্ষেত্ৰখনত বহুলভাৱে চৰ্চিত এটি তত্ত্ব হৈছে ছাব অলটান ষ্টাডিছ অৰ্থাৎ নিম্নবৰ্গীয় অধ্যয়ন। সমাজৰ বিভিন্ন ক্ষেত্ৰত শোষিত, বঞ্চিত, অৱহেলিত, অৱদমিত তথা সকলো ধৰণৰ সুযোগ সুবিধাৰ পৰা বঞ্চিত এক। লোকক বুজাবলৈ এই ছাবঅলটান (Subaltern) শব্দটো ব্যৱহাৰ কৰা হয়। ইংৰাজী ছাবঅলটান শব্দটোৰ অসমীয়া। শব্দৰূপে নিম্নবৰ্গীয় বা প্ৰান্তীয়বৰ্গ এই শব্দ দুটা ব্যৱহাৰ হৈ আহিছে। 'ছাবঅলটান' শব্দটো পোনপ্ৰথমে ইটালীৰ মাৰ্ক্সবাদী। এণ্টনিঅ গ্ৰাম্‌স্কিয়ে (Antonio Gramsci) ব্যৱহাৰ কৰিছিল। গ্ৰাম্‌স্কিয়ে তেওঁৰ বিখ্যাত 'Prison Note-। গ্ৰহিত নিম্নশ্ৰেণীৰ লোকক বুজাবলৈ এই শব্দটোৰ ব্যৱহাৰ কৰিছিল। সমাজৰ নিম্নস্তৰত বসবাস কৰা মানুহক বুজাবৰ। ব্যৱহাৰ কৰা এই শব্দটোৱেই পৰৱৰ্তী সময়ত কঠহীন, ভীক, অসহায়, দলিত-পীড়িত, শোষিত-বঞ্চিত, অৱহেলিত,। মত এনে লোকসকলক বুজাবৰ বাবে ব্যৱহাৰ হ'বলৈ ধৰিলে।

'ছাবঅলটান ষ্টাডিছ' তথা নিম্নবৰ্গীয় অধ্যয়নে বহু যুগৰ পৰা শোষণ বঞ্চনাৰ বলি হৈ অহা এচাম অসহায় লোক আৰু। জীৱ লোকৰ ওচৰত আনুগত্য স্বীকাৰ কৰিবলৈ বাধ্য হোৱা নিম্নবৰ্গীয় লোকৰ জীৱন সম্পৰ্কে অধ্যয়ন তথা বিচাৰ

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Vivo V15Pro
AI Triple Camera

Comparative Study of Coupling Behaviour of Muga Silkworm (*Antheraea assama* Ww) from both Controlled and Polluted sites in Geleky area of Sivasagar District, Assam

–Chitralkha Gogoi–

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Sibsagar Girls' College, Sivasagar, Assam

Abstract:

Muga silk occupies a prominent position in the history and cultural heritage of Assamese people. The traditional skills involved in muga culture plays a very important role in socioeconomic and cultural life of Assamese people. Sivasagar District of Assam is one of the important muga cultivation areas including various farms and 'Sumoni's. But the present status of muga culture has been very deteriorating. This is because of various human interventions like extension activities near muga farms by tea planters, oil industries, etc. the coupling behaviour is also affected due to these activities, which is one of the important characteristics of grainage of *Antheraea assama* Ww. Geleky area of Sivasagar District has various oil field industries, tea plantations near 'sumoni's as well as some problems regarding this problem. Key words: *Comparative Study, Coupling behaviour, Antheraea assama Ww, Geleky area, Sivasagar District*

Introduction:

Muga silkworm (*Antheraea assama* Ww) is a multivoltine sericogenic insect and unique strain of saturnidae. Endemic to Assam, the *Antheraea assama* Ww silk moths that help produce the world famous golden weaves are facing premature death due to air pollution and the vagaries of the climate. According to the Assam State Action Plan for Climate Change 2012-2017, the state of Assam is most vulnerable to climate change than its sister-states.

Silk cultivation in Assam was introduced during the Tai-Ahom rule that chanced upon Assam during their wandering years. During the 1st century

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15. জ্যোতিপ্ৰসাদ আগৰৱালাৰ গল্পৰ ভাষাশৈলী
(সাৰ-পত্ৰ)

ড° শান্তনা দুৱৰা সন্দিকৈ
সহঃ অধ্যাপিকা, অসমীয়া বিভাগ
শিবসাগৰ জ্যেষ্ঠা শৈলী কলেজ, শিবসাগৰ।

কুৰি শতিকাৰ পৰা সাহিত্য আলোচনাত শৈলীবিজ্ঞান সম্পৰ্কীয় চিন্তা-চৰ্চাই যথেষ্ট গুৰুত লাভ কৰি আহিছে। ই ভাষাবিজ্ঞানৰ অন্তৰ্গত এটা শাখা। ভাষাবিজ্ঞানৰ এই শাখাত এজন সাহিত্যিকৰ সাহিত্য নিৰ্মাণ শৈলীৰ পূৰ্বানুপূৰণৰ সন্ধান বিবেচনা কৰা হয়। সাহিত্যৰ ক্ষেত্ৰত শৈলী হৈছে — এজন লেখকৰ লেখাৰ নিজস্ব দৰা বা ভঙ্গী। ভাষাৰ ক্ষেত্ৰতো শৈলী হৈছে এক বিশেষত্বপূৰ্ণ পৰিষ্কাৰ। শৈলীবিজ্ঞানত লেখক এজনৰ সাহিত্য কৰ্মত পাঠ দিচালে লৈ তাত গভীৰ ভাৱিত সমলবোৰৰ আলোচনা কৰা হয়। প্ৰত্যেক লেখকৰে গদ্য ৰচনাৰ বীতি সুৰীয়া সুৰীয়া অৰ্থাৎ শব্দ, বাক্য, অক্ষৰাণুসংগ্ৰহ, অলাকাৰ আদি প্ৰয়োগ কৰাৰ কৌশল ভিন্ন ধৰণৰ হয়। সেয়ে শৈলী অধ্যয়নৰ ভৱিষ্যতে লেখক এজনৰ সাহিত্যৰ সঠিক মূল্যায়ন কৰিব পৰা যায়।

আধুনিক অসমীয়া ভাষা-সাহিত্য-সংস্কৃতিৰ কাণ্ডাৰী স্বৰূপ জ্যোতিপ্ৰসাদ আগৰৱালা কল্পনাবী প্ৰতিভাৰ অধিকাৰী। তেওঁ একাধাৰে কবি, গীতিকাৰ, সুৰকাৰ, নাট্যকাৰ, প্ৰবন্ধকাৰ, গল্পকাৰ, চলচ্চিত্ৰ নিৰ্মাতা। জ্যোতিপ্ৰসাদৰ ক্ৰৌঞ্চিক সৃষ্টি ৰীতি, কবিতা, নাটক, গল্প আদিৰ মাজত তেওঁৰ সাহিত্যিক আৰু সাংগীতিক মনৰ সুন্দৰ প্ৰতিফলন ঘটা দেখিবলৈ পোৱা যায়। তদুপৰি জ্যোতিপ্ৰসাদৰ ৰচনাৰাজিৰ ভাষাৰ অধ্যয়নৰ ভৱিষ্যতেও তেওঁৰ সাহিত্যিক মনৰ পৰিচয় পোৱা যায়। জ্যোতিপ্ৰসাদ আগৰৱালাৰ ৰচনা শৈলী স্বকীয় বিশেষত্বপূৰ্ণ। বিষয়বস্তুৰ লগত সঙ্গতি ৰাখি তেওঁ ৰচনাৰ মাজত প্ৰয়োজন সাপেক্ষে সহজ-সৰল পোমপটীয়া তথা নিবলকাৰ গদ্য আৰু ঠাইবিশেষে আলাকাৰিক গদ্যৰ প্ৰয়োগ কৰি পাঠসমূহ সুখপাঠ্য কৰি তুলিছে। বিশেষকৈ শব্দ গঠন, বাক্য গঠন, বস্তুবাক্যৰ ব্যৱহাৰ, আলাকাৰিক ভাষাৰ প্ৰয়োগে জ্যোতিপ্ৰসাদৰ গদ্যৰ ভাষাক বিশেষত্বপূৰ্ণ কৰি তুলিছে। প্ৰভাৱিত গদ্যৰ প্ৰকৃত শৈলীবিজ্ঞানৰ দৃষ্টিভঙ্গিৰে জ্যোতিপ্ৰসাদ আগৰৱালাৰ গদ্যৰ ভাষাশৈলী আলোচনা কৰা হ'ব। ভাষা শৈলীৰ এনে অধ্যয়নৰ ভৱিষ্যতে তেওঁৰ উক্ত বৈশিষ্ট্যসমূহ পোহৰলৈ আহিব। তদুপৰি পৰবৰ্তী লেখকসকলে জ্যোতিপ্ৰসাদৰ শৈলীৰ দ্বাৰা অনুপ্ৰাণিত হ'ব।

