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## CONTENTS

<b>Editorial</b>	....	....	v
Economic Reforms and Food Security: Rationale for State Intervention in India <i>V. BIJUKUMAR</i>	....	....	1
Nutritional Intake and Consumption Pattern in the States of Himachal Pradesh and Meghalaya <i>ANIKA M. W. K. SHADAP AND VERONICA PALA</i>	....	....	15
Social Audit in Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) with Special Reference to Tripura <i>SANJOY ROY</i>	....	....	29
Irrigation System and Pattern of Crop Combination, Concentration and Diversification in Barddhaman District, West Bengal <i>KSHUDIRAM CHAKRABORTY AND BISWRANJAN MISTRI</i>	....	....	45
Buddhist 'Theory of Meaning' (Aphavāda) as Negative Meaning <i>SANJIT CHAKRABORTY</i>	....	....	67
Negation in Nyishi <i>MOUMITA DEY</i>	....	....	79

Menstruation Pollution Taboos and Gender Based Violence in Western Nepal <i>PRAKASH UPADHYAY</i>	....	....	101
Knowledge of ICT and Computer Proficiency in College and University Teachers: A Survey <i>KUHELI BISWAS DAS, QUENDARISA KHARBULI AND BAPHIMON RYNJAH</i>	....	....	113
Kepler's Third Law, Dimensional Analysis and More <i>ANINDYA KUMAR BISWAS</i>	....	....	127
<b>Guidelines for Authors</b>	....	....	134

## Editorial

**B**ecause of the Editorial Committee's decision to bring out a special issue on Biotic Systems, many good papers submitted earlier to The NEHU Journal could not be considered for publication in January-June issue, 2017. Hence, we have included more papers in this issue. Themes of the papers included in the issue cover a range of disciplines – Economics, Philosophy, Linguistics, Anthropology and Education to Physics.

The first four papers touch different economic issues – food security, nutritional intake, social auditing of MGNREGS and crop pattern. It is indeed a matter of serious concern that India ranks 100<sup>th</sup> position in the World Hunger Index. It is a paradox that on the one hand we boast of the success of the Green Revolution, but on the other hand we see India facing the problem of food security. V. Biju Kumar's paper seeks to address the causes for and implications of food security problem that the country is facing. In the second article, Anika Shadap and Veronica Pala make a study of consumption pattern in two hill states, namely Himachal Pradesh and Meghalaya, and examine the reasons for differences in nutritional intake pattern in the states. Social auditing has been conceived as integral part of the MGNREGS, one of the most ambitious programs initiated by the Government of India to address the problem of rural unemployment. Sanjoy Roy paper examines how social audit mechanism has been working in the state of Tripura, which ranks high among the successful states implementing MGNREGS in the country. In the next paper, based on the study of cropping pattern in Bardhaman district in West Bengal, Kshudiram Chakraborty and Biswranjan Mistri show how cropping pattern depends on access to irrigation and soil conditions.

From ancient times to the present post-modern time there are debates in philosophy on the relationship between word and its meaning. How does a word connote meaning, and does the meaning of the word connote something particular or universal? Sanjit Chakraborty's paper focuses on the debate between Realist (*nyaaya*) and Buddhist (*Apohavada*) on the issue of word and the meaning it conveys. While Sanjit Chakraborty's paper talks about negation to make sense of meaning, Moumita Dey in her paper examines different forms in which Negation finds expression in Nyishi language spoken in the state of Arunachal Pradesh. There are several taboos regarding the menstruating women in Hindu community in Nepal, which are

discriminative in nature and violative of basic human rights. How the practice of *Chaupadi* affect the health and security of the women are brought out in Prakash Updhyay's paper on Menstruation taboos in Nepal. In the next paper, Kuheli Biswas Das, Quendarisa Kharbuli and Baphimon Rynjah make a survey of the knowledge and use of ICT by teachers attending the Orientation Course and Refresher Courses and conclude that the teachers attending Orientation Courses are better equipped in ICT, as they are younger and more familiar with computer and digital technologies. The last paper by Anindya Kumar Biswas interrogates Kepler's Third Law and examines harmonic oscillator potential for two body problems.

Apart from editorial committee members, I thank my NEHU colleagues who reviewed the papers and gave their valuable suggestions. As informed in the last issue, the NEHU Journal is a UGC recognized journal. We request the cooperation of everyone to make the NEHU Journal a reputed multi-disciplinary academic journal in the country.

**H. Srikanth**  
**Editor**

## **Economic Reforms and Food Security: Rationale for State Intervention in India**

V. BIJUKUMAR\*

### **Abstract**

*In the twenty first century, the world is witnessing various technological advancement, however, it fails to address food security to millions of the poor putting a larger question mark on human security. The food insecurity leads to malnutrition among children, pregnant women and socially marginalized sections, etc. In the age of economic liberalization, food security is adversely affected by the withdrawal of state in developmental expenditure and the entry of market forces in the agriculture and food sectors. In fact, India's failure to prioritize socio-economic democracy over political democracy created infirmities in achieving food security.*

**H**uman security emerged as an important theme in the contemporary world. It is largely discussed in the context of democratization, human rights, globalized markets and neo-liberal economic development. Traditionally security is viewed as a state-centered focus on national security and is viewed as prevention and resolution of violent conflicts. Amartya Sen argues that promoting human rights and addressing multiple deprivation and social inequalities are at the core of protecting human security (Sen, 1999). According to him, lack of individual human security is the absence of income and deprivation. Social exclusion created by income and deprivation is thus considered to be a serious hurdle in the way of human security. In the era of globalization, human security is debated by policy makers, nongovernmental organizations and various movements which stand for alternative politics. Accordingly, globalization generates a sense of insecurity, underdevelopment and poverty. It affects individual's freedom to live in dignity and right to democratic participation.

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\* V.Biju Kumar (vbijuk@yahoo.co.in) is Associate Professor in Centre for Political Studies Jawaharlal Nehru University, New Delhi.

All over the world, poverty is considered to be the greatest challenge to human security. Poverty leads to insecurity of individual, groups and community. Extreme poverty not only leads to lack of basic security and capability deprivation but also leads to relative deprivation and conflict leading to emergence of conflicts. Poverty thus deprives of basic capabilities and creates human insecurity. Amartya Sen sees that “poverty must be seen as the deprivation of basic capabilities, rather than merely, as lowness of income” (Sen, 2000: 87). In the broader context, Jean Dreze argued that “the right to food needs to be linked to other economic and social rights relating to education, work, health and information, which together hold the promise of radical change in public priorities and democratic politics” (Dreze, 2004: 1723).

In the recent past, food security emerged as a constituent of human security reaffirming the commitment to reduce poverty and hunger among human beings. The World Food Summit of 1996 defined food security as existing “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.<sup>1</sup> Food security ideally means population lives free from starvation and hunger. It is based on access to sufficient, safe and nutritious food. Food is essential for freedom and developing capability. It is argued that “the issue of food security is understood not in terms of how much food is produced but, rather, whether and how those in need gain access to that food” (Pritchard, 2014: 4). Food security involves three aspects - food availability, food access and food use. Firstly, sufficient quantities of food should be available on a consistent basis. Secondly, the accessibility of food depends on people within a particular region or country receives or gain access to the foods. Food use means appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation. Food access involves having sufficient resources to obtain appropriate foods for nutritious diet. Food security aims at accessing healthy food and optimal nutrition for all and is basically related to the accessibility of food. The acceleration of domestic food production does not solve the problem; only increasing purchasing power among the people can.

In democratic regimes food security helps in eradicating poverty and enables citizens to access democratic rights. In other words, healthy citizens are considered to be the backbone of any democratic regime. Food is essential for building a healthy individual and citizen in a country, personal and intellectual development of the citizenry. In democracy, access to food is a precondition for the enjoyment of all other rights. Moreover, food is essential for bringing



socio-economic democracy. Food is a basic entitlement for human beings and the lack of entitlement lead to food deprivation. Lack of food, leads to a situation of economic deprivation that would further aggravate social deprivation. In ensuring human security, state is regarded as the primary agent. State intervention makes the availability of food grains to the people, increases food production and ensures food to the needy through PDS. The political survival of a democratic state is often determined by its ability to feed its population.

### **Indian Situation**

The political journey of the Indian state began with a 'trust with destiny' speech of Jawaharlal Nehru, the first prime minister of independent India on the midnight of 14<sup>th</sup> August, 1947, underlying the need for 'ending poverty and ignorance and disease and equality of opportunity'. Though, the newly adopted constitution does not specifically emphasize the right to food, Article 21 of the Indian Constitution provides right to life with dignity. Right to food is thus construed as a part of the right to life. In fact, other rights are meaningless, if there is no emphasis on the right to food. In the aftermath of independence, India adopted a developmental state which played decisive role in providing welfare for the poor. The state intervention through planned mechanism aimed at addressing the security of the people through allocation in developmental expenditure.

The Nehruvian commitment to modernization through industrialization and establishment of a socialist pattern of society gained momentum in the development process of India. Nehru thought that centralized planning with the active intervention of the state and heavy industrialization would solve most of the problems faced by India in the nascent stage of its development. However, in the 1960s, food security became a pertinent issue in the aftermath of the American decision to stop wheat to India under the PL 480. This issue raised the doubt about India's ability to feed its population and achieving food self-sufficiency. The political response to such challenge was the green revolution, the application of technology in the production of food grains. In the Green Revolution, the government intervention in food security began with adoption of technology in agriculture, High Yielding Varieties (HYV) seeds to address the problem of food shortage. In order to achieve the objectives of increasing food production and improving food availability, the government's intervention sought in food security which include, price assurance to producers using the system of minimum support prices,

implemented through obligatory procurement, inter and intra year price stability through open market operations, maintaining buffer stock, and distribution of food grains at reasonable prices through the public distribution system (Chand, 2005: 1055). It also marked the government's direct intervention in food markets in India such as public procurement of food grains by giving support process for farmers, storage of food grains creating buffer stock operations, public distribution system, intervention of government in trade such as the 'legal controls on hoarding and other aspects of internal trade and restrictions on external trade' (Swaminathan, 1996: 1665). Moreover, the institutional mechanisms put into place include: Food Corporation of India (FCI), network of Public Distribution Units and the Commission on Agricultural Cost and Prices for suggesting Minimum Support Price (MSP) for good grains. In this context, the Green Revolution was considered as a milestone in achieving food security in India.

Though Green Revolution increased the production of food grains, it did not bring food security for the vast majority of the people due to the lack of supportive mechanisms. The government's commitment to alleviation of poverty rather remained a political slogan and instrument of political mobilization. For instance, Indira Gandhi's 'garibihatao' emerged as a central mobilisation strategy of the Congress to recover from the crisis in the late 1960s. As result, poverty remains a key factor in the socio-economic life of the people and the vast majority of people are still under the vicious circles of poverty and hunger.

