

## STUDY ON SEED MYCOFLORA OF DIFFERENT VARIETIES OF FRENCH BEAN (*PHASEOLUS VULGARIS* L.)

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### ABSTRACT

Seeds of eight French bean varieties were selected to study the occurrence of seed mycoflora. Isolation was done by Direct Plate method (Warcup, 1950) and Dilution Plate method (Johnson and Curl, 1972) using Rose Bengal Agar medium. A total of 17 genera, 31 fungal species and 2 sterile mycelia were isolated from the seed varieties. The most abundant species were found to be species of *Aspergillus*, *Cladosporium* and *Penicillium* while the least abundant were species of *Actinomucor*, *Eupenicillium*, *Fusarium*, *Nectria* and *Rhizopus*. The highest colony form unit (CFU) was observed in FB 62 and FB 61 in Direct Plate method and Dilution Plate method respectively, while the lowest CFU was observed in Manipur variety in Direct Plate method and Naga Local variety in Dilution Plate method. From the present study, it was observed that a large number of fungal species colonized all the seed varieties studied which may cause deterioration in the seed quality and poor performance of the crop in the field. It was also observed that the Direct Plate method was more suitable for the isolation of seed microflora in comparison to Dilution Plate method.

**KEYWORDS:** Seed Mycoflora, French Bean, Direct Plate Method & Dilution Plate Method

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### INTRODUCTION

French bean or common bean (*Phaseolus vulgaris* L.) is considered as one of the most important legume crops grown worldwide, and is consumed both as a pulse and green vegetable. It contains many essential nutrients, but it is well known for its protein rich (23%) seeds. French beans are usually being grown as winter crop, however, in hilly regions; the crop is cultivated throughout the year except winter. In Meghalaya and other places situated in the mid-hills of north-eastern region, French beans are grown from the month of March to December when highest summer temperature reaches up to 32°C (Shivastava *et al.*, 2012).

In agricultural production, the most important input is the seed quality which greatly influences the survival and yield of the crop in the field (Eliud *et al.*, 2010). The viable seed is a source of a new plant and contains genetic material in compact form that is well protected from extraneous factors. The quality of seeds depends on many factors such as viability of seeds, field deterioration and other environmental factors. Besides, microorganisms also play a dominant role in decreasing quality and longevity of the seeds. After harvesting, seeds are stored at different storage conditions. The unfavorable storage conditions can lead to the colonization of various microorganisms like bacteria, viruses, nematodes and fungi in these seeds. Among these microorganisms, fungi are the largest group (Javaid *et al.*, 2006).

The influence of microorganisms on the overall health, germination and final crop stand in the field have brought about the importance in the study of seed mycoflora. The dissemination of plant pathogens, disease

STUDIES ON THE BIOLOGY OF THRIPS (*STENCHAETOTHRIPS BIFORMIS*) OF  
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## ABSTRACT

Study on biology of *Stenchaetothrips biformis* (Bagnall) on rice *Oryza sativa* (Linn.) showed that the thrips laid singly minute, kidney shape and translucent white in colour egg inside the leaf tissues with its pointed ovipositor. The average incubation period varied from  $2.92 \pm 0.18$  days. The Larvae passed through two instars. The average first larval period varied from  $3.38 \pm 0.19$  days and second larval period varied from  $1.5 \pm 0$  days while both pre-pupal and pupal period were  $1.38 \pm 0.19$  days, respectively. The average pre oviposition, oviposition and post-oviposition period were  $2.63 \pm 0.19$ ,  $3.29 \pm 0.14$  and  $3.63 \pm 0.49$  days, respectively. The average fecundity of female was  $22.25 \pm 0.7$  eggs during entire life span. The average longevity of adult was  $21.79 \pm 0.58$  days. Total life cycle lasted for 25.75 to 36.17 days with an average of  $30.96 \pm 0.61$  days.

**KEYWORDS:** *Stenchaetothrips biformis* (Bagnall); *Oryza sativa* (Linn); Biology (Egg, Larvae, Pre-pupa, Pupa and Adult).

## INTRODUCTION

Thrips (Thysanoptera) are closely related to other insects in hemipteroid assemblage, such as book lice (Psocoptera), lice (Phthiraptera), true bugs (Hemiptera), whiteflies and aphids (Sternorrhyncha), cicadas and treehoppers (Auchenorrhyncha). Although, insects in hemipteroid assemblage develop hemimetabolously, they are exopterygotes that most closely relate to endopterygotes which develop holometabolously.<sup>[1]</sup> Thrips, though do not have complete metamorphosis, they do have two or three quiescent and non-feeding stages depending on suborder classification.<sup>[2]</sup> Females of most thrips species in the suborder Terebrantia oviposit within the leaf tissue of host plants. Incubation and developmental periods vary with species and environmental conditions.<sup>[3, 4, 5, 6]</sup> Eggs hatch after 2-26 days.<sup>[7, 8, 9, 10, 11, 12, 13, 3, 14, 4, 5, 6]</sup> Following eclosion, two plant feeding larval stages occur. Larval development periods range from 2-13 days.<sup>[7, 8, 9, 10, 11, 12, 13, 3, 14, 4, 15, 6]</sup> These two larval stages are followed by a mobile, but non-feeding pre-pupal stage. Thrips adults emerge after 1-10 days.<sup>[7, 8, 9, 10, 11, 12, 13, 3, 14, 4, 15, 5, 6]</sup> Most species of thrips overwinter as adults.<sup>[4, 16, 17, 15, 18, 19]</sup>

The life stages exhibited by *Stenchaetothrips biformis* are typical of the Terebrantian Thysanoptera. There are four immature stages before adulthood, two of which are active and two of which are inactive. The two active immature stages are termed larva 1 and larva 2 and the inactive stages, pre-pupa and pupa.<sup>[20]</sup> The two active

larval stages ingest all the food required by the thrips for development to the adult stage. Reproduction in *S.biformis* is predominantly parthenogenetic especially in the warmer environment where males are rarely seen at all.<sup>[21]</sup> Some males are seen in field populations but they are rare and the sex ratios of most populations appear to be heavily balanced in favour of females. Female's ovipositors are sharp and saw-like and are used to cut into the surface of the leaf; eggs are then laid inside the leaf surface with only a small area projecting above it. This provides the egg with a high level of protection from both predators and desiccation and makes *S.biformis* eggs very difficult to locate.

## MATERIAL AND METHODS

**Experimental sites:** The study specimen were from Mawlai site in Meghalaya "Fig. 1." under laboratory condition at an average temperature of 16 - 26°C and relative humidity 40-60%, following the protocol of H. M. Rohini and K. Ekanayake, 1984<sup>[22]</sup> and H. R. Pourian *et al.*, 2009<sup>[23]</sup>, in the Department of Zoology Entomology Laboratory, North Eastern Hill University, Shillong.

# Efficacy of antagonistic fungi for the control of *Colletotrichum lindemuthianum* in *in vitro* conditions

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## Abstract

Antagonistic effect of *Aspergillus flavus*, *Cladosporium herbarum*, *Penicillium expansum* and *Trichoderma viride* against *Colletotrichum lindemuthianum* isolated from infected pods of eight French bean (*Phaseolus vulgaris* L.) varieties was studied in *in vitro* conditions by conducting dual culture and inverted plate techniques. In dual culture technique, *T. viride* and *A. flavus* revealed the highest percentage of inhibition on the mycelial growth of the pathogen, exhibiting 81% inhibition, and in inverted plate technique, 79% inhibition and 70% inhibition respectively. *P. expansum* showed an inhibitory percentage of 62% in dual culture and a low inhibition of 27% in inverted plate. The least effective antagonist was found to be *Cladosporium herbarum* which exhibited a percentage of inhibition of 38% in dual culture and 20% in inverted plate. *T. viride* and *A. flavus* were found to exhibit the maximum potentiality to suppress the mycelial growth of the pathogen and can be further exploited for controlling the disease at a commercial scale.

**Keywords:** Antagonistic fungi, *Colletotrichum lindemuthianum*, French bean, *In vitro* conditions

## 1. Introduction

French bean or common bean (*Phaseolus vulgaris* L.) is an important leguminous crop which among major food legumes, is third in importance, has broadest genetic base and is grown and consumed in almost every part of the world (Broughton *et al.*, 2003). Annually, a large quantity of the crop is being lost or spoiled due to fungal infection both in terms of quality as well as quantity. Bean anthracnose is a major disease of French beans, caused by the fungus *Colletotrichum*

*lindemuthianum*, which results in serious crop loss in many parts of the world. The infected seeds are the most important means of dissemination of this pathogen, hence its worldwide distribution (Mudawi *et al.*, 2009). The crop is vulnerable to the attack of the pathogen at all the stages, from seedling to maturity, depending on the prevalence of favourable environmental conditions that are essential for the initiation and further development of the disease (Padder *et al.*, 2011). The high variability of *C. lindemuthianum* has resulted in continuous breakdown of resistance in commercial cultivars which has complicated the use of host resistance genes (Kelly *et al.*, 1994; Melotto *et al.*, 2000) and has made it difficult to develop or design effective anthracnose control strategies.

The use of microbial biocontrol agents have been considered a more natural and environmentally acceptable alternative approach to the existing chemical treatment methods for controlling fungal diseases in plants because it is ecofriendly in nature and safe to use in agricultural system to increase crop productivity since the action of such microbes is highly specific and cost effective. Several fungal species, such as species of *Alternaria*, *Aspergillus*, *Cladosporium*, *Coniothyrium*, *Curvularia*, *Gilocladium*, *Fusarium*, *Metarhizium*, *Penicillium*, *Phoma*, *Phytophthora* and *Trichoderma* were found to be effective biocontrol agents (Feng, 2008). These biocontrol agents produce growth inhibitory substances called toxins or phytochemicals or antibiotics as well as biologically active volatile substances which inhibit the growth of other fungi (Aktar *et al.*, 2014; Campbell, 1989). World's leading plant pathologists have been examining the use of antagonistic microorganisms and natural fungicides for plant protection that's safe, economical, and

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## Preface

I feel privileged to present to members and the general public this volume of Proceedings of the 38th session of the North East India History Association (NEIHA) held at D. K. Girls' College, Mirza, Kamrup, Assam on 2-4 October 2017. This Volume is a collection of the papers presented in the various academic panels during the 38th session and also the proceedings of the business meetings of the Session. We are thankful to the College authorities for untiring efforts in successfully hosting the session.

Dr. Gajendra Adhikary, Principal, D. K. Girls' College, Mirza, and the Local Secretary of the Session welcomed the guests in the Inaugural function. Professor Priyam Goswami (who was elected at the 37th session at Gangtok, Sikkim to be the President of the 38th session) kindly accepted the position and presided over this session. His Majesty Governor of Assam, Shri Banwarilal Purohit addressed during the Inaugural function as the Chief Guest. Prof. Dipak Kumar Sarmah, V. C., Bhaskar Varma Sanskrit and Ancient Studies University and Dr. Samujjal Kumar Bhattacharya, Chief Advisor, ASSU graced the occasion during the Inaugural function as the Guests of Honour. Sjt. Pranab Kalita, Hon'ble MLA, Palasbari, Assam and Sjt. Vinod Sessan, IAS, Hon'ble D. C. Kamrup, the Patrons of the session also addressed during the Inaugural session. Sjt. Babulal Sarmah, Director Higher Education, Assam also shared his views as the Advisor of the Session during the Inaugural function. Prof. Hira Neog, the President of the Governing Body, D. K. Girls' College offered the vote of thanks. More than two hundred fifty outstation members attended the annual conference. It is a healthy sign for the discipline of history and the NEIHA that a large number of young teachers and research scholars of history and sister disciplines attended the session, presented papers in person.

All the participants of the session would recall with gratitude the affectionate hospitality of the management, faculty, other staff and students of D. K. Girls' College, other nearby colleges and people at large. The artists of the cultural programmes were excellent in their performances. We again record our appreciation and best wishes to all of them. We also appreciate the enthusiasm of history lovers for holding the session for the first time in Mirza and most importantly in befitting manners.


The Association is thankful to the Indian Council of Historical Research for the financial support advanced towards the publication of the Proceedings volume. As the Editor, I have tried my best with the help of the Editorial Board to maintain as far as possible a particular academic standard in publishing the volume. I gratefully record the support I received from Prof. Priyam Goswami,

General President during the session and after. Initially these papers, while being presented, had been given critical comments for improvements by the Presidents of the academic sections. After being submitted again these papers have been further screened by the Editorial Board. Thus these papers are fully reviewed.

It pleases me greatly to see that the style sheet of NEIHA is being followed by the paper presenters. We would also like to remind the esteemed members of NEIHA again that they should ensure that the revised papers should reach us within the last day announced in the business session. The time taking task of editing, composing, proof reading, etc. of such a large number of papers within a very limited time period is tough task to undertake and we can do the work upto the satisfaction of all NEIHA members only with the co-operation of all the papers presenters. **In this regard I would like to appeal to all the NEIHA members to precisely FOLLOW THE NEIHA STYLE SHEET and submit neatly typed papers and abstracts in duplicate for presentation at the session. The papers may also be sent to the General Secretary by email in MS Word. This will help in improving the quality of the Proceedings.** I am also thankful to ICSSR-NERC, Shillong and the ICHR, New Delhi for providing financial support towards holding the Session.

Finally, I would like to say a very special word of thanks to the Chairpersons of various academic sessions during the three day session for their comments on each and every paper, members of the Editorial Board for editing the papers and deciding the status of the same. Their commitment to the cause of NEIHA made my job as the Editor much easier. I would also like to thank the Treasurer, Prof. Amena N. Passah for managing the finances of NEIHA and Dr. Sagar Boruah for helping in every way. My colleagues, research scholars and office staff of the Department of History, NEHU, Shillong also deserve my sincere thanks for helping us in various ways to run the permanent office of NEIHA and the printing of the Proceedings Volume in time. In particular I am thankful to Dr. Aparna Mathur who not only helped in proof reading but also in editing some of the papers dealing with ancient and early medieval northeast India; Dr. Rusievan Shangplian, Ms. Babhador Khongdup and Dr. Lasoborki Pymgap for their support and concern. Last but not the least Mr. Pradeep Kr. Shaha and his staff of Modern Offset, Shillong deserve our heartfelt thanks for their interest in the work and their efforts in getting the Volume ready in time for release during the 39<sup>th</sup> session.

Shillong :  
15<sup>th</sup> October 2018



(Amrendra Kr Thakur)

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Migration is a universal phenomenon and no part of the world can be completely immune from it. Meghalaya, one of the states in Northeast India, is not an exception and has been experiencing migration of the outsiders particularly the non-tribals over a fairly long period of time. However, it was in the 1970s that the process of its problematization started with the tribal educated elite undermining the leadership role under the influence of several factors that worked collectively. Though the process eventually led to the occurrence of a series of ethnic ethnic conflict in the state, yet it was largely responsible for the pervasion of the emergence of existential crisis situation for the indigenous tribals.

**Introduction**

Human migration is a universal phenomenon and it has been taking place throughout human history. It has also been recognized as one of the basic human rights by the Universal Declaration of Human Rights, adopted by the UN General Assembly in 1948. The Declaration in clause 1 and 2 of Article 13 states, "Everyone has the right to freedom of movement and residence within the borders of each state... to leave any country, including his own, and to return to his country." Almost all regions of the world have experienced migration of people of one type or the other caused by one or the other factors and there is hardly a region that is not affected by the phenomenon. Migration of people takes place from those regions with higher density of population to those with less density, from those having lower level of development to those with higher level of development and from those that are conflict-ridden to those that are more peaceful and ensuring better security context for human life.

# ANALYZING AND PREDICTING STUDENT PERFORMANCE USING DATA MINING

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**Abstract:** One of the main issues in the educational institutions is finding out the cause of student's lack of performance in academics. In this study student's performance will be evaluated using association rule mining algorithm based on various attributes. The results will then be used to help students improve their performance.

**Index Terms** - Association Rule Mining; Apriori algorithm, multiple regression.

## I. INTRODUCTION

Data Mining is the process of extracting useful information from large datasets. The useful information is then analyzed and summarized thereby converting into knowledge. Therefore, sometimes it also called data or knowledge discovery. The knowledge that is extracted can be useful for variety of purposes. In data mining, association rule learning is a popular and well researched method for discovering interesting relations between variables in large databases. Apriori is a classic algorithm for learning association rules. Apriori is designed to operate on databases containing transactions (for example, collections of items bought by customers, or details of a website frequentation).[1,2]

Predictive tasks are used to predict the value of a particular attribute based on the values of other attributes that are known. Predictive modeling refers to the task of building a model for the target variable as a function of the explanatory variables. There are two types of predictive modeling tasks: Classification, which is used for discrete target variables and Regression, which is used for continuous target variables.[3]

The objective of the paper is to analyze and predict the student's performance based on their previous and current academic performance in previous exams, unit test, assignments, attendance etc and family background by applying association rule and multiple regression analysis with two predictors.

## II. DATA MINING TASK

### Association Rule Mining:

Association Rule Mining is a popular and well researched method for discovering interesting relations between variables in large databases. The uncovered relationship can be represented in the form of association rules or set of frequent items.[4]

Table 1: an example of market transactions

| TID | Items                        |
|-----|------------------------------|
| 1.  | {Bread, Milk}                |
| 2.  | {Bread, Diapers, Beer, Egg}  |
| 3.  | {Milk, Diapers, Beer, Cola}  |
| 4.  | {Bread, Milk, Diapers, Beer} |
| 5.  | {Bread, Milk, Diapers, Cola} |

To illustrate the concepts, we use a small example from the dataset in Table 1. The set of items is  $I = \{\text{milk, bread, beer, cola, diapers, egg}\}$ . An example rule can be extracted from table 1 could be  $\{\text{diapers}\} \Rightarrow \{\text{beer}\}$  meaning that if diapers are bought, customers also buy beer.[4]

### Regression:

Regression is a statistical perspective which can be used to evaluate the strength of a relationship between two variables. It is generally used to predict future values based on past values by fitting a set of a points to a curve.[7]

Linear regression assumes that a linear relationship exist between the input data and the output data.[7] In simple linear regression a criterion variable is predicted from one of the predictor variable. In multiple regression, the criterion variable is predicted by two or more predictors.

Based on the two tasks briefly discussed above, this study will try to answer the following questions:

1. What are the attributes that can be used to predict student's performance?
2. Which attributes affect the student's performance?

The common formula for a linear relationship is used in this model:

$$y = c_0 + c_1x_1 + c_2x_2 + \dots + c_nx_n$$

Here there are  $n$  input variables which are called predictors or regressors; one output variable, which is called as the response and  $n+1$  constants. This is sometimes called multiple linear regression because there is more than one prediction.[7]

## III. DATA SETS

In this study the data of the students who are pursuing their BCA 3<sup>rd</sup> semester will be considered as training datasets. Association rules will be use for selecting attributes from the dataset and based on the accuracy of the relationship between the attributes rules





## Research paper

Antimicrobial selectivity of ruthenium, rhodium, and iridium half sandwich complexes containing phenyl hydrazone Schiff base ligands towards *B. thuringiensis* and *P. aeruginosa* bacteriaAgreeda Lapasam<sup>a</sup>, Lincoln Dkhar<sup>a</sup>, Nidhi Joshi<sup>b</sup>, Krishna Mohan Poluri<sup>b</sup>, Mohan Rao Kollipara<sup>a,\*</sup><sup>a</sup> Centre for Advanced Studies in Chemistry, North-Eastern Hill University, Shillong 793 022, India<sup>b</sup> Department of Biotechnology and Centre for Nanotechnology, Indian Institute of Technology Roorkee, Roorkee 247667, Uttarakhand, India

## ARTICLE INFO

**Keywords:**  
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Antibacterial

## ABSTRACT

A series of new hydrazone mononuclear complexes of the type  $[(arene)M(Cl)]PF_6$  ( $M = Ru, Rh, Ir$ ) have been synthesized in this study. All these complexes were fully characterized with the help of FT-IR, UV-Vis, mass and NMR spectroscopy. The molecular structures of representative complexes (1, 2, 7 and 8) were established by single crystal X-ray diffraction study. The molecular structures of the complexes revealed typical piano stool geometry around the metal center in which the ligand acts as  $NN'$  donor chelating ligand. In the case of complexes (1–3), the ligand coordinates to the metal by using both the pyridine nitrogen atoms forming a six membered metallacycle whereas in complexes (4–8) one hydrazone nitrogen atom and one pyridine nitrogen atom coordinates to the metal ion forming a five membered metallacycle. These compounds were evaluated for their *in vitro* antibacterial activity by agar well diffusion method against two Gram-negative bacteria *Escherichia coli*, *Pseudomonas aeruginosa*, and two Gram-positive bacteria *Staphylococcus aureus*, *Bacillus thuringiensis*. Results show that all the complexes inhibit the growth of bacteria.