(বীজ শব্দ: ভাষাশৈলী, শৈলীবিজ্ঞান, ভাষিক প্ৰসঙ্গ, আলাকাৰিক ভাষা, সমান্তৰালতা, অপ্রতীক্ষিত ইত্যাদি)

জ্যোতিপ্ৰসাদ আগৰৱালাৰ গল্পৰ ভাষাশৈলী

- ০.০ অৱতৰণিকা
- ০.১ বিষয় পৰিচয়

কুৰি শতিকাৰ পৰা সাহিত্য আলোচনাত শৈলীবিজ্ঞান সম্পৰ্কীয় চিন্তা-চৰ্চাই যথেষ্ট গুৰুত লাভ কৰি আহিছে। ই ভাষাবিজ্ঞানৰ অন্তৰ্গত এটা শাখা। প্ৰত্যেক লিখকৰ একোটা নিৰ্দিষ্ট ৰচনা কৌশল থাকে। সেই ৰচনা কৌশলৰ মাধ্যমেৰে লিখক এজনে তেওঁৰ ভাব-অনুভূতিক সাহিত্যত ৰূপ দিয়ে। সাহিত্য সৃষ্টিৰ এই কৌশলকে বিভিন্ন সমালোচকে ৰচনা ৰীতি, প্ৰকাশ ৰীতি, ৰচনা কৌশল, প্ৰকাশভাঙ্গী, কথাসৈলী, গদ্যৰীতি, গদ্যশৈলী, ভাষাশৈলী আদি আখ্যা দিছে। গদ্যশৈলীৰ সহায়ত সাহিত্যিকজনৰ বা লিখকজনৰ ব্যক্তিত্ব তথা তেওঁৰ মনন, চিন্তা আদি একান্ত ব্যক্তিগত অনুভৱৰ প্ৰকাশ ঘটে। সেয়ে শৈলী অধ্যয়নৰ ভৱিষ্যতে লেখক এজনৰ সাহিত্যৰ সঠিক মূল্যায়ন কৰিব পৰা যায়।

বসন্ত কুমাৰ ভট্টাচাৰ্যই 'শৈলী'ৰ সম্পৰ্কে মন্তব্য কৰি কৈছে যে, এগৰাকী সাহিত্যিকৰ ব্যক্তিগত অনুভৱ, সৃজন আৰু



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Study on economic importance of indigenous dyes

RAJASHREE PHUKON

Assistant Professor

Sibsagar Girls' College (Dibrugarh University), Sibsagar (Assam) India

ABSTRACT

The age-old art of dyeing with indigenous dyes was common in India. These dyes are generally obtained from vegetable matter, minerals and insects. Indigenous dyes are eco-friendly, biodegradable and less toxic and less allergic compared to synthetic dyes. In spite of several advantages indigenous dyes have over synthetics, the use of indigenous colour is still very limited due to non-availability of standard shade card, precise and specific way of application, standard norms and also lack of awareness. Even though most of the ethnic communities of Assam still practicing indigenous dyes for dyeing traditional textiles with their own way. Hence the study was undertaken with an aim to develop the dyeing conditions of the bark of Cochin goroka tree (*Garcinia xanthochymus*), which is easily available in North East India, on muga (*Antheraea assamensis*) silk yarn. The eco-friendly mordant used in the research work is alum for better fixation of the dyes. The dyes are extracted by alkaline method and the extraction time is optimized from the optical density values. Three different mordanting method is used for mordanting the yarn. Golden yellow colour is obtained from the dye which is found to be colour fast and suitable for muga silk.

Key Words : Indigenous dyes, Colourfast, Mordant

INTRODUCTION

The Sub-Himalayan region of North-Eastern India particularly Assam and Arunachal Pradesh are the treasure house of wide varieties of plant species. Due to the varied topographic and climatic conditions, various types of flora with their own distinctive characteristics are available in this part of the country. Many of the plant species have medicinal and aromatic value, while some plant species contain indigenous colouring matters. The practice of extraction of colouring matters from plant sources is in vogue in this part of the country from very ancient time. The rural people of NE region extract dyes either from leaves, roots, flowers, seeds or bark of some selected plant species, adopting their own methods of extractions. These methods mostly involve boiling, scraping, powdering and mixing with other materials to get desired colour. In these methods wastages of raw materials were observed very much. Sometimes fermentation processes are also involved in extraction of dyes. In most cases, dyes are extracted and used fresh for colouring textile materials. Apart from a few conventionally used plant materials for extraction of dyes by rural folks, many dye-yielding plants remain unutilized due to ignorance and due to non-availability of research and development data on their quality and quantity. Thus, the present work is an attempt to develop standard methods for extraction and dyeing

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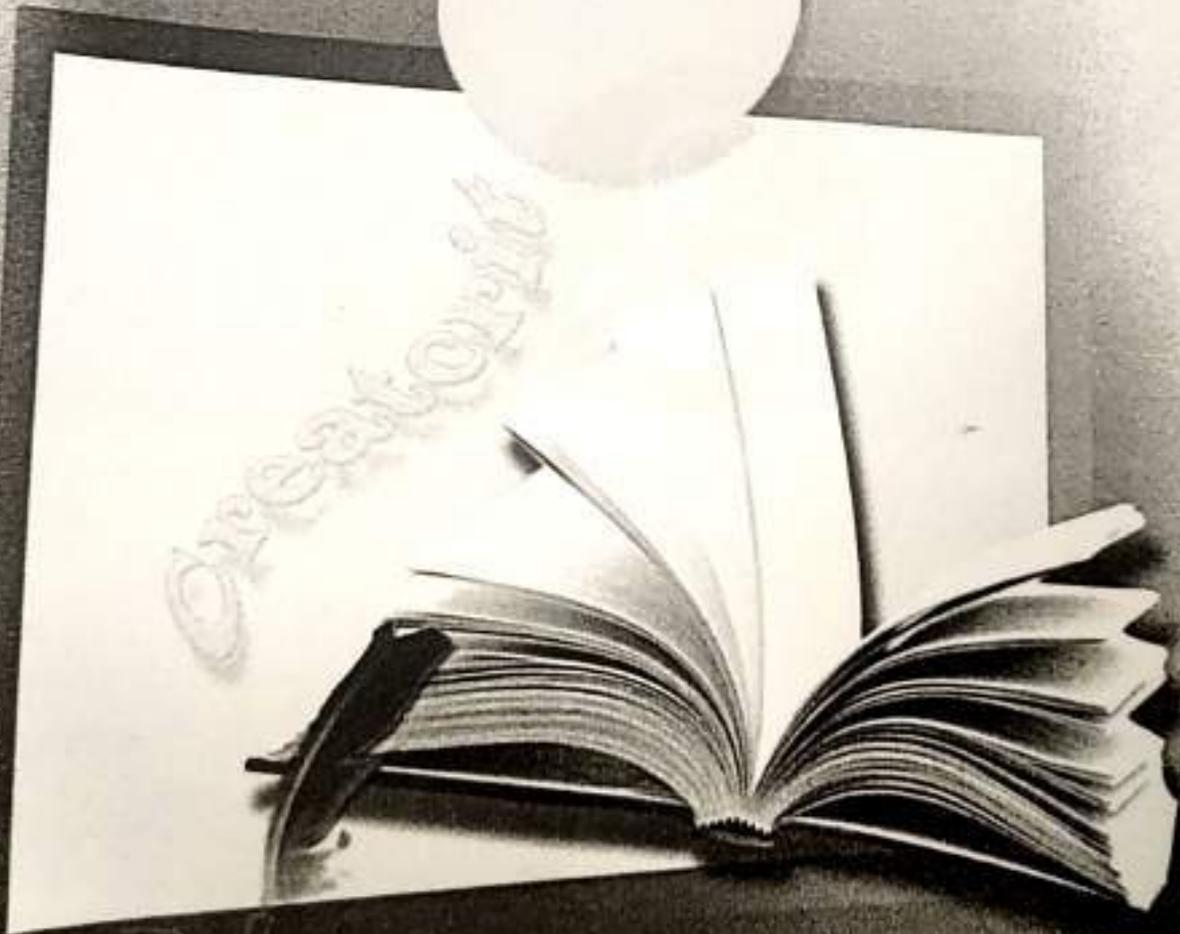
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The Play of Emotions: A Study of Jamaica Kincaid's *Annie John*

Rajashree Dutta

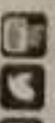
Abstract: Jamaica Kincaid's works reveal a sense of self-hidden trauma, which the protagonist of her work asserts vividly. This paper as such seeks to study the emotional turmoil of the daughter-protagonist with her mother, family, society and the realm of motherhood. In Kincaid's *Annie John* (1985), Annie, the daughter-protagonist undergoes tremendous emotional pressure to adjust her love and hatred towards her mother. She tries to seek a valve out of this constant turmoil present in her mind. This paper will try to see is how she denies the opportunity of motherhood as her own life is a spillage of this sacred relationship and tries to create a separate identity for herself.

Keywords: trauma, daughterhood, identity, Caribbean.