### **Food Security in the Era of Liberalization**

The economic reforms of 1991 can be considered as a defining event in the development history of India. These economic reforms were intended to reduce the fiscal deficit and to achieve a high rate of growth through fiscal austerity measures. It brought radical changes not only in all sectors of the economy, but also marked a departure from the past as it altered the time-tested goals of Indian development policy such as growth with justice, social responsibility and accountability, equity and self-reliance, etc. As a result, the basic thrust of public policy in terms of subsidies, poverty alleviation, safety net programmes, unemployment schemes, etc., were altered. New concepts like liberalization, privatization and globalization gained wider currency in the realm of economic policy. But the most important development in the reform process was the redefined role of the state vis-à-vis the market in development. In other words, the reform process renewed commitment to

market and altered the positive role of the state as an instrument to bring out social change and as the agency for providing social security measures. The state was, thus, no longer considered as an instrument for achieving the welfare of the people, which was left to free market competition.

Like any other sectors of the economy, market forces are entering into the food sector in India causing a serious challenge to food security. In 1994, when the trade liberalization extended to agriculture, the Government lifted a number of quantitative restrictions on imports, simplified trade measures and reduced public interventions in domestic markets. On the export liberalization, it resulted in rising food prices and declining food accessibility for poor people, while important liberalization was threatening to wipe out millions of small producers by destroying domestic markets. The state intervention in procurement and distribution of food grains is losing. On the other hand, the Multinational Corporations are engaging food especially fast food. In the context of economic liberalization, the political commitment to eradicate poverty is stalled by economic discipline and the craze for accelerating economic growth. Under pressure from the International Monetary Fund (IMF) and the World Bank, the central government curtailed the allocation for Public Distribution System (PDS). It is to be reminded that PDS emerged as an instrument of poverty alleviation and the goal is to intervene in market at various stages such as procurement of food grains by giving adequate minimum support price to farmers and distribute to the poor through PDS. However, in the liberalized era, food subsidy which intended to achieve food security was considered as a heavy burden on country's exchequer and a wasteful expenditure. In 1997, in pursuance of new economic policy, the government abandoned the universal PDS and introduced the Targeted Public Distribution System (TPDS) with the intension to reduce the benefit of PDS to really deserving people. Under the renewed scheme, the allocation of food grains was confined only to the people Below Poverty Line (BPL). In other words, the intension of the government was limiting the benefit of the PDS only to the poor and excluding the rich and affordable sections, the Above Poverty Line (APL) to the market prices from the purview of PDS. According to Utsa Patnaik, "economic reform policies of expenditure cuts and trade liberalization, along with targeting, by inducing demand deflation on the one hand and administratively excluding poor from the PDS on the other, have reduced a functioning PDS to a shambles before our very eyes and gravely undermined the little food security that the people had" (Patnaik, 2007: 107).

In the 1990s, when the Congress government at the Centre took number of initiative to bring economic discipline, most of the state governments ruled by the regional parties incorporated competitive populism of food security in its agenda (Bijukumar, 2004: 174). The promise of food security is an instrument of political mobilization in India, particularly the regional parties. These state governments felt that as they were the most accessible level of government for the people, it was they who had to face the discontent of reform and they feared that it would erode their mass base. They were of the view that economic policies were a threat to its political future and even for the survival of the state governments. When the central government withdrew their subsidies, the state governments were forced to substitute their own food subsidies to supply subsidized food grains to the poor, and price incentives to the farmers. Even, the Congress party ruled state governments were forced to adopt certain measures to counteract the ill effects of economic reforms when its counterpart at the Centre was advocating against populism. For example, in Karnataka, the Congress government of Veerappa Moily in 1994 reduced the prices at which PDS outlets in the states sold rice and wheat. The additional cost for the state exchequer was Rs. 420 million. In Andhra Pradesh, the government promised Rs. 2 per kg rice scheme and this enabled the Telugu Desam Party (TDP), a regional party, to win the 1994 assembly elections. The Janata Dal government under H .D. Deve Gowda in Karnataka announced an extended state-level subsidized rice scheme, at a cost of Rs. 2.2 billion per year, five times more than the amount which the previous Congress government under Verappa Moily had offered to the people.

### **Poverty Line and Food Security**

The introduction of TPDS brought the debate on identifying the poor and non-poor. Since 1990s, number of criterion were adopted by various individuals, organizations and committees to identify poverty line. The methodology for estimation of poverty followed by the Planning Commission has been based on the recommendation made by experts in the field from time to time. In December, 2005, Planning Commission constituted an Expert Group under the Chairmanship of Suresh D. Tendulkar, the former chief of National Statistical Commission, to review the methodology for estimation of poverty. The Tendulkar Committee submitted its report in December 2005 and computed poverty line and poverty ratios for 2004-05. Tendulkar methodology is estimated at Rs 33.33 in cities and Rs 27.20 in villages per day, per person (Government of India, 2009). Any one spending more than

this amount on food and other goods and services is not poor. However, the Tendulkar committee recommendations on poverty have generated lot of political controversy. In response to augmenting criticisms from many quarters, in June 2012, the Planning Commission constituted an Expert Group under the Chairmanship of C. Rangarajan to review once again the methodology for the measurement of poverty. The Rangarajan Committee is deliberating on this issue and is expected to submit its report by middle of 2014. It is an irony that without waiting for the Rangarajan Committee Report, the Planning Commission based on the 68<sup>th</sup> Round National Sample Survey Data brought out the poverty estimates for the year 2011-12 as per the recommendations of the Tendulkar Committee.

The Planning Commission at various points of time claimed that rural poverty was declining in India. The Planning Commission's affidavit clarified that the official poverty estimation methodology is based on the Tendulkar Committee Report (2009) (i.e., Rs. 32 per persons per day in urban areas and Rs. 26 per persons per day in rural areas. In fact, the Planning Commission by lowering the criteria for poverty declared poverty has declined. The official poverty lines are anchored to a fixed commodity basket corresponding to the poverty line (Rs.49.09 per person per month at 1973-74 prices for rural areas and Rs.56.64 for urban areas). The suggested rural commodity basket by the Expert Group contained 2400 kcal per capita per day in rural areas and the urban food basket had 2100 kcal per capita per day in 1973-4. For subsequent years, poverty line is updated with consumer prices.

In India poverty is defined not in terms of calories intake. The accepted calorie norm is that 2100 calories per person per day in Urban Indian and 2400 calories (later reduced to 2200 calories) per person per day in rural India. In fact, for the sake of argument one can say that poverty has come down while hunger has increased. Both rural and urban average daily intake of energy (calories) and protein have been declining. The average daily rural/urban energy in take was 2020/1946 calories in 2009-10, compared to 2221/2089 calories in 1983. The decline is primarily owing to the decline in food grains consumption, since staple grains remain the main sources of both energy and protein for the population. On the other hand, the go downs of Food Corporation of India are filled with food grain stock. It is estimated that in June 2011 public food stocks were a mountainous 82 million tons in excess of buffer norms.

The UPA government's estimate of poverty as per Tendulkar's criteria

was 29.8% for 2009-10, whereas the World Bank's estimate (where the criteria in spending less than 1.25 US dollars per day) was 32.7% in 2010. The UNDP estimate was 29.8%, similar to that of the government. The World Bank believes that India's poverty ratio will reach 23.6 per cent by 2015. UN Development Goals report believes that India's poverty ratio will come down to 22% by 2015 which would mean a fall from 51% in 1990 to 22% in 2015. The Twelfth Five Year Plan projects a 10 per cent reduction in the poverty ration (2% per year) to less than 20% (19.8% be precise) by the end of the Plan. It is a contradiction that when the Government, World Bank and UNDP highlight the reduction in poverty during the reform period, the government passed the much proclaimed Food Security Bill aimed at poverty reduction.

### **Agrarian Crisis and Food Insecurity**

The growing agrarian crisis has serious implications for the food security in India. The three basic parameters of food security such as availability, accessibility and affordability are under attack due to the dismantling role of the state and the augmenting entry of the market forces in the agriculture sector. During the course of economic reforms, India witnessed a cut in farm subsidies, irrigation, electricity, fertilizer, pesticides, etc. Moreover, institutional credit facilities to farmers have been curtailed. The complexities of acquiring credit from governmental financial institutions forced the farmers to approach informal credit networks often with high interest have implications for agricultural production. Since 1990s, the deceleration of growth rate in agriculture due to the dwindling cases of public investment in agriculture resulted in the reduction of food production which adversely affected the availability of food. There is a growing food insecurity where women and children and the socially marginalised sections are worst affected. The lack of access to food leads to growing incidents of malnutrition especially among the marginalized groups such as Dalits and tribals. The growing incidents of food insecurity lead to children underweight. According to Ghosh, "the average daily intake of protein by the Indian population decreased from 60.2 to 57 grams in rural Indian between 1993-94 and 2004-05 and remained stable at around 57 grams in the urban areas during the same period" (Ghosh, 2010). When there is growing increase in poverty, malnutrition the FCI godowns are overflowing and spoiling food grains. In a reply to an RTI query, the FCI accepted that as much as 1, 94, 502 metric tonnes of food grains worth cores of rupees was wasted in India due to various reasons between 2015 and March 2013. Interestingly, poverty and starvation deaths reported

in various parts of India, FCI is wasting food grains.<sup>2</sup>According to Utsa Patnaik, the very large increase in the inequality of access to food in India is the outcome of the two sets of processes – absolute decline in real incomes and hence loss of purchasing power through unemployment and income deflation for a substantial section of the population, and targeting in the PDS (Patnaik, 2007: 102).

Another impact on liberalization which has serious repercussions on food security is the shifting in cultivation pattern from traditional food crops to cash crops. In the age of neoliberal policies, the total area under food grain cultivation has been falling. The farmers are shifting to the cultivation of cash crops to earn more foreign exchange earnings for their products. All these generate a great concern in the realization of food security. The entry of corporate business in agriculture is another trend since the 1990s. On the one hand, there is increasing prices of food grains, the farmers are really getting less remuneration that in fact, affect the access to food. The lack of adequate remuneration to their products leads to increasing incidents of farmers' suicide. The Structural Adjustment Program further raised the gap between MSP (domestic prices) and international prices. In many cases, the government's procurement price was less. It is observed that "reducing or closing down the PDS would be a direct threat to procurement as well, as there would remain no incentive to procure" (Sinha, 2015: 18). Further, it is argued that "though CACP was required to take into consideration the international price situation, this aspect was never given any weight while arriving at the level of MSPs. In general, the MSP was lower than international prices" (Chand, 2005: 1055).