## 1. Introduction

Antimicrobials are one of the most significant weapons in fighting bacterial infections [1,2]. Antibacterial substances therefore are of great importance and necessity in treating infectious diseases caused by pathogenic bacteria [3–8]. However, the wide use of antibiotics caused pathogenic bacteria to grow increasingly resistant to commercially available antimicrobial agents, resulting in poor treatment efficacy and significant economic losses [9–11]. The increasing cases of microbial resistance pose a major concern to the scientific community and have become a threat for human life worldwide [12]. To overcome these problems, the development of new and safe antimicrobial agents with better effectiveness is required day by day. Therefore, the search for antimicrobials is a never-ending task. Now a day a number of hydrazone derivatives have been developed and evaluated for their antibacterial and antifungal activity [13]. Hydrazone derivatives also draw considerable attention due to their extensive applications in pharmaceutical and biological activities like anticancer [14], anti-inflammatory [15], antimalarial [16], antitubercular [17] activities. In previous studies, metallo elements such as, copper, cobalt, nickel, zinc and ruthenium, have been investigated because of their small size,

comparatively high nuclear charge and consequently great ability to form coordination compounds [18–21]. But among the transition metal complexes, ruthenium-based complexes have been widely studied and displayed significant biological activity. This can be due to their ability to strongly bind nucleic acids and proteins, ligand exchange kinetics similar to those of their platinum counterparts, the prevalence of two main oxidation states (II and III) and the iron-mimicking property when bound to biological molecules [22–28]. In addition, both the commonly accessible oxidation states of ruthenium are octahedral and relatively inert and moreover the synthetic chemistry is very well established [27]. Over the last decade their therapeutic potential as anticancer and antimicrobial agents have been demonstrated that may have advantages, such as minimal side effects and immunity to drug resistance [29–32].

Nevertheless,  $Cp^*Rh$  and  $Cp^*Ir$  complexes have also been considered as alternatives to ruthenium based drugs mainly because of their water solubility and inert facial co-ligand  $Cp^*$  which allows half-sandwich complexes to be easily tailored for catalytic or biological applications. This has led to a growing interest in the chemistry of pentamethylcyclopentadienyl complexes of the type  $[Cp^*M(Cl)]^{2+}$  ( $M = Rh/Ir$ ,  $L$  a chelating ligand). These complexes have also been

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# Synthesis, characterization and chemosensitivity studies of half-sandwich ruthenium, rhodium and iridium complexes containing $\kappa^1(S)$ and $\kappa^2(NS)$ aroylthiourea ligands

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Chemosensitivity

## ABSTRACT

The reaction of [(p-cymene)RuCl<sub>2</sub>]<sub>2</sub> and [Cp\*<sub>2</sub>MCl<sub>2</sub>] (M = Rh/Ir) metal precursors with aroylthiourea ligands (L1–L3) yielded a series of neutral mono-dentate complexes 1–9. The neutral mono-dentate coordination of aroylthiourea with metals via S atom was confirmed by single crystal X-ray diffraction study. Further reaction of mono-dentate complexes 1–9 with excess NaN<sub>3</sub> in polar solvent resulted in the formation of highly strained four member ring  $\kappa^2(NS)$  azido complexes 10–18. Further these complexes were treated with activated alkynes to isolate triazole complexes, but unfortunately the reaction was unsuccessful. All these complexes were fully characterized by various spectroscopic techniques. The molecular structures of the representative complexes have been determined by single crystal X-ray diffraction studies. The molecular structures of the complexes revealed typical piano stool geometry around the metal center. The chemosensitivity activities of the complexes 1–9 evaluated against the cancer cell line HCT-116 (human colorectal carcinoma) and ARPE-19 (human retinal epithelial cells) cell line. Of these, complex 3 was the most potent and whilst its potency was less than cisplatin, its selectivity for cancer as opposed to non-cancer cell lines in vitro was comparable to cisplatin.

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## 1. Introduction

The discovery of the anticancer activity of cisplatin by Rosenberg led to the development of numerous metal-based compounds as potential drugs in the war on cancer. Platinum based drugs namely cisplatin, carboplatin and oxaliplatin are among the most effective anticancer drugs, which have been widely used [1,2]. However, some drawback such as neurotoxicity, nephrotoxicity, intrinsic resistance of some tumors and dose-limiting side effects has limited the use of the platinum diammine compounds, cisplatin and carboplatin [3]. In order to overcome these obstacles and develop safer and more effective remedial agents, intensive efforts have been devoted toward the design and pharmacological evaluation of other metal-based drugs [4,5]. In the search for anticancer agents containing metals other than platinum, ruthenium

compounds turned out to be the most promising ones, largely because the ligand exchange kinetics of metal complexes in aqueous solution, (which seem to be crucial for the anticancer activity) is favored [6,7]. Ruthenium has therefore been considered to be an attractive alternative to platinum particularly as many ruthenium compounds are not very toxic and some ruthenium compounds have been shown to be quite selective for cancer cells [8,9]. Following the first in vitro study of arene ruthenium compounds as anticancer agents by Tocher et al., in 1992, the field of antitumor and anti-metastatic arene ruthenium complexes has received considerable attention and several anticancer ruthenium complexes, NAMI-A and KP1019 exerted potent activities against numerous tumor cells [10,11]. Furthermore, (p-cymene)Ru complexes like [RuCl<sub>2</sub>(p-cymene)(pta)] (RAPTA-C), show attracted considerable attention due to their promising anti-metastatic activity in vivo activities on the inhibition of metastasis growth, together with a high selectivity and low general toxicity [12]. In addition Cp\*rhodium and Cp\*iridium complexes have also attracted considerable current interest due to their potential anticancer

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# Synthesis, structural and antimicrobial studies of half-sandwich ruthenium, rhodium and iridium complexes containing nitrogen donor Schiff-base ligands

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## ABSTRACT

Synthesis, characterization and antibacterial activity of *p*-cymene ruthenium, Cp<sup>+</sup>rhodium and Cp<sup>+</sup>iridium metal complexes containing pyridyl azine Schiff base ligands have been described. All the complexes have been characterized by various spectroscopic techniques. Molecular structure of complexes **1**, **2**, **5**, **6** and **8** have been obtained by single crystal X-ray diffraction analyses. Spectral studies revealed that ligand **L1** bound to metals as neutral mono dentate N donor whereas ligand **L2** and **L3** revealed the formation of bi dentate NN<sup>+</sup> cationic complexes. In vitro antibacterial activity of the complexes was evaluated by the agar well diffusion method using human pathogenic Gram positive bacteria *Staphylococcus aureus* and Gram-negative bacteria viz., *Escherichia coli* and *Klebsiella pneumoniae*. Complexes **2–4** does not show any activity against the selected bacteria whereas complexes **1**, **5–8** possesses moderate antimicrobial activity and they are more active than the free ligands. The potent activities of the complexes may arise from the coordination, which tends to make metal complexes act as more controlling and potent antimicrobial agents, thus hindering the growth of microorganisms.

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## 1. Introduction

Owing to the global emergence of drug resistant bacteria in response to clinically applied antibiotics, we need to discover new classes of antimicrobials to overcome the overwhelming antibiotic resistance problems in our community. Schiff bases are an important set of chelating ligands in main group and transition metal coordination chemistry and have become an important class of compounds in medicinal and pharmaceutical fields as well (<http://www.sciencedirect.com/science/article/pii/S0022286011001608> [1–3]). Among the various Schiff base ligands, compounds possessing azine moiety are still the order of the day due to the broad spectrum of biological activity profiles displayed. Ketazines, mixed azines, and cyclic compounds have exhibited antitumor [4], antibacterial [5], anti-inflammatory [6], and many other activities.

The capability of identifying and realizing the functions of metal ions for disease treatments remains important in bioinorganic and

medicinal inorganic chemistry [7]. Arene ruthenium complexes play an important role in the organometallic chemistry, among various metal complexes; ruthenium complexes have been shown to exhibit antimicrobial activity against drug-resistant pathogenic microorganisms [8]. The increase activity of ruthenium complexes towards antimicrobial, antibiotic [9–14] and anti-cancer activity [15,16], has greatly contributed to the interest in synthesizing new ruthenium complexes and investigating their possible use. In recent years, we have reported the antibacterial activity of many organometallic complexes like, half-sandwich platinum group metals with various ligands such as pyrimidine-based ligand, (di-2-pyridylaminomethyl) benzene ligand and hydrazine based ligand [17]. Rhodium complexes with nitrogen containing ligands have been used as antibacterial, antitumor agents as well as in hydrogenation catalysts [18].

Our present work reports the synthesis of a series of *p*-cymene ruthenium, Cp<sup>+</sup>rhodium and Cp<sup>+</sup>iridium metal complexes containing nitrogen donor Schiff based ligand and their antibacterial activity. Ligand used for this study is shown in Chart 1.

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# Synthesis, structure and bonding modes of pyrazine based ligands of Cp<sup>\*</sup>Rh and Cp<sup>\*</sup>Ir complexes: The study of *in-vitro* cytotoxicity against human cell lines

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## ABSTRACT

The reaction of multidentate pyrazine based ligands was explored towards Cp<sup>\*</sup>rhodium and Cp<sup>\*</sup>iridium precursors. Mononuclear and dinuclear complexes formed by the ratio-based reaction between ligand and metal precursor. The representative complexes and their complexes are evaluated against human colorectal cancer cell lines HT-29, HCT-116 p53<sup>+/+</sup> and HCT-116 p53<sup>-/-</sup> and ARPE-19 (non-cancer retinal epithelium) cells. Complexes 2-5 and 7-8 were cytotoxic to cells and although the potency of these complexes was less than cisplatin, selectivity towards cancer cell lines as opposed to non-cancer ARPE-19 cells was comparable to cisplatin. From *in-vitro* cytotoxicity studies complexes 4 and 5 demonstrated good selectivity towards HCT116 p53<sup>-/-</sup> cells suggesting that these complexes are promising leads for the treatment of p53 deficient cancers.

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## 1. Introduction

Metal-based drugs such as cisplatin, oxaliplatin, and carboplatin compounds have a huge potential in cancer chemotherapy over many years [1–3]. The clinical utility of these compounds is limited to a relatively narrow range of tumors (sarcomas, small cell lung cancer, ovarian cancer, lymphomas and germ cell tumors) [4], as it has high toxicity leading to side effects which limit the administered dose and easily acquired drug resistance. In order to overcome these severe side effects caused by platinum-based drugs intense research efforts have been devoted toward the design of other metal-based drugs that have low toxicity [5] and recently there has been resurgence in interest in organometallics as potential anti-cancer drugs, as they have different mechanisms of action to the platinum compounds [6]. In one such approach, ruthenium-based compounds turned out to show the most promising anticancer activity. In particular, ruthenium-arene half-sandwich complexes have gained increasing interest in

recent years due to favorable *in vivo* anticancer properties [7–9]. Rhodium and iridium complexes like acetylacetonato-1,5-cyclooctadienylrhodium(I), and acetylacetonato-1,5-cyclooctadienyliridium(I) displayed promising percentage of antitumor activity when tested in mice bearing Ehrlich ascites carcinoma, more over they shows high selective toxicity for tumor cells and marginally nephrotoxic [10]. The half-sandwich rhodium and iridium complexes have recently been explored, which have been less investigated as metallo drugs [11–13]. Piano-stool pentamethylcyclopentadienyl group 9 complexes acts as chemotherapeutic agent [14–17], and in some cases, they exhibit a superior activity to that of related ruthenium-arene complexes [18,19]. Multinuclear complexes that comprised more than one metal centers pay attracted interest in the field of medicinal chemistry. The anticancer activity of these compounds can be enhanced because they might possess different properties compared to their mononuclear derivatives in redox activities and selectivity towards various biomolecules [20]. Rh and Ir complexes recently shown promising anticancer activity via intercalating target DNA in the cancer cells [21–23]. On the other hand, pyrazine based ligands and their complexes are well known for their pronounced biological

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# Teachers' professional ethics and its implications

Baldwin B Sumer\*

Ibadani Syiem\*\*

## Abstract

*'Teaching is a noble profession' is an oft repeated adage that we have heard and will continue to hear in the future. This saying is pregnant with meaning. As a profession it (teaching) is laden with risk and responsibility. It calls for greater commitment, personal integrity and ideal service to society at large. Teachers, as professionals, are engaged in one of the most ethically demanding jobs, the education of young people; thus it is important that teachers should constantly reflect on the ethics of their activities to ensure that they exhibit the best ethical example possible in their work to those they are morally educating.*

*There is a felt need that teachers as professionals need to conduct themselves befitting the type of profession they practice. This paper is an attempt to bring to light some of the important aspects of professional ethics and its implications in the field of teaching that are essential for the attainment of professional excellence and self-satisfaction among the teachers and other stakeholders.*

**KEYWORDS:** Professional Ethics, Teachers, Profession, Integrity, Self- Satisfaction

## Introduction

In the history of education, the teacher has occupied a very important role. A number of books and eminent thinkers/writers have rightly pointed out the significant of the teacher not only in the teaching-learning process but also to the society at large. Dr. Radhakrishnan observed that the teacher has a special place in the society; they are the transmitters of knowledge and value, and are responsible for keeping the lamp of the civilization burning. Society on the other hand has its due share to honour the teaching profession and to ensure that teachers are given due status which will command respect from the students.



# TEACHER EFFECTIVENESS OF THE SECONDARY SCHOOL TEACHERS OF EAST KHASI HILLS DISTRICT OF MEGHALAYA

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**Abstract:** *This descriptive study attempts to bring to light the status of teacher effectiveness of the secondary school teachers of East Khasi Hills District of Meghalaya. Further, it sought to compare their effectiveness on the bases of sex, locale and types of management that the teachers serve and bring out the implications of the findings and offers suggestions for strengthening their teacher effectiveness.*

**Key words:** *Teacher effectiveness, secondary school, teacher, Meghalaya, Management.*

## INTRODUCTION

Teachers hold a pivotal role in the teaching learning process for the fact they have a multifaceted roles and responsibilities that the profession mandated of them. Irrespective of the diversified role that they play in the teaching-learning process, students' achievement often have become the yard stick for measuring their effectiveness. Effectiveness or teacher effectiveness refers to the competencies and skills that the teachers must demonstrate in order to be able to accomplish the task that they have at hand as a teacher. This is manifested in the achievement of the learning objectives and outcomes that s/he sets for herself or himself while embarking on the task of teaching the students in the classroom. Such effective teachers display high level of professionalism, commitment, confidence, trustworthiness etc... while fulfilling their duties and responsibilities. In short, teacher effectiveness is encompassed in the knowledge, attitude and performance of the teachers. Teacher effectiveness plays an important role in the teaching learning process as teacher forms an important contributive factors to the student achievement through the expertise that they have in the contents of the subjects specific, the approaches and pedagogical knowledge and experiences. Effective teachers are boon to the schools as they not only have a positive impact in the students' learning but also for the performance of the school as a whole. They become an asset to the institutions.

## NEED AND JUSTIFICATION OF STUDY

Teacher effectiveness may be said that it correlates directly with the performance of the students. If this is to be true, records has shown that the passed percentage of students in the district has been remarkably higher as compare to the rest of the districts in the state of Meghalaya, which only substantiate the teacher teachers in the district are more effective than those working in other districts. However, paucity of studies of teacher effectiveness in the district at different levels of education are very scares especial in the secondary level. Hence, the investigator felt the need of undertaking this studies to find out the current status of effectiveness of the teachers in the district; identify the levels of effectiveness and to compare their performances on the basis of sex, locale and types of management.

## OBJECTIVES OF THE STUDY

The followings are the objectives of the present investigation:

1. To study teacher effectiveness of secondary school teachers of East Khasi Hills District of Meghalaya
2. To find out differences in teacher effectiveness of secondary teachers on the basis of sex, locale, type of management

## HYPOTHESES

The hypotheses of the study are spelt out as:

1. H<sub>0</sub> 1: There is no significant difference between the male and female teachers in the teacher effective
2. H<sub>0</sub> 2: There is no significant difference between the rural and urban teachers in teacher effectiveness

# HAPPINESS OF FEMALE HIGHER SECONDARY STUDENTS

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**Abstract:** Happiness is a concept which has become of high importance for the past years (Ghasempour et al., 2013). Heizomi et al. (2015) stated that Happiness is the sign of mental integrity and students who are happy in their life indicate better school performance and higher level of success in their life. Therefore the main purpose of this study is to investigate the Happiness of Female Higher Secondary Students in West Garo Hills district of Meghalaya. The material used for this present study is a self-constructed and standardised Happiness Scale. Appropriate statistical technique like percentage, t-test and One-way ANOVA method was used for analysing the data. The findings of the study are discussed in the light of the objectives formulated.

**Key words:** *happiness, higher secondary students.*

## Introduction

Happiness is a concept which has become of high importance for the past years (Ghasempour et al., 2013). It has recently received increased attention from both researcher and policy makers (Guomundsdottir and Sigfusdottir, 2012). Heizomi et al. (2015) stated that Happiness is the sign of mental integrity and students who are happy in their life indicate better school performance and higher level of success in their life. Therefore it is the main goal: most individuals reach out for a happy life and many policy makers aim at greater number (Veenhoven, R. 2012). Burns (2012) stated that happy people are healthy people and they live longer and enjoy a greater quality of life.

While reviewing studies on Happiness we found that in most cases females are happier than males. Therefore the main purpose of this study is to investigate the Happiness of Female Higher Secondary Students in West Garo Hills districts of Meghalaya.

On approaching the previous literatures with respect to Happiness, Nair and Haripriya (2013) found that the level of Happiness was found to be greater in the case of govt. school students. Tabbodi, et al. (2015) founded that the student's happiness was not satisfactory and the mean score of happiness among female students is more than the male students. Further it is also found that there is a significant positive relationship between happiness and the progress of students. Kirmani et al. (2015) in their study found that the female adolescents have a relatively an average subjective wellbeing. Suthar (2016) found that there is no significant difference in happiness and satisfaction among student of general stream and science stream

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## Preface

I feel privileged to present to members of the Association and the general public this volume of Proceedings of the 39th session of the North East India History Association (NEIHA) held at Synod College, Shillong, Meghalaya on 1-3 November 2018. This Volume comprises of papers presented in the various academic panels and minutes of the business meetings held during the 39th session. We are thankful to the Organising Committee and the College authorities for their untiring efforts which made the session a great success.

At the offset of the Inaugural Function, Dr. D. Wanswett, the Principal of Synod College, Shillong welcomed the invited guests and other attendees. Dr. Rajen Saikia (who was elected to be the President of the 39 session during the 38<sup>th</sup> session at Mirza) kindly accepted the position and presided over this session. Prof. Amrendra Kumar Thakur, General Secretary, NEIHA, presented an account of the activities of the Association in his address. Shri Vincent H. Pala, Hon'ble Member of Parliament, Lok Sabha graced the Inaugural Function as Chief Guest and addressed the gathering. This was followed by the Presidential Address by Dr. Rajen Saikia. Their prowess and eloquence in oration left the gathering motivated and gave a great start to the session. Shri Kerl'ihok L. Buam, Local Secretary for the session presented the vote of thanks. The annual conference was attended by over two hundred members. Thus, it provided a platform for an academic congregation of teachers, students and researchers of history and its sister disciplines from northeast India and beyond to engage in insightful discourses through presentations of various papers.

All the participants of the session would recall with gratitude the affectionate hospitality of the management, faculty, other staff and students of Synod College, Shillong, Meghalaya and people at large. The artists who participated in the cultural programmes performed exceedingly well and were highly appreciated. This was the seventh session of NEIHA to be held in Meghalaya. We are grateful to the enthusiastic history lovers in the state.

I, the Editor of the Volume and the entire Editorial Board strived to maintain a certain academic standard in its publication. I acknowledge the continued support rendered by Dr. Rajen Saikia, General President of the 39<sup>th</sup> session during and after the session and am greatly thankful to him for

the same. **During the presentation of papers in the different academic sections of the session critical comments for improvements were made by the respective Chairpersons and other attendees. The Editorial Board further screened the papers after their final submission for consideration for publication. Thus, the papers included in the Volume have been comprehensively reviewed.** I am also thankful to ICSSR-NERC, Shillong and the ICHR, New Delhi for providing financial support for holding the Session.

Finally, I would like to express my gratitude to the Chairpersons of various academic sections during the three day session for their diligent comments on each and every paper. I am also thankful to the members of the Editorial Board for editing the papers and being decisive about their possible publication. Their commitment to the cause of NEIHA made my job as the Editor much easier. I would also like to thank the Treasurer, Prof. Amena N. Passah for managing the finances of NEIHA and Dr. Sagar Boruah for his dedication to NEIHA. My colleagues, research scholars and office staff of the Department of History, NEHU, Shillong also deserve my sincere thanks for helping us in running the Permanent Office of NEIHA and in the timely printing of the Proceedings Volume. In particular I am thankful to Dr. Raktim Patar, Dr. Rusievan Shangpliang, Ms. Babhador Khongdup and Ms. P. Gracefulness Bonney for their relentless services to NEIHA. Last but not the least Mr. Pradeep Kr. Shaha and his staff of Modern Offset, Shillong deserve our heartfelt thanks for their passionate efforts in getting the Volume ready in time for release during the 40<sup>th</sup> session.