Jamaica Kincaid's *Annie John*, a Caribbean daughter is a true and vivid demonstration of pain and suffering. Throughout her life she has undergone tremendous emotional turmoil and pressure from family, society and the colonizers. Here the daughter turns out to be victim of emotions and becomes an individual devastated to the core. Nevertheless she fights all odds and shows her resilience, her enormous mental ability to recover and pull herself up from every difficult situation- whether it is depression, lack of parental love, lack of societal love, misfortune, illness or colonial pressure.

Kincaid has created in *Annie* such a daughter who since her childhood became a victim to traumatic events surrounding her life. The intensity of feelings and incapacity to respond adequately sometimes tears her apart as an individual. But some events, situations and relationships leave a deep impression of sorrow and a psychological anguish in her life.

Kincaid by initiating this trauma narrative in the novel tries to trace the social and psychological issue of the Antiguans. She tries to draw the



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Teaching English Communication to Non-English Medium School Students: A Learning Experience

Authors: Sharmila Prasad¹, Mall. Shiva Prasad²

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Spectrophotometric estimation of ascorbic acid and total phenol and flavonoid contents of certain fruits in Sivasagar, Assam, India

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Abstract

Fruits contain various biologically active compounds and vitamins that can promote certain synergistic and health-related activities which signify the phrase that "fruit juices are the pure gifts from mother nature". Ascorbic acid (Vitamin C) cannot be synthesized by humans directly hence needs to be supplemented with the diet of their natural form. Besides the biologically active compounds such as phenols and flavonoids which is the natural source of antioxidants, ascorbic acid plays a vital role in various beneficial activities. The present studies were conducted to estimate the phenol and flavonoid, and ascorbic acid contents in fruits like *Spondias pinnata* (L.F.) Kurz., *Psidium guajava* L., *Syzynium cumini* (L.) Skeels., *Syzynium jambos* (L.) Alston., *Prunus persica* (L.) Stokes and *Pyrus communis* L. were estimated by the spectrophotometric method. The vitamin C, total phenol and flavonoid contents were determined by the standard protocol. The vitamin C estimation was found highest in *P. guajava* (0.300±0.030) followed by *S. cumini* (0.280±0.039) and *S. jambos* (0.027±0.021). The phenol content was found significantly highest in *S. cumini* (0.153±0.013) followed by *S. jambos* (0.127±0.018) and *P. guajava* (0.123±0.018). Also the flavonoid content was observed highest in *P. guajava* (0.587±0.067), *S. jambos* (0.245±0.074) and *S. cumini* (0.192±0.056). The results of the present investigation were analyzed statistically by using ANOVA single factor analysis and the p value was found less than the significant level ($p < 0.05$). The data so obtained reflects that the fleshy fruits are an important source of phytochemicals with potent antioxidant activity.

Keywords: ascorbic acid, phenol, flavonoid, antioxidants, phytochemicals, ANOVA

1. Introduction

"An apple a day keeps a doctor away" the popular phrase that reveals the importance of fruits in our day to day life. Interestingly, from the time of traditional Ayurveda, there exist strong evidence and belief about the nutraceutical and medicinal importance among the peoples at that time. Fruits are one of the pure products of mother nature having certain physiological benefits related to human health due to the presence of certain polyphenols compounds, vitamins (ascorbic acid) imparting a protective role against several diseases. Recent studies have shown promising results for these compounds in various pathological complications such as diabetes, atherosclerosis, cardiovascular diseases (CVDs), cancer, and neurological disorder. Most of the nutraceuticals have antioxidant activity with the ability to counteract this situation. Hence, they are considered as healthy sources of health promotion, especially for the prevention of life-threatening diseases^{1, 2, 3}. Phytochemical screening involves botanical identification, extraction with suitable solvents, purification, and characterization of the bioactive constituents of pharmaceutical importance^{4, 5, 6}. Such substances may range from isolated nutrients, dietary supplements and specific diets to genetically engineered designer

foods, herbal products, processed foods and beverages^{7, 8, 9}. Polyphenols form a large group of phytochemicals, which are produced by plants as secondary metabolites to protect them from photosynthetic stress, reactive oxygen species. There are approximately 8,000 different classes of polyphenols, the most important being flavonols, flavones, flavan-3-ols, flavanones, and anthocyanins. The highly branched phenylpropanoid pathway synthesizes the majority of polyphenols. The most commonly occurring polyphenols in food include flavonoids and phenolic acids^{10, 11, 12}.

Assam, due to its diverse climate, topography and agricultural conditions can be considered as one of the richest biodiversity hotspots of the world. There may exist different diversity among the different fruits such as wild, semi-wild, semi-domesticated and cultivated. Because of this widespread use, it is incumbent on the scientific community to have access to rigorous and reliable information of the experimental and clinical pharmacology of fruit products. Therefore, based on several informative reviews published in the concerned area, this paper aims to provide an overview of the importance of the nutraceutical properties of indigenous fruits.

Table 1: Detail list of selected fruits for the study

Sl. No	Scientific Name	Family	Vernacular Name	Time of availability	Taste
1	<i>Spondias pinnata</i> (L.F.) Kurz.	Anacardiaceae	Amora	August-October	Sweetish sour
2	<i>Psidium guajava</i> L.	Myrtaceae	Modhuri	May-June	Sweetish sour
3	<i>Syzynium cumini</i> (L.) Skeels	Myrtaceae	Kola Januk	June-July	Sweet

**SPEAKING IN ENGLISH: CLASSROOM EXPERIENCE IN THE COLLEGES OF ASSAM**

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ABSTRACT

One of the purposes of English education in the schools and the colleges is to enable students to know English. Knowing English enables a student to master the four skills of language. After, a few years of their exposure to English, students are supposed to speak in English in their communicative activities. But many English teachers in the colleges of Assam experience the very opposite to the expected outcome of the English education. Most of the Assamese medium students are to be encouraged and motivated a lot so that they should speak in English inside and outside the classroom. Still only a few numbers of students try to speak in English. However, it is seen that after their start with English, they most often code switch to the Assamese language in most of their conversation with their classmates and teachers. We see that certain issues seem to arise here. There is a need to investigate what are the reasons that Assamese students use their mother tongue, and what are the actions that English teachers can take to promote the use of English in and outside the classroom.

Key words: English, Assamese Students, Assam Experience

1. Use of English in the colleges of Assam

Like most other states in India, Assam is one of the educational focal points in the entire North eastern states. Assam has good number of higher educational institutes including technical and professional colleges. However, more than three hundred undergraduate colleges occupy greater stock of educational institutes. Following the recommendation of the different educational commissions, Assam government also underlined the importance of English education and its practical knowledge. When the existing curriculum at the undergraduate level is examined it is seen that the curriculum has been designed and developed to increase proficiency in English of the Assamese undergraduate learners. There are strict guidelines and recommendation given for the syllabus designers, text books writers, teachers, students and those who are concerned with the teaching and learning of English at the UG level in Assam. It is also seen that the present curriculum also emphasises the communicative language teaching practice for the improvement of the learners' four languages skills, viz. LSRW Listening. Thus, the present curriculum stresses the importance of continuous and qualitative study of college English. The basic aims include how to improve the teaching-

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অসমীয়া গল্পসাহিত্য ক্ষেত্ৰখনৰ এটি পৰিচিত নাম অকপ কুমাৰ নাথ। অকপ কুমাৰ নাথৰ গল্পৰ এটি উল্লেখযোগ্য বৈশিষ্ট্য নিম্নবৰ্গীয় শ্ৰেণীৰ প্ৰতি সহমৰ্মিতা প্ৰকাশ। তেওঁৰ গল্পসমূহৰ প্ৰতিফলিত হোকা দুটা প্ৰধান শ্ৰেণীৰ ভিতৰত এটি হৈছে মূলতঃ শ্ৰেণীস্বৰূপী শ্ৰেণীৰ লোক আৰু আনটো হৈছে অসহায়, অকৰ্মিত, কলিত, পীড়িত, শোষিত - বঞ্চিত শ্ৰেণীৰ লোক। অকপ কুমাৰ নাথৰ গল্পত প্ৰতিফলিত হোকা দুৰ্বল শ্ৰেণীটো হৈছে লবিত কৃষক, শ্ৰমিক, সাধাৰণ খাটি হোকা লোক আৰু সেৱা নথী। গল্পকাৰে এই শোষিত শ্ৰেণীটোৰ প্ৰতি সহানুভূতি প্ৰকাশ কৰাৰ লগতে সলগে তেওঁলোকৰ লক্ষ্য বিয়া দি আহিছে। গল্পকাৰ অকপ কুমাৰ নাথে তেওঁৰ ‘জোক’ গল্পটোৰ মাজেৰে নিম্নবৰ্গীয় শ্ৰেণীটোৰ কথা কওঁতে বিশেষভাৱে পুৰুষতান্ত্ৰিক আৰু লিংগভিত্তিক সমাজ ব্যবস্থাৰ বৈষম্যৰ বৰি হোকা নথী আৰু বৰ্জভৈৰ ব্যবস্থাত অস্থায়ীভাৱে সন্নিৱসিত হোকা নথীসকলক সামৰি লৈছে। এইদৰে পুৰুষতান্ত্ৰিক সমাজব্যৱস্থাৰ বৈষম্যৰ বৰি হোকা অসহায় নথী জোনাকীক সৰ্বশক্তি সমাজ ব্যবস্থাত একে সময়তে কিমৰে দুবাৰকৈ প্ৰাণীভৱণ কৰা হৈছে উক্ত শিল্পটোৰ নিম্নবৰ্গীয় অধ্যয়ন বহু ছাৰভালটান ইতিহাসৰ আলোক পোহৰলৈ অনাৰ প্ৰয়াস কৰা হৈছে।