The integration of domestic economy to the global economy worsened the agrarian situation. In terms and condition of WTO agreement, in which India was a signatory in 1995, developing countries like India have to enforce three reforms – market access, domestic support and export subsidies. Free market access means removal of quantitative restriction on goods coming from other countries. The removal of quantitative restrictions and free import of agricultural product to Indian market adversely affect the domestic food production. While in developed countries the subsidy on agriculture is amounting, pressure on developing countries to scrap subsidies on agriculture. In the recent past, the BJP-led NDA government's slogan of 'Make in India' further proved to be anti-agricultural and pro-industrial and business oriented. The government's effort to spread red carpet to industrial business in India through number of policy initiatives and incentives would further alienate the

farming sector in the developmental process. The Land Acquisition Bill of the government has rampant implication for the agricultural sector as the farmers are losing their land and livelihood which ultimately leads to shortage of food production.

### **Economic Growth and Poverty Reduction**

When government claims that India achieved impressive economic growth in the recent past and subsequent reduction in poverty, the emerging reality would be contrary to this argument. The modest growth rate achieved in the recent past could not translate into checking food inflation as the prices of essential food grains are sharply rising causing a grave concern for the poor people. Although there is significant decline in the prices of crude oil in the international market, the government could not slash down the prices of essential commodities. It is estimated that more than 80 per cent of rural households in India had a daily per capita of consumer expenditure of Rs.50 or less in 2011-12. This was also true of 45 per cent of all urban households. The per capita availability of food grains was 164 kg per year in 2012, which is below the figure in 1991 when per capita availability was 186 kg per year. The Global Hunger Index ranked 120 countries out of which India is positioned at 55<sup>th</sup> position. The growing income disparities, the widening gap between rich and poor and asymmetrical distribution of resources have implication for food security. In such a situation, the growing food insecurity leads to food deprivation which would adversely affect citizens' capacity to effectively participate in deliberative institutions.

### **National Food Security Bill 2013**

Perhaps, the most radical steps to ensure food security in India was the National Food Security Act, 2013 of the UPA led Congress Government. The Bill seeks "to provide for food and nutritional security in human life cycle approach, by ensuring access to adequate quantity of quality food at affordable prices to people to live a life with dignity and for matters connected therewith and incidental thereto". Priority households are entitled to 5 kgs of foodgrains per person per month, and *Antyodaya* households to 35 kgs per household per month. The combined coverage of Priority and *Antyodaya* households (meaning "eligible households") shall extend "up to 75% of the rural population and up to 50% of the urban population". For children in the age group of 6 months to 6 years: an age-appropriate meal, free of charge, through the local *anganwadi*. For children aged 6-14 years, one free mid-day meal every day (except on school holidays) in all government and



government-aided schools, up to Class VIII. For children below six months, “exclusive breastfeeding shall be promoted”. For children who suffer from malnutrition, meals will be provided to them free of charge “through the local *anganwadi*”. Every pregnant and lactating mother is entitled to a free meal at the local *anganwadi* (during pregnancy and six months after child birth) as well as maternity benefits of Rs 6,000, in installments. In addition to the core provisions, it envisages the revitalization of agriculture - agrarian reforms through measures for securing interest of small and marginal farmers; increase in investments in agriculture, including research and development, extension services, micro and minor irrigation and power to increase productivity and production; ensuring livelihood security to farmers by way of remunerable prices, access to inputs, credits, irrigation, power, crop insurance, etc. and prohibiting unwarranted diversion of land and water from food production. The Food Security Act along with the MGNREGA, made some effect on the everyday life of the people of India. Though MGNREGA is an employment guarantee program for the rural population, it is closely related to food security as it increases the purchasing power of the people.

### **Shanta Kumar Committee Report and Food Security**

The food security legislation is a flagship program of the UPA – II government. After coming to power, the BJP led NDA government showed its discomfort with the legislation and diluted the spirit of the legislation. For instance, the BJP-Shiv Sena government in Maharashtra curtailed the food subsidy for the supply of subsidized food grains to 1.75 core people in the State.<sup>3</sup> However, the BJP’s attitude to food security manifested in its approach to the Shanta Kumar Committee recommendations. The Eight Members Committee headed by Shanta Kumar, former Cabinet Minister set up in August 2014 to recommend the restricting of beneficiaries of the food security. The report was prepared under the guidance of the Prime Minister’s Office which submitted the report on January 2015 to PM recommended reforming the food subsidy.

The Report recommended revisiting the policy of MSP, deregulating the fertilizer sector by directly transferring Rs. 7000 per hectare as subsidy to the farmers. It is to be reminded that FCI came into existence in the mid-1960s in the midst of food crisis faced by India. Since then, the FCI emerged as the key public institution to manage the food procurement and ensure food security in India. The Committee viewed that the government’s food

subsidy bill can come down by over Rs. 30, 000 crore a year by reducing coverage of beneficiaries to 40 percent under the food law and outsourcing major work of FCI to state governments and private players.

Another recommendation, the cash transfer scheme – food security allowance in cash in lieu of PDS entitlements - is another bolt to food security in India after the TPDS. It would endanger the goal and philosophy of universal PDS. It not only affects the food entitlement but also the production, procurement and storage process. The farmers who are getting minimum support price in over production seasons are the worst affected as the procurement of food grains no longer required when cash transfer takes place. It is argued that “cash transfers will not protect people against inflation, especially in the context of fluctuating and generally high food inflation” (Sinha, 2015: 19). The DBT is yet another stumbling block to universal PDS as it adversely affects the food security in India. PDS is depending on other allied activities such as procurement and storage. While the government claims that DBT can avoid leakages of commodities distributed in PDS, there are certain difficulties in the DBT such as targeting and identification of beneficiaries, access to banks, etc. Dipa Sinha argues that “given the vulnerability of livelihoods, indebtedness, increasing commercialization of basic education and health services, the poor have a need for cash and there is no guarantee that the money can be used or kept aside for a time when there is no food available. The PDS plays a role in filling this gap” (Sinha, 2015: 18). Interestingly, the government’s move to dismantle of the universal PDS through the Cash beneficiary scheme can be seen in the larger context of opening of retail sector for FDI. Cash may flow to corporate sector and often people prefer other consumer goods rather than food grains. Moreover, it often leads to the purchase of readymade food which further boost to retail business sector.

The Committee’s recommendation to stopping food grain procurement by FCI irked its ally, the Shiromani Akali Dal (SAD) led government in Punjab. The SAD government in Punjab asked the Centre to reconsider its decision of stopping food grain procurement by FCI which was adversely affecting the farmers. It is argued that “the Centre’s move of stopping procurement of food grain from states like Punjab could prove to be very harmful for state growers as they could be denied of appropriate prices of their crops (in the wake of FCI’s absence from the Market)”.<sup>4</sup>The vehement protest amongst the opposition parties came from the DMK chief Karunanidhi, who asserted that it would pave way for closure of public distribution system in a state like

Tamil Nadu. According to him, the state government would have to spend more for the rice subsidy. In his opinion, “it would force the state government to spend an additional Rs, 1,000 crore for food security. The Centre should reject the recommendations and ensure food security for the people”.<sup>5</sup> On the other hand, the government argument is that farmers would not lose if private companies are allowed to procure food grains from them. Replying to a question in Rajya Sabha, Ram Vilas Paswan, Minister of Consumer Affairs Food and Public Distribution allaying the apprehension that “farmers will not lose if private companies are allowed to procure”<sup>6</sup>. Amidst protest, the Food Ministry rejected the Shanta Kumar Committee’s recommendation to cut the number of beneficiaries under the food security law to 40 per cent of the population against the current 67 percent.<sup>7</sup>

The Shanta Kumar Committee recommendations pose a threat to PDS as it is witnessing the retreat of the state and entry of market forces in food security. It’s not only destroying the state intervention in distribution, but also procurement and storage system, giving way to market forces. It is clear indication that the government’s failure to tackle hunger and malnutrition and eliminate the PDS in the country. The growing private sectors’ role in food grain procurement is yet another bonanza for corporate business and scarce attention to farming community and poor of the country.

### **Conclusion**

Though India could emerge as a potential force in the global arena and its growth rate accelerated impressively since 1990s, after the forty years of Hindu rate of growth, death related to poverty and hunger shamed the political idea of India. In the course of sixty-eight years of its magnificent journey, India averted Bengal famine like situation. However, there is the need to address reconciling growth with justice by adopting a redistributive strategy aimed at alleviating poverty. Food security which emerged as one of the ways to address poverty is based not only on the availability of food grains, but also on increasing the purchasing power of the people. The lack of purchasing power however adversely affects the consumption and nutritional levels of the people. Food security can be strengthened through public distribution system, decentralization of procurement and effective implementation of food for work programme. However, targeting the beneficiaries to avail food security and rising the prices of food grains is mocking the spirit of food security in particular and human security in general.

## Notes

- <sup>1</sup>See, United Nations. 1975. Report of the World Food Conference; Rome, 5-16 November 1974. New York
- <sup>2</sup>“FCI admits 1.94 lakh food grain wasted between 2005-13”, *The Hindu*, February 12, 2014.
- <sup>3</sup>“Maharashtra cuts food subsidy for 1.7 crore people “, *The Indian Express*, January 18, 2015.
- <sup>4</sup>“Stopping food grains buying by FCI to be harmful for farmers: Punjab Government”, *The Economic Times*, February 27, 2015.
- <sup>5</sup>“Reject Shanta Kumar Panel Recommendations: Karunanidhi”, *The Hindu*, January 25, 2015.
- <sup>6</sup>“Farmers will not lose if private players procure food grains: Government”, *The Economic Times*, March 3, 2015.
- <sup>7</sup>“Food Ministry Rejects FCI Committee’s suggestion on Food Law”, *The Economic Times*, March 4, 2015.

## References

- Bijukumar, V. 2004. ‘Economic Reforms, Populism and Party Politics in India’, *The Indian Journal of Political Science*, 65(2): 161-180.
- Chand, Ramesh. 2005. ‘Whither India’s Food Policy?: From Food Security to Food Deprivation’, *Economic and Political Weekly*, 40 (11): 1055-1062.
- Dreze, Jean. 2004. ‘Democracy and Right to Food’, *Economic and Political Weekly*, 39(17): 1723-1731.
- Ghosh, Jayati. 2010. ‘The Political Economy of Hunger in 21<sup>st</sup> Century India’, *Economic and Political Weekly*, 45(44-45): 33-38.
- Patnaik, Utsa. 2007. *The Republic of Hunger and other Essays. Three Essays Collective*. Gurgaon:
- Pritchard, Bill et al. 2014. *Feeding India: Livelihood, Entitlements and Capabilities*. Routledge, London and New York.
- Sen, Amartya. 1999. *Development as Freedom*. Anchor Press, New York.
- Sinha, Dipa. 2015. ‘Cash for Food – A Misplaced Idea’, *Economic and Political Weekly*, 50(16): 17-20.
- Swaminathan, Madhura. 1996. ‘Structural Adjustment, Food Security and System of Public Distribution of Food’, *Economic and Political Weekly*, 31(26): 1665-1672.