Shillong :  
13<sup>th</sup> June, 2019



(Amrendra Kr Thakur)

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# Dynamics and Implications of Human Migration

Batskhem Myrboh\*

## Introduction:

Migration has been an important part of human life and it is as old as human history itself. In this context William H. Mc Neil (1984: 1) puts it, 'It is safe to assume that when our ancestors first became fully human they were already migratory, moving about in pursuit of big game'. Migration continues from the time when man was under foraging culture to the present times when man is so technologically advanced though its nature may have changed. Taking into account its international aspect the United Nations in its *International Migration Report 2017: Highlights* (2017: 1) states that migration has been a rapidly growing phenomenon. People across the world either collectively or individually have always experienced migration whether voluntarily or involuntarily at one time or the other, taking place either over a short or great distance, and whether temporarily, semi-permanently or permanently. In this paper an over view of the forces that have been responsible for causing people to migrate and the consequences of such movement will be made using mainly the secondary sources of data.

## Causes of Migration

The type and nature of migration is not the same for different places and at different points of times and as such the factors affecting migration also change according to space and time (Singh 1993: 83). Being a complex and dynamic phenomenon, migration is determined by varied factors which are difficult to

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specify with precision. Many factors are responsible for migration and these are "cultural, demographic, economic, geographical, political, social and security factors" (Debbarma & George 1993: 9-14) and these factors tend to work not separately but in combination (Ibid). On the whole, factors of migration can be classified as push and pull factors. While the push factors are responsible for compelling the people to migrate to other destinations, the pull factors attract them to migrate into a particular place offering better opportunities and conditions to the migrants. R. B. Mandall (1981: 9-10) while discussing the factors of migration prefers to make use of the terms emigrating and immigrating forces instead of push and pull factors though their meanings remain the same. According to him, "emigrating forces refer to those forces that lead to outside migration of a permanent resident of any place and immigrating forces lead to the in-migration of the population of a country from the outside world" (Ibid).

In general, the push and the pull factors of migration can be classified as the demographic, economic, social and cultural, political and environmental factors that may influence migration both at its source as well as at its destination. The rapid growth of population coupled with lack of economic opportunities forces people to migrate to other places. On the other hand, a decreased rate of population growth leads to the diminishing of the total population of a particular area and as the population becomes increasingly ageing, it needs the migration of people from other areas to bring in balance in population and economy. It is an undisputed fact that people migrate mostly from developing countries across the different continents to the developed countries and other oil rich countries of the Middle East thereby contributing towards population growth in the latter on the one hand and easing out the population pressure on the former. In this process of international migration, developing countries such as India, Mexico, China, Bangladesh, Pakistan and the Philippines serve as the major sources of migration where as the United States, Saudi Arabia, Germany, Russia, United Arab Emirates (UAE), United Kingdom, France, Canada, Spain and Australia are the top ten destinations for the migrants (International Migration at All-Time High: 2015). But the influence of demography on migration is not only operative at the international level but along with low economic opportunities it plays a decisive role even in the case of internal migration. For example, the migration of people from Uttar Pradesh and Bihar to other parts of India can be explained from this perspective



(Debbarma & George 1993: 11)

Of all the causes of migration, economic considerations assume primacy both as the push and pull factors and according to K.C. Zachariah and Julien Conde (1981: 53), "There is a general positive relation between the economic status of an area and the rate of migration". Migration takes place from an area characterized by problems of under-development, unemployment, deprivation to means of livelihood like possession of land and such other similar economic conditions (Ibid). For example, the great migration from England to America during 1630-40, according to Nellis M. Crouse (1932: 3-15) was caused partly due to industrial depression in England and severity of food grain shortage. People generally migrate to a place with better economic opportunities such as higher growth rate of development, availability of job opportunities, higher wages etc (Ibid). Ram Nath Singh (1990: 88-89) in his studies of migration in Khutouna Block in Bihar state of India finds that urban centers like Kolkata, Delhi, Jamshedpur, Ranchi etc attracted migrants from Khutouna Block because they provide better economic opportunities. Therefore, there is a direct relation between a place of origin and the place of destination in the process of human migration. Mere prevalence of underdevelopment and other conditions of deprivation in a potential source will not lead to migration unless better opportunities exist in the potential place of destination.

Social and cultural factors such as education, marriage and social status are also responsible for human migration. Many studies that were conducted have revealed that there is a close link between educational quest and migration. Studies conducted in countries like Thailand, Philippines, Taiwan and Nigeria have shown that a substantial proportion of migrating population migrate for the purpose of education (as cited in Connel, Dasgupta, Laishley & Lipton 1976: 66). Marriage is another socio-cultural factor responsible for human migration and this is driven by sex-imbalance. Studies have revealed that there is a high rate of migration caused by marriage especially in the case of women (Ibid: 49). In many regions of the world such as in Peru, Thailand, Oceania and Africa migration has become part of the process of ritualization of an individual to adulthood (Ibid: 50). Even where migration does not become ritualized, migration is encouraged and looked upon as an important process of social life to improve one's socio-economic status in society (Ibid).

Political factors have also become important for human migration. People



from regions with dictatorial regime where human rights are often trespassed tend to migrate to those regions with better political systems. Reasons such as political instability, civil war, racial and ethnic discrimination are the reasons for people to migrate to other places in search of better security to their human life (Debbarma & George 1993: 12). Migration of millions of people from North Korea, Syria, Iraq, Afghanistan, Somalia, Eritrea, Nigeria Sudan and South Sudan are the living examples of the role of political factors pushing people to migrate to other safer places.

Human kind has throughout history responded to environmental and specifically climatic challenges by moving and the relevance that climate change holds for migration is well founded (Ewing 2012: 12) and it is predicted that the quantum of human migration as a result of adverse environmental condition would increase as never before in human history. Though it is an often contested estimate, the number of people that has been projected to be displaced by climate change would be around 250 million by the year 2050 (Mayer 2012: 28). According to the study conducted by World Bank and Agency Francaise de Development (AFD) in the Middle East and North Africa, there is a close link between environmental change and migration (Wodon & Liverani 2013: 10) and that migration is a way to cope with and adapt to changes in climatic and environmental conditions (Ibid: 9). However, according to Mayer (2012: 33) though climatic and environmental changes may constitute a push to migration, they are very rarely directly responsible for causing migration. Therefore, for migration to take place climatic and environmental changes have to be accompanied by other factors as well.

From the above discussion, it is clear that though there are a variety of factors responsible for human migration, yet economic factors play the most crucial part and that the different factors do not play an influencing role independently but they often overlap, particularly with the economic factors.

### Implications of Migration

Migration has many and varied consequences which can be either positive or negative and which can be felt both at the place of origin and the place of destination as well whether at the micro or the macro level. Sushanta Bannerjee, V. Jayachandra and T.K. Roy (2002: 1755) in their joint study at the micro level establish that migration brings about changes in the lives of the migrants and their households. Firstly, it brings about changes in the status of the house-



from regions with dictatorial regime where human rights are often trespassed tend to migrate to those regions with better political systems. Reasons such as political instability, civil war, racial and ethnic discrimination are the reasons for people to migrate to other places in search of better security to their human life (Debbarma & George 1993: 12). Migration of millions of people from North Korea, Syria, Iraq, Afghanistan, Somalia, Eritrea, Nigeria Sudan and South Sudan are the living examples of the role of political factors pushing people to migrate to other safer places.

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hold through the active impact of the regular inflow of remittances, ideas, attitudes and global messages from the place of destination and secondly, through the passive impact of physical absence of a young household member in the place of origin. Migration induces the native household to change their consumption, savings and investment pattern in order to achieve a better standard of living and also increase awareness on various issues such as health, child care and family size. Migration can also have a beneficial effect on the migrant household members by opening up their mind and providing them a broader perspective of the outer world. Ram Nath Singh (1990: 124) also finds that migration brings improvement in social orientation of the migrants and their households. It is also established by the same author that those migrating from rural to urban areas after getting exposure to different ideas and interactions with different peoples change their individual perception towards education, family planning, caste system, lifestyles and they also influence their family members with their newly acquired ideas.

Similarly, the impact of migration are visible and realized at the macro level both in the place of origin as well as in the place of destination. However, it is interesting to note that P.K. Debbarma and Sudhir Jacob George (1993:14) argue that the impact of migration are felt more in the place of destination. The impact is multi-dimensional which can be felt in various aspects of human life which can be in terms of demography, economy, culture, language and ethnicity, politics and environment. Migration has played a major role in the development and under-development of both the place of origin and destination. Veronique Du Pont (1992: p.2427) finds that in Jetpur (Gujarat), the migrants who were mainly the Khatri played a crucial role in the industrial and entrepreneurial development of the town. The Middle East oil producing countries and the developed countries of the world depend largely on the labour from other developing countries to further and sustain their economic development.

Many developing countries benefit from migration in the form of remittances sent back by the migrant working in other countries. Although remittances usually refer to money transmitted by the migrants to their original residence while they are away, yet the term is also used to include savings brought back by the returning migrants, and any reverse flow of either remittances or savings in cash or in kind (Connel, Dasgupta, Laishley & Lipton 1976: 90). The importance of remittances in the place of origin is observed by the World Bank that they help in fighting not only against severe poverty but also lead to



the overall development of the place in other sectors as well. Developing countries are the major recipients of remittances sent by migrants. The top recipients of officially recorded remittances in the recent times are India, China, the Philippines, and Mexico. Other large recipients included Nigeria, Egypt, Bangladesh, Pakistan, Vietnam and Ukraine. However, as a share of GDP, remittances were larger in smaller and lower income countries. According to World Bank estimates the top recipients of remittances in relation to national gross domestic product (GDP) were Tajikistan, Kyrgyz Republic, Nepal, and Lesotho where the share of remittances is more than 25 percent. According to World Bank's *Migration and Development Brief* (2018), global remittance flows, including those to high-income countries, was \$ 613 billion in 2017 and it was expected that it would increase further in the future. Realizing the important role that remittances have been contributing towards a country's developmental processes, many states, according to Manolo I. Abella (1995: 429), adopt a certain kind of policy encouraging emigration for their citizens. However, studies conducted by Johnson and Whitelaw (Kenya), Adepoju (Nigeria) and Cadwell (Ghana) in the past suggest that much of such remittances were used to support families with very little on investment (Connell, Dasgupta, Laishley, & Lipton 1976: 98) thereby negating the much expected role that remittances play in the national development of those countries exporting labour.

Generally studies that have been conducted concentrate on the inflow of remittances though migration also involves outflow of remittances. John Connell, Biplab Dasgupta, Roy Laishley and Michael Lipton (1976: 101) describe out-migration as being responsible for the out flow of financial resources from the place of origin for travel, maintenance and other costs during the transitional period of migration until the migrants are able to secure means of livelihood in the place of destination. Such outflow of remittances can entail heavy costs in the place of origin.

International migration, both because it involves high initial costs and because it produces greater returns, records the highest amount of remittances sent back by the migrating workers (Abella 1995: 419) whereas internal migration though it may involve higher proportion of migrants sending back remittances, but the overall amount whether in absolute or proportional terms, is usually smaller (Connell, Dasgupta, Laishley & Lipton, 1976, 91) thereby reflecting the lower earning capacity of internal migrant workers. However,



attributable to migration since the Second World War and in 2001, 4.5 million people (23% of the population) and 2 million workers (25% of the workforce) in the country were immigrants (Productivity Commission 2006: 1).

People often migrate from rural areas to urban areas because the latter offers better economic opportunities. This leads to the growth of urban population. A study has shown that immigrants have contributed in some measure to the growth of the urban population in Ghana both in the case of internal or international immigrants (Zakhariah & Conde: 83). About 60 percent of the urban growth in Senegal during 1960-70 was due to migration (Ibid). Similarly, much of the urban growth in Ivory Coast during the period 1965-75 has been mainly due to migrants both internal and international (Ibid). Internal migration continues to be a major contributor to the rapid growth of the cities of the less developed countries. It is estimated that net migration currently accounts for between one-third and three-fourths of the urban population growth in the developing nations and this, in turn, has contributed significantly to the growing urbanization in those countries. It has been concluded by Kempe Ronald Hope, Sr., (1989: 6) that the phenomenal growth of urban populations in the Caribbean has been fueled by two major forces. These are (1) natural increase, and (2) rural-urban migration.

Not only that it affects the demography of an area, migration affects the culture of people in the place of destination especially if its volume is huge or continuous. The migrants carry with them their own religious, linguistic and cultural traditions which can leave a deep impact on the local people and eventually lead to the emergence of a mixed culture in the receiving area (Chattopadhyaya 1996: VII). For example, migration of people from India to Nepal has had deep impact on the culture of the people of Nepal. It has led to the adoption of many Indian socio-cultural practices by the people of Nepal as well as the spread of religious faith practiced in India such as Hinduism, Buddhism, Jainism and Islam and many religious festivals (Ibid: 40-57). Similar is the case of tribals in Tripura whose socio-cultural life underwent significant change due to increasing penetration of the Bengali migrants who brought their culture along with them.

Similarly, one of the important impacts of migration is the spread of infectious disease. The association of human migration and the spread of infectious diseases is long and well recognized. Therefore, border health and quarantine medicine practices were developed as an attempt to control the



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Not only that it affects the demography of an area, migration affects the culture of people in the place of destination especially if its volume is huge or continuous. The migrants carry with them their own religious, linguistic and cultural traditions which can leave a deep impact on the local people and eventually lead to the emergence of a mixed culture in the receiving area (Chattopadhyaya 1996: VII). For example, migration of people from India to Nepal has had deep impact on the culture of the people of Nepal. It has led to the adoption of many Indian socio-cultural practices by the people of Nepal as well as the spread of religious faith practiced in India such as Hinduism, Buddhism, Jainism and Islam and many religious festivals (Ibid: 40-57). Similar is the case of tribals in Tripura whose socio-cultural life underwent significant change due to increasing penetration of the Bengali migrants who brought their culture along with them.

Similarly, one of the important impacts of migration is the spread of infectious disease. The association of human migration and the spread of infectious diseases is long and well recognized. Therefore, border health and quarantine medicine practices were developed as an attempt to control the



importation of epidemic infections. Brian D. Gushak and Douglas W. Macpherson (2004: 1742-1748) argue that migration of people from Latin America, Africa and Asia, the regions where infectious diseases like respiratory infections, gastro-intestinal and diarrheal diseases, tuberculosis, HIV infections/AIDS continue to be the causes of death and morbidity poses a threat of infectious diseases at their destination, i.e., the developed countries of the world.

It is generally noticed that wherever there is a continuous inflow of migrants, the immigrants not only over a period of time outnumber the local population but also begin to wield and control economic and political powers thereby shrinking the opportunities for the indigenous people. Migration often leads to and creates socio-economic and political tensions between the local people and the immigrants. Such tensions were witnessed in the United States of America against the Chinese and the European immigrants during the second half of the twentieth century (Bennet 2008). Similarly, the different states in North-East India like Tripura (Singh 2010: 80-81), Arunachal Pradesh (Ibid: 88-98; 104-108), Assam (De 2005: 57-67) and Meghalaya have witnessed anti immigrant movements popularly known as anti-foreigner movements at different periods of time.

### **Conclusion:**

Migration has been a part of human life taking place since the time when food gathering and hunting was the defining human activity in our struggle for existence. However, with the advancement of science and technology and the growing complexity of human life, migration has become increasingly more important both in terms of volume as well as its contribution towards human socio-economic evolution and adjustment. Migration is caused by a number of push and pull factors operating at the places of origin and destination respectively. However, not a single factor may be responsible for influencing one's decision for migration rather a number of factors may be working in close relationship with one another though the economic factor is the most important one. Similarly, migration generates a number of repercussions which can be either positive or negative both in places of origin and destination.

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# Human Migration: A Conceptual and Dimensional Analysis



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## Abstract

*Human migration is a complex phenomenon taking place across the world making it difficult to arrive at a universally acceptable and workable definition. However, while defining the concept of migration, a broader perspective has to be employed in order to capture its different aspects. Also, given its complexity and dynamicism different dimensions of migration have evolved over a period of time though there have been debates among scholars regarding the criteria for its classification and the terminologies used for such dimensions. In this paper an attempt has been made to provide a more comprehensive understanding of the concept of migration and to capture its different dimensions. In this paper mainly secondary data have been used for qualitative analysis in order to achieve the desired objectives.*

**Keywords:** Human, Migration, Definitions, Dimensions

## Introduction

Migration in a layman's language is described as movement of people from one residence to another either permanent or temporary though its meaning is not as simple as it seems to be. Rather migration is a broad and tenuous concept that defies any easy and universally acceptable definition. H. Dingle argues that there is no other activity that is as much confusing as migration as it is debatable what really constitutes migration thereby making it difficult to arrive at a generally agreed definition not only across disciplines (Dingle 1996: 20) but even within the domain of any particular discipline. Varied and sometimes even wrangling definitions of migration have been advanced by different scholars using distance, duration and nature of migration as the bases of such definitions. Lack of universal application and acceptability is not only associated with only the meaning of migration but it also extends to its dimensions as well. In this paper an attempt is made to arrive at a more encompassing definition by critically examining

the definitions that have been advanced by other scholars. Also, an attempt is made to provide an overview of the different facets of the human migration phenomenon.

## Definitions of migration

Migration is not simply a movement of people. It is a movement of people to involving change of residence notwithstanding permanent or temporary. J.B. Donald defines migration as a "rationally planned action which is the result of conscious decision taken after a consideration or calculation of the advantages and disadvantages of moving and staying" (as quoted in Lobo 2004: 2). This definition of migration, however, is quite limited in so far as it includes within its ambit only voluntary and planned migration leaving aside involuntary or forced migration such as the movements of refugees, internally displaced peoples, forced labourers and slaves. In fact, different parts of the world at different periods of history witnessed different streams of forced migration. Therefore, it is incorrect



to exclude forced migration from the ambit of definition of migration. There has been a tendency among scholars to limit the concept of migration to a long term or permanent or at least semi-permanent movement of people over a fairly substantial distance. William Petersen in the *International Encyclopaedia of Social Science* observes that 'migration in "its general sense is ordinarily defined as the relatively permanent movement of persons over a significant distance" (Petersen 1968: 286). However, it is argued by Petersen that it is debatable whether to exclude short term movement of people from the ambit of the concept of migration and according to him the matter should be left to the individual researchers to consider on pending on the purpose of their respective studies (Ibid: 286-287). The definition of migration given by Sister Violita A.C. tries to clear the confusion surrounding short term-long term migration debate where she defines that migration is a 'movement of people and their groups from one country or region to another, both temporary or permanently with a view to reside there.' (Violita 1981: 333). The problem with Sister Violita's definition lies in the fact that migration seems to be narrowed down to only international migration leaving aside its internal aspect. It is essential for a broader understanding of the process of migration that its internal aspect is taken into account while defining the concept. In fact, many migration streams have taken place internally within the same country and even within the same district and, therefore, such a definition lacks comprehensiveness.

Everett S. Lee tries to provide a more encompassing definition by taking into consideration both voluntary as well as involuntary, international as well as internal movement of people within migration though he prescribes that such movement should involve change of residence which is more or less permanent (Lee 1966: 49). Though the definition of migration by Lee is more inclusive, yet it consciously avoids recognizing the temporary change of residence within its ambit. Similarly, scholars such as V.C. Sinha and E. Zacharia and P.K. Debbarma and Sudhir J. George

exclude temporary change of residence from the definition of migration. Sinha and Zakharia's definition of the term migrant can be taken as an inference of their understanding of the concept of migration. They define a migrant as the one who changes residence from "geographically well defined area to another area with the intention of permanently or semi-permanently settling at a new place." (Sinha & Zakharia 1984: 182). According to them temporary movement of people is different from migration and they prefer use the concept of circulation instead for such movement (Ibid). Debbarma and George define migration as "leaving one's original place of residence and going to a new one for permanent settlement or residence for a long duration of time" (Debbarma & George 1993: 2). However, scholars such as Najma Khan and R.B. Mandal do not exclude temporary migration in their definitions. Najma Khan states that migration means human movement involving change of residence irrespective of the distance between changed residences and it can be of duration as short as one month (Khan 1983: 1-2). Similarly, R.B. Mandal opines that migration takes place when people move from the place of their permanent residence to a new place of residence which may be permanent or temporary (Mandal 1981: 1). Though Mandal includes temporary change of residence in the meaning of migration yet he maintains that it should involve 'substantial period of time' and that it has to involve in it the loss of cultural and social contact by the migrating people from those in the original place of residence (Ibid) but how long that 'substantial period' is not properly defined.