বীজ শব্দ : নিম্নবৰ্গীয় অধ্যয়ন, বৰ্জভৈৰ, পুৰুষতান্ত্ৰিক, স্ত্ৰী নিম্নবৰ্গীয়, নথী, সহমৰ্মিতা, শোষণ বঞ্জন, প্ৰাণীভৱণ, অকৰ্মিত, অকৰ্মিত ইত্যাদি।

নিম্নবৰ্গীয় অধ্যয়ন : এটি পৰিচয়

সমকালীন সাহিত্য সমালোচনাৰ ক্ষেত্ৰখনৰ বহুদূৰতঃ প্ৰাচ্য হোকা এটি সাহিত্যাত্মক বৈশিষ্ট্য নিম্নবৰ্গীয় অধ্যয়ন সমাজ ব্যবস্থাৰ ভিন্ন ভিন্ন ক্ষেত্ৰৰ সমালোচনা-সূচনা সুবিধাৰ লগে বঞ্চিত, বৰ্জ অকৰ্মিত, অকৰ্মিত, শোষিত নিম্নবৰ্গীয় আৰু বঞ্জনৰ সন্নিৱসিত হোকা শ্ৰেণীটোক বুজাবলৈকে ছাৰভালটান (Subaltern) শব্দটো ব্যৱহাৰ হৈ আহিছে। ছাৰভালটান শব্দটো অসমীয়া প্ৰতিশব্দ ৰূপে নিম্নবৰ্গ বা প্ৰাণীভৱণ শব্দটো ব্যৱহাৰ কৰা হৈছে। এই ছাৰভালটান (Subaltern) শব্দটো



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Study on Ethnic socio-cultural identity through textiles among Taiphake of Assam

RAJASHREE PHUKON

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ABSTRACT

Tais are the people of Mongoloid origin from South East Asia are settled on the Bank of Brahmaputra valley of NE India. They have been grouped as Tai Ahom, Tai Phake, Tai Khampti, Tai Khamyang, Tai Aiton, Tai Nora and Tai Turung. Aims of this paper are: (1) current studies on historical back ground of Tais (2) issues of cultural assimilation among Tais (3) Specific aim to focus on Textiles tradition of Tai Phake in the light of ethnic socio cultural identity. Descriptive method has been adopted with simple random sampling along with structured questionnaire for primary data collection from 75 respondents from the Namphake village of Dibrugarh District, Assam, India and supported by secondary data. Hand loom textiles woven by Tai-Phake women of NE India for their traditional attire which has vast similarity with Thai culture of Thailand. The 'Chin' a female garment use to cover the lower part of the body from waist down to ankles. 'Nangwat' a cloth for married women to wrap over chin for covering the breast; Pha-fek- hang is same as 'Nangwat' is use for grown up girls. Pha-fek mai or Pha-mai is use as a wrapper by men and women while entering the Vihar (Buddhist temple) has important significance in socio-religious occasions. 'Pha-nung' a men's apparel use to cover the lower part of the body from waist down to the ankles. 'Thung' a shoulder bag is an indispensable part of Phake men's dress etc. The textiles of Tai-Phake have distinctive ethnic characteristics. where checked and stripes are arranged in a harmonious pattern to produce conspicuous designed with their indigenous loom. Traditionally they use both cotton and silk yarns in their textiles production. Wearing traditional dress during ceremony and function as well as in village is compulsory to maintain their ethnic socio cultural identity.

Key Words : Ethnicity, Socio-cultural identity, Traditional Textiles, Tais

INTRODUCTION

All Tais in Assam refer to themselves simply as "Tai". The names; Ahom, Khamti, Phake, Aiton, and Khamyang - are used by other people to distinguish those Tai groups from one another. The names, however, are accepted by each and every group of the Tai themselves. The Tai is a generic name denoting a great branch of the Mongoloid population of Asia. The Tai people are now mainly concentrated in the Indo-Chinese peninsula. The present habitat of the Tai people extends from Assam in the west to Kwangsi and Hainan in the east and from the interior of Yunnan in the north to the southern-most extremity of Thailand (Siam) in the south.

The Tai-Phakes entered Assam in 1775 A.D during the reign of the Ahom king Lakshmi Sinha (1769- 1780 A.D) and settled at Nangtao of present Arunachal Pradesh. They belong to the great Tai race. Ethnically they belong to the Mongoloid tribe and linguistically they belong to the Tibeto- Chinese families. They settled in Arunachal Pradesh for a few years and during the British rule they gradually entered Assam and started living in small groups in Dibrugarh and Tinsukia districts, where they are still found now. Presently they live in nine villages of Dibrugarh and Tinsukia districts which are as follows :- Namphake and Tipamphake on the bank of the river Buridihing of Naharkatiya area of Dibrugarh district, and Mounglang, Man Mou, Bor Phake, Man Long or Long

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অসমীয়া চুটিগল্পত লিংগ বৈষম্যৰ প্ৰতিফলন

(অৰুপা পটঙ্গীয়া কলিতাৰ প্ৰস্তাবনা আৰু টিলাটোৰ ইপাৰে সিপাৰে গল্পৰ
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কাকলি সোণোৱাল

সাৰাংশ

সাম্প্ৰতিক বিদ্যায়তনিক ক্ষেত্ৰখনত লিংগ অধ্যয়ন (Gender Studies) বিষয়টোৱে ব্যাপক ৰূপত চৰ্চালাভ কৰিছে। প্ৰকৃততে মানৱ সমাজত লিংগ বৈষম্যৰ কোনো প্ৰাকৃতিক ভেঁটি নাই। লিংগ বৈষম্য মানৱ সভ্যতাৰ সৃষ্টি। পুৰুষতান্ত্ৰিক সমাজ ব্যৱস্থাত সামাজিক-সাংস্কৃতিক তথা অন্যান্য ক্ষেত্ৰসমূহত নাৰীক সদায় পুৰুষৰ তলত স্থান দিয়া হয়। যুগ যুগ ধৰি পুৰুষতান্ত্ৰিক সমাজত নাৰীক অৱদমিত কৰি অহা দেখা গৈছে। আধুনিক অসমীয়া সাহিত্যতো লিংগ বৈষম্য এই বিষয়টোৱে যথেষ্ট পৰিমাণে চৰ্চা লাভ কৰিছে। এনে বিষয়ক লৈ অৰুপা পটঙ্গীয়া কলিতাই ভালেমান চুটিগল্প ৰচনা কৰিছে। তেওঁৰ প্ৰস্তাবনা, টিলাটোৰ ইপাৰ-সিপাৰ, মৰুভূমিত মেনকা ইত্যাদি গল্পত পুৰুষতান্ত্ৰিক সমাজত নাৰীক কৰা অৱদমনৰ সমস্যাটোক উপস্থাপন কৰিছে। এই আলোচনাপত্ৰত নিৰ্বাচিত গল্পকেইটাৰ মাজেৰে কিদৰে লিংগ বৈষম্যৰ প্ৰতিফলন ঘটিছে, উক্ত দিশটোক আলোচনা কৰাৰ প্ৰয়াস কৰা হৈছে।

বীজশব্দ : লিংগ অধ্যয়ন, লিংগ বৈষম্য, পুৰুষতান্ত্ৰিক, অৱদমন, নাৰী।

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Projections for COVID 19 Pandemic in Assam using Autoregressive Integrated Moving Average (ARIMA) Models

Jyotsnali Chetia

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ABSTRACT: The current outbreak of COVID 19 pandemic creates a serious threat to all over the world. Most of the nations including India have gone into a lockdown situation. The disease is spread by respiratory droplets and communication pathways. Fever, cough, shortness of breath to pneumonia, kidney failure and even death are some of the symptoms of this disease which can take 2- 14 days to appear in human body(WHO). Assam reported its first COVID 19 confirmed case on 31 of March and first death was reported on 10th April. The upsurge of COVID 19 pandemic in the state has been traced to persons who attended the conference of the Tablighi Jamaat religious organization at Nizamuddin Markaz, Delhi and also boost up due to some pilgrims of Ajmer Sharif Dargah, Rajasthan who arrived in the Silchar city of Cachar district on 6th May, 2020. The state has also begun witnessing a spike in the number of COVID 19 cases due to returning of migrant workers from different parts of the country. The daily count of number of cases of the disease has been increasing in an alarming rate. As of 21st July 2020, the Government of Assam has confirmed 26772 confirmed cases of COVID 19 including 18033 recoveries, 3 migrants and 64 deaths in the state. This paper is an attempt to forecast the number of cases of COVID 19 in Assam for the days to come. Univariate time series modeling has been applied to forecast the number of COVID- 19 infected cases that can be expected in upcoming days in Assam. The study finds that there is an increasing trend in the actual and forecasted number of cases of COVID- 19 which is for serious concern for the people as well as the government. In order to prevent the spread of the virus an increase in the intensity of prevailing interventions is required. At the same time additional and strict intervention and active support of the Central Government, international organizations and the people of Assam is very much essential.