## Nutritional Intake and Consumption Pattern in the States of Himachal Pradesh and Meghalaya

ANIKA M. W. K. SHADAP\* & VERONICA PALA\*\*

### Abstract

*According to the recent reports of the National Sample Survey Organisation (NSSO) on nutritional intake, Meghalaya reported the lowest intake of dietary energy and protein per capita per diem whereas Himachal Pradesh reported the highest intake. These two small hilly states are similar in several aspects but they are at each end of the spectrum in terms of nutritional intake. Using the NSSO data on consumer expenditure in 2004-05 and 2011-12, the paper analyses the consumption pattern of the people in Himachal Pradesh and Meghalaya.*

**Keywords: Calorie intake, Consumption pattern, Himachal Pradesh, Meghalaya**

### Introduction

Food is one of the basic needs of human beings. Information on intake levels of nutrients is important in order to understand the general health status and level of living of the people. Further, monitoring the nutritional intake of people in developing economies is essential since substantial sections of the population cannot meet their dietary requirements on account of poverty. Moreover, cultural and traditional factors also play a role in food consumption. Thus, awareness of any widespread deficiency is necessary for informed and appropriate policy measures.

There are wide interstate variations in nutritional intake in India. According to the 68<sup>th</sup> round of National Sample Survey on Consumer Expenditure conducted in 2011-12, in case of per capita per diem intake of

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\*Anika M.W.K. Shadap (anikakshiar@gmail.com) is a Research Scholar in the Department of Economics, NEHU, Shillong.

\*\*Veronica Pala (veronicapala@gmail.com) is an Assistant Professor in the Department of Economics, NEHU, Shillong.

calories and protein, Meghalaya reported the lowest intake whereas Himachal Pradesh reported the highest intake. In respect of fat intake, Meghalaya ranked fourth from the bottom and Himachal Pradesh occupied the fourth position from the top after Punjab, Haryana and Delhi [NSSO (2014), pp. A-73 – A-108].

Himachal Pradesh is a state in Northern India covering an area of over 55,670 square kilometres. As per the 2011 Census it has a population of 68,64,602. It is the least urbanised state in the country with 90 percent of the population living in the rural areas. It is also considered as the second least corrupt state in the country after Kerala. The main occupation of the people is agriculture with 93 percent of its population depending on it for their livelihood. It contributes about 45 percent to the State Domestic Product. The main crops grown here are wheat, maize, rice, barley, seed potato, ginger, vegetables, vegetable seeds, mushrooms, olives, figs, etc. Another main contributor to the state's economy is tourism. It is also a state that has a rich heritage of handicrafts. Himachal Pradesh is one of the few states that has remained untouched by other customs external to it mainly because of its difficult terrain. In their day-to-day diet, the people include lentils, rice and vegetables. Flours like wheat and maize are also used to make bread or *roti*.

Meghalaya is a state in the North-Eastern Region of India and covers an area of 22,429 square kilometres. As per the Census 2011, the state has a population of 29,66,889. About two-thirds of the total work force of the state is engaged in agriculture. The major crops grown here are potatoes, rice, maize, pineapples, bananas, papayas, spices, etc. However, the contribution of agriculture to the State Domestic Product is only about one-third. Meghalaya is also one of the tourist destinations that attract many tourists both national and international. It has beautiful landscapes, waterfalls, caves, sacred groves, etc. which are major tourist attractions and is many times compared to Scotland. The staple food of the people is rice which is eaten with different preparations of meat or fish and also vegetables. After meals, the people have a habit of consuming areca nuts along with betel leaves, lime and sometimes with dried tobacco.

Himachal Pradesh became a full-fledged state in 1971, and Meghalaya in 1972. Meghalaya's per capita Net State Domestic Product at current prices was Rs. 61,548 and that of Himachal Pradesh was Rs. 92,300 in 2013-14 (Government of India 2016a, p. A25). The all India per capita income in the same year was Rs. 74,380. Thus, Meghalaya has a lower than average

per capita income compared to Himachal Pradesh. Both are small hilly states in which the terrain is not suitable for modern and large scale cultivation of cereals. Both have huge potential for the cultivation of cash crops and fruits. Himachal Pradesh has harnessed this potential and is currently the 'apple state of India'.

Although the two states are similar in several aspects, Meghalaya lags behind in terms of the level of development. In particular it is intriguing to observe that the level of nutritional intake of Himachal Pradesh and Meghalaya are at each end of the spatial spectrum. This is the issue that this paper attempts to explore.

### **Data and Methodology**

In this paper, we have used the unit record data collected by the National Sample Survey Organisation (NSSO) on Consumption Expenditure during the 61<sup>st</sup> round (July 2004 to June 2005) and 68<sup>th</sup> round, Schedule Type 1 (July 2011 to June 2012). The survey covers the entire country and over one lakh households were surveyed. In particular, for the Schedule Type 1 of the 68<sup>th</sup> round, 2041 households in Himachal Pradesh and 1259 households in Meghalaya were surveyed. The sample size for the 61<sup>st</sup> round is similar but slightly larger since the survey in this round was not divided into Type 1 and Type 2!

Besides recording the household monthly expenditure, the schedule of enquiry used for the survey records quantities of various items of consumption, in particular, of each food item consumed by the household during the 30 days preceding the date of survey. The Consumption Expenditure datasets give the consumption of various items by the surveyed households. Information is also collected on whether meals were taken at home or not, and if not, whether the meals were taken from school, employer or purchased and consumed while away from home. The quantities of food recorded as consumed by the households are converted into the equivalent amounts of calorie, protein and fat on the basis of a Nutrition Chart, which gives the energy, protein and fat content per unit of different foods in the Indian diet. The Nutrition Chart is largely based on Gopalan *et. al.* (1991). It needs to be said, however, that the actual intake of nutrients depends on how these foods are actually processed and/or cooked in the surveyed households. We have used the nutrient contents of each item per unit of quantity as reported in pages 14-18 of NSSO 2014. We have also adjusted for outside meals and meals served to non-household members as per the methodology states in pages 9-10 of NSSO 2014.

The major components of food or nutrients are: carbohydrates, proteins, fats, vitamins and minerals. Proteins, fats and carbohydrates are mostly the energy yielding components of a diet. Proteins normally supply 10-12 per cent of energy in most diets; energy that carbohydrates and fats contribute may vary from diet to diet. Quantitative food requirements are usually estimated in terms of energy or calorie. The unit of measuring energy is kilocalories (Kcal) which is the amount of heat required to raise the temperature of one kg of water from 14.5°C to 15.5°C. We restrict our estimates of nutritional intake to intake of energy, protein and, fat and we have calculated the per capita per day intake of these nutrients.

We have calculated the per capita food expenditure and per capita total consumption expenditure in the last 30 days. Using these we have found the percentage of food expenditure out of total consumption expenditure for the two states. Further, we have studied the allocation of the food expenditure across various food groups in order to analyse the consumption pattern. The analysis has been done for the rural and urban sectors as well as for the all India level.

While examining the estimates of distribution of nutritional intake, information on food consumption was collected for a household as a whole. The per capita intake is derived by dividing the household intake by the number of household members without considering the composition of the household in terms of age, sex, occupation, etc. which are important factors in determining food consumption. Nevertheless, household per capita intake of nutrients is an important tool for analysis and for studying adequacy of dietary energy intake (NSSO 2014, p.21).

### **Nutritional Intake**

The normative calorie consumption for Indians as given by the Indian Council of Medical Research (ICMR) differ according to gender, age group and types of activity. For a man weighing 60 kg and engaged in sedentary activities, the minimum daily calorie requirement is 2320 Kcal, for a similar man doing moderate physical activities, the norm is 2730 Kcal and for someone doing heavy physical activities, it is 3490 Kcal. For women weighing 55 kg the norms are 1900 Kcal, 2230 Kcal and 2850 Kcal respectively for those engaging in sedentary, moderate and heavy physical activities (ICMR 2010, p. 66). Therefore, on an average, the Planning Commission has recommended



2,400 Kcal for the rural areas and 2,100 Kcal in the urban areas as the minimum daily calorie consumption requirement per person (Government of India, 1993)<sup>2</sup>

The norm is 1770 Kcal for Indians as recommended by the Food and Agriculture Organisation, (Government of India, 2009). However, this minimum threshold is determined with reference to light physical activity, normally associated with a sedentary lifestyle (FAO, 2015, p.51). These norms give us some benchmark in order to assess the adequacy of calorie intake although the actual requirement differs according to the age, sex, height and level of physical activity which we have no way to take into consideration from the consumption data. In Table 1 we have reported the per capita per diem intake of calories, proteins and fats in the rural and urban areas of Himachal Pradesh, Meghalaya and All India in 2004-05 and 2011-12.

**Table 1**

**Average per capita per diem intake of calories, proteins and fats**

State/ Nutritional intake / Sector	Himachal Pradesh			Meghalaya			All India		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
<b>2004-05</b>									
<b>Calorie (kcal)</b>	2326	2389	2332	1900	1898	1900	2047	2020	2040
<b>Protein (gm)</b>	67.9	67.1	67.8	48.8	49.8	48.9	55.8	55.4	55.7
<b>Fat (gm)</b>	52.5	59.9	53.2	25.4	37.2	27	35.4	47.4	38.5
<b>2011-12</b>									
<b>Calorie (kcal)</b>	2502	2513	2503	1688	1757	1703	2101	2060	2089
<b>Protein (gm)</b>	71.4	70.7	71.4	41.7	46.1	42.6	56.5	55.7	56.3
<b>Fat (gm)</b>	59.3	66.4	60.1	21.5	27.7	22.8	41.7	52.5	44.8

**Source:** *Special tabulation by the authors using unit record data on Consumer Expenditure collected by the National Sample Survey Organisation in the 61<sup>st</sup> and 68<sup>th</sup> rounds.*

**Calorie intake:** In 2011-12 the average dietary energy intake per person per day was 2101 Kcal for rural India and 2060 Kcal for urban India. There has been a slight increase from the levels observed in 2004-05 in case of Himachal Pradesh and the all India average but we see a decline in the case of Meghalaya. One thing that strikes us is that Meghalaya is consuming less than the minimum calorie requirement of 1770 Kcal which is the FAO norm and also much lower than the normative calorie consumption as given by the ICMR.

**Protein intake:** The normative protein consumption for Indians as given by the ICMR differentiates between men and women. The recommended protein requirement for a man (weighing 60kg) is 60 grams per day and for a woman (weighing 50kg) is 50 grams per day (ICMR 2010, p.109). At the all India level protein intake per day was about 56.5 grams per capita in the rural areas and 55.7 grams per capita in the urban areas in 2011-12. As noted earlier, the average intake is the highest in Himachal Pradesh and the lowest in Meghalaya among all the Indian states. The protein intake has increased for Himachal Pradesh and the all India average. On the other hand, consumption of protein in Meghalaya falls short of the normative requirement and has declined during the period 2004-05 to 2011-12.