A broad definition of migration is put forth by the International Organization for Migration (IOM) which defines it as:

*The movement of a person or a group of persons, either across an international border, or within a State. It is a population movement, encompassing any kind of movement of people, whatever its length, composition and causes; it includes migration of refugees, displaced persons, economic*



migrants, and persons moving for other purposes, including family reunification. (Key Migration Terms, IOM)

After considering the definitions given by the above scholars and IOM, migration can be defined as any movement of people from one place to another involving change of residence. The change of residence may be temporary, semi-permanent or permanent and it may take place across national boundaries or within a particular country or within its province or other smaller administrative units. However, movement of people considered as migration is distinguishable from other movements meant for other purposes such as recreation, family visitation, pilgrimage, business meetings and short term academic activities such as attending seminars, conferences and data collection for research.

### Dimensions of Migration

Migration is a complex process having different dimensions. Different scholars have tried to look into its different aspects using different criteria such as direction, space, duration, cause and legality. On the basis of direction, migration is generally classified as emigration and immigration. Emigration is a movement of persons from a country or region or in other words it is called an out migration. Immigration on the other hand refers to the movement of persons into a new residence or it is called as in-migration (Mandal 1981: 6-7). This binary classification, however, does not satisfactorily explain the phenomenon whereby an emigrant returns to his original place. Therefore, an important aspect of migration that has now started receiving attention among scholars is return migration. Return migration refers to the movement of the migrants or emigrants back to their homeland. In the words of T.V. Sekher, "Return migration is ultimate phase when the reverse movement sets in and the cycle of migration is completed. Although the possibilities of the process restarting cannot be ruled out, it generally takes place after sometimes (Sekher 1997: 97).

Analysing migration using space as a tool of classification, migration has been divided into international and internal migration. International migration refers to that type of migration which involves crossing of international borders. International migration is the present day global phenomenon that is growing in scope, complexity and impact. According to the United Nations General Assembly, today, virtually all countries around the world are simultaneously countries of destination, origin and transit for international migrants (International Migration and Development, 2006). As per the estimates of the UN Department of Economic and Social Affairs' *The International Migration Report 2017 Highlights* there were 258 million who migrated outside the country of their birth which recorded a growth of 49 percent from 2000 and that around 3.4 percent of the world's total population were migrants indicating the increasing importance of international migration. Migration of people within the same country is described as internal migration. Internal migration has further been sub-divided into inter-state migration and local migration. Inter-state migration refers to the movement of people between two or more state of the same country. Migration taking place within the same state is described as local migration. Local migration can take place from rural to rural or rural to urban though the latter is a common phenomenon in the present times (Mandal 1981:7-8).

On the basis of duration, migration has been categorized by Gonzalez into five types: 'seasonal', 'temporary non-seasonal', 'recurrent', 'continuous' and 'permanent migration' (As cited in Brettel 2000: 99). On the basis of the same criteria, R. B. Mandal on the other hand divides migration into two types: long range migration and periodic or seasonal migration (Mandal 1981: 8).). From the above observations, it can be argued that long range migration is that form of migration which takes place over a long distance across continents and which is more likely to be a permanent migration while a periodic or



seasonal migration refers to such migration that takes place over a relatively short distance and occurring time and again.

Generally in terms of duration migration has been broadly classified into short term and long term migration. Though taken only in the context of international migration, the UN classification of migration into short term and long term can be taken as the basis of consideration for other types of migration, i.e., internal and local migration as well. Short term migration is defined as a movement of a person to "a country other than that of his or her usual residence for a period of at least 3 months but less than a year (12 months)" (Recommendations on Statistics of International Migration Revision 1 1998: 18). On the other hand, long term migration is defined as a movement of a person to "a country other than that of his or her usual residence for a period of at least a year (12 months), so that the country of destination effectively becomes his or her new country of usual residence" (Ibid). Instead of using the term like long term and short term migration, migration may also be classified as periodic or seasonal, semi-permanent and permanent migration. Periodic or seasonal migration refers to that type of migration which re-occurs time and again and where individuals migrate for certain seasons of the year. Semi-permanent migration refers to that type of migration where the migrant though essentially lives and get employment at the place of destination of migration yet still has connection with his original place and having a possibility of returning once he completes his term of employment. Permanent migration refers to that type of migration where the migrant stays permanently in the receiving areas (R.B. Mandal 1981: 15).

Migration can be also divided into legal and illegal migration. Migration that takes place in accordance with law and staying in the country in accordance with his or her admission criteria is called a documented (Miller 1995: 537) or legitimate or legal migration. Illegal migration on the other hand has been used by scholars

like Khakchagg Debbarma as interchangeably with the term undocumented migration which is used to define the movements of persons from ones' residence to another without documents or without permission of law (Debbarma 1995: 19). The IOM, however, does not make use of the term illegal migration to refer to the movement of people without proper documents. Such migration is instead defined by the IOM as irregular migration which "takes place outside the regulatory norms of the sending, transit and receiving countries" (Key migration terms, IOM). Further, the IOM states that there is a "tendency to restrict illegal migration to cases of smuggling of migrants and trafficking in persons" (Ibid). In spite of these observations, irregular migration can be taken as synonymous with illegal and undocumented migration. Illegal migration is not uncommon throughout the world. Rather, different countries have either been the source or destination of illegal migration. For example, it has been argued that the migration of people from Bangladesh to the states of Assam, Tripura, Meghalaya and West Bengal of India is an illegal migration (Kumar 2006: 1). Similarly, Graeme Hugo observes that illegal migration is taking place from Asian countries to countries such as the USA, Canada, Australia, and other European countries (Hugo 1995: 397-398). But, knowledge about the nature and extent of such migration as stated by Hugo is difficult in view of the absence of proper records because of its being illegal and taking place in a surreptitious manner and proper study about such migration is not always possible (Ibid). However, it is quite possible that legal migration can suddenly become illegal due to the change of laws or policies of an area and history has shown numerous such cases (Miller 1995: 538).

The above consideration of illegal migration is taken mainly within the context of international migration. But even at the inter-provincial level which is considered as an internal migration, there can be illegal migration. For example, migration of people from other parts of India into those territories of North East India, in



which the Bengal Eastern Frontier Regulation, 1873 is implemented, without permit obtained from appropriate authorities is considered illegal migration. Such territories include Nagaland, Mizoram and Arunachal Pradesh.

Migration is also classified using cause as a criterion into voluntary or forced migration. Voluntary migration refers to that type of migration in which the migrant on his or her own will migrate from one residence to another. In case of voluntary or free and planned migration, it is the people or community who decides or selects to migrate to some other or better place for certain specific reasons. Such migration is usually undertaken by those who prefer to secure better lives in the new place of residence. The mass migration from Europe across the Atlantic during the nineteenth century can be cited as an example (Thomas 1968: 293). Similarly, in the present times the world is witnessing many cases of voluntary migration and such migrants are the economic migrants. For example, migration of the Indian professionals to the western industrialized countries of United Kingdom, United States of America, Canada, Australia, and Western Europe and the Indian migration towards the oil producing countries of the Gulf region (Sekher 1997: 33-35) in search for better economic opportunities. On the other hand, there is also forced migration. Throughout human history, people are usually forced to migrate out of their countries for fear of persecution. Forced migrants if they cross an international border they become refugees but if they remain within their homeland they are displaced persons (Hein 1993: 44). The 1951 Refugee Convention defines a refugee as someone who leaves one's own country due to genuine fear of imminent persecution by the state machinery (Who is a Refugee).

According to Earl E. Huyck and Leon F. Bouvier, refugees have four characteristics which include crossing one's national boundary, desiring to come back once congenial atmosphere prevails in the country of origin, responding more predominantly to push factors rather than the

pull factors and that the failure to respond to such push factors would be disastrous for one's life and liberty. Such push factors can be the political, environment and economic factors (Huyck & Bouvier 1983: 40-41).

Refugee migration has now become as the most dominant and sensitive form of human migration (Cohen 1995: 431). Some of the examples of refugee migration include the Bangladeshi refugees during the Bangladesh War of Liberation 1971 (Chakraborty 2001: 154-158) the Tibetans migration after the annexation of Tibet by China in the 1950s (Ibid) the Tamils refugees from Srilanka, following the Tamil uprising (Ibid) the Chakma refugees in North East India, the most recent are the case of the Syrian refugees and the Rohingya refugees fleeing from Burma. The volume of refugee migration is startling. According to the estimate of the United Nations High Commissioner for Refugees (UNHCR) there were 20.8 million refugees worldwide at the end of 2017. The burden of refugees however is mostly felt in developing countries where they host over four-fifths (80%) of the world's refugees (New UNHCR reports says global forced displacement at an 18 year high: 2013).

There has been an attempt to differentiate between refugees and migrants. It is contended that refugees and migrants, even if they often travel in the same way, are fundamentally different, and for that reason are treated differently under modern international law. Migrants, especially economic migrants, choose to move in order to improve the future prospects of themselves and their families. Refugees have to move if they are to save their lives or preserve their freedom. They have no protection from their own state; rather it is often their own government that is threatening to persecute them (UNHCR viewpoint: 'Refugee' or 'migrant' – Which is right? 2016). However, such a distinction is only superficial at least at the conceptual level since a differentiation of migration into forced and voluntary migration has been considered.

Forced migration besides taking the form of refugees is described as internal displacement.



Internally displaced persons (IDPs) are those people who are forced to migrate out of their original place of inhabitants due to conflicts, civil war, climatic adversity but who remain within the territorial limit of their country (Internally Displaced People 2007: 4-5). According to the findings of the UN Higher Commissioner for Refugees nearly 60 percent of the total forced migration globally takes the form of internal displacement as at the end of 2017. Further, in absolute terms the number of internally displaced persons in 2017 was 40 million (Global Trends 2017: 33). Therefore, internal displacement assumes great significance in migration studies.

The above classifications of migration are not absolute and no water tight compartmentalization is possible as one type of migration often overlaps with another and therefore, they "are more akin to Weber ideal types which can be briefly defined as archetypes used for analytical, evaluative and comparative purposes" (Cohen 1995: 6). It is rather difficult to make a clear and distinct differentiation between the different types of migration that have been spelt out.

### Conclusion

From the foregoing discussions it is evident that though migration is a universal phenomenon yet it is rather a difficult task to offer a precise conceptual understanding of it in view of its inherent complexity. Different scholars have rather given wide ranging definitions which may be either narrow or broad depending on how one looks at it and which dimension of it a particular scholar tries to look at. Scholars have exercised their own respective discretions and discriminations in either including or excluding what types of movement of people within or from an ambit of the definition of migration depending on the contexts of their studies. However, in order to understand the concept of migration in its entirety, it is important to minutely capture the phenomenon both in its contextual as well as in its universal application and offer a definition that is as inclusive as possible. In relation to its dimensions different scholars have used different criteria for identification and categorization

which in many cases such categorization tends to be vague and confusing. However, the different dimensions of migration are not in all situations water tightly compartmentalized as one dimension at times overlaps with the other. Also, migrations being a dynamic process, new dimensions are emerging with the passage of time bringing new complexities to the already complex phenomenon thereby throwing more challenges to the researchers and policy makers. It is in this context that the study of migration needs to be studied and appreciated with more precision and clarity as this would be more useful to the policy makers.

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# ULTRASTRUCTURE OF THE SKIN OF THE TREE FROG *Polypedates leucomystax*

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## Abstract

Amphibians live in varied habitats. This fact probably explains the great morphofunctional diversity in their skins. Although the integument is the structural and functional interface between the organism and its environment, the morphological and complexity of amphibian skin is not fully understood. There is practically no information on the integument of the tree frog *Polypedates leucomystax* found in Cherrapunjee. Therefore, ultrastructure of the skin of the adult frog of *Polypedates leucomystax* was studied during the breeding phase with the help of transmission electron microscopy. Adult males and females of *Polypedates leucomystax* were collected from the study sites at Cherrapunjee. The epidermis consisted of four layers namely, stratum corneum, stratum granulosum, stratum spinosum and stratum germinativum. Desmosomes, ribosomes, tonofilaments, golgi bodies, vacuoles and collagen fibres were observed in the epidermal cells. The basement membrane composed of collagenous fibres separated the epidermis from the dermis. Pigment cells like pterinocytes, melanophores and iridophores were observed and these pigment cells may work together to determine the varied skin colouration and patterns displayed in *Polypedates leucomystax* and may have important roles in adapting this frog to its



# Half-sandwich arene ruthenium, rhodium and iridium thiosemicarbazone complexes: synthesis, characterization and biological evaluation

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**Abstract.** A series of ruthenium, rhodium and iridium complexes with 4-phenyl-1-(pyridin-4yl)methylene thiosemicarbazide (L1) and 4-phenyl-1-(pyridin-4yl)ethylidene thiosemicarbazide (L2) ligands were synthesized and isolated with hexafluorophosphate as a counter ion. All these complexes were fully characterized with the help of FT-IR, UV-Vis, <sup>1</sup>H NMR, <sup>13</sup>C NMR and elemental analysis. An agar-well diffusion method was employed for evaluation of antibacterial activities against one Gram-positive bacteria *Staphylococcus aureus* and two Gram-negative bacteria *Escherichia coli*, *Klebsiella pneumoniae*. Antimicrobial activity evaluation revealed that Cp\* rhodium complexes has a significant antibacterial activity for all the three strains, Cp\* iridium and *p*-cymene ruthenium complexes have shown moderated activity against the microorganisms but none of the complexes surpass the activity of their reference drugs. Results indicated that all the complexes reported here inhibit the growth of bacteria.

**Keywords.** Ruthenium; rhodium; iridium; thiosemicarbazide; antibacterial.

## 1. Introduction

For many years, new drugs of an interesting structure, unknown molecular target, low toxicity and a high therapeutic index have been looked for. This is due to the impossibility of treating many serious diseases, such as bacterial infections or cancer. The ruthenium arene-based drugs have attracted particular interest in recent years.<sup>1,2</sup> Beside platinum compounds, piano-stool ruthenium half-sandwich complexes are the very promising class of antimicrobial and antitumor agents as the stereochemistry of these complexes offers a good platform for producing new molecules by changing the chelated ligand, coordinated arene and the labile group.<sup>3,4</sup> In addition, both the commonly accessible oxidation states of ruthenium (II and III) are octahedral and relatively inert.<sup>5</sup> Cp\*Rh and Cp\*Ir complexes have also been considered as alternatives to

ruthenium-based drugs mainly because of their water solubility which allows half-sandwich complexes to be easily tailored for catalytic or biological applications. The interesting chemical properties exhibited by the complexes of rhodium metal encourage the large considerable current attention of rhodium chemistry.<sup>6,7</sup> The anticancer activity of iridium complexes have made great progress, where a number of iridium complexes show high anticancer effect.<sup>8–10</sup> But there are relatively few reports on the antimicrobial properties of organometallic iridium complexes.<sup>11,12</sup> The results available to date strongly indicate that organometallic compounds have greatly contributed to the interest in synthesizing new metals complexes and investigating their biological applications.

Last few years, pronounced number of Schiff base complexes of transition metal prompted wide interest because of their wide range of pharmacological effects.

\*For correspondence

Electronic supplementary material: The online version of this article (<https://doi.org/10.1007/s12039-019-1731-5>) contains supplementary material, which is available to authorized users.

[Home](#) > [Journal of Chemical Crystallography](#) > ArticleBrief Communication | [Published: 20 May 2020](#)

# Crystal Structure of 1,2,3,4-Tetrahaptohexakiscarbomethoxybenzene ( $\eta^5$ -Pentamethylcyclopentadienyl) Rhodium Complex

[Mohan Rao Kollipara](#) , [Agreedda Lapasam](#) & [Werner Kaminsky](#)[Journal of Chemical Crystallography](#) **51**, 288–292 (2021)**207** Accesses | **1** Altmetric | [Metrics](#)

## Abstract

The title complex (**1**),  $C_{28}H_{33}O_{12}Rh$ , has been isolated as a major product during the reaction of strained azido thiourea rhodium complex with dimethyl acetylene dicarboxylate. This compound is isolated as air-stable bright red crystals and crystallizes in the triclinic space group  $P\bar{1}$  with  $Z = 2$ . The Rh(I) atoms, lying on center, are coordinated by the four carbon atoms of the benzene ring. The Rh atom revealed an unusual heptahedral coordination sphere. It is one of the rare examples of compounds formed by cyclotrimerization of alkynes. The  $Cp^*$  moiety is disordered over two sets of sites with occupancies of 50%.

## Graphic Abstract



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Articles

# Arene platinum group metal complexes containing imino-quinolyl ligands: synthesis and antibacterial studies

Agreedda Lapasam, Sanjay Adhikari, Venkanna Banothu, Uma Addepally & Mohan Rao Kollipara 

Pages 737-753 | Received 12 Nov 2019, Accepted 27 Mar 2020, Published online: 24 Apr 2020

 Download citation  <https://doi.org/10.1080/00958972.2020.1753037>



## Abstract

Imino-quinolyl Schiff-base ligands have been prepared by the condensation reaction of substituted 2-aminopyridine and quinoline-2-carbaldehyde. The reaction of  $[(\text{arene})\text{MCl}_2]_2$  with imino-quinolyl Schiff-base ligands leads to the formation of cationic complexes  $[(\text{arene})\text{M}(\text{L})\text{Cl}]^+$  (**1–12**). Single crystal X-ray diffraction studies were used to confirm the coordination mode and structures of these complexes. The molecular structures of these complexes revealed that they adopt characteristic

three-legged piano stool geometry with the metal coordinating through a terminal chloride and imino-quinolyl ligands in a bidentate chelating NN' fashion. The ligand



# Ruthenium, rhodium and iridium complexes containing pyrimidine based thienyl pyrazoles: Synthesis and antibacterial studies

Agreedda Lapasam<sup>a</sup>, Ibaniewkor L. Mawnai<sup>a</sup>, Venkanna Banothu<sup>b</sup>, Werner Kaminsky<sup>c</sup>, Mohan Rao Kollipara<sup>a</sup>  

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## Highlights

- Pyrimidine based thienyl pyrazole complexes of Ru, Rh and Ir have been isolated.
- All the complexes shown potent activity against tested bacterial strain.
- Both sides of the ligand having identical metal coordination geometry.

## Abstract

The reaction of pyrimidine based electron-rich heterocyclic thiophene pyrazoles and halide bridged arene d<sup>6</sup> metal precursors yielded a series of mononuclear and dinuclear half sandwich d<sup>6</sup> metal complexes. Mononuclear and dinuclear complexes formed by the ratio-based reaction between ligand and metal precursor. All these cationic complexes have been characterized by IR, UV–Vis, <sup>1</sup>H NMR, <sup>13</sup>C NMR spectroscopic techniques. Complex **5** has been established by single-crystal analysis. X-ray diffraction studies revealed the formation of mononuclear and dinuclear complexes and suggest that the vicinity around the metal atom is distorted octahedral. An *in vitro* study to screen the antibacterial potential of these complexes against pathogenic bacteria, *S. aureus*, *K. pneumoniae*, and *E. coli* was addressed. All the complexes display a better zone of inhibitions for both Gram-positive (*S. aureus*) and Gram-negative strains (*K. pneumoniae*, and *E. coli*). The minimum inhibitory concentrations (MICs) for the most active complex ranged from 0.125 to 0.25 mg/ml for *S. aureus* and *Klebsiella Pneumoniae* and 0.25–0.5 mg/ml for *E. coli*.