KEY WORD: Univariate Time Series, Novel coronavirus, ARIMA, BIC, Forecasting.

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I. INTRODUCTION

Assam is situated in the North-East region of India- bordering seven States viz. Arunachal Pradesh, Manipur, Mizoram, Meghalaya, Nagaland, Tripura and West Bengal and two countries viz. Bhutan and Bangladesh. The geographical area of Assam is 78438 sq. kilometer of which 98.4 percent is rural area. The state shares about 2.4 percent of the country's total geographical area and provides shelter to 2.6 percent population of the country. Assam is the 15th most populous state in India as per 2011 census with 312.05 lakh population. As per National Family Health Survey Report (NFHS-IV) Assam shows a critical state of affairs in case of some vital statistics viz. birth rate (22.4), death rate(7.2), Infant mortality rate (49), under-5 mortality rate (2.3), maternal mortality rate(300) etc. The status of health infrastructure in the state is very indigent. According to Economic Survey, 2016-17 there are 25 civil hospitals, 13 sub-divisional civil hospitals, 1014 PHCs, 62 FRUs, 151 CHCs and 4621 Sub Centres with 18356 numbers of total beds in the state at the end of 2015. The number of available medical and paramedical staff in Assam is 5004 including Ayurvedic and Homeopathic doctors in 2015. As on 1.1.2013 average population served per Govt. hospitals was 30556 and average population per bed in hospital was 3062. Most surprisingly the number of government doctors was 12 per lakh population. In such a pathetic situation, if the number of cases of COVID 19 increases at existing rate government has to struggle to accommodate the critically ill patients. The present paper is a humble attempt to analyze the present situation and to give statistical evidence on potential evolution of COVID 19 pandemic in the state. The current situation of COVID 19 pandemic in Assam can be witnessed from Figure-1.



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Present Scenario of Assam Tea Industry: Opportunities and Challenges

Miss Dipamoni Ozah

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Abstract

Tea is one of the most popular beverage in the world. Assam is blessed with a high potential for development of resources and demand based industries and produces more than 50% of the tea produced in India and about 1/6th of the tea produced in the world. Tea industry has contributed substantially to the economy of Assam. About 17% of the workers of Assam are engaged in the tea industry. Assam tea industry is India's largest tea industry and second largest tea production region in the world after China. But the growth rate of Assam tea industry is falling in compare to earlier days due to some challenged, which was directly and indirectly can create hindrance to growth of this industry. This paper mainly tries to examine the present status of Assam tea industry with special references to its origin by taken in view some opportunities ,challenges and policies.

Keywords: Tea industry, Opportunities, Challenges, Growth, Compare, Largest, Policies.

1.Introduction:

Assam is located in the North Eastern part in India. The total geographical area of Assam is 78,438 square kilometers, which is about 24% of the total geographical area of the country. The economy of Assam continues to be primarily agrarian and the agriculture sector is providing employment to more than 50% of the rural population. Tea is considered as one of the main agricultural produced in the state and is reputed all over the world for its aromatic quality. The tea industry in Assam is about 180 years old. It occupies an important place and plays a very useful part in the national economy. Robert Bruce in 1823 discovered tea plants growing wild in upper Brahmaputra Valley. A tea garden was started by the government in 1833 in erstwhile Lakhimpur district. With the arrival in London of the fine quality tea from this garden in 1938, the commercial circle of the city took a keen interest in the plantations in Assam and a company known as the Assam Company was formed in 1939 to take over the experimental holdings of the East India Company's Administration over the tea gardens established in Assam till then. In 1911, the Toklai Research station was established in Jorhat with a view to carrying on research on cultivation and manufacture of tea. After independence subsequently Assam tea cultivation was extended to other parts of the country between 50's and 60's of the last century. As of to today, Assam tea has retained its international standard and commands significant share in the world market. The tea industry in Assam also gives average daily employment to more than six lakh persons in the state. To considering the major socio- economic contribution of Assam tea industry it is popularly known as "Tea -the green gold" and "Pride of Assam". According to the All Assam Small Tea Growers Association, the small tea growers contributed 29% of the state's total tea production and with 14% of the country overall production. In the year 2019, Assam contribute 701.35 million kilograms production volume of tea to overall India's share ,which is the highest to any other region in the country. Therefore, Assam tea industry is the most emerging sector of Assam economy. But due to numbers of challenged, this industry was not touched the height of top most production and revenue earning. Government of India need to take some new technology and processes training facility to Assam tea labourers to give big pushed to tea industry of Assam.



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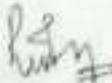
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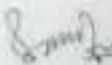
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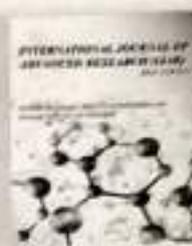


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RESEARCH ARTICLE

MIGRATION PATTERN WITH SPECIAL REFERENCE TO NORTH EASTERN REGION OF INDIA

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North East, Corridor, Impact, Migration, Mainland

Abstract

North East India, popularly Known as 'Seven Sister States', comprising Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura and recently including Sikkim can earned a diverse and unique identity within and outside the nation. The Siliguri corridor, which connects mainland India with the rest of the North Eastern states, is regarded as the 'Mongoloid Fringe', from where the land of the Mongoloid races starts. This uncommon area of nations with natural boutiques attracts the migrants from all over the world leading different problems on local people. This paper mainly tries to examine the pattern of migration of North Eastern region by considering impacts of migration on the migrated region.

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Introduction:-

'Migration', as defined in the Oxford English Dictionary is, "The movement of a person or people from one country, locality, place of residence etc., to settle in another". From the time immemorial human beings have always moved from one place/locality/region to another; be it, in search of job opportunities, shelter, food and what not! Migration affects the size of population and its demographic character very significantly and hence in recent years it has come to occupy an important place in demographic analysis. Although traditionally international migration has always been in the limelight of late, the focus has been on the causes and consequences of internal migration, especially on rural to urban flows. In the modern history, major demographic transitions have depicted the influx of immigrants to the U.S. from the mid-1800s to the early 20th century. Today, more than 200 million people, most from Latin America, South Asia and Africa are migrants both within and across continents. When we talk about country to country migration, India is no less; with over tens of millions migrated people settled in the early stages in India. At the onset of farming, the population of India changed significantly by the migration of Iranian agriculturalists and the Indo-European, while the migrations of the 'Munda' people and the 'Tibeto-Burmese' speaking people also added new elements to the scene. However, if we start discussing the entire migration pattern across countries then it would be an epic. So, in this paper we are limiting our discussion about migration patterns to the 'North Eastern States' of India only.

Objectives:-

The specific objectives of this paper can be summarized as:

1. To throw light on the migration pattern of the 'North Eastern states' of India
2. To discuss the type of Migration (in general) and the causes of migration (especially in the North Eastern states of India).
3. To study the impact of migration on the migrated region.

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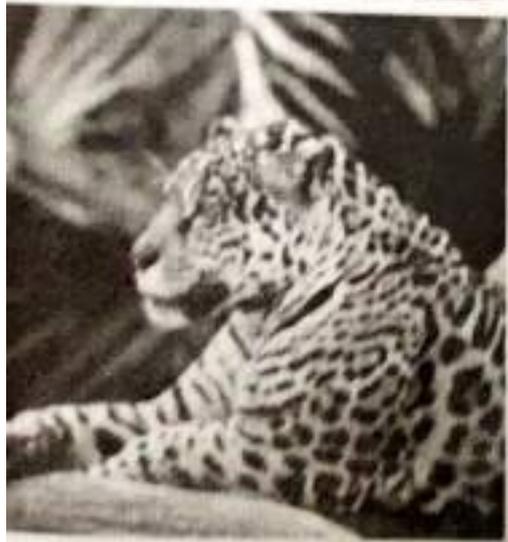
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Ethno zoological knowledge and its present status among the Tai-Ahom people of Sivasagar District, Assam

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Abstract

Sivasagar district, the capital of Ahom kingdom of Northeast India is a part of Indo-Burma, Eastern Himalayan biodiversity hotspot enriched with traditional knowledge. Among the various ethnic diversity Tai-Ahom is the dominant community of the study area. As the traditional knowledge specially ethno zoological knowledge and practices has been eroding among the Tai-Ahom people; An attempt has been made to explore the indigenous ethnozoozoological knowledge and ascertain the present status in the district.