**Fat intake:** The normative fat consumption for Indians as given by the ICMR recommends 20 grams per day for a man weighing 60kg as well as for a woman weighing 50kg (ICMR 2010, p.132). Average fat intake for the country as a whole per capita per day was about 41.6 grams in the rural sector and 52.5 grams in the urban sector. The observed fat intake is marginally higher than the norm in Meghalaya and much higher in Himachal Pradesh. Just as in case of dietary energy and proteins the consumption has declined in case of Meghalaya and risen in case of Himachal Pradesh during the period that is considered in this paper.

### **Food consumption pattern**

In this section we look at the average expenditure on food and the percentage of food expenses out of the total expenditure. Further, we look at the percentage distribution of the food expenditure over food groups.

**Food consumption expenditure:** Table 2 reports the monthly per capita food expenditure and the total expenditure in absolute terms. It also gives the estimated proportion of food expenses out of the total expenses. In 2004-05 the per capita food consumption in both the states have higher values than the all India average of Rs 430/. We also notice that there seems to be

hardly any difference between the values recorded in the two states, with Himachal Pradesh having per capita food consumption expenditure of Rs 499/- and Meghalaya at Rs 498/-. On the other hand, when we look at the data of 2011-12 we find that once again both the states have higher values than the all India average of Rs 739/-. The average food consumption expenditure in Himachal Pradesh has increased to Rs 870/- and in Meghalaya it has increased to Rs 770/-. We notice that in the gap of just 7 years the difference in the consumption expenditure has increased to Rs 100/- between the two states.

**Table 2**  
**Monthly per capita food expenditure and total expenditure**

State	Himachal Pradesh			Meghalaya			All India		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
<b>2004-05</b>									
Food expenditure	470	655	499	463	591	498	385	510	430
MPCE	904	1540	1004	729	1189	855	696	1123	852
Food expenditure out of MPCE (%)	51.99	42.53	49.7	63.51	49.71	58.25	55.32	45.41	50.47
<b>2011-12</b>									
Food expenditure	832	1186	870	715	975	770	652	956	739
MPCE	1859	3135	1997	1271	2158	1458	1279	2399	1599
Food expenditure out of MPCE (%)	44.76	37.83	43.57	56.25	45.18	52.81	50.98	39.85	46.22

**Notes:**

- (i) MPCE- monthly per capita total expenditure based on Uniform Recall Period.<sup>33</sup>
- (ii) Food expenditure and MPCE are in Rupees at current prices.

**Source:** As in Table 1.

According to Engel's law, the poorer a household is, the larger the budget share it spends on food. The estimates in Table 2 enable us to gauge to some extent the level of development of the two states. In 2004-05, we notice that Meghalaya spent a higher percentage of its MPCE on food compared to Himachal Pradesh and the rest of the country. Meghalaya spends as much as 58.25 percent of its MPCE on food whereas Himachal Pradesh spent 49.70 percent of its MPCE on food. The percentage of expenditure on food at the all India level was 50.47 percent. In 2011-12, we observe that, in absolute terms Himachal Pradesh spends more than Meghalaya on food. However, Meghalaya spends 52.81 percent on food compared to 43.57 percent in Himachal Pradesh and 46.22 percent at the all India level. It is to be noted that the percentage of food expenditure has declined by more or less the same level in the two states as well as India as a whole.

**Expenditure on different food groups:** How a household allocates its food budget over various food groups has implications on the nutritional status of the household members. In Table 3 we report the percentage distribution of the food expenditure over various food groups in 2004-05 and 2011-12. In view of space constraint, we have reported only the combined results and therefore separate results for rural and urban sectors are available from the authors upon request. We have classified the various food items into 13 groups, namely, (i) cereals and cereal substitutes; (ii) pulses and pulse products; (iii) milk and milk products; (iv) salt and sugar; (v) edible oils; (vi) eggs, fish and meat; (vii) vegetables; (viii) fruits, which include fresh and dry fruits; (ix) spices; (x) beverages, snacks, processed and packed food; (xi) *paan*, *supari*, etc.; (xii) tobacco and (xiii) intoxicants, i.e. beer, liquor, *ganja*, etc

**Table 3: Percentage Expenditure on different food groups**

Year/State/ Food groups	2004-05			2011-12		
	Himachal Pradesh	Meghalaya	All India	Himachal Pradesh	Meghalaya	All India
Cereals	18.02	23.12	21.12	18.34	22.84	21.72
Pulses & pulse products	5.84	2.15	4.11	7.13	2.82	6.15
Milk & milk products	21.92	6.81	14.77	27.47	6.69	18.43
Salt & sugar	3.73	2.69	2.99	3.67	2.65	3.70

Edible oil	6.66	4.66	5.98	5.63	4.60	7.12
Eggs, fish & meat	5.84	18.28	9.53	4.13	18.97	7.00
Vegetables	6.82	11.11	8.97	7.33	10.77	9.13
Fruits	6.00	3.23	5.23	4.03	2.84	4.56
Spices	2.11	1.08	2.43	3.51	2.22	4.21
Beverages & packed food	8.60	10.22	10.47	13.36	14.52	13.78
<i>Paan</i>	2.60	6.45	2.62	0.00	5.27	0.60
Tobacco	4.55	4.30	3.36	2.69	4.24	2.08
Intoxicants	7.31	5.91	8.41	2.72	1.58	1.53
<b>Total food expenditure</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Source:** As in Table 1.

From the above Table, it is evident that in 2011-12 the people in Himachal Pradesh spent 18.34 percent of their food consumption expenditure on cereals and cereal substitutes, while people in Meghalaya spend 22.84 percent of their food consumption expenditure on the same which is higher than the national average of 21.72 percent. In 2004-05 the people in Himachal Pradesh spent 18.02 percent of their food expenditure on cereals and cereal substitutes whereas people in Meghalaya spent a higher proportion on this category i.e. 23.12 percent which was higher than the national average of 21.12 percent. The share of this category has thus remained more or less at the same level. We see a marked difference in the percentage of expenses on pulses and pulse products between the two states. Himachal Pradesh spends over seven percent whereas Meghalaya spends less than three percent of their consumption expenditure on this category. This is much lower than the national average of 6.15 percent in 2011-12. The percentage has increased in case of Himachal Pradesh and the all India level while no substantial change has taken place in Meghalaya. Meghalaya seems to be consuming a very small amount of pulses and pulse products (which is a good source of vegetable protein), compared to the rest of the country.

When it comes to milk and milk products, in 2004-05 we note that the percentage of expenses on milk and milk products by Himachal Pradesh at 21.92 percent was much higher than the percentage it spent on cereals. However, Meghalaya seems to have given lesser importance to this category at 6.81 percent of its consumption expenditure which is also much lower than the national average of 14.77 percent. In 2011-12 on the other hand, we see that the percentage spent on this category has increased both in Himachal Pradesh as well as at the national level at 27.47 percent and 18.43 percent respectively. However, at 6.69 percent we notice a slight decrease in the percentage of expenditure on this category in Meghalaya. Once again in the case of a nutritious food we see that Meghalaya spends a very small amount which may be a cause of widespread malnourishment in the state.

The percentage of expenses on eggs, fish and meat in 2004-05 was 5.84 percent in Himachal Pradesh whereas it was very high in case of Meghalaya at 18.28 percent. The national average shows the percentage of expenditure in this category at 9.53 percent. Calculations of 2011-12, show that there has been a decline in the consumption of eggs, fish and meat in Himachal Pradesh showing that the percentage of expenses was 4.13 percent while at the national level it was seven percent (a decrease of about two percentage points). However, Meghalaya has shown a very slight increase in the percentage of expenditure at 18.97 percent. We may say that people in Meghalaya eat a lot of meat and so they derive protein in their diet from this category of food. Religious and cultural factors play a major role in the dietary habits of people.

We know that the consumption of fruits and vegetables supplies essential vitamins and minerals to the body. In 2004-05 the percentage of expenditure on consumption of fruits and vegetables taken together is higher in Meghalaya at 14.34 percent compared to Himachal Pradesh at 12.82 percent and the rest of India at 14.2 percent. In 2011-12 the percentage of expenditure on fruits and vegetables taken together has decreased to 13.61 percent in Meghalaya, 11.36 percent in Himachal Pradesh and 13.69 percent at the all India level.

Consumption of snacks and beverages as well as processed, packed or ready-to-serve food has increased considerably in both states and at the all India level with the changing lifestyle of the people. When we consider the percentage of expenditure on *paan*, *supari*, etc. we find that out of the total consumption expenditure in 2004-05, Himachal Pradesh spent 2.60

percent and Meghalaya spent 6.45 percent and the expenditure at the national level was also low at 2.62 percent. In 2011-12 there has been a big change both at the national level and more so in case of Himachal Pradesh which spends nothing on this category. Though there has been a slight reduction in expenditure in this category in case of Meghalaya at 5.27 percent, yet it is still a large percentage of its consumption expenditure compared to that of the national level at only 0.60 percent. When we take a look at the consumption of tobacco in 2004-05, we see that both the states spent around four percent of their consumption expenditure on this category with Himachal Pradesh at 4.55 percent and Meghalaya at 4.30 percent while at the national level it is 3.36 percent. In 2011-12, there has been a fall in the consumption expenditure on tobacco at the national level to 2.08 percent and Himachal Pradesh at 2.69 percent. However we see a very small fall in the percentage spent in Meghalaya at 4.24 percent.

In the case of expenditure on various types of intoxicants like *ganja*, beer, liquor, etc. we find that the national average was a higher percentage than both the states at 8.41 percent in 2004-05. Himachal Pradesh also spent a higher percentage at 7.31 percent while Meghalaya spent 5.91 percent. In 2011-12 on the other hand, we see that this changed drastically with expenses at the national level having fallen to only 1.53 percent, Himachal Pradesh to 2.72 percent and Meghalaya to 1.58 percent. Expenditure on intoxicants has decreased over the period 2004-05 and 2011-2012 all over the country.

It may be noted that the pattern of consumption plays a role in shaping the health of the people of a state. It is not only the absolute amount of expenditure that matters but how this expenditure is distributed among different food items that will actually determine the health of the people. A widely used summary indicator of the health status is the infant mortality rate. The infant mortality rate currently is 32 per 1000 live births in Himachal Pradesh and 46 in Meghalaya for the period 2012-14 (Government of India, 2016b). The National Family and Health Survey (NFHS) usually estimates three anthropometric measures to look at the nutritional status of children. They are the proportions of stunted (low height for age), wasted (low weight for height) and underweight (low weight for age) children. The NFHS-3 (2005-06)<sup>1</sup> report states that, 55 percent of children in Meghalaya under the age of 5 were stunted, 31 percent of the children were wasted or too thin for their age and 49 percent were underweight. All of these indicate that there is widespread malnutrition among children in Meghalaya. In Himachal Pradesh, 39 percent of children were stunted, 19 percent were wasted and 37 percent

were underweight in 2005-06 (IIPS 2007).