## Graphical abstract



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Review

# A survey of crystal structures and biological activities of platinum group metal complexes containing *N*-acylthiourea ligands

Agreedda Lapasam & Mohan Rao Kollipara

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## Abstract

*N*-Acyl-thioureas are important compounds in the field of organic synthesis and medicinal chemistry. Research interest in these compounds has grown recently because coordination to metal ions enhances their application especially in view of medicinal studies. These thiourea derivatives possess rich coordination chemistry and the coordination behavior of these derivatives alters upon reaction with

different metals. Such ligands generally coordinate to Pt(II) and Pd(II) ions in a bidentate *S,O* manner and often coordinate to Ru(II), Rh(III) and Ir(III) centers



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Research Article

# Arene ruthenium, rhodium and iridium complexes containing NNO chelating ligands: synthesis, antibacterial and antioxidant studies

Agreedda Lapasam, Lathewdeipor Shadap, Deepak Kumar Tripathi, Krishna Mohan Poluri, Werner Kaminsky & **Mohan Rao Kollipara**

Pages 2365-2379 | Received 16 Oct 2020, Accepted 13 Jul 2021, Published online: 16 Aug 2021

Download citation <https://doi.org/10.1080/00958972.2021.1963439>



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## Abstract

The reaction of  $[(\text{arene})\text{MCl}_2]_2$  with ligands 4-hydroxy-benzhydrazide (L1) and 3-methoxy-benzhydrazide (L2) leads to formation of cationic complexes **1-6** having the general formula  $[(\text{arene})\text{M}(\text{L})\text{Cl}]^+$  {arene = *p*-cymene, M = Ru; arene = Cp\*; M = Rh/Ir; L = L1 and L2}. The reaction of  $[\text{CpRu}(\text{PPh}_3)_2\text{Cl}]$  with L1 and L2 yielded cationic complexes that have been formulated as  $[\text{CpRu}(\text{L})\text{PPh}_3]\text{Y}$  {Y = Cl (**7**), Y = PF<sub>6</sub> (**8**)}. The molecular structures of **1**, **2** and **4** revealed that these complexes adopt typical



# Self-concept of higher secondary students in Meghalaya

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**Abstract:** Self-concept is one of the most dominating factors that influence the behaviour of an individual (Deo, 1971). It is assumed as an important factor for each and can change his or her belief, attitude and reaction toward personal and social life (Mehrad, 2016). Self Concept is the perception of one-selves involving his/her attitudes, feelings and knowledge about skills, abilities, appearance and social acceptability (Mahakud & Joshi, 2016). Self-concept is the feeling that one has about oneself and the evaluation of one's capability. Thus, it is important to be aware of oneself. Self-concept consists of an individual's viewpoint, perspective, belief and characteristics about themselves. The purpose of the present study is to investigate the self-concept of higher secondary students in Meghalaya. The participants in the study consist of 500 higher secondary students drawn from the seven districts of Meghalaya. The tool that is used in the study for collection of data is a self-constructed Self-concept scale. Appropriate statistical technique like percentage and t-test are used for analysing the data. The result of the present study is discussed in the light of the objectives formulated.

**Key words:** self-concept, higher secondary students.

## 1. INTRODUCTION:

Self-concept is one of the most dominating factors that influence the behaviour of an individual (Deo, 1971). It is assumed as an important factor for each and can change his or her belief, attitude and reaction toward personal and social life (Mehrad, 2016). Self Concept is the perception of one-selves involving his/her attitudes, feelings and knowledge about skills, abilities, appearance and social acceptability (Mahakud & Joshi, 2016). Self-concept is the feeling that one has about oneself and the evaluation of one's capability. Thus, it is important to be aware of oneself. Self-concept consists of an individual's viewpoint, perspective, belief and characteristics about themselves. What you wish you were really like - Ideal self (Nath, 2015). The sense of self summarizes how the individual sees oneself (Ummet, 2014). Self-concept is the individual's belief about himself or herself, including the person's attributes and who and what the self is (Baumeister 1999). Self-concept is the overall way I see my-self. As such, it is composed of all those perception of 'I' and 'me' (self, society, ideals) together with the feelings, values and beliefs associated with them (Gaheroa, 2012). Further, self-concept is also defined as the totality of a complex, organized and dynamic system of learned beliefs, attitudes and opinions that each person holds to be true about his or her personal existence (Nath, 2015). The purpose of the present study is to investigate the self-concept of higher secondary students in Meghalaya.

However a more thorough definition was given by an american psychologists carl ransom roger in 1947, who developed the self theory and stressed the importance of an individual's self for determining the process of his growth, development and appropriate adjustment to his environment. self- concept can be best understood in terms of our concept of i, me and myself (mangal, 2014).

### 1.1. Objectives of the study:

- To find out the self-concept of higher secondary students in Meghalaya.
- To find out the difference in self-concept between male and female higher secondary students.
- To find out the difference in self concept between urban and rural higher secondary students.

### 1.2. Hypotheses of the study: The hypotheses formulated are as follows

Ho1. There is no significant difference in self concept between male and female higher secondary students.

Ho2. There is no significant difference in self concept between urban and rural higher secondary students.

## 2. LITERATURE REVIEW:

Studies on self-concept that was conducted in Nagaland by Chakravarty (1977) found that boy's self-concept was higher than girls. A study conducted in Meghalaya by Dkhar (2011) showed that there is no significant difference in self-concept of boys and girls of secondary schools Khliehriat Block. Shantharam (2011) found that there is no significant difference in self-concept between boys and girls and further, urban students have obtained a higher self-concept than the rural students. Gaherao (2012) found that male participants do not differ from female participants on self-concept. Thakar (2013) found that there is no significant difference between the mean score of self-concept of boy

## Negotiating Representation: The Self and Community in *The Story of a Tribal: An Autobiography*

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### Abstract

Literature as a means of representation and understanding selfhood and identity was oral based for the Khasis prior to colonialism but the coming of education via the proselytising efforts of the Welsh Mission led to the development of Khasi literature by the end of the 19<sup>th</sup> century. As mode of representation, literature for Khasis became a space of negotiation and of adaptation of foreign modes of expression and representation to reclaim an identity which has been suppressed by the colonial rulers via their discursive practices. This is clearly seen in the trend of the literary production of the community. The 20<sup>th</sup> century saw a mushrooming of literary production by Khasi writers, with most of them preferring to write in their own language and about their oral tradition. Interestingly, despite this trend, the first autobiography by a Khasi, B. M. Pugh's *The Story of a Tribal* (1976), was written in English. The title of the text itself alerts the readers of the highly politicised term 'tribal' as Pugh himself points out in his Preface and along with the fact that it is an autobiography the implication of issues of representation in terms of identity and selfhood cannot be missed. The text is also historically significant because of the author's articulation of his understanding of identity making in the midst of the cultural and political forces of colonialism and later Indian nationalism especially because it provides a glimpse of the hill state movement that surged in the Northeast immediately after Independence. This text thus gives an eye-witness account of the struggle that the hill tribes of Northeast faced to maintain their political and cultural identity.

**Keywords:** postcolonialism, literature, representation, self, identity, literature, autobiography

The literature of the Khasis, a tribe from North East India, is relatively young, owing to the tribe being oral based. The transcription of Khasi into its written form began with Alexander Lish, Joshua Rowe, Jacob Tomlin with the help of local informants/translators but was completed by Thomas Jones in 1842 (May, 2018). Literary production which began as early as 1842 mostly came from the resident missionaries who wrote mostly primers and books on catechism to serve their proselytising efforts in the Khasi Hills, hence most of these books were useful only for education and religious teaching. Fiction saw the light of day with the translation of the first part of Bunyan's *Pilgrim's Progress* by one of Jones' successors, Mrs. Lewis in 1867 (Nonglait, 2005, p. 47). John Roberts' *Second Reader* is another important milestone in the history of Khasi fiction as he includes adaptations of stories from the Bible (Ibid, p. 52). But here too the goal was to impress Christian teachings in the minds of Khasis. Though Roberts' *Fourth Reader* included non-Christian fiction like translations of "Jack and the Beanstalk" and "The Vision of Mirza" (Ibid, p. 57), literature was still not written for



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## The Politics of Inner Line Permit Extension to Manipur

[Commentary \(/commentary\)](#)[Vol. 55, Issue No. 5, 01 Feb, 2020 \(/journal/2020/5\)](#)

Updated on 4 February 2020

[Batskhem Myrboh \(/author/batskhem-myrboh\)](#)

*The extension to Manipur of the Inner Line Permit by the Bharatiya Janata Party government at the centre is an attempt to weaken the anticipated strong protests in the state against the Citizenship (Amendment) Act, 2019. It comes across as a ploy to weaken the forces that stand in the way of achieving the Hindutva agenda, and also, possibly a means to negotiate the Meiteis' opposition to the National Socialist Council of Nagaland (Isak-Muivah)'s intricate demand for Greater Nagalim.*

The author acknowledges the comments and suggestions rendered by Susmita Sen Gupta, Department of Political Science, North-Eastern Hill University, Shillong for the qualitative improvement of the article.

On 9 December 2019, Amit Shah, the home minister of India, announced on the floor of the Lok Sabha while introducing the Citizenship (Amendment) Bill, (CAB)<sup>1</sup> 2019 that the Inner Line Permit (ILP) as provided in the Bengal Eastern Frontier Regulation (BEFR), 1873 would be made applicable to Manipur. True to his words, the Government of India (GoI) swiftly notified the extension of the ILP to Manipur in the *Gazette of India* on 11 December 2019 (Bhalla 2019). Meanwhile, the Government of Manipur issued a notification on the same day of the home minister's announcement, for this was perceived as a historic development (Thockchom 2019). With this decision, Manipur achieved two objectives: First, the exemption of Manipur from the purview of the CAA as the act contains provisions

# APICULTURE AS AN INCOME ALLEVIATION IN THREE VILLAGES OF SOUTH WEST KHASI HILLS, MEGHALAYA

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## AUTHORS' CONTRIBUTIONS

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

*Original Research Article*

## ABSTRACT

Beekeeping acts as a subsidiary occupation in rural areas which farmers and entrepreneurs take up as to generate additional income. The study focuses on how much that income generated through beekeeping over the years. If the income of the household from beekeeping played a role in generating an extra income to the households in these villages. Most of the studies focus on the problems of beekeeping rather the role of income from beekeeping in reducing poverty in rural areas. The collection of honey for household consumption has been done for generations but the exploitation for commercial purposes has gain momentum in the present scenario. The aim of the study is to examine that beekeeping can be considered as one of the solutions for poor households in rural areas to enhance their household income. The objectives of the study are to know about the households in the villages, the role that beekeeping played in breaching the gap between farm and non-farm activities and increasing the households' income over the years. The research design was based on the three villages with a purposive sampling and based on a random sampling in choosing the samples of beekeepers. Results obtained shows that with globalisation and the spread of social media, the market for export of honey even from remote areas has increase and this has made beekeeping as a subsidiary occupation. Apiculture in Meghalaya can be considered as a subsidiary occupation which can help in poverty reduction and as a supplement to the household income in rural areas. Even though beekeeping is a significant subsidiary occupation for households in rural areas for increasing income it still has a long way to go to make it more viable. The pricing of the honey sold should be determined so that it does not take away the profit from the primary producers, good advertisement is needed and there is a need for community linkage to further add to the growth of commercialisation of honey and its products.

**Keywords:** Apiculture; income elevation; market potential; poverty reduction.

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## 1. INTRODUCTION AND PROBLEM EXPOSITION

Beekeeping is an agro-based enterprise which acts as a subsidiary occupation in rural areas which farmers and entrepreneurs take up as to generate additional income. Honey bees (*Apis Cerana Indica*) convert nectar of flowers into honey and store them in the comb of the hives. The collection of honey for household consumption has been done for generations but the exploitation for commercial purposes has gain momentum in the present scenario. The growing potential for honey and its products has resulted in beekeeping as an emerging viable enterprise. Honey and wax are the two economically important products. With globalisation and the spread of social media, the market for export of honey even from remote areas has increase and this has made beekeeping as a subsidiary occupation which is a combination of farm and non-farm enterprise.

Beekeeping requires less money less time and less investment. It is and was an indigenous knowledge passed from one generation to another. Bees play an important role in the pollination of different flowering plants, which increases the yield of certain plants like sunflowers and fruits. Honey bee (*Apis Cerana Indica*) is the most common here in India and even in Meghalaya. The honey produced in Meghalaya differs in colour from one area to the other due to the different species of flowers in different regions. The honey produced in the War region of East Khasi Hills is dark brown in colour, in Ri-Bhoi District it is black in colour and in honey from South West and West Khasi Hills Districts is light brown in colour.

Apiculture or beekeeping in Meghalaya is considered as a subsidiary occupation which can help in poverty reduction or as a supplement to the household income. Most of the households in rural areas of Meghalaya are mainly involved in farm activities where the incomes barely cover their household expenditure. The apiculture mission which started in Meghalaya has helped the producers of honey in the rural areas to commercialise it which has increase their household incomes [1].

Honey hunting is a practice that has been going on for many thousands of years when people practised bee collection from the bee hives which they realised the benefits derived from it. Beekeeping tends to be perceived as a hobby or as a subsidiary occupation but also a resilient livelihood- one that keeps people out of poverty [2]. This perception of bee keeping has started way back 4500 years ago when the Egyptians started domesticating bees for honey. Beekeeping is advocated to improve human welfare by alleviating

poverty through increased household income, biodiversity conservation, food and nutritional security, raw materials for industries and enhance environmental resilience [3]. It is a fascinating occupation which has been taken by the people in many countries not only for honey but for the products that come with the extraction of honey e.g., wax, pollen, propolis used for different purposes enhancing incomes. It is an activity with less investment requirement since the raw materials needed for making honey are readily available in nature. Furthermore, it can be carried out by all age groups, men, women, and children and even by physically handicapped and retired persons [4]. According to Hill and Webster [5] shows that forestry and bee production goes a long way. According to them purposeful planting of trees as in agro forestry systems, could be designed to favour bee production. The work done by Kishan, Aruna, Mishra & Srinivasan [6] on beekeeping in India provides an insight of beekeeping as a full-time occupation providing a handsome income for households since it has market potential by using simple mechanized techniques. Beekeeping even though started on a small scale just for recreation purposes for many people in the rural areas but with time the increase in the demand of honey has introduced beekeeping as a business activity and improving their pre-existent skills. According to a study by Ntaliwa, Mwakatobe, Kipembe, & Kohi [7] in their study in beekeeping in Western Tanzania shows the role that apiculture has in poverty alleviation. It states that when apiculture form a part of people's livelihood it brings about various outcomes which includes not only income and material things but also contentment and well beings of the apiarists. Honey is considered as a medicine and the consumption of honey has increased over the years in all countries. Honey which is produced if it is sold in markets in rural areas or in a better and captivating packaging generates income to households and increases their chance of a better livelihood in the society. The products produce from beekeeping like beeswax can be used to produce candles, beauty creams, beer, etc. where the majority of import for beeswax comes from developing countries.

## 2. LITERATURE REVIEW

Beekeeping or honey production is an age-old tradition carried out by families for generations. The main purpose is basically to utilised as food consumption especially for poor families since they can gather it naturally from the forests. Honey collected from the forests have often been used in food, confectionary, bakery, pharmaceutical and medicine [8]. Beekeeping has emerged over the years as a subsidiary occupation in rural villages of India



and in the world and this has gain widespread attention where many farmers have also turn entrepreneurs to generate additional income. Anandhy & Buella [9], highlights the prospects, potential of beekeeping as an entrepreneurship activity being an economically profitable enterprise. A project which is carried out by Yap & Devlin [10] for Vietnam small farmers on modern beekeeping and shows that farmers developed more benefits than those envisioned in terms of health, more income, a greater satisfaction in life. A financial analysis carried out by Islam, Chhay, Mian & Nasry [11] in a study of apiculture in Bangladesh analyses that higher bee colony is resulting higher honey production as well as higher return. The indirect effects of beekeeping could provide 10 times worth for additional crop, vegetable and fruit production than the direct benefits of marketing of honey. The Indian apiculture market is also growing with the adoption of modern beekeeping in recent years though its per consumption is less as compared to developed countries. Beekeeping has proven to be such an alternative livelihood option with potential of providing alternative income security to smallholder farmers living in forest areas of Dantewada as an effort initiated by the Krishi Vigyan Kendra Dantewada Chhattisgarh [12]. In Meghalaya when the government launched the State Apiculture Mission under the Integrated Basin Development and Livelihood Promotion Program (IBDLP) in 2014 with the main objective of reducing poverty, generating employment and generating livelihood. In a Report "In conversation with people of Meghalaya, Apiculture mission" (2015), a Meghalaya Basin Development Authority (MBDA) publication of IBDLP shows an insight of the success of some entrepreneurs benefitted from the apiculture mission. The report also added that honey produced from Meghalaya is almost organic and it's the best in the country due to its multi floral type of ecology [13].

## 2.1 The Study Area

Meghalaya is one of the Indian states located in the North East of India. Meghalaya is predominantly an agrarian economy with the majority of its population tribal. The geographical location of the state is in between 20°1'North and 26°5'North latitude and longitude 85°49'East and 92°52'East and the state is almost 2000 metres above mean sea level. Meghalaya has a geographical area of 22,429 square kilometres which is 0.70 percent of the total area of the country. Its total population as per census 2011 is 2.967 million. The density of population per square kilometre is 132, literacy percentage is 74.43 percent. The Apiculture Mission is one of the specific missions under the Integrated Basin Development and Livelihood Promotion Program [14] as a way of

improving employment, poverty reduction and livelihood promotion. The Apiculture Mission in Meghalaya is an initiative taken together with the Department of Commerce and Industries to improve the mode of honey production create market linkages for profitable production of honey and honey products, providing financial and human capacity development. Meghalaya has a huge potential for beekeeping and around 7000 potential beekeepers are there owing to the superior quality of honey produced here in the state.

The study is carried out on three villages namely Mawten, Wahkaji and Phlangdiloin from South West Khasi Hills District of Meghalaya.

## 2.2 Profile of Selected Villages

The three villages belong to Mawkyrwat District under the South West Khasi Hills District of Meghalaya. The district has an area of 1341 square kilometres and is located at 25.3106°North and 91.2059°East. The district has its headquarters at Mawkyrwat. As per census 2011, the district has a population of 1, 10,152 with a literacy rate of 76.84 percent. South West Khasi Hills is mainly agrarian with 81 percent of the population depending entirely on agriculture for its livelihood.

Mawten village situated at a distance of 2 kilometres from the district headquarters Mawkyrwat with a population of 2,268 as per census 2011 with 347 households altogether. Mawten has a higher literacy rate of 90.58 percent than that of Meghalaya. The village have more main workers working in government and private sector; however, agriculture still occupies an integral part of their daily life. Apiculture forms an important subsidiary occupation for most households in the village.

Wahkaji is a medium size village located in Ranikor block of South West Khasi Hills of Meghalaya with a population of 626 as per census 2011 and 64 households residing in the village. The literacy rate is 89.77 percent. The roads condition is at its worse especially after the abandonment of uranium mining fell through. The village is dependent on agriculture with potato, rice, maize as main crops grown. There is timber production and charcoal which is rampant in the village. To supplement their income most households in the village takes up beekeeping as a subsidiary occupation.

Phlangdiloin has a total of 122 families residing with a population of 675 as per census 2011. It is a village situated near Wahkaji, there is huge charcoal production and rampant destruction of forests,



however, with the increase in demand of honey consumption by people in the state and the initiatives taken by the government in apiculture, most households in the village have started beekeeping to enhance their income generation.

### 3. MATERIALS AND METHODS

The study is confined primarily to the three villages of Mawten, Wakhaji and Phlangdiloin of South West Khasi Hills district of Meghalaya. The selective villages are quite prominent in beekeeping practice in the district since the natural forests and the surrounding environment are suitable for apiculture. The villages are purposely selected and a random sample of 20 households' having apiaries were chosen. The respondents' who were chosen randomly from the households' having apiaries in the three villages were interviewed with the help of a structured and semi- structured questionnaire (close and open ended) and the interview conducted developed into a group discussion.

The study uses primary data and the purpose is to draw both qualitative and quantitative data. The qualitative data is based on the open-ended questionnaires which are usually descriptive data while the quantitative data are based on the closed ended questionnaires and are mostly numerical data which are analysed.

The data is analysed by using ANOVA for the qualitative data and SPSS version 19 for the quantitative collected data to establish occupational pattern, purpose of beekeeping by using descriptive tools and graphs whenever necessary. The descriptive statistics would be used to describe the various characteristics of the households of the respondents in the three villages. Interviews and field notes taken during the conversation and interactions with the respondents were compared to ensure trustworthiness. Data triangulation is incorporated to ensure validity and reliability of the data for qualitative analysis.

The main aim of the study is to test the hypotheses that there is significant difference between the income earned by the respondents and the production of honey by the apiaries or bee boxes of the beekeepers.

### 4. RESULTS AND DISCUSSION

The three selective villages differ in their socio and economic levels since those villages nearer to the district capital can access more of the socio-economic and health benefits than those farther away. The

socio-economic status shows that most households considered beekeeping an important part for earning livelihood as has been shown by various studies [11]. Beekeeping is also seen as an opportunity from field observations that most of the households having young people look at it as an entrepreneurship for employment opportunities [9,15].

Most of the respondents are male headed households which is around 70 percent while the rest 30 percent are headed by females. This shows that beekeeping is not confined or restricted as male oriented due to its physical activity but females can also take on the opportunity to supplement their earnings from beekeeping. All of the respondents are married while some female headed households where their husbands had passed away and the burden falls on them to take care of the family. From the field observations and discussions with the households maintaining of the apiaries takes about 30-45 minutes for 7 colonies. However, with more members helping, maintaining of the apiaries becomes much easier. Thus, beekeeping becomes a subsidiary occupation for most households since the majority of the households are engaged in farming and cattle rearing.

The mean and standard deviation are given in Table 1 which shows that the variation in age in the villages shows that experience helps in identifying the local honeybees and in the process of production of good honey.

In terms of educational qualifications around 35 percent of the respondents passed their secondary education, 30 percent of the respondents have passed their higher secondary education, 25 percent are illiterate and 5 percent of the respondent have finished their post graduate and professional course. The data shows that beekeeping applies to diverse people with varied educational qualifications and even to those who are illiterate. People take up this occupation due to the increasing demand of honey as a way to supplement their income. Most of the young people in the villages observed through their fathers, mothers and elders in beekeeping and they try to help to innovate and improve their methods of beekeeping for increase production.