Keywords: Hotspots, Assam, ethno zoological knowledge, Tai-Ahom people

1. Introduction

Assam is an imperishable repository of various categories of faunal and floral resources. Sivasagar district of Assam has been recognized as "Iconic Heritage Site" in 2014 by the Government of India due to the rich historical background. As per 2011 census, the Sivasagar district covering an area of 2668 Sq Km with a total population of 1,150,253 is comprising of three subdivisions, viz. Sivsagar, Nazira and Charaideo. Urban population was 9.55% and rural population of the district was 90.45% of the total population. About 70% of Tai-Ahom population inhabit in this district. Tai-Ahom people entered into this area in the 13th century A.D., followed by other communities and tribes viz. Koch Kalita, Tea-Garden Communities, Indigenous Muslims, Moran, Motok, Chutia, Mising, Bengali, Bihari, Punjabi, Nepali, Rajasthani, Mech - Kochari, Brahamn- Ganak, Nath- Jogi, Koiborta, Kanayak-Naga, Aao-Naga, Tai-Phake, Tai-Turung, Tai-Khamiyang, Monipuri, Sonowal, Kachari, Barahi, Garu, Deori, Auranachali [Nokty], Moria, Hira. Actually Sivasagar district is the central part of the Tai-Ahom community according to the historical survey with varied ethno-zoological background. The ethnic mosaic of Northeast India specifically Sivasagar of Assam offers a fascinating area of academic discourse which needs to be examined for a clear understanding of the elements of traditional knowledge. The Tai-Ahom people are well acknowledged with the ethno-zoological concepts. They have vast knowledge about uses of diversified fauna from their ancestors who learned through a long series of observations in nature by trial and error experiments. They heavily rely on faunal resources for food, medicine, rituals, ornaments, weapons and even for aesthetic and ceremonial purposes. But this indigenous knowledge is on the brink of extinction for most of the practices are obsolete now.

According to Millennium Ecosystem Assessment the total number of species on earth ranges from five to thirty million and only 1.7 -2 million species have been formally identified. IUCN has access to various kinds of information on species. Recently some ethno botanical research had been worked out in various parts of Assam (Hazarika *et al.*, 2014) and on Indigenous Knowledge among Tai-Khamiyangs by Sonowal & Boruah in 2012^[1]; but very few attempts were made to know the scientific approach in reviving the already eroded ethno zoological knowledge of Tai Ahom people.

At present exploration and systematic documentation of traditional knowledge (TK) of the tribal communities is globally considered as a high priority research area. The nature based TK has been responsible for maintaining man-nature equilibrium and has permitted the knowledge holders to utilize the resource sustainably. (Sonowal & Boruah, 2012)^[2]. The global economy is in transition to a "Knowledge Economy", where knowledge resources are considered as important economic resources and its protection through Intellectual Property Right [IPR] assumes great significance.

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Community Response to Local Environment: Reflections in Certain Micro-Landscapes of the Brahmaputra River Valley in Assam, India

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I. Abstract

With an area of 56,194 sq. km., the Brahmaputra river valley in Assam, India is an environmentally unique area characterized by the presence of a variety of micro-landscapes within its broad geographical framework. Endowed with various natural resources such as habitable lands, fertile soils, water bodies, fauna and flora, these micro-landscapes have attracted people of different ethnic backgrounds from around for settlement since time immemorial. These people have responded to their local micro-landscapes sustainably, and in course of time set good examples of harmonious living with nature. However, due to the rapid growth of population and growing external influences during the recent period, these landscapes have experienced remarkable change in their ecological and cultural characteristics.

The present study is an attempt to investigate the process and pattern of response of the communities to their local environment and how the micro-landscapes shared by them are getting modified in course of time. It has been observed that certain unconformities have already emerged in the process of nature-culture interaction leading to a number of environmental and socio-cultural problems in the concerned landscapes. The study is mainly based on field survey carried out in selected landscapes within the valley and systematic interaction with the targeted communities sharing the landscapes through generations. The landscapes are mapped using conventional and modern techniques in order to understand their environmental characteristics and modifications made by the associated communities.

Key words: Micro-landscape, ethnic communities, nature-culture interaction, Brahmaputra valley.

II. Introduction

The nature-culture model is the representation of nature as the ecosystem physically integrated with human society (Bocking, 1994; Ignatow, 2006). Nature has always been effective in all aspects of human life and livelihoods and thus it plays a dominant role in shaping the associated culture (Salman and Munir, 2016; Thakur, 2018). The unique drama of existence is going on with changing socio-economic experiences over time. For man, no matter how he becomes aware of himself or exalts himself above, the world always draws the means of his existence from one and the same source-nature (Laptav, 1979). It is precisely labour, raising man above nature, that again unites him with it, realizing itself as "a process in which both man and nature participates, and in

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Reflection of nature in the material culture of the Karbi tribe: A case from Kamrup (M) district, Assam, India

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Abstract

The processes of nature-culture interaction and resulting landscapes in an area form fertile fields for geographical research. The present study is an attempt to analyse the reciprocal relation between people and nature in a tribal village environment of the Brahmaputra Valley, Assam. Based on intensive field survey and interviews with the inhabitants, the study reveals that the human-environment relationship in the village is still mutually helpful and more or less sustainable. However, perceptible changes have occurred in the traditional cordial relationship between the people and their environment in respect of habitat, economy and mode of living mainly due to the growing influence of modernization.

Keyword: Nature-culture interaction, material culture, environment, rural landscape.

Introduction

The broad cultural landscapes of the Brahmaputra Valley, Assam are basically the mosaic of ethnic cultural elements that evolved through interaction with its diverse physical settings (Deka and Bhagabati, 2010). The indigenous tribal and non-tribal ethnic groups with their respective cultural backgrounds have used the natural resources sustainably and thus given rise to some distinctive cultural elements in the Valley (Deka and Bhagabati, 2015). The culture and the associated natural settings shared by the ethnic communities are intrinsically linked, and this kind of bond between them is the product of their reciprocal response to each other (Hartel *et al.*, 2014; Kizos, *et al.*, 2010; Nassaue, 1997).

RESEARCH ARTICLE

Foray into Land Use/Land Cover Dynamics in Sibsagar District, Assam using RS and GIS Techniques

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ABSTRACT

The present study used satellite data from Landsat ETM image for the years 1991 and 2016. These data were taken from the Global Land Cover Database maintained by United States Geological Survey (USGS). These data were radiometrically and geometrically corrected. For the year 1971, the groundwork of land use/land cover (LU/LC) map using Survey of India (SOI) topographic map. Using visual interpretation technique LU/LC maps of 1991 and 2016 were prepared with the help of vector polygons for various units and then these data were converted in to raster grids format for the purpose of further analysis. The most predominant land use found is agricultural land with an aerial extent of 56.54% of the total area followed by settlement covering about 20.22 %. The LU/LC categories of water bodies, agriculture, swamps and marshes, settlements, built-up, grass lands, fallow lands and forests were considered for each year. The dynamics in it were analyzed. It is found that agriculture is the most dynamic land use category followed by settlement. Due to the growth of population in the district the requirement for agriculture land is very high. As a result of which there is growth of agricultural and settlements at the cost of marshes and swamps, forests and grasslands which are declined over the period of nearly four decades.

KEYWORDS: LU/LC Dynamics, GIS & RS.

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Introduction

Land use/land cover studies are now conventional as essential to any estimation of assets and deterioration of environment. (Lillesand and Kiefer, 1972). Land use is a periphery bordered by the biological, physical, social and economic systems. In case of planning and resource management land use and land cover change study is the most important. These two concept "land use and land cover" are connected by the change sources like the human actions that modify directly the physical environment (Turner and Mayer, 1994). Land use and land cover is devoted to the vegetation and artificial construction covering the land surface (Anderson et al., 1976).

Conventional systems for collecting anthropological information and quantitative analysis of environmental issues are not satisfactory for multivariate environmental studies and managing the multivariate data set, we need modern technologies like Remote Sensing and GIS. The word Remote Sensing has new on the way to perform by means of the scientific conduct of collecting air and space borne information. Land use and land cover distribution are the product of relations between man and their surroundings. A few of the land make use of are directly associated to cultures, and socio-economic conditions of the people (Vink, 1975).

In the mid 1970 it was recognized that LU/LC dynamics modifies our environment (Otterman, 1974; Charney and Stone, 1975;

Sagan et al, 1977). In the early 1980s, terrestrial ecosystems as sources and sinks of carbon were highlighted this underscore the impact of LU/LC dynamics on global climate via carbon cycle (Houghton et al, 1985). Since 1970 spatio-temporal remotely sensed satellite data were used to detect LU/LC change studies (Singh, 1989). Scientist and the public alike now understand that contemporary change in many realms of the biosphere is largely the product of human activities. Human impacts on the global environment are operating at unprecedented magnitudes rates and spatial scales For example: at least half of the ice-free surface of the Earth has already been substantially altered for a variety of human uses (Kates et al. 1990).