There are several diseases that are closely linked to consumption of certain food items. One such disease is tuberculosis. The number of people who have medically treated tuberculosis according to NFHS-3 was higher in Meghalaya at 446 per 100,000 persons while it was 171 per 100,000 persons in Himachal Pradesh. As is widely known, one of the risk factors of tuberculosis is weakened immune system and the possible reasons for this is malnutrition, use of tobacco, alcohol and drugs. We see that the incidence of malnutrition is higher in Meghalaya than Himachal Pradesh. From the data given above, we also see that there is a higher consumption of *paan*, *supari*, etc and tobacco in Meghalaya.

### **Conclusion**

In this paper we have analysed the consumption pattern of the people in Himachal Pradesh and Meghalaya. Among all the states in India, Himachal Pradesh reported the highest and Meghalaya the lowest calorie intake per person per day. It is also seen that there is a substantial decline in the consumption of protein in Meghalaya compared to the recommended requirement. However, in case of consumption of fat, it is above the normative requirement in both the states. We also note that Meghalaya spends a higher percentage on food than Himachal Pradesh and the rest of India. In spite of that we see that the calorie consumption is very low in Meghalaya. Considering the distribution of expenses on the different food items, Meghalaya spends a lower percentage in the consumption of pulses and pulse products, milk and milk products and a higher percentage on egg, fish and meat, *paan*, *supari*, etc. and tobacco than Himachal Pradesh.

When we consider the health of the people in Meghalaya, more than half of children suffer from chronic malnutrition. Meghalaya also has a higher percentage of children and women suffering from anaemia than Himachal Pradesh. The number of people suffering from tuberculosis is also higher in Meghalaya compared to Himachal Pradesh. As has been observed, Meghalaya spends a good percentage of its per capita consumption expenditure on food but the people are malnourished. The reason as indicated by the findings in this paper is that there is lower allocation of expenditure on basic food items of a balanced diet.

Meghalaya has always been described as a state with a lot of potential to grow and develop in various areas due to its rich natural resources, its



scenic beauty, its unique culture and so on. However we find that there is deterioration of development in Meghalaya and whatever development is taking place, it is concentrated in the urban areas (Government of Meghalaya 2009, p. 27). People in the rural areas are unable to enjoy the basic facilities found in the urban areas like roads, transport and communication, electricity, clean fuel for cooking, health facilities, schools, etc. For example, it is seen that only around 56 percent of the households in the rural sector of Meghalaya use electricity as the main source of lighting compared to 95 percent in the urban sector. In case of fuel used for cooking, around 94 percent of the households use firewood and around three percent of the households use LPG in the rural sector while it is 26 percent and 46 percent respectively in the urban sector (Census, 2011). The fact that there has been little development in the rural areas is also one of the indirect causes of malnutrition. The state of Himachal Pradesh on the other hand is relatively more developed both in the rural and urban areas. This enables people to enjoy better standard of living in every aspect without having to migrate from rural to urban areas as indicated by the fact that the state is the least urbanised among all Indian states.

## Notes

<sup>1</sup>From the 66<sup>th</sup> round (2009-10) onwards, the NSS Consumer Expenditure

Survey used two different schedules of enquiry – Type 1 and Type 2. They were canvassed in two independent samples of matching size. The difference between the two is in the recall period for the consumption of certain items. In Type 1, the reference period for all food items is the last 30 days preceding the date of survey.

<sup>1</sup>The minimum calorie requirement has been used in the determination of the poverty line in India.

<sup>2</sup>The uniform recall period refers to the collection of information regarding the consumption in the last 30 days prior to the survey for all items. The mixed recall period refers to consumption of less frequently purchased items during the last 365 days and the last 30 days for the rest of the items.

<sup>3</sup>Data from the latest NFHS – 4 (2015-16) are not yet available for Himachal Pradesh.

## References

Food and Agriculture Organisation of the United Nations. 2015. The State of Food Insecurity in the World, Rome:51.

- Gopalan C., B. V. Rama Sastri and S. C. Balasubramanian.1991. 'Nutritive Value of Indian Foods', National Institute of Nutrition, Indian Council of Medical Research, Hyderabad.
- Government of Meghalaya. 2009. Meghalaya Human Development Report, 2008, Planning Department, Shillong.
- Planning Commission, Perspective Planning Division.1993.Report of the Expert Group on Estimation of Proportion and Number of Poor, Government of India, New Delhi.
- Planning Commission.2009. Report of the Expert Group to Review the Methodology for Estimation of Poverty, Government of India, New Delhi.
- Ministry of Finance.2016(a).Economic Survey 2015-16.Government of India, New Delhi:1(A-25), <http://indiabudget.nic.in>
- Registrar General of India, Ministry of Home Affairs.2016(b).SRS Bulletin.Government of India, New Delhi: 50(1), <http://censusindia.gov.in>
- National Institute of Nutrition.2010.Nutrient Requirements and Recommended Dietary Allowances for Indians. Indian Council of Medical Research, Hyderabad, <http://icmr.nic.in/final/RDA-2010.pdf>
- International Institute for Population Sciences (IIPS) and Macro International.2007. National Family Health Survey (NFHS-3), 2005-06, India: Volume-I.Mumbai.
- National Sample Survey Organisation. 2007. Nutritional Intake in India, 2004-2005, NSS 61st Round, Report No. 513(61/1.0/6). Ministry of Statistics and Programme Implementation, Government of India, New Delhi.
- National Sample Survey Organisation. 2014. Nutritional Intake in India, 2011-12, NSS 68<sup>th</sup> Round, Report No. 560(68/1.0/3), Ministry of Statistics and Programme Implementation, Government of India, New Delhi:9,10,21.
- Population Census 2011. <http://www.census2011.co.in/states.php7>.

## **Social Audit in Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) with Special Reference to Tripura**

SANJOY ROY\*

### **Abstract**

*With a view to plugging the loopholes and achieving good governance, social audit has been integrated into the MGNREGS in June 2011. The idea of social audit is already put into practice in all states since the notification of MGNREGA audit schemes rules and almost 80% of districts are already covered under compulsory social audit scheme. In Tripura social audit has increased delivery capacity of workers, planners and even decision makers. The effectiveness of social audit will increase manifold if functioning of PRIs and Gram Sabhas are further strengthened and perception of the stakeholders about the duties of panchayats become clear.*

**Keywords: Gram Panchayats (GP), Job card holders, Awareness, Transparency, and Governance.**

### **Introduction**

The idea of 'Social Audit' is derived from the concept, "Corporate Social Responsibility" (CSR) adopted first in western countries and followed by many corporate entities and social institutions around the globe. In the 1980s, the social audit concept traveled from the private to the public sector in response to the growing shift to democratic governance issues related to public policy making, empowerment and citizen participation. A social audit is an accountability mechanism where citizens organize and mobilize to evaluate or audit the government's performance and policy decisions. In India, Social Audit is of recent origin, initiated first by Tata Iron and Steel Company Limited (TISCO), Jamshedpur in the year 1979. In India, social

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\*Sanjoy Roy (roysanjoyagartala@gmail.com) is the Principal of Netaji Subhash Mahavidyalaya (Government of Tripura), Udaipur, Tripura, 799114.

audit gained impetus after the 73rd amendment of the Constitution relating to Panchayats Raj Institutions, wherein power of auditing the accounts of Panchayats are clearly vested upon. As per the 73rd Constitutional Amendment in 1993, Gram Sabha are indirectly empowered to conduct social audit in addition with other functions.

The approach paper to the Ninth Five Year Plan (2002-07) also emphasized upon social audit for effective functioning of Panchayat Raj Institutions (PRIs) empowering the Gram Sabhas to conduct social audits in addition with its other functions. The relentless movement of Mazdoor Kisan Shakti Sangathan (MKSS) since early 1990's against the corruption in public works and subsequent enactment of Right to Information Act, 2005 had been influencing factors for the introduction of social auditing within local governance processes. The Right to Information (RTI) Act, 2005 made easy the process of conducting social audits. Social audit conducted by Parivartan, a citizen's initiative, along with the local residents of two resettlement colonies of North East Delhi, Sundernagri and New Seemapuri - for development works undertaken by the Engineering Department of the Municipal Corporation of Delhi (MCD) in these resettlement colonies between April 1, 2000 and March 31, 2002 is noteworthy. The introduction of MGNREGA in 2006 particularly inclusion of section 17 as statutory provisions for transparency and public scrutiny of the MGNREGA works made social audit more relevant and acceptable across the world.

### **Objective and Methodology of the Paper**

The present paper highlights the importance and objectives of social audit from the perspective of Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) in India with special reference to Tripura. The objective of the paper is to examine whether social audit is effective in the implementation and control of irregularities of MGNREGS etc. The paper sketches a bird's eye view on process of social audit facilitation, all India scenario and the scenario of Tripura with the emphasis on the impacts of social audit in Tripura. The constraints impeding social audit from delivering its avowed objective in the state are also analyzed.

The discourse is based on secondary data collected from MGNREGA website, various reports like Performance Audit report on MGNREGA 2013 and Report of the Task Group on Social Audit conducted by Comptroller and Auditor General of India, Discussion paper, Final Report of Planning Commission on social Audit, Report of Social Audit of MGNREGA in Gomati

District (Quarter IV of 2014-15), different circulars of Ministry of Rural Development on social audit etc. Some primary data particularly minutes of public meetings related to social audit held, quarterly social audit report, social audit calendar etc. are collected from the office of District Magistrate, Gomati District of Tripura and Two Rural Development Blocks (Tepania and Matabari Blocks) out of 8 eight blocks in Gomati Districts. Opinions and views are heard from two Block Development Officers (BDO), District Panchayat Officer (DPO) of Gomati District, some elected representatives of Gram Panchayats (GP) and Panchayat Samity, representative of Society for Social Services Madhya Bharat Chapter (SoSSMBC) involved in the conduct of Social Audit in Tripura and eight Gram Panchayats secretaries spread over Gomati and West Tripura District of Tripura through personal interviews particularly on some cardinal issues like Provisions of MGNREGA Act on social audit, participation of stakeholders and role of Gram panchayats, participation of common villagers at the social audit, impact of social audit on the common people and PRIs member and constraints inhibiting its success so to gauge the ground reality with the all available reports.