From the answer of the respondents around 60 percent of the respondents as well as the households have less than 5 years of experience, 20 percent have an experience of 6 to 10 years, 5 percent have an experience of 11 to 15 years, 10 percent have an experience of beekeeping for 16 to 20 years and 5 percent have an experience of 20 to 25 years.



**Table 1. The mean and standard deviation in age of the beekeepers in the villages**

| Villages     | No of cases | Mean age of beekeepers | Minimum | Maximum | Standard deviation |
|--------------|-------------|------------------------|---------|---------|--------------------|
| Mawten       | 10          | 46                     | 31      | 79      | 19.066             |
| Wahkaji      | 5           | 40.6                   | 29      | 59      | 9.333              |
| Phlangdiloin | 5           | 45                     | 34      | 58      | 9.539              |

Source: Field Work

The Table 2 shows a vast difference in the years of experience of the people in the three villages with mean years of experience of 7.60 and standard deviation of 6.613 showing no significant difference from the mean with a range from 2 to 25 years.

The number of hives which the respondents have also depends on their years of experience in beekeeping. Around 35 percent of the beekeepers have less than 5 beehives, 45 percent owned around 6 -10 beehives, 5 percent of the respondents owned 16-20 and 21-25 beehives respectively and 10 percent owned 31-35 beehives or bee colonies.

The honey being produced in these villages differ in colour owing to the type of vegetation and bees present in the ecosystem. The honey is a darker shade of brown in Wahkaji and Phlangdiloin compared to the honey of a lighter shade of brown produced in Mawten (*field observations*). Since the bee boxes are kept in the premises of the house the bee is of lighter brown colour which is less harmful.

In the villages, around 60 percent of the respondents could produce honey twice a year that is February-March and October-November while 40 percent of the respondents produce honey once a year mainly in October-December. The production of honey from the apiaries depends on the vegetation grown, the forests around the villages. The honey production for some respondents comes from wild honey (wasps honey) collected from the forests and sold at a higher price in

the market. The reason may be that the honey is from a wild bee and not domesticated ones which limits its production. The villagers usually collected honey directly from honey frames from their apiaries without any protection and this has been done with the knowledge passed from one generation to the other. Since most of the respondents do not use a machine for honey production, hence honey is separated manually from the beeswax.

From the Table 3 the production of honey shows a range from 3 kg to 9 kg per apiary with a mean production of 5.20 and a standard deviation of 1.936 showing significant difference from the mean.

The price of honey differs where some respondents keep the price at Rs 400 per kg, others at Rs 500 per kg and some at Rs 450 per kg of honey. The difference in price lies in the purity of honey produced. Some respondents state that if honey is not mixed with the beeswax, then the price becomes more expensive. Beekeeping as an occupation have helped the respondents in earning an additional income for the households.

From the Table 4 the income earned by the respondents ranges from a minimum of Rs 9000 per year to Rs 196000 per year depending on the production of honey by the respondents in the three villages. The mean income earn is Rs 41895 with a standard deviation of Rs 53229.607 per year.

**Table 2. The experience in years of beekeeping**

|                     | N  | Minimum | Maximum | Mean | Std. Deviation |
|---------------------|----|---------|---------|------|----------------|
| No years            | 20 | 2       | 25      | 7.60 | 6.613          |
| Valid N (list wise) | 20 |         |         |      |                |

Source: Field work

**Table 3. The production of honey per hive**

|                     | N  | Minimum in Kg | Maximum in Kg | Mean | Std. Deviation |
|---------------------|----|---------------|---------------|------|----------------|
| Prod honey/apiary   | 20 | 3             | 9             | 5.20 | 1.936          |
| Valid N (list wise) | 20 |               |               |      |                |

Source: Field Work



In the survey of the 20 households in the three villages of Mawten, Wahkaji and Phlangdiloin the income earnings from beekeeping shows an increase. The Table 5 below depicts the growth of income from beekeeping for the respondents from the three villages.

All the respondents' states that their main livelihood is agriculture (98%) while others are involved in services and other non-farm services (2%). Beekeeping is a subsidiary occupation which has shown its growing importance for generating additional income for households which is 10 percent for households in Mawten, 20 percent in Wahkaji and Phlangdiloin.

Using ANOVA one way shows that production of honey per year helps in increasing the income of the respondents.

The descriptive Table 6 shows that as the number of production of honey increases the mean income increases ( $M=18\pm$ ,  $S.E. = 13\pm$ ) to ( $M=85\pm$ ,  $S.E=105\pm$ ). The increase however is not significant since some beekeepers having fewer beehives earn more than those having more beehives and vice versa. The Fig. 1 shows that the value of money income generated increases as the production of honey from beehives increases with some exemptions.

**Table 4. Income earned by the beekeepers per year (in rupees)**

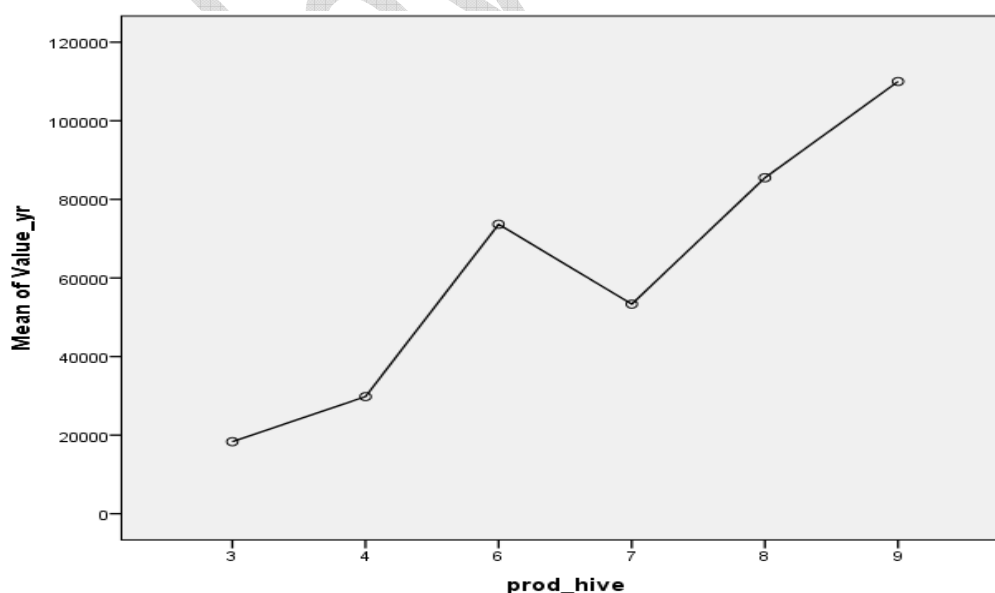
|                     | <b>N</b> | <b>Minimum (Rs)</b> | <b>Maximum (Rs)</b> | <b>Mean</b> | <b>Std. Deviation</b> |
|---------------------|----------|---------------------|---------------------|-------------|-----------------------|
| Value of honey/year | 20       | 9000                | 196000              | 41895.00    | 53229.607             |
| Valid N             | 20       |                     |                     |             |                       |

*Source: Field Work*

**Table 5. Depicts the growth of income from beekeeping**

| <b>Village</b> | <b>No. of respondents</b> | <b>Mean Income /year</b> | <b>Total income of beekeepers/year</b> | <b>% of increase in income from beekeeping</b> |
|----------------|---------------------------|--------------------------|--|--|
| Mawten         | 10                        | Rs 99381.8               | Rs 993818                              | 10   |
| Wahkaji        | 5                         | Rs 58460                 | Rs 292300                              | 20   |
| Phlangdiloin   | 5                         | Rs 117800                | Rs 117800                              | 20   |

*Source: Field work*



**Fig. 1. Production of honey and the increase of income of the beekeepers per year**

*Source: Field work*



**Table 6. Production of honey with increase in income per year**

| No of apiaries | N  | Mean      | Std. Deviation | 95% Confidence Interval for Mean |             | Minimum | Maximum |
|----------------|----|-----------|----------------|----------------------------------|-------------|---------|---------|
|                |    |           |                | Lower Bound                      | Upper Bound |         |         |
| 3              | 4  | 18325.00  | 13123.357      | -2557.19                         | 39207.19    | 9000    | 37500   |
| 4              | 7  | 29800.00  | 23466.572      | 8097.04                          | 51502.96    | 12000   | 64000   |
| 6              | 3  | 73666.67  | 105973.267     | -189585.52                       | 336918.86   | 10000   | 196000  |
| 7              | 3  | 18000.00  | 3464.102       | 9394.69                          | 26605.31    | 14000   | 20000   |
| 8              | 2  | 85500.00  | 105358.910     | -861112.25                       | 1032112.25  | 11000   | 160000  |
| 9              | 1  | 110000.00 | .              | .                                | .           | 110000  | 110000  |
| Total          | 20 | 41895.00  | 53229.607      | 16982.78                         | 66807.22    | 9000    | 196000  |

Source: Field Work

The ANOVA test shows that there is significant difference between the production of hives and the income generated by the beekeepers ( $F_{5, 14} = 4.029$ ) and  $p = .064$  which is less than the significant level ( $p = 0.05$ ). This only shows that the income of earning by the beekeepers in the villages shows significance difference from the production of beehives.

The production of honey has increase over the years with the efforts and intervention of various factors of the Government, private entrepreneurs, demand by consumers and so on. As the majority of the people in Meghalaya lived in rural areas, commercial beekeeping can provide job opportunity and meaningful income. It is essential however to raise the level of this industry through creating effective national and international trade linkages to improve the marketing and processing.

## 5. CONCLUSION

Examining the various characteristics of the respondents from the three villages shows that beekeeping is not confined only to the elder adults but the younger generation are also keen in being part of this activity which is another way of sustaining their livelihoods. Beekeeping is a small-scale industry especially in the rural areas. With age and experience respondents know what kind of bee to be domesticated, how and where to keep the bee frames for bee swarming so that it helps in increasing production of honey. These will positively help in increasing the quality of honey produced which will fetch them better value to increase income earnings.

Beekeeping requires care and attention to the bees especially during swarming since it would be uneconomical to the beekeepers if care and prevention is not taken. In these study areas some of the respondents started bee pollination to start increasing their yields.

Since the implementation of the Integrated Basin Development and Livelihood Promotion Program launched by the Government of Meghalaya (IBDLP) in April 2012 trainings were given to beekeepers and some of the respondents have even undergone training organised to further enhance their skills at beekeeping.

In Meghalaya most people market their own products at different prices. In India there are departmental marketing depots located in various parts of India and they purchase, process, in collaboration with Khadi and Village Industries Commission (KVIC). Now the IBDLP also focus on this aspect by the intervention undertaken realizing the importance of honey in both national and international markets.

## DISCLAIMER

The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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# Tribals' Struggle for Inner Line Permit in Meghalaya

Batskhem Myrboh\*

## Abstract

*The indigenous tribals in Meghalaya have been trying to put in place mechanisms for community protection against the danger posed by in-migration into Meghalaya. Pressure groups particularly the Khasi Students' Union and most of the regional political parties have been consistent in demanding the implementation of Inner Line Permit. The struggle for Inner Line Permit implementation began in the latter part of the 1970s. After the enactment of the Citizenship Amendment Act 2019, there was near unanimity in the state including those who opposed its implementation earlier on the need for implementation. A resolution to this effect was adopted in late 2019 by the state legislative assembly urging the Union Government to enact the Inner Line Permit in Meghalaya but the latter is yet to positively respond.*

**Keywords:** Community protection, tribal communities, vulnerable, Inner Line Permit, Meghalaya, Khasis, Garos

## 1. Introduction

It has been well documented, researched and observed that the tribal communities in India are vulnerable and do experience exclusion, displacement and land alienation either because of incursion of non-tribal population and due to the developmental or other activities undertaken on their land both by state and private agencies (Ambagudia, 2010; Jojo, 2011; Xaxa et.al., 2014; Tripura, 2015; Xaxa, 2019). However, not all tribal communities experience the same level of vulnerabilities. Of the 705 Scheduled Tribe communities, the Government of India identified 75 communities as the most vulnerable or the Particularly Vulnerable Tribal Groups (PVTGs) (Ministry of Tribal Affairs, 2013). The tribal communities in the states of Arunachal Pradesh, Meghalaya, Mizoram and Nagaland enjoy better socio-economic and political status compared to other tribal communities in India mainly because of enjoyment of land ownership rights and political autonomy (Nathan & Xaxa, 2012) by virtue of being the majority in their respective states.

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The Khasis<sup>1</sup> and the Garos are the two indigenous tribal communities of Meghalaya which, according to 2011 census, constitute more than 78 percent of nearly 3 million population in the state. The members of these communities, particularly the Khasis, have been consistently restive to protect themselves from threats posed by the caste societies. It was their strong political assertion that the Sixth Schedule of the Indian Constitution was put in place and eventually a separate state was formed through which political autonomy was ensured. In spite of having the Sixth Schedule and a separate state, where they form the majority communities, there remains a generalised fear of migration of dominant communities from other parts of India or from other countries that threaten their identity, culture, political and economic interests. In view of this, there have been periodic struggles to put in place protective measures to counter the threats posed by migrants. This struggle was initially spearheaded by regional political parties but was subsequently taken over by tribal students under the banner of the Khasi Students' Union (KSU) together with other tribal centric pressure groups.

## 2. Conceptualizing community protection

Protection is a concept that has been used differently in different spheres of human activity though its core meaning pertains to saving someone or something from harm. In the context of defending human rights during a conflict situation, the concept of protection not only refers to "physical security" but a larger sense of "human security and human dignity" (International Committee of the Red Cross, 2012, p. 3). In the Background Paper of the Third Workshop on Protection, organised by the International Committee of the Red Cross in 1999, it was observed that the notion of protection connotes "all activities aimed at obtaining full respect for the rights of the individual in accordance with the letter and the spirit of the relevant bodies of law" (Inter-Agency Standing Committee, 1999, p.4). This definition was adopted by the Inter-Agency Standing Committee (1999) which considered it "comprehensive in scope, both in terms of the legal framework for protection... and in terms of the strategies and methods by which protection may be achieved..." (p. 4). The concept of protection has also been used together with other terms like social, environmental, consumer, children and others. In all these cases, the term protection always refers to the measures and activities taken with an aim of defending and preventing the vulnerable, whether human beings or other entities, from being exploited by the powerful.

From the above discussion, an inference can be drawn regarding the concept



of protection by which it refers to the policy and measures that are adopted to protect the weak and vulnerable group or groups from the threat posed by stronger group or groups possessing enough strength and resources to threaten the interest and even existence of the former. It is in this context, this paper attempts to conceptualise 'community protection', which can be defined as the safeguard adopted either constitutionally or statutorily with a view to save the distinct but minor and vulnerable communities from being dominated numerically, economically or politically by the more dominant communities with greater numerical strength and possessing greater resources and networks whether politically or economically. In the Indian context, the Tribes are one such vulnerable community.

### **3. The Inner Line Permit as a measure of community protection**

The Inner Line Permit (ILP), provided under the Bengal Eastern Frontier Regulation, 1873 (BEFR of 1873), was a colonial measure enforced by the British in certain areas of North East India. Originally, the BEFR of 1873 was applicable to the Districts of Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur, Garo Hills, Khasi and Jaintia Hills, Naga Hills and Cachar. However, in Garo Hills, the British Government was not inclined to implement the BEFR of 1873 and in its place in 1876 promulgated a separate Garo Hills Regulation. In the later period, the British Government extended the BEFR of 1873 to other districts which included Sadiya Frontier Tract, Balipara Frontier Tract, Lakhimpur Frontier Tract and the Lushai District. At present, the Indian state operationalises BEFR of 1873 in states of Arunachal Pradesh, Manipur, Mizoram and Nagaland.

In the BEFR of 1873, para 2 of Section 2 prohibits the entry of any person including the citizens of India from entering into those areas notified under this Regulation without obtaining the permit from the authority empowered for its issuance. Further, according to Section 3, any person who is convicted for violation of this restriction can be punished with imprisonment which can be up to one year or imposed with a penalty which can go up to one thousand rupees or both. Also, Section 7 prohibits the non-native of those inner regulation areas from developing any interest on land or other products related to land.

There has been a debate as to the real intention of the British Government in bringing the ILP under the BEFR of 1873. Taking a critical stand, Jafa (n.d) insinuates that the purpose of ILP, though initially meant to protect the colonial interests in the plains from the warring tribes, eventually became an instrument to prevent the migration of non-tribals to the tribal



areas. He further argues that the continuance of ILP in the post British-tribal conflict period was mainly driven by the colonial interest to insulate the tribal communities from the influence of Indian culture while allowing the Christian missionaries' proselytisation programme. This standpoint has been shared by other writers as well (Mukhim, 2012 a; Sharma, 1997; Zahluna, 2011). However, Myrboh (2015) refutes the above contention arguing that the British, as evident in Section 7 of the BEFR of 1873, had the intention of protecting the interests of the tribal communities. Also, it cannot be denied that the ILP has been a positive instrument, from the perspectives of Tribes, protecting them from the threat of incursions of people from outside their indigenous territories particularly the non-tribes.

#### **4. Inner Line Permit struggle in Meghalaya**

Initially, the idea of implementing ILP as a community protection measure against the threat of non-tribal migration was not felt by the tribal political leaders after the formation of the state of Meghalaya in 1972. Rather an attempt was made to enact the Meghalaya Residential Permit Bill, 1973 to regulate the migration of non-tribals to the state. It was most probably the failure to get the assent of the President of India to this Bill that prompted the political leaders to later start exploring the possibility of implementing the ILP to regulate non-tribal migration. Since the second half of the 1970s, the agenda and struggle for implementing ILP has passed through several phases with different intensity. The entire struggle for ILP implementation can be divided into four phases- the first phase covering the period from latter part of 1970s to latter part of 1980s, the second phase spanning for two decades, i.e., from 1990s to 2000s, the third phase which started in 2011 and the fourth phase beginning in 2014.

##### **4.1 First phase**

The idea of the need to implement ILP in Meghalaya was for the first time made in the memorandum submitted by the Khasi traditional chiefs of Hima Khyrim, Hima Mawsynram and Shella Confederacy to the Indian Prime Minister, Indira Gandhi during her visit to Nongkrem festival in 1976 (Kharshiing & bodhi, 2019). Later, M.N. Majaw, the then MLA from a small regional party, the Public Demand Implementation Committee (PDIC) introduced a private member bill, The Meghalaya (Extension and Application of the Bengal Eastern Frontier Regulation) (Inner Line) Bill in the Meghalaya Legislative Assembly in 1979. This Bill, however, died a natural death when it was sent to the Select Committee. In 1985, the influential Khasi Students' Union (KSU), which was formed in 1978, made



a demand to the Government of India for ILP implementation, along with several other demands that were deemed necessary to protect the interests of the indigenous tribals in the state. This demand for ILP implementation was reiterated and put forth before the state government in 1987. It was during this time that the state Chief Minister, Williamson A. Sangma held the same opinion as the KSU, though concrete action was absent. In 1987, S.D. Khongwir who was an MLA from the Hill State People's Democratic Party (HSPDP), a strong tribal regional party, re-introduced the same bill, The Meghalaya (Extension and Application of Bengal Eastern Frontier Regulation) (Inner Line) Bill, 1987 in the Assembly that was earlier introduced by M.N. Majaw. The 1987 Bill, however, met the same fate as the 1979 Bill (Myrboh, 2016).

#### 4.2 Second phase

After 1987, for a fairly long period of time there was an air of silence concerning the demand for ILP implementation. It, however, resurfaced again in the late 1990s when three students' organisations, the KSU, the Jaiñtia Students' Union (JSU) and the Garo Students' Union (GSU), for the first time came together to form the Meghalaya Students' Federation (MSF) demanding that the state government regulate non-tribal migration and implement the ILP. In response, the United Democratic Party (UDP) led state government constituted the Working Group Committee (WGC) under the chairmanship of T.H. Rngad, the then Home Minister and MLA from the Bharatiya Janata Party (BJP). The WGC was mandated, *inter alia*, to look into the issue of ILP implementation. In order to closely study the feasibility of implementing ILP, a Study Group on Inner Line Permit which, besides others, consisted of members of the three students' unions, was constituted by the WGC. Meanwhile, the MSF put a great deal of pressure on the state government and the WGC to complete its work which finally happened in 2001. Based on the findings of its Study Group, the WGC did not recommend the implementation of ILP though other measures were recommended to check migration from outside the state. The main finding of the Study Group was the inability of the Mizoram government to effectively implement ILP propelled by the shortage of domestic labour. It is interesting to note that neither the MSF nor any of its constituents reacted to the recommendation of the Committee, for reasons that are unknown.