LU/LC change impacts both biosphere and atmosphere. Changes in environment, hydrosphere and atmosphere quality and the quality of existence are a number of environmental, social and economic apprehensions related with land use and land cover transform. Sustainable land resource supervision can be administered by means of precise knowledge of land use and land cover features and relative jeopardy of environmental vulnerability. Much of land in the earth has by now been customized except for unreachable locations (Turner and Meyer, 1994).

The extreme jeopardy and major confront for the society are high growth rate of population, climate change, and over utilization of ecosystem services (Sachs, 2009). Land only determines the pace

of development of man's economic and social activities and land is a significant reserve (Rayamane, 2001). As a result of enormous assorted anthropogenic stress, for instance agricultural expansion, lumbering, growth of plantation, mining, industrial intensification, urbanization, growth of transport system etc., land is turn in to a inadequate reserve. These underlying driving forces are accountable for harmful land cover change (Geist and Lambin, 2002). Designed for planning and execution of land uses schemes, reliable LU/LC information are most urgent and important and considered as primary key. Today, LU/LC information has increasing demands for important human desires and pleasure. In support of gathering information on LU/LC status simultaneously

with field surveys and mapping from aerial photography and satellite imagery, several techniques are being used. These techniques have a range of advantages and disadvantages. In this regard, field study are incredibly time consuming and normally impracticable for large area but it could provide and make available extremely precise LU/LC information. There is a progressive turn down in area under agriculture, built up area has witnessed a fruitful development. Correspondingly area under wasteland, forests and fallow land too has witnessed a decline. Space technology through Remote Sensing has provided us with workable tool to evaluate such changes (Verma et. al, 2013).

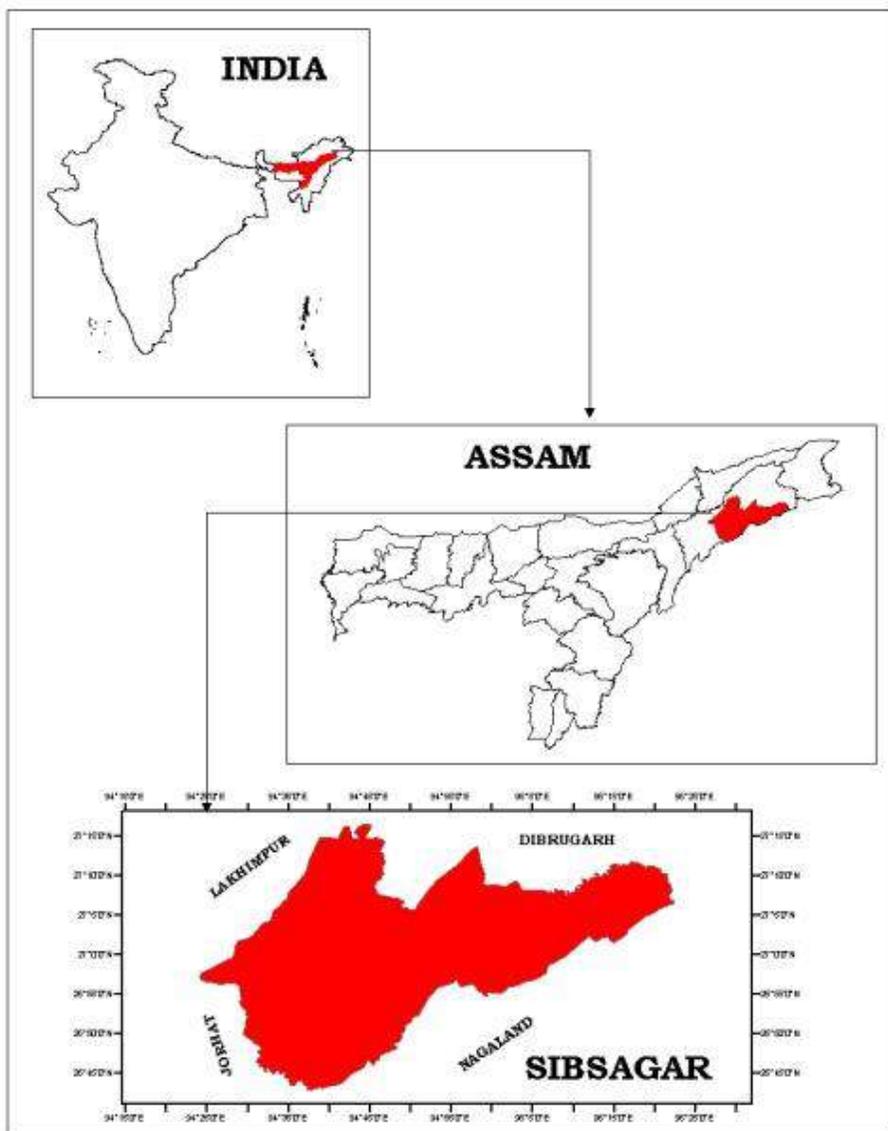


Figure 1. Location of the study area.



Figure 2. LU/LC of 1971 based on Survey of India Topographic Map, 1971, referred to this map as 1:50,000 (1972).

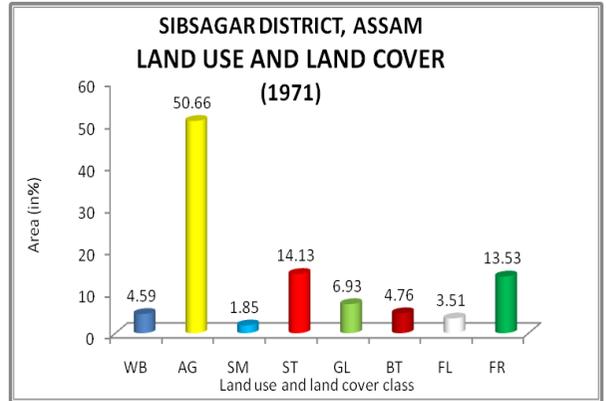


Figure 3. LU/LC of Sibsagar District, Assam (1971)

Table 2. Total geographical area and percentage.

LU/LC Class	Area in km ²			Area in %		
	1971	1991	2016	1971	1991	2016
Water bodies	122.52	124.36	122.83	4.59	4.66	4.60
Agriculture	1351.85	1485.54	1508.69	50.66	55.67	56.54
Swamps and Marshes	49.48	40.35	22.31	1.85	1.51	0.83
Rural Settlement	377.03	525.44	539.72	14.13	19.69	20.22
Grass lands	184.93	63.24	51.07	6.93	2.37	1.91
Built-up	127.17	140.29	149.55	4.76	5.25	5.60
Fallow lands	93.8	51.75	50.12	3.51	1.93	1.87
Forests	361.19	237	223.36	13.53	8.88	8.37
Total	2668	2668	2668	100	100	100

Source: Survey of India topographic map 1971 and satellite data 1991 and 2016.

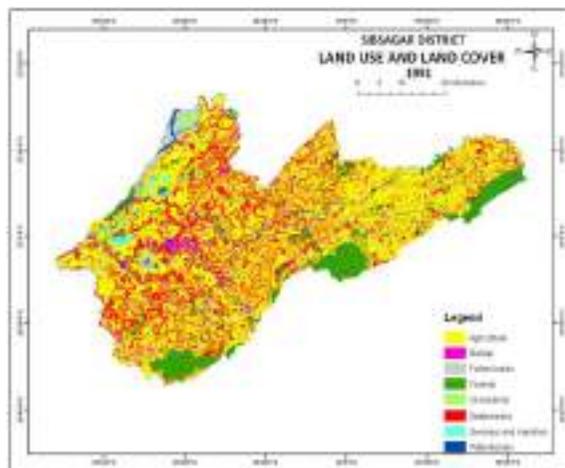


Figure 4. LU/LC of 1991 based on satellite imagery (LAND SAT-ETM, Band 6, 7, 8, Resolution – 30mt. November, 1991.)

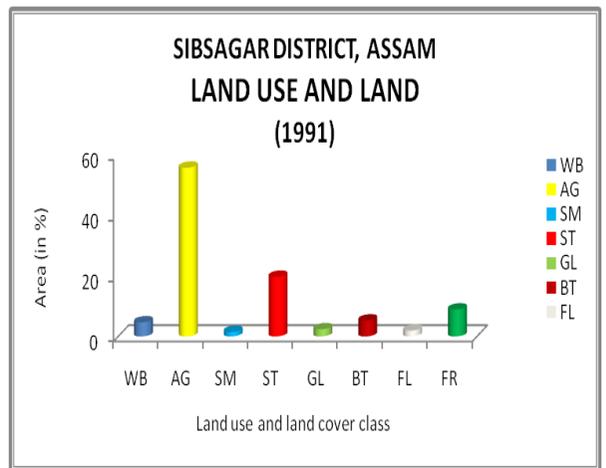


Figure 5. LU/LC of Sibsagar District, Assam, 1991

Table 3. Total Geographical Area (TGA) change and change percentage.