### **Definition**

‘A social audit is a process by which the people, the final beneficiaries of any scheme, programme, policy or law are empowered to audit such schemes, programmes, policies and laws. A social audit is an ongoing process by which the potential beneficiaries and other stakeholders of an activity or project are involved from the planning to the monitoring and evaluation of that activity or project’ (rural.assam.gov.in). There are some basic principles on which social audit centre around and these are transparency, participation, and accountability. Thus, there should be complete transparency in the process of administration and decision-making and Government should *suomoto* disclose full information to the people. Participation ensures a right based entitlement for all the affected persons to participate in the process of decision making and validation. Accountability is immediate and public answerability of elected representatives and government functionaries, to all the concerned and affected people, on relevant actions or inactions.

Social audit is a process in which, details of the resource, financial and nonfinancial, used by public agencies for development initiatives are shared with the people, often through a public platform. Social audits allow people to enforce accountability and transparency, providing the ultimate users an opportunity to scrutinize development initiatives’ (Planning Commission,

2005). The definition given by Planning commission for social audit involves, three components i.e., a) availability of information/details of the resource, financial and non-financial, used by public agencies for development initiatives, b) organizing the ultimate users/beneficiaries/people and c) scrutiny of the information by the end users. The fundamentals of social audit are (i) information availability – willingness of the government officials to provide information and (ii) ability of people to ask questions.

<b>Figure 1 Social Audit System</b>		
INPUTS	PROCESS	OUTPUT
<ul style="list-style-type: none"> <li>• Information</li> <li>• Expertise to conduct Social Audit</li> <li>• Ability of Gram Sabha to process information and ask questions</li> </ul>	<p style="text-align: center;">* Scrutiny of Information by Gram Sabha</p> <ul style="list-style-type: none"> <li>• Performance assessment of the Delivery System by beneficiary</li> </ul>	<ul style="list-style-type: none"> <li>• Empowerment of people</li> <li>• Increased effectiveness of Delivery / Supply System</li> <li>• Strengthens between Supply side &amp; Demand side.</li> </ul>
<p><b>Source:</b> 'Final Report on Social Audit: Gram Sabha and Panchayats Raj', Planning Commission, 2005,p 21</p>		

It is fact that people can ask questions only when they have the requisite information on the subject. That is why dissemination of information is a prerequisite for social audit. The people may demand explanations only after the receipt and understanding the contents of information. Thus, the foundation of the social audit process is 'information availability'. Social audit is a democratic process where the concerned community demands information and verification from agencies in a systematic manner, leading to public accountability. 'The process of social audit goes beyond the realm of financial auditing and covers the issues of equity and quality in programme implementation, in response to programmes already being implemented by

the government' (SSAAT<sup>1</sup>). In short, social audit can be defined as checking and verification of a programme/scheme implementation and its results by the community with the active involvement of the primary stakeholders. It is also a process of reviewing official records and determining whether reported expenditures reflect the actual money spent on the ground.

### **Importance and Objectives of Social Audit**

Since Independence, thousands of crores of rupees are spent by the central and state governments and various national agencies for social development programmes. However, the impact it has made is below the expectation. Huge gaps between the desired impact and the actual impact warrant the need to think deeply about their failures. This calls for the introduction of social audit to eliminate loopholes of programme/scheme implementation. Social auditing values the voices of stakeholders, including marginalized/poor groups whose voices are rarely heard, and influences the governance.

With a view to plugging the loopholes, social audit has been integrated into the MGNREGS. Fundamental objectives of social audit under MGNREGS are to ensure that the activity or project designed and implemented in a manner suitable for the prevailing (local) conditions reflect the priorities and preferences of those affected by it appropriately and serve public interest. Developing a sense of ownership amongst the beneficiaries and empowering the communities through the MGNREGS are also its objectives. Social audit includes the quantity and quality of works in relation to the expenses incurred, disbursement made, number of works/materials used and also selection of works and location of works. Thus, the aim is effective implementation and control of irregularities. Coupled with the Right to Information Act, social audit acts as check bulb in revealing and ultimately reducing corruption, malpractices and deviations. This is a critical step in streamlining service delivery systems and ensuring transparency and accountability essential for good governance. The main objective of social audit is to ensure public accountability in the implementation of projects, laws and policies (GOI, MoRD, 2013). The other objectives include:

1. Assessing the physical and financial gaps between needs and resources available for local development;
2. Creating awareness among beneficiaries and providers of local social and productive services;
3. Increasing efficacy and efficiency of local development programmes;

4. Scrutiny of various policy decisions, keeping in view stakeholder interests and priorities particularly of rural poor and etc.

#### **Process of social audit facilitation: All India scenarios**

Section 17 of NREGA provides that the Gram Sabha shall conduct regular social audit of all the projects under the Scheme taken up within the Gram Panchayats (GP). The GP shall make available all relevant documents including the muster rolls, bills, vouchers, measurement books, copies of sanction orders, cash book, bank statements and financial records and other connected books of account and papers to the Gram Sabha for the purpose of conducting the social audit including the wall painting showing details of money paid to all job card holders, etc. Besides, social audit may examine whether sufficient notices are given to ensure full participation of all stakeholders. The labourers and village community shall have to be informed about social audit. All elected members of the panchayats and staff involved in implementing the schemes shall be present at the Gram Sabha and respond to the queries. The Gram Sabha shall provide a platform to villagers or to any interested persons, to seek and obtain information and responses from all involved in the implementation of scheme. The District Programme Coordinator or its nominee must remain present at the Gram Sabha meeting for the smooth conduct of social audit. The action taken report relating to previous social audit would be read out before the beginning of the social audit and all reports would be made in local language. A glimpse of social audit held under MGNREGS in different states across the districts etc. in India is depicted in Table 1:

<b>Table 1</b>							
<b>Glimpse of Social Audit in India under MGNREGS from 2011-12 to 2013-14</b>							
Year	No of states/ U.T	Districts	No of districts started social audit	Total GP	Number of GP covered (%)	No of social audit	Issue raised and action taken
2011-12	34	668	527(79)	262275	172392((66)	291141	132160
2012-13	34	668	555(83)	262275	175270(67)	327112	152735
2013-14	34	668	512(77)	261403	116662(45)	187059	117573
Source: MGNREGA, Government of India ( <a href="http://nrega.nic.in/circular/social_audit.htm">http://nrega.nic.in/circular/social_audit.htm</a> , accessed on 25/11/2015 and 22/12/2015)							



Table 1 shows that the concept of social audit is already replicated in all states since the notification of MGNREGA audit scheme rules in June 2011. Table 1 establishes that almost 80% of districts are already covered under compulsory social audit scheme. Social audit is embraced by majority of the GPs to create awareness amongst the rural poor and make them knowledgeable about the government money earmarked for development. Total number of social audit conducted in 2012-13 was 3,27,122; it plummeted to 1,87,059 in 2013-14. The states which achieved remarkable performances in terms of GP covered are Odisha (99%), Gujarat and Bihar (98%), Assam, Puducherry and Punjab (97%)(MGNREGA, 2015). As per rules although one social audit is to be conducted in each GP in every six months, it does not take place in practice as evidenced by number of social audit that took place 2012-13 and 2013-14. The number of social audits that should have taken place during the period from 2011-12 to 2013-14 was about 5.22 lakh (number of GPx2), but the actual number of social audit is much less. Thus, the percentage GP covered in various states from 2011-12 to 2013-14 should be read as half the figure shown in Table 1 indicating that social audit process needs to go a long way if the mission is to be achieved. Table 1 establishes that social audit could bring to light at least more than 1 lakh issues that would remain in dark unless social audit would be implemented and this is really a big achievement. Field data indicates that most of the issues raised relate to delay in receiving job cards, delay in the payment of wages, individual workers output, inaccurate or excessive estimates, measurement related issues and issues of system for taking complaints and grievances etc.

### **Tripura Scenario**

Before switching over to the scenario of social audit in Tripura, it needs to be mentioned that Tripura comprises 8 districts, 58 blocks, 1118 Gram Panchayats spread over Tribal sub-plan area and non-tribal sub plan areas. Total population of the State was 36 lakhs as per 2011 Census with 32% ST and 18% SC population (Government of Tripura,2016). Tripura is known in the country for success in MGNREGS. 'Tripura retained its top position for the seventh consecutive year in providing jobs under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) – a staggering 94.46-person days per household – in just ended fiscal 2015-16 against the national average of national average of 48.51 days' (Financial Express, 2016). 'Tripura held the highest record in terms of employing women in NREGS among the northeastern states' (Roy,2010). Participation of tribal is splendid and a lot of durable/community assets have been created under MGNREGS. Table 3 shows the scenario of Social Audit in Tripura from 2011-12 to 2013-14.

Name of District	No of Block	No of Block covered (%)		No of GP	No GP covered (%)			No of social audit		
		2012-13	2013-14		2011-12	2012-13	2013-14	2011-12	2012-13	2013-14
Dhalai	8	4	3	137	128	89	21	164	25	78
Gomati	8	3	7	165	0	64	157	NA	26	153
Khowai	6	6	1	113	0	106	22	NA	58	4
North	8	0	1	120	140	0	6	162	0	6
Sepahijala	7	2	2	163	0	40	58	NA	41	232
South Tripura	8	5	6	169	228	138	160	375	193	189
Unakoti	4	3	3	86	NA	78	76	NA	85	53
West Tripura	9	2	2	164	203	55	70	175	48	70
<b>TOTAL</b>	<b>58</b>	<b>25(43)</b>	<b>19(33)</b>	<b>1118</b>	<b>699(63)</b>	<b>570(51)</b>	<b>570(51)</b>	<b>876</b>	<b>476</b>	<b>785</b>

Source: MGNREGA Tripura,  
[http://164.100.112.66/netnrega/state\\_html/social\\_auditNT.aspx](http://164.100.112.66/netnrega/state_html/social_auditNT.aspx) (Date of access 25/11/2015, 22/12/2015, 1/1/2016 and 2/1/2016)

In Tripura, social audit was first launched in 2009. Since then social audit is taking place throughout the state regularly in all districts and across the blocks. As per Section 4(1) and Section 5(1) of the MGNREGA Audit of Scheme Rules, 2011, every State is required to set up/identify a Social Audit Unit (SAU) independent from the agency implementing the MGNREGA. In Tripura, Society for Social Services Madhya Bharat Chapter (SoSSMBC), an NGO has been discharging the role of SAU and performing social audit in various GPs across the state. Table 3 evinces that social audit is implemented in all districts. Sixty three percent of GPs had conducted social audits in 2011-12, which came down to 51% in 2012-13 and 2013-14. In 2013-14, the percentage of blocks conducted social audit slipped to 33 from 43 in 2012-13. Table 3 establishes that number of social audits in 2012-13 had declined to 476 from 876 in 2011-12 but it picked up momentum in 2013-14 rising to 785 establishing the fact that some GPs are conducting more than one social audit in a calendar year and following the MGNREGA rules for audit schemes.