While the WGC was examining and considering the demands of the MSF, the KSU in 2000 launched the *Ksan Rngiew* Movement. As part of the Movement, the KSU demanded from the state government the implementation of ILP, reiterating the same demand in 2002. According



to Paul Lyngdoh, the then president of the KSU, the implementation of ILP in the state can be implemented without needing the consent of the Union Government. This agenda of the KSU became part of the election manifesto of the newly formed regional party, the Khun Hyññiewtrep National Awakening Movement (KHNAM) during the 2003 state assembly elections (Lanong, 2011).

### 4.3 Third phase

The third phase of the struggle for ILP implementation began in 2011 and it continued till 2014. It was in 2011, that the KSU re-ignited the imagination that Meghalaya needed an ILP to check migration to the state. However, the struggle suddenly took centre stage in state politics during 2012-14 due to communal conflict between the indigenous tribal Bodos and the immigrant Muslim non-tribals in Assam in mid 2012. Alarmed by the fate of the Bodos, a dozen pressure groups including the three major students' unions in the state, the KSU, JSU and GSU, and other prominent pressure groups such as the Federation of the Khasi Jaiñtia and Garo People (FKJGP) and the Hyññiewtrep National Youth Federation (HNYF) joined hands together to launch a united struggle for ILP implementation. Though unwilling to concede to their demands but keeping in mind the ensuing state assembly elections in 2013, the state coalition government headed by the Congress party constituted the High Level Committee on Influx headed by B.M Lanong, the then Deputy Chief Minister belonging to the UDP. Several organisations and individuals made submissions to the Committee and after several rounds of meetings and consultations, the Committee made a recommendation to the state government for the implementation of ILP in December 2012.

During the 2013 state assembly elections held in February 2013, all political parties acknowledged that migration of outsiders to the state posed a serious threat to the indigenous peoples and that it needed regulation, yet there was no agreement among them on the need to implement ILP. It was only the HSPDP and KHNAM that promised to the electorate the implementation of ILP. Even the UDP whose MLA headed the High Level Committee on Influx never promised its implementation. In this election, it was the Congress party that emerged victorious and was able to form the government with Mukul Sangma as the Chief Minister.

Soon after the new government was formed in March 2013, the pressure groups started to pursue the matter with the state government. Though the pressure groups tried to implore upon the government to implement ILP as



recommended by the High Level Committee on Influx through democratic means by way of negotiation, yet the unwillingness of the state government soon created a deadlock. A showdown between the agitating pressure groups and the government was imminent. As a result, the state witnessed several phases of agitations in the form of bandhs, office picketing and night road blockade which lasted for about four months beginning September 2013. Besides agitations, the pressure groups organised public meetings and programmes in different parts of the state to create awareness among the people and build support for ILP implementation (Myrboh, 2015). In response to the agitations launched by the pressure groups, the state government filed a damage suit in a special court in Shillong against the leaders of all the pressure groups spearheading the ILP struggle to the tune of 310 crores. The leaders of the pressure groups considered this attempt of the government as a pressure tactic to end their struggle.

Meanwhile, the opposition political parties, such as the HSPDP, UDP and NPP, extended their support to the demand of the pressure groups. Among them, the HSPDP was more vociferous where its leaders conducted ILP awareness programmes in different parts of Khasi-Jaintia Hills. Ardent Basaiawmoit, the HSPDP MLA and its Vice-President, brought a resolution for ILP implementation in the Legislative Assembly which was supported by other opposition parties, including the UDP and NPP, but it was comprehensively defeated. Similarly, in the Khasi Hills Autonomous District Council (KHADC), the members of the KHNAM and HSPDP, which were the opposition parties, moved a resolution to urge the state government to implement ILP. This was again overwhelmingly rejected by the house.

The Chief Minister accused the opposition parties of raking up the issue of ILP not because of genuine concerns but for political dividends in the ensuing Lok Sabha and the KHADC elections. This observation was not unfounded in the case of the UDP and NPP. Though the parties supported the pressure groups' struggle, yet their leaders in different fora expressed their lack of conviction of the feasibility of the implementation of ILP; rather they spoke of the modified ILP, the details of which were never spelt out.

The struggle of the pressure groups was not only met with stiff resistance from the state government. Critique also came from different quarters ranging from those occupying high constitutional and official positions to public intellectuals. The then Governor of Meghalaya, R.S. Mooshahary in



July 2013 noted that ILP would be ineffective to check migration but would adversely affect tourism and development. The Civil Society Women's Organisation (CSWO) led by Irene Hujon praised Mukul Sangma for his strong stand against the demand for ILP believing that ILP would bring hardship to the people due to its stifling effect on economic development. Shambu Singh, the Joint Secretary in charge of North East India under the Ministry of Home Affairs provided three reasons for the ILP non-implementability which included (i) non-existence of provision in the Indian Constitution for its extension to new areas, (ii) violation of article 19 of the Indian Constitution which provided for the right to freedom including freedom of movement to Indian citizens, (iii) negative impact on economic development in the state.

Many scholars and columnists, both from within and from without the tribal communities, through various platforms raised their serious doubts about the necessity and effectiveness of implementing ILP in protecting the tribal communities' interests and identity (Srikanth, 2014). It was generally contended that ILP was an outdated law, which would not only be ineffective to check illegal migration but would be counter-productive economically, impeding tourism and investment (Mohrmen, 2012; Mukhim, 2012 b).

The Chief Minister came up with four justifications for the non implementation of ILP. Firstly, it was contended that the tribal communities in Meghalaya did not face demographic threat as available census data revealed, unlike in the ILP states. Secondly, the demand for ILP was not the popular demand; in fact according to him the people of the state by and large rejected the idea of ILP implementation as the electorate voted to power the Congress party which did not promise ILP in its election manifesto. Thirdly, his government had already adopted several necessary measures to check migration of people from outside which no previous governments had ever committed. Fourthly, he cited the Union Government's refusal to entertain the idea and demand for ILP implementation. However, these arguments were challenged by leaders and supporters of pressure groups and certain writers as well (Myrboh & Mawlong, 2013; Myrboh, 2016).

Given the prevailing opposition to their demand, the pressure groups after a series of negotiations in mid 2014 came up with a proposal to implement a comprehensive mechanism also known as a modified ILP but in line with the inner line permit system as provided by the BEFR of 1873. The HSPDP, which was consistent in its fight for ILP, was quite critical of the stand taken by the pressure groups. However, it is interesting to note that the JSU and



the Jaiñtia Youth Federation (JYF), which were part of the 13 pressure groups, who initially accepted the modified ILP retracted their stand and instead resolved to fight for ILP as provided under the BEFR of 1873. The state government under the Congress party after accepting the proposal of the pressure groups enacted the Meghalaya Resident Safety and Security Act in 2016, which sought to regulate migration to the state through strict vigil and documentation of all the tenants in the state.

#### 4.4 Fourth phase

While the process of negotiation for the implementation of a modified ILP between the pressure groups and the state government was undergoing, a section of the KSU broke away and formed the Hyññiewtrep Youth Council (HYC) in mid 2014. The HYC immediately rejected the idea of a modified ILP and instead vowed to fight for the enforcement of ILP as provided under the BEFR of 1873. Electorally also, the issue refused to die down as observed in the 2018 state assembly elections. The KHNAM and HSPDP raised the ILP issue in their election manifestoes.

The ILP struggle resurged with great intensity in late 2019 driven by the enactment of the Citizenship Amendment Act (CAA) by the BJP government at the centre. The CAA generated a high degree of fear and resentment among the communities in North East India. Similar to assertions from other parts of North East India, several pressure groups in Meghalaya organised strong anti CAA protests whilst demanding for ILP implementation. To weaken the anti CAA protest in North East India, the BJP government made exemption in the application of the CAA in Sixth Schedule areas and the ILP states. It was also at this juncture that Manipur which is a non-tribal majority state was also extended with the application of the BEFR of 1873. The extension of ILP to Manipur convinced the pressure groups that the same could be extended to Meghalaya provided there was enough pressure on the central government. The pressure groups, therefore, reignited the ILP imagination and re-started their struggle. However, unlike in the third phase of the movement, the pressure groups at this critical phase of their struggle failed to work together. While the goal remained the same, different pressure groups were divided into two camps - one camp consisting of the 12 pressure groups under the banner of the Confederation of Meghalaya Social Organisations (COMSO) led by the HYC and the other camp included the KSU, FKJGP, HNYF and others.

In response to the demand of the pressure groups, the special session of the Meghalaya Legislative Assembly was convened on December 19, 2019,



whereby the Resolution for ILP implementation in the state was adopted unanimously by all the 60 members belonging to different political parties including those from the Congress that vehemently opposed the idea of ILP implementation earlier. The Chief Minister, Conrad Sangma stated that the adopted Resolution carried the weight of the aspirations of the whole people of Meghalaya and not simply those of the members of the House. However, in spite of parleys and negotiations made by the state government and pressure groups with the Union Home Minister, the Union Government is yet to respond to the said demand comprehensively.

## 5. Conclusion

The struggle for ILP in Meghalaya has been a long and protracted struggle exhibiting different characteristics in different phases. A critical view of the ILP struggle in Meghalaya shows that in the first phase, it was at most a half-hearted struggle combined with a lack of understanding concerning that implementation of ILP as falling within the prerogative of the Union Government. In the second phase, there was a more concerted effort on the part of the KSU and other pressure groups in the state to demand the ILP implementation, yet ILP was never made as a single point agenda in their struggle. There was no specific ILP demand and struggle even during this phase. Therefore, the ILP struggle lacked the necessary strength and vigour. However, during this phase barring the HSPDP and KHNAM, none of the political parties, especially the national parties, were inclined to support the idea of ILP implementation. This phase instead only witnessed the counter arguments and possible realisation that ILP would impede the prospects of growth and development in the state.

The third phase could be identified as the most critical in the struggle for realizing ILP in Meghalaya. The struggle was focused and sharp and became a mass movement of almost all the prominent pressure groups cohered by almost all political parties, albeit in certain cases it was opportunistic in nature. However, just as the struggle became more intense, the opposition to it also emerged stronger. The opposition mainly came from the proponents of the policy of open market or neo-liberalism who believed that the tribals in order to develop needed integration and mainstreaming with the Indian economy and even with the global economy. Therefore, the pressure groups fighting for the introduction of ILP were faced with multi-pronged challenges. First, was the opposition from the state government; second, was the negative opinion painted by many scholars and columnists and third, the negative response of the Government of India to the said demand.



The struggle eventually faded because of the strong pressure and opposition to it. Nonetheless, the whole struggle was able to achieve other legislative measures that somewhat resemble a weaker legal standing compared to ILP.

The fourth phase of the struggle was the most intense coupled with a greater degree of legitimacy since not only pressure groups and certain political parties were involved but even the state government was on the side of the ILP demand. However, the logical standpoint of the struggle during this phase was rather weak for a number of reasons. First, it suffered the convincibility deficit in the sense that ILP which was considered earlier by the state government to be impractical, imprudent and lacking support of the people suddenly became an imperative for the state. Second, the demand for ILP during this phase was intricately linked with the CAA. When almost the entire territory of Meghalaya was already exempted from the application of the CAA being the Sixth Schedule area, the demand for ILP fearing the impact of CAA seemed illogical. Considering these factors, it seems the Government of India is unlikely to agree to the demand for ILP implementation in Meghalaya, in spite of a unanimous resolution adopted by the Meghalaya Legislative Assembly.

These are the embedded complexities concerning the demand and implementation of ILP in Meghalaya at this particular juncture. One cannot predict with certainty the course that these struggles will take, one however can only state that, as it stands today, the struggle will persist without any signs of fading away. □

### Notes:

<sup>1</sup>The term Khasis is inclusive of the Jaiñtias which is generally treated as a separate tribe. The Jaiñtias are treated as Khasis in this paper as in the linguistic census of India, the Jaiñtias usually reported Khasi Language as their mother tongue.

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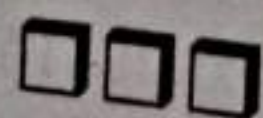
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## Abstract

Beekeeping acts as a subsidiary occupation in rural areas which farmers and entrepreneurs take up as to generate additional income. The study focuses on how much that income generated through beekeeping over the years. If the income of the household from beekeeping played a role in generating an extra income to the households in these villages. Most of the studies focus on the problems of beekeeping rather the role of income from beekeeping in reducing poverty in rural areas. The collection of honey for household consumption has been done for generations but the exploitation for commercial purposes has gain momentum in the present scenario. The aim of the study is to examine that beekeeping can be considered as one of the solutions for poor households in rural areas to enhance their household income. The objectives of the study are to know about the households in the villages, the role that beekeeping played in breaching the gap between farm and non-farm activities and increasing the households' income over the years. The research design was based on the three villages with a purposive sampling and based on a random sampling in choosing the samples of beekeepers. Results obtained shows that with globalisation and the spread of social media, the market for export of honey even from remote areas has increase and this has made beekeeping as a subsidiary occupation. Apiculture in Meghalaya can be considered as a subsidiary occupation which can help in poverty reduction and as a supplement to the household income in rural areas. Even though beekeeping is a significant subsidiary occupation for households in rural areas for increasing income it still has a long way to go to make it



more viable. The pricing of the honey sold should be determined so that it does not take away the profit from the primary producers, good advertisement is needed and there is a need for community linkage to further add to the growth of commercialisation of honey and its products.

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## **Governance and Collegiate Education in Meghalaya: Implementation of UGC Regulations**

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Batskhem Myrboh\*  
Berylda Hedi Pati Buam<sup>#</sup>

### **Abstract**

Universities and colleges are fertile grounds for new ideas, innovation and research that shape the key sectors and thereby help create cohesive and fair societies, an effective governance of which becomes fundamental. In India, the process of governance of higher education involves agents at three levels — the national, state and institutional level agents. This paper attempts to examine the role of the state and institutional agents of governance in Meghalaya in the process of implementing the regulations adopted by the national regulatory body — the University Grants Commission. The study revealed that no committed efforts have been made to effectively implement the regulations whereof a number of the provisions have been breached upon.





# Intermediate length scale of water jets under gravity: An experimental result

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**Abstract.** The profile of water jets along its length before breakup is indirectly inferred from the observation of surface waves created by the jet as it plunges into a reservoir of pure and contaminated water. The inference is drawn based on the measurement of surface wavelengths as a function of jet length before it touches the reservoir surface. It is observed that the nature of variation of wavelength changes abruptly at a certain jet length  $L_0$ . It is found that the dimensionless  $L_0$  depends only on the local velocity and diameter of the jet at  $L = L_0$  apart from the local acceleration due to gravity but is not a function of the surface tension of the reservoir; i.e.,  $L_0$  is a function of the Froude number  $Fr$  at  $L = L_0$ . Our analysis suggests the existence of an intermediate length scale  $L_0$  that demarcates the inertia-dominated region ( $L < L_0$ ) of the jet from the gravity-dominated region ( $L > L_0$ ).

**Keywords.** Water jet; under gravity; capillary waves; gravity/surface waves; fluid pipe.

**PACS Nos** 47.60.-i; 47.20.Dr; 47.35.Pq

## 1. Introduction

A jet is formed as water flows down a vertically oriented nozzle of a small horizontal cross-section of radius  $r_0$  under gravity at a flow rate  $Q$  greater than the critical rate  $Q_c$  [1]. The vertical jet flowing down under its own weight breaks up into drops at a mean distance  $L = L_B$  from the nozzle exit. The breakup length  $L = L_B$  of the jet is usually a monotonically increasing function of flow rate  $Q$ . The length  $L_B$  for viscous liquids like silicon oil can be as large as 10 m whereas  $L_B$  for water is usually less than 10 cm [2]. The understanding of this ubiquitous phenomenon is still a continuing saga, though notable advances have been made beginning with the famous Plateau–Rayleigh theory [3,4]. These advances have been described well in some recent reviews [5,6] and many other important publications [2,7–15] to cite but a few among the representative ones.

Most of the works on jets describe conditions of breakup of axisymmetric unconfined jets. Hancock and Bush [13] and Martinez-Calvo *et al* [14] investigated jets confined between the point of their emergence at the mouth of the nozzle and the surface of the liquid in the reservoir placed on the path of the jet when

length  $L < L_B$ . Martinez-Calvo *et al* [14] explained the condition of stability of confined viscous liquid jets in their steady and oscillatory regimes, occurring at different values of  $L$  as a function of  $Q$ , discovered earlier in unconfined jets [11]. In ref. [13], clean water jets were allowed to impinge on the liquid surface in a reservoir containing, separately, clean water and dilute water-detergent solution. The authors observed the resulting capillary waves on the clean water jets in the case of clean water reservoir and also in solution reservoir. However, in the case of solution reservoir, ‘fluid pipes’ appeared above the liquid surface in the reservoir and the capillary waves showed up above the entry point of the fluid pipe. In the present work, we describe and explain our experimental results on confined clean water jets as in the case of ref. [13].

There has been a spurt of activity recently in this field of research on account of the potential technological applications of viscous jets and significant results have been obtained on the gravitationally stretched jets [2,7,8,12]. For example, Javadi *et al* [2] confirmed the important role played by viscosity in determining the large breakup length  $L_B$  of a gravitationally stretched jet, resolving an earlier paradox that  $L_B$



## History and Nature of Non-tribal Migration to Meghalaya

**Batskhem Myrboh**

In Meghalaya, migration of non-tribals has been a dominant political issue since the formation of the state in 1972. Even though attempts were made to regulate such migration in the interest of the indigenous tribal communities in the past, violent ethnic conflicts have taken place and the issue remains unresolved even today. Various push and pull factors have influenced the nature of non-tribal migration. In this context, the paper attempts to examine the process of non-tribal migration by looking into its history for a more nuanced understanding of its complexity.

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### INTRODUCTION

The issue of non-tribal migration in Meghalaya<sup>1</sup>, popularly referred to as ‘influx’, has been a dominant issue in political discourses ever since the formation of the state. While the state government has over a period of time tried to bring in measures to regulate such migration, the local pressure groups have found these legal measures inadequate to protect the economic and political interests of the indigenous tribals<sup>2</sup>; and are, therefore, consistently raking up the issue with the state and central government for more stringent restrictive measures. At times, the differences between the government authorities and the pressure groups have led to law and order problems, as solutions remain elusive. This is partly because of the lack of a proper understanding of the issue that necessitates a more nuanced perspective. This paper attempts to understand the pull factors for non-tribal migration to Meghalaya from a historical perspective. Further, the paper also looks at the legal, spatial, and durational aspects of migration.

### History of Non-tribal Migration

Non-tribal migration to Meghalaya, which initially started as a colonial phenomenon, although numerically limited, was politically and socially significant. The pre-colonial non-tribal migration was significant for the political and sociological expansion of the Khasi community wherein women from the plains, such as the Sylhet of present day Bangladesh and, elsewhere, migrated and married Khasi men thus becoming progenitors of many clans including the *Syiems* (traditional chiefs among the Khasis and the Jaintias) of a number of *Himas* (Khasi states). In this context, Bareh (1967) observed that female Muslim wanderers from the plains eventually became the progenitors of the *Syiem* of Hima Mawiang (Mawiang is one of the Khasi states) in the 17<sup>th</sup> century.

Similarly, the origin of a number of Khasi clans has been attributed to Muslim and the Hindu migrants coming in from the plains (Bareh, 1967). These Muslim and Hindu women migrants could have been women abducted by Khasi men from the plains during their nocturnal raids. It was known that the Khasi men as observed by Mackenzie “had at different times descended into the plains both of Assam and Sylhet and ravaged...the villages which stretched along the base of this lofty region...” (Mackenzie, 1979: 220). During such raids, non-tribal women from the plains were abducted by Khasi men for marriage and new clans were created (Snaitang 1998). Another tradition involved the abduction of non-Khasi males for marriage with Khasi women in cases where Khasi men were not available to prevent extinction of their clan (Dkhar 2000).

Though there is no recorded history of such raids, abductions and marriages, this could possibly have been the earliest form of non-tribal migration to Meghalaya. Such migration enriched the Khasi society socially and culturally (Bareh, 1967). The assimilation of non-tribal women in Khasi



society continues to date; as such migration is not considered detrimental to society. Children born from such marriages are not discriminated against, as the process helps the numerical growth of the Khasi community. It may be noted that many clan names among the Khasis begin with a prefix *Khar* or are simply known as *Dkhar*.<sup>3</sup> Such clans emerged through the process of *tangjait*<sup>4</sup> necessitated by marriage between Khasi men and non-Khasi women, who are mostly non-tribals. While Kharakor (1981) lists 327 clans having a prefix *Khar* or *Dkhar* out of a total of 3,363 clans, Kharkongor (2004), lists 447 clans beginning with a prefix *Khar* or simply *Dkhar* out of the total of 5,204 clans. Though some of them may be of recent origin, many such clans have been in existence for a very long period. Also, there could be clans who owe their origin to non-tribal ancestors without the prefix *Khar* or *Dkhar*.