LU/LC	TGA change in km ²			TGA change in %		
	1971-1991	1991-2016	1971-2016	1971-1991	1991-2016	1971-2016
Water bodies	1.84	1.53	0.31	+0.07	-0.06	+0.01
Agriculture	133.69	23.15	156.69	+5.01	+0.87	+5.88
Swamps and Marshes	9.13	18.04	27.17	-0.34	-0.68	-1.02
Rural settlement	148.41	14.28	162.69	+5.56	+0.53	+6.09
Grass lands	121.69	12.17	133.86	-4.56	-0.46	-5.02
Built-up	13.12	9.26	22.38	+4.9	+0.36	+0.84
Fallow lands	46.55	1.63	43.68	-1.58	-0.06	-1.64
Forests	124.19	13.64	137.83	-4.65	-0.51	-5.18

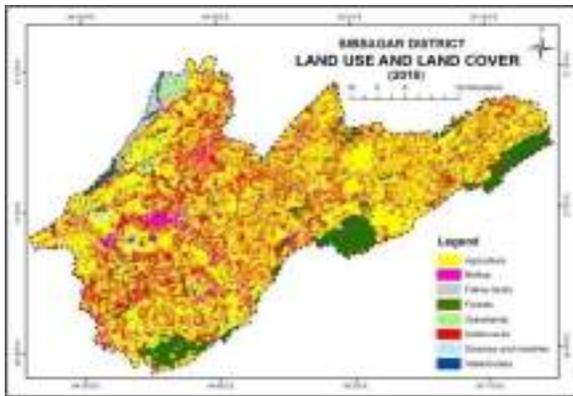


Figure 6. LU/LC status of 2016 based on satellite imagery (LAND SAT-ETM, Band 6, 7, 8).

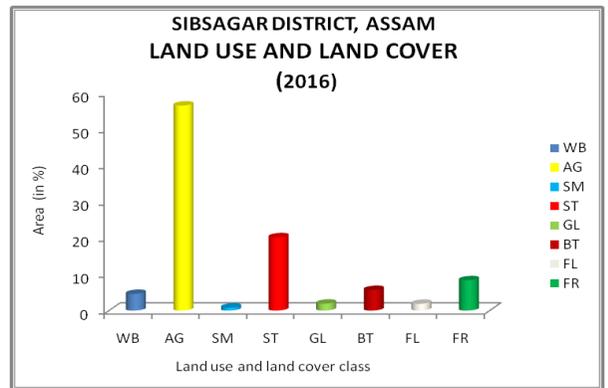


Figure 7. LU/LC of Sibsagar District, Assam, 2016.

SIBSAGAR DISTRICT, ASSAM LAND USE AND LAND COVER DYNAMICS 1971-2016

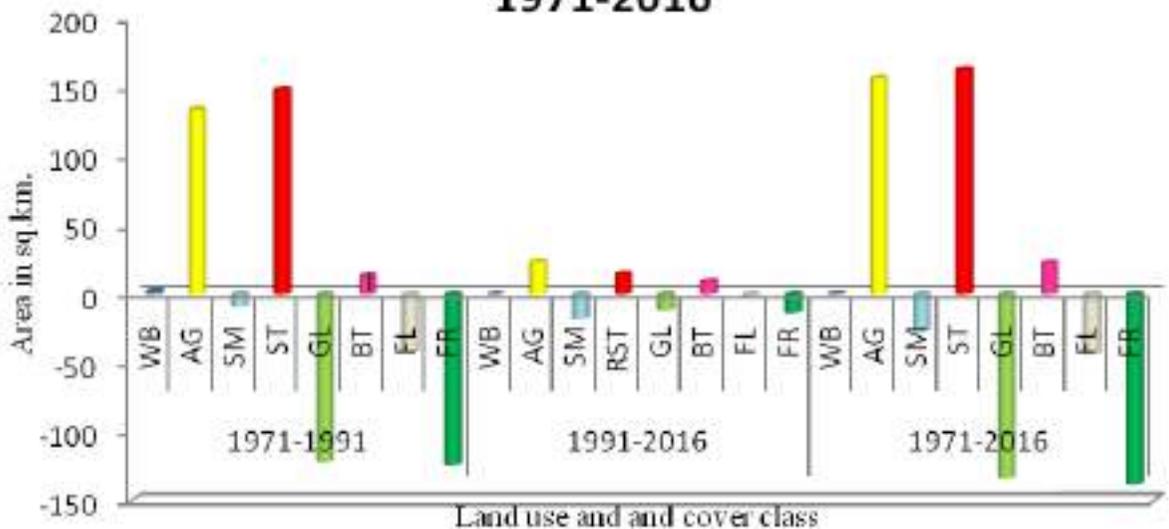


Figure 8. LU/LC dynamics of Sibsagar District, Assam, from 1971 to 2016.

Similarly, the status of LU/LC for 1991 is shown in the Fig. 4 and its statistics in Fig.5. It is found that out of the total area agriculture land occupied major percentage and followed by rural settlements. In the same way status of LU/LC for 2016 is shown in Fig. 5.6 and Fig.5.7. This is the latest LU/LC map and it obviously shows the most recent LU/LC scenario of the study area. Similarly, Table-5.1 is shown the total geographical area and percentage of LU/LC for the year 2016, from which it is quite clear that agriculture has the largest share followed by rural settlements, forests, built up, water bodies, grassland, fallow lands and swamps and marshes. This trend continued since 1971.

Land use and land cover dynamics

A statistical evaluation of the nature and dynamics of LU/LC change gives the primary evidence to understand the possible degradation of environment. The comparative study of the LU/LC pattern of 1971, 1991 and 2016 clearly revealed the change in different LU/LC categories. The temporal variation in LU/LC between 1971 and 2016 is reflected from the following Fig. 5.8 and Table 3. Apart from water bodies, there lies a considerable change in almost each category of LU/LC in the study area during this period. It is observed that the area under agriculture and rural settlements is increased significantly.

There are several underlying factors of transformation of LU/LC pattern varying from bio-physical to anthropogenic based on the locality of the changing site. The study area witnessed major percentage of forests, grass lands and swamps and marshes converted in to agriculture and rural settlements and other development activities as the population increased. Similar situation is found by Sachs in 2009. Moreover, LU/LC of the study area is going under rapid change due to anthropogenic pressure, such as agricultural expansion, industrialization, urbanization etc. Similarly, same situation is described by Singh in 2015 regarding LU/LC dynamics. The following Table 4 show the growth rate and density of population of the study area since 1971-2011.

Table 4. Decadal growth rate and density of population of the study area.

Year	Decadal growth rate of population in %	Density of population/km ²
1961-1971	19.47	245
1971-1991	38.85	340
1991-2001	15.75	394
2001-2011	9.44	431

Source: Census of India, Primary Census Abstract, Sivasagar District, Assam

Accuracy assessment

Evaluating the accuracy of the results of image classification is of great significance since it gives evidence of how well the classifier is able to take out the preferred objectives from the image. By and large overall accuracies for the LU/LC maps of the study area in 1991 and 2016 were 92% and 89% respectively (Table 5).

Conclusion

The study area has been suffering from rapid land use and land cover change owing to increase of population that resulted sharp reduction in forests, grass lands and marshes and swamps. The study covers the LU/LC dynamics from 1971 to 1991 and 1991 to 2016 (Table: 5.2) over the district at different temporal scales. The agricultural land increase from 50.24% to 54.20 % within 1971 to 1991 and it is slightly increased within 1991 to 2016 from 55.67 % to 56.54%. Correspondingly, area under rural settlement is also increased in between 1971 to 1991 from 14.11% to 19.61% and in between 1991 to 2016 from 19.61% to 20.15%. The area under agriculture has increased by 133.6km² between 1971 and 2016. It is observed that water bodies are remaining unchanged .during this period. LU/LC changes are forever determined by their respective space and time in relation to demand of population and food. From the above discussion, review of literature, findings and statistics, this study reveals that expansion of agriculture and rural settlement plays a significant role over LU/LC change in the study area.

Table 5. Accuracy assessment statistics.

LU/LC	Year					
	1991			2016		
	PA(%)	UA(%)	KA(%)	PA(%)	UA(%)	KA(%)
Water bodies	100.0	100.0	1.00	100.0	100.0	100
Agriculture	91.38	94.64	0.87	96.08	87.50	0.74
Swamps and marshes	50.00	100.0	1.00	84.21	80.00	0.75
Settlements	100.0	80.00	0.76	33.33	100.0	100
Grass lands	100.0	100.0	1.00	75.00	100.0	100
Built-up	100	100.0	1.00	100.0	100.0	100
Fallow lands	66.67	100.0	1.00	100.0	100.0	100
Forests	88.89	88.89	0.87	80.00	100.0	100
KAPPA	0.87			0.83		
Overall Accuracy	92			89		

Note: PA= Producer Accuracy, UA= User Accuracy.

Where ever population increase, it creates pressure on other categories of LU/LC and started to illegal encroachment in to the other categories of land use and land cover and starting to change the existing land use and land cover kinds.

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