Non-tribal migration started around the medieval period with the repeated attempts by the Mughals to invade Assam between the sixteenth and seventeenth centuries (Shakespeare, 2004). Some of the Bengali Muslims who stayed back in the plains, subsequently migrated to the interior hilly regions of Garo Hills attracted by the availability of land. Later, other Bengalis followed and practiced cultivation or trading activities (Sangma, no date). Therefore, as was the case in Khasi-Jaintia Hills, non-tribal migration to Garo Hills preceded the British colonial period.

British colonisation, however, facilitated the process of non-tribal migration on a larger scale. 'Along with the British came the "dkhar" (plainsmen) – as labourers, clerks, interpreters and government functionaries' (War, 1998: 17). The migration began with the construction of a road by the British connecting the Brahmaputra and Surma valleys. The construction began after securing permission from Tirot Sing Syiem, a chief of Hima Nongkhlaw, a Khasi state in 1826. Convicts from Sylhet and also the soldiers of the English East India Company which included mostly non-tribals were brought in for the purpose (Syiemlieh, 1988). With the British eventually establishing control over the Khasi Hills in 1833, the Jaintia Hills in 1835 and Garo Hills in 1869, more and more non-tribals migrated to these hills particularly Shillong in the Khasi Jaintia Hills and Tura in Garo Hills.

After their annexation, the Khasi-Jaintia Hills and the Garo Hills were initially brought under the Bengal Presidency. With the creation of the Office of Chief Commissioner of Assam in early 1874, they became part of Assam along with other districts including Kamrup, Darrang, Nowgong, Sibsagar, Naga Hills, Cachar and Goalpara and later Sylhet and Lushai Hills with Shillong as the headquarter. This politico-administrative setup continued till independence except for a brief period from 1905 to 1911 when the entire Assam province with Dhaka as the capital became a part of the Province of Eastern Bengal (Bhattacharjee, 1983). Under both these colonial administrative arrangements, the Khasi-Jaintia Hills and the Garo Hills became accessible for non-tribal migration, as they were part of the same administrative setup dominated by non-tribals.

The British colonisation over the Khasi-Jaintia Hills and Garo Hills, and particularly, the establishment of Shillong as the capital of Assam in 1874 after its formation as the Commissioner's province, facilitated the migration of more non-tribals from the plains of India (including the plains in present day Bangladesh) as well as from Nepal. The Nepalis came to Khasi and Jaintia Hills in 1829 as the Gorkha troops, part of the Sylhet Light Infantry of the British Indian Army (Rana, 2008). Cherrapunjee, which became the headquarters of the British administration in the Khasi-Jaintia Hills, was also the headquarters of the Gorkha Regiment. Shillong became its headquarters in 1867 (Rana, 2008). It may be noted that the Nepalis were recruited in the British Indian Army in accordance with the Treaty of Sagauli between British India and Nepal in 1816 (Ramakant, 1968).

In order to ensure a regular supply of Nepali men into the Army, the British Government encouraged the retired personnel to establish their settlements in Shillong to facilitate the process (Rana, 2008). '[A]s without the British inroad into the United Khasi and Jaintia Hills and establishment of Shillong as their administrative centre perhaps the settlement of the Gurkhas in this

Not clear; were these people (convicts and soldiers) used as labour for the road construction? Or to quell some rebellion.

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region would not have taken place' (Rana 2008: 19). The Nepalis served as soldiers in the Assam Rifles and in the Gorkha Regiment. After their retirement from the British military, they settled down in Tura and other areas of Garo Hills. The other Nepalis came to Garo Hills and took to cattle rearing (Sangma, no date).

Bengalis and Assamese employed with the British in lower and middle level administrative positions were mainly from Sylhet and Dhaka; these employees were given residential plots in Shillong and in Tura (Ghosh, 2014). The British also brought people from Punjab to work as sweepers. Other non-tribals such as the Marwaris, Sindhis and a section of the Bengalis also migrated for business purposes because of economic opportunities in the administrative centres of Shillong and Tura (Ghosh, 2014; Saikia, 2016). The other non-tribal communities that migrated to Meghalaya since the British period include the Hindi and Urdu speaking people, the Oriyas, the Telegus, the Manipuris and other smaller communities.<sup>5</sup>

After India attained independence, the Khasi-Jaintia and Garo Hills became part of the then composite State of Assam and Shillong was retained as the state capital. As such, with the Assamese engaged in government service, more migration was expected. At the same time, a substantial number of Hindus facing religious persecution from then East Pakistan, were allowed to settle in Shillong (U Rupang, 2014).

Article 7 of [The Indo-Nepal Treaty of Peace and Friendship, 1950](#) signed between India and Nepal is important from the point of view of migration, as the two countries agreed to accord the nationals the same privileges in matters of residence, ownership of property, participation in trade and commerce, movement and other privileges of a similar nature on a reciprocal basis. The 1950 Treaty also led to the migration of non-tribals to Meghalaya; although the movement of Nepali nationals to Meghalaya between August 14, 1971<sup>6</sup> and May 19, 1995<sup>7</sup> were restricted due to the enforcement of the [Foreigners \(Restricted Areas\) Order, 1963](#).

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Even after Bangladesh gained independence in 1971, people from the country continue to migrate to Meghalaya because of its high population density and low levels of development (Mishra, 2014; Sinha 1998). However, while non-tribal migration from Bangladesh pre 1971 was mainly in the form of forced migration of refugees, post 1971 was mainly for economic considerations.

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Coal mining and coal export has become an important economic activity in Jaintia Hills, West Khasi Hills and Garo Hills Districts since the 1970s. Unlike the modern and scientific technology used in industrially advanced countries, Meghalaya follows the traditional rat-hole method, which requires intensive labour. Largely, migrant labourers from Nepal and Bangladesh driven by poverty and unemployment are engaged in this dangerous though lucrative activity. With several infrastructural development projects, Meghalaya has also been attracting migrant labour. Shillong was also home to a number of central government establishments with employees from various parts of India. In the recent past, private enterprises and corporate establishments have attracted several non-tribals with technical expertise from other parts of the country.

Over the centuries, therefore, several pull factors have resulted in creating favourable situations for non-tribal migration to Meghalaya. However, the last fifty years have seen various individuals, pressure groups and political parties resisting migration of non-tribals. The indigenous tribals have raised concerns regarding misuse of state resources including land and opportunistic marriages with tribal women by non-tribals for trading enterprises. In this context, the Khasi Hills Autonomous District Council (KHADC) tabled a bill in 2021 seeking to disinherit a Khasi woman and her children of her tribal status and inheritance to property, if she married a non-Khasi man (*The Shillong Times*, 2021). Non-tribals, particularly the Marwaris, have been dominating the political economy of the state since the colonial period (Myrbooh, 2016; Saikia, 2016) and even trade illegally through *benami* transactions in the names of the tribal individuals despite the promulgation of the



Meghalaya (Benami Transaction Prohibition) Act, 1980. This malpractice was unearthed by the Income Tax Department in the recent past (*Business Line*, 2019).

## **NATURE OF NON-TRIBAL MIGRATION**

Migration is a complex human phenomenon and assumes different characteristics largely based on the causes and motives for migration; the political and legal measures adopted by the authorities to regulate migration; and the duration of stay. Although it is hard to discern and identify the different aspects of migration, it is worthwhile to discuss the nature of non-tribal migration in Meghalaya.

### **Legal and Illegal Non-tribal Migration**

In order to understand the nature of non-tribal migration in Meghalaya, its history can be classified into three different phases: pre-colonial (before 1833) and the colonial phase; pre-Indian Republic phase (between 1833 and 25 January 1950); and post Republic (after 26 January 1950). The forced migration of non-tribal women who eventually assimilated into the Khasi society through marriage with local tribal men during the pre-colonial phase, is numerically insignificant. During this period, the idea of legal and illegal migration was absent. Similarly, the idea of legal and illegal migration of Bengalis to Garo Hills during the pre-colonial period does not arise, as there was no known existing law barring them from migrating to the region during that point of time.

Non-tribal migration was encouraged by the British during colonial times, as they required subordinate officials for government and military services. The non-tribals therefore legitimately migrated and became permanent residents of the State. Under The Bengal Eastern Frontier Regulation, 1873 made under the Government of India Act, 1870, outsiders who did not have a pass were prohibited from entry in Khasi, Jaintia and Garo Hills including some districts in Assam namely, Kamrup, Darrang, Nowgong, Sibsagar, Lakhimpur, Naga Hills, Cachar, Sadiya Frontier Tract, Balipara Frontier Tract, Lakhimpur Frontier Tract and Lushai Hills. However, according to the former Advocate General of the Government of Meghalaya, K.S. Kynjing, while the Regulation was applicable across all areas of Jaintia Hills considered as British territory (Lanong, 2012), in the case of Khasi Hills, the Regulation was applicable only in British occupied areas—the Shillong Municipality and Cantonment and 31 villages. Those who migrated and settled without getting the permission of the Government were considered illegal migrants. However, as there was no law barring people from migrating to the other non-British occupied areas of Khasi hills, people continued to migrate, as the traditional Khasi chiefs facilitated migration of non-tribals in their own respective territories to increase revenue generation (Passah, 2003).

As noted earlier, Garo Hills was also placed under the purview of the Bengal Regulation. However, the Regulation was never implemented in the District and it was eventually repealed by the Repealing Act 1897 (V of 1897). In its place, The Garo Hills Regulation of 1876 was applied, which remained in force as the Garo Hills Regulations, 1882 till India adopted a new Constitution in 1950 (Sangma, 1987). The Regulation of 1876 and its 1882 version did not contain any provision prohibiting entry of people from outside the District; though non-natives were prohibited from carrying out certain activities without permit. Therefore, non-tribal migration to Garo Hills during the colonial period and pre-Indian Republic phase was legal.

The Constitution of India guarantees all citizens the fundamental right to migrate to any part of the country as enshrined in Article 19. Article 19 of the Constitution guarantees six fundamental freedoms, which also include the right to move freely throughout the territory of India [19(1)(d)] and the right to reside and settle in any part of the territory of India [19(1)(e)]. These two freedoms are, however, not absolute. Clause 5 of Article 19 of the Indian Constitution stipulates that nothing



in sub clauses (d) and (e) of Clause 1 of Article 19 shall affect the operation of any existing law in so far as the State imposes, or prevents the State from imposing reasonable restrictions on the exercise of any of the rights conferred by the said sub-clauses either in the interests of the general public or for the protection of the interests of any Scheduled Tribe. Since there is no law prohibiting movement of people from other parts of the country to the State to protect the interests of the tribals in accordance with Clause 5 of Article 19, migration of non-tribals from other states to Meghalaya continues to be considered as legal migration. It should be noted that the Bengal Eastern Frontier Regulation, 1873 was not implemented in the post republic phase in the state unlike in the states of Nagaland, Arunachal Pradesh Mizoram and Manipur.

Migration of non-tribals from Nepal is regularised by the Indo-Nepal Treaty, which allows free movement of people between India and Nepal without requiring special travel documents such as a passport and visa. However, Nepalis who migrated without obtaining the Restricted Area Permit (RAP) or those who overstayed beyond the permit between August 14, 1971 and May 19, 1995 became illegal migrants in view of the enforcement of the Foreigners (Restricted Area) Order, 1963.

The migration of refugees facing religious discrimination from then East Pakistan was not considered illegal. Though not a party to the United Nations Convention Relating the Status of Refugees, 1951 and its Optional Protocol, 1967, India responded positively and rehabilitated the refugees in Shillong and in other places bordering Bangladesh and Meghalaya. Based on the understanding between the Government of India and the Government of Bangladesh, the Meghalaya High Court in 2014 delivered a ruling stating that those refugees migrating from East Pakistan to India should be considered as Indian citizens (Meghalaya High Court, 2014). However, migration from erstwhile Bangladesh after March 24, 1971 in violation of the Citizenship Act, 1955, that is, migration without valid passport and visa or overstaying beyond the permitted period is illegal and theoretically can be deported from India. With the passing of the Citizenship (Amendment) Act, 2019 by Parliament in 2019, illegal migration from Bangladesh on or before December 31, 2014 were legalised except for those belonging to the Islam faith.

The legal and illegal aspects of migration of non-tribals to Meghalaya are represented in a summarised form in Table 1.

**Table 1: Legal and Illegal Non-tribal Migration to Meghalaya**

| Period  | Legal migration   | Illegal migration   |
|---|---|---|
| <b>Pre-colonial (before 1833)</b>                         | All non-tribal migration since the idea of legality in context of modern legal sense was absent.    |   |
| <b>Colonial and pre-Indian Republic (1833-25.01.1950)</b> | All non-tribal migration to Garo Hills and Khasi States as there was no law barring such migration. | Non-tribal migration to the British areas in Khasi Hills and Jaintia Hills without obtaining permit under the Bengal Eastern Frontier Regulation, 1873. |
| <b>Post Indian Republic (26.01.1950 and after)</b>        | Migration of non-tribals as Indian citizens from other parts of India being governed                | Migration of Nepali nationals between 14.08.1971 and 19.05.1995   |



|  |   |   |
|--|---|---|
|  | <p>by Article 19 (d) and (e) of the Indian Constitution.</p> <p>Migration of Nepali nationals under Article 7 of the Indo-Nepal Treaty of Peace and Friendship, 1950.</p> <p>Migration of the non-Muslim non-tribals from Bangladesh before 31.12.2014.</p> | <p>in contravention to Restricted Area Permit under the Foreigners (Protected Area) Order, 1963.</p> <p>Migration of Muslim non-tribals from erstwhile East Pakistan and Bangladesh after 24.05.1971.</p> |
|--|---|---|

### Internal and International Migration

Migration of non-tribals to Meghalaya can be classified into two politico-geographical categories—internal and international migration. However, this division has not remained the same and has undergone changes with political developments. During the colonial period, Meghalaya received substantial international migrants from Nepal, to the extent that a British official undertaking the census in 1931 warned of the potential colonisation of the Khasi Hills by Nepali migrants (Myrboh, 2016). The internal migration of non-tribals mainly took place from the plains of Sylhet of Bengal province and from other parts of India including Assam (Myrboh, 2016).

Post-independence, international migrants have been mainly from Nepal and erstwhile East Pakistan or present day Bangladesh. Nepali migrants had entered as workers in the coal mines of Jaintia Hills since the 1970s (Upadhyay, 2016). On the other hand, migrants from erstwhile East Pakistan were mostly Hindus and settled in different parts of the state after the partition of India in 1947. However, even after the creation of Bangladesh in 1971, Meghalaya continues to receive substantial migrants from that country (Myrboh 2016; Lyngdoh 2013). Meghalaya has also received a small number of migrants from Tibet, Bhutan and other countries, though the number of such migrants was small. Internal migration of individuals from other states of India continued after independence.

### Short-term and Long-term Migration

Non-tribal migration to Meghalaya can be classified as short term and long term migration. According to the United Nations, short term migration is moving to a country other than his own for a duration of more than three months but less than one year and any migration that goes beyond the twelve months is a long term migration. Nepali, Bangladeshi and workers from other states in India employed in the coal mines of Meghalaya are seasonal migrants. It may be noted that besides coal mining, there are inter-state migrant workers engaged in construction and other industrial activities registered with the state government under the Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979 (Myrboh, 2016). The migrant workers generally would not feature in the census reports and, therefore, do not add to the total population of the state. However, this does not imply that all seasonal migrant workers return to their place of origin. It has been observed that in the case of the Nepalis, some stayed on permanently in Meghalaya through marriage (Upadhyay, 2016).

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During the colonial and even post-colonial period, long term non-tribal migrants from different places of the Indian sub-continent migrated to Meghalaya. These comprised two categories of migrants: (i) those engaged in service with the British government and later with the government of Assam and India after independence; (ii) migrants who came mainly for trade and other economic activities such as cattle grazing. Data from the 1901 census reveals that the migrant population in Khasi-Jaintia Hills and Garo Hills was 20,089 constituting 5.90 percent of the total population. In 1991, the migrant population increased to 1.24 lakhs and accounted for 9.26 percent of the 17.75 lakhs state's total population (Myrboh, 2016). With the institution of the Meghalaya Transfer of Land (Regulation) Act, 1971, the possibility of migrants permanently residing in the state is unlikely to take place; except for those who come from economically underdeveloped and poor regions such as Bangladesh.

### **Economic and Forced Migration**

Taking into consideration the motives for migration, non-tribal migration whether internal or international, can be classified as voluntary and involuntary or forced migration. While voluntary migration is economic in nature and migrants move in order to improve their economic prospects, forced migration on the other hand takes place primarily against the will of the migrants, that is, either as refugees or internal displacement (Debbarma, 1995; Myrboh, 2016). However, a combination of the two may not be totally ruled out. During the colonial period, non-tribal migration whether internal or international, was largely due to economic considerations, and hence, voluntary in nature. Migration of the Bengali Hindus from erstwhile East Pakistan and even present Bangladesh and the migration of the Tibetans can be classified as involuntary or forced migration, as these migrants were pushed out more because of insecurity in their place of origin (Legal Inquiry Committee on Tibet, 1960; Minority Rights Group International, 2018) rather than being pulled by the favourable conditions in the place of destination.

### **CONCLUSION**

Non-tribal communities are not homogenous in Meghalaya and not all of them are migrants. While a section of them belong to the category of migrants, there are non-tribals who have become permanent residents of the state by birth. Even among the migrants, non-tribals are heterogeneous in terms of ethnicity. The reasons for migration are driven by both economic and political considerations whether seasonal, semi-permanent or permanent. Nevertheless, irrespective of the causes of migration, the migrants have contributed towards the state's economy and overall socioeconomic development.

However, non-tribal migration must be viewed from a broader perspective. While economic considerations are important factors to keep in mind, the protection of land and resources of tribal populations cannot be negated. It may be noted that land for tribal communities are not only economic resources but is intricately linked with identity. In the recent past, there is emerging consciousness among tribal communities to preserve their identity and resources while at the same time acknowledging the role of non-tribal migrants in the development of the state. This kind of consciousness needs an acknowledgement, accommodation and space in the social and political life of the state.

### **Notes**

1. Meghalaya is the state in North East India formed by carving the United Khasi-Jaintia Hills District and the Garo Hills District out of Assam in 1972.
2. The Khasis, Jaintias and the Garos are the three tribal communities considered as indigenous tribals of Meghalaya. However, there is no law in India to define the term indigenous and to identify the indigenous communities. Also, there is no clear ethnic boundary between the



Khasis and the Jaintias. In accordance with the Census of India, almost all the Jaintias can be classified as Khasis, as they are enumerated as speakers of Khasi Language.

3. The clans having *Dkhar* as the title or other clan titles beginning with '*Khar*' are the clans having non-Khasi female progenitors where most of them were/are non-tribal women.
4. *Tangjait* is a ceremony by which a non-Khasi woman married to a Khasi man and her children born from such a marriage are given a new clan title and absorbed into the Khasi Society.
5. The presence of these communities was reflected in the Census of India as early as 1881.
6. The Foreigners (Restricted Areas) Order, 1963 was amended in 1976 vide Ministry of Home Affairs' Notification No. GSR.1216. Dated 30.7.76 and published in the Gazette of India on 14.08.1976 whereby free movement of the Nepali nationals to Meghalaya was restricted. However, the Order took effect 5 years before its notification. See, Proceedings of the Budget Session of the Meghalaya Legislative Assembly held on Tuesday 18 March 1986.
7. Meghalaya was de-notified from the purview of The Foreigners (Restricted Areas) Order, 1963 vide Ministry of Home Affairs' Notification S.O. No. 450 (E) dated 19.05.1995. See *The Gazette of India*, Part II- Section 3- Sub-section (ii) dated 19 May 1995, p. 522.

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# STAGES OF DEVELOPMENT AND METAMORPHOSIS OF TREE FROG POLYPEDATES LEUCOMYSTAX (AMPHIBIA, Rhacophoridae)

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## Abstract

Most anurans have complex life cycles involving egg fertilization, embryo and larval development in aquatic habitats. Detailed descriptions of the ontogeny of embryonic, larval metamorphic and post metamorphic frogs are important for understanding the general patterns of development of representative taxa and, by comparisons of different patterns for resolving questions about systematic relationships. For anurans, staging tables are a condensed way of describing ontogenetic changes. Appropriate staging of the larval period, is therefore, fundamental to various life history studies of amphibians suggested that complete tables of development are necessary for accurate comparison of developmental stages in different organisms. Hence, tables of normal stages of development have been worked out for a number of species by several workers. Findings of the present study indicate that under natural environment as well as in the laboratory condition, the development and metamorphosis of *Polypedates leucomystax* was completed in about 60 – 61 days. This tree frog was observed to be dependent on the ephemeral pools at the breeding sites to complete their life cycle. The duration of development and metamorphosis of this tree frog seems to be similar to the other species of tree frog.