Available records show that all GPs in Salema Block under Dhalai District had conducted at least two social audits in 2013-14. All GPs in 6 blocks out of a total of 8 blocks under Gomati District had conducted social audit with Killa Block, which is mainly tribal dominated, completed 2 social audits in 2013-14. While all GPs under Boxanagar and Nalchar Block of Sepahijala District had conducted 4 social audits in each GP in the year 2013-14. On the other hand, all GPs under Sat Chand, Rupaichari and Bokafa Blocks of South Tripura Districts and 2 Blocks namely Hezamara and Jirania

blocks under West Tripura District have conducted social audit. It is a fact that social audit was not conducted in all the districts with equal emphasis in every year except South Tripura District. On the other hand, performance of social audit is sporadic in the GPs of North Tripura, Stephanial and West Tripura Districts.

Field data indicates that number of social audits held in various GPs across the state is more than what is reflected by NREGA website. Field data shows that total number of social audits in Gomati District in 2014-15 was conducted in 165 GPs covering all the eight revenue blocks under its jurisdiction. Available records also establish that the participants were fully satisfied in 163 villages of Gomati District (SoSSMBC, 2015). The minutes of the meeting were also recorded and signed by the secretary in all the villages in all blocks of the district.

### **Impact of Social Audit in Tripura**

It is already mentioned that social audit acts both a monitoring tool as well as evaluative tool. As social audit warrants proactive disclosure and facilitates reviewing, inspecting and verifying by the stakeholders in open forum, it increases awareness among the villagers and wage seekers. Labourers can know whether they got their right wages, villagers may know whether the works carried out under MGNREGS and amount involved in such implementation truly reflect the actual happenings or not. As muster rolls and all financial documents remain open to public scrutiny, anybody interested in social audit may participate and ask questions. Reasons for delayed payment or projects remained half-done or ill-performed get answered in social audit. This garners interest in the proceedings and encourages villagers to question transactions – breaking barriers of social hierarchy. It is a valuable tool to recognize the gaps and leakages in scheme implementation which often remain left out in the process monitoring and MIS systems. In true sense, social audit empowers the common people to testify the corrupt people in the Gram Sabha and gives the affected people an opportunity to place their grievances. Social audit is a grievance redressing mechanism where many problems of job seekers get solved. Defaulting officials are called for explanations and correction of discrepancies, if found. The government takes action against those guilty of siphoning off funds. This unique effort helps to ensure good governance.

The social audit of MGNREGS in Tripura helped in handling the problems of misappropriation of funds, engagement of ghost workers, payment

of wages without signature, engagement of workers under different muster rolls for the same period, tampering of muster rolls, irregular cash payment of wages, non-payment of wages, irregular issue of multiple job cards, delay in issue of job cards, suspected misappropriation of wages etc., as per the Report 6 of 2013 Performance Audit of Mahatma Gandhi National Rural Employment Guarantee Scheme. Besides, 'number of complaints received is insignificant' (Roy, 2010). The higher awareness level of the implementing agencies, greater involvement of the PRI members, making villagers & MGNREGS beneficiaries proactive in claiming their rights & privileges, improved documentation, record keeping and data management at GP level, 'opening of bank account and implementation of Public Management Fund System (PFMS) and ensuring all wage payment through Direct Benefit Transfer Scheme' (Roy, 2015), enabling financial inclusion effective in Tripura (Roy, 2016) and 'improved grievance redressing mechanisms and voluntary disclosures of work details in most GPs' (SoSSMBC) are the noteworthy contributions of social audit.

The social audit reports clearly indicate that there are sixteen different registers need to be maintained regarding the execution of MGNREGS works. It is observed that many of registers were maintained up to date in most of GPs under Gomati District. Nearly 10 of the 16 registers are well maintained in 97% GPs in Gomati District. Social audit report for the Gomati District also indicates that wages were paid in time in 146 out of 165 GPs in Gomati district. Social Audit report also substantiate that all the important stakeholders like Gram Pradhan, PRI/ward members, Panchayats Secretary and GRS were present at the social audit meetings in almost all the villages.

In a nutshell, the notable impacts of Social Audit in Tripura are outlined below:

1. Increased awareness among the stakeholders about MGNREGA – the Act and its relevance. The villagers and MGNREGS beneficiaries are proactive in claiming their rights and privileges. The State provided employment to almost all Job Card holders (99.63 per cent to 99.94 per cent) who reportedly sought employment (Government of Tripura, 2013).
2. False and ghost job cards are checked and deleted. As per the MIS report, 591266 (98.95) number of job cards are verified out of a total of 597959 job cards (as on 27.9.2017) (MoRD, GOI, 2017).

3. Documentation, record keeping and data management capacities at GP/ADC level in the state have significantly improved. As per latest circular, 7(seven) registers<sup>2</sup> are to be mandatorily maintained by GP under MGNREGA since October 2016 (Sinha, 2016). As per MIS report 'M6. Master Circular/New Asset Register/Seven Register Status', 99.9% GPs have been maintaining the new registers (GOI, MoRD, 2017).
4. Participation level and involvement of people in Social Audit Gram Sabhas have improved considerably, as issues are resolved instantly to the satisfaction of the beneficiaries. Available reports show that 133 out of 202 grievances reported (66%) were redressed during the FY 2015-16 in Tripura while the rest are forwarded to appropriate authorities for necessary remedy as per MIS Report, R10 .2 Complaint Register (GOI, MoRD,2017).
5. Job Card holders are sensitized on output based payments which is must as per latest regulation.
6. PRI members' knowledge of the provisions and procedures under the Act has improved.
7. The improved awareness levels have now created congenial atmosphere for smooth implementation, better selection/prioritization of works and accountability under MGNREGA.
8. There exists an improved grievance redressal mechanism including Voluntary disclosures of work details at all GPs.To strengthen the grievance redressal mechanisms, States have been advised for the appointment of Ombudsman at the District-level. In Tripura,the office of Ombudsman has materialized in six districts (Sarangi,2017) and appointment of ombudsman for other districts is being processed.

Thus, it may be mentioned that impact of social audit in Tripura is immense and it has made people of Tripura aware of their rights, entitlements and obligations under the scheme. It is ensured that all the forms and documents are readily available in simple, easily understandable language. All important information publicly is displayed and read out at appropriate time for the people. It ensures that the decision-making process is transparent, open and carried out, as far as possible, in the presence of the affected persons. It is also making certain that all decisions, along with valid and appropriate reasons are also communicated to the affected people. In true

sense, social audit is identifying the capacity gap; it increases the delivery capacity of workers, planners and even decision makers and brings down many irregularities and malpractices.

### **Constraints in Tripura**

The above discourse shows that social audit has innumerable benefits and it has proved its essence as an effective tool of transparency and accountability thwarting corruption, malpractices and identifying and making perpetrators accountable in public forum. But still, social audit is not free of criticism and it suffers from some constraints. In Tripura, the following are the important constraints of social audit found ubiquitous in various reports and disclosed by participants during discussion:

1. There is lack of clarity on concept/relevance of social audit process, particularly latest provisions amongst the PRIs. The problem is substantiated in the 'Summary of National Level Monitoring, Common Review Mission and Internal Audit on MGNREGA (NLM)' for FY 2014-15, 2015-16 and 2016-17. As per NLMs' assessment, the PRI members in 42% of the villages were 'fully aware' on social audit concept, latest provisions and procedures. In another 44% of villages, PRI members were 'somewhat aware', while in 10% of the villages, they were completely ignorant about social audit concept and its provisions. (GOI, MoRD,2017). In Tripura too, some implementing agencies (GPs) and officials do not attach adequate attention/importance to social audit and view it as financial audit<sup>3</sup>or government audit.
2. Participation of village organizers, NGO, Block officials, local school teacher and official of line departments at the social audits is slender (SoSSMBC, 2015). Common phenomenon of the country is that villagers are not much interested. Despite notices circulated and public announcement made, villagers are not willing to attend the social audit and ask very limited questions. Latest social audit report of 2015-16 shows that there were 527 social audits conducted in Tripura while number of issues raised is only 84. This shows lackadaisical attitudes of villagers towards social audit. Available field reports show that most of the questions raised in social audits under GPs of Gomati District relate to delayed payment of wages, individual output.
3. The concept of transparency and accountability is very new to the villagers. Peoples' participation in formulation, planning and monitoring

is not significant. According to the study entitled, 'MGNREGS in Tripura — A Study on Efficiency and Equity', almost 60 percent of the workers are aware of the concept of social audit, but their participation in the process is very low, 27.75 percent. The awareness is high in the South Tripura district but participation is very low (Bhaumik, 2013). Social audit report shows that only 10% of labourers attended the social audits in 132 GP out of 165 GP in Gomati District in 2015 (SoSSMBC, 2015).

4. Under the present social audit rules, the SAU is an important body regulating the ultimate outcome. Role played by the SAU determines future course of social audit in India. Right from developing the capacity of Gram Sabha to the creation of awareness amongst the labourers about their rights and entitlements, facilitating the verification of documents, smooth conduct of social audit and subsequently proper reporting of issues and objections raised by stakeholders are vested at the hands of SAU which can immensely impact audit scope as well the standards and acceptability of social audit. Naturally reporting organizations may deliberately help the vested group to skip controversies.
5. In Tripura, the responsibility for conducting social audit has been given to the SoSSMBC, an NGO which has hardly adequate infrastructure and trained personnel to undertake such a voluminous work. It is reported that social audit teams attend more than one village panchayat in one day and perform work in a routine way.
6. The opposition parties in Tripura allege corruption and malpractices of officials involved in the mismanagement of MGNREGS fund. Audit Reports reveal some irregularities like diversion of fund, incomplete works (Government of Tripura, 2013), wasteful expenditure and doubtful execution of work (Government of Tripura, 2014), etc. Recently, the High Court of Tripura has asked the Government of Tripura to conduct for re-audit of 58 blocks in Tripura on two writ petitions and directed the state government to engage chartered accountants to conduct audit of MGNREGA in all the eight districts of the state and the State Employment Guarantee Fund (Tripurainfo.com, 2016).

### **Conclusion**

Despite the shortcomings, it is unequivocally true that social audit has positive impact on implementation of the MGNREGA in Tripura. The success of

social audit is not uniform across the country. Compared to other States in India, the social audit in Tripura has been quite successful. However, even here, social audit is seen more as financial audit. Malpractices, corruption and poor implementation of the schemes in certain pockets partially hinder the MGNREGS. The effectiveness of social audit will increase manifold if functioning of PRIs and Gram Sabhas are strengthened and perception of the stakeholders are properly sensitized about the duties of panchayats through proper information dissemination and active participation of the villagers. To achieve success, the gaps between the ideas and practice are to be bridged, and the policy makers and the service provider must change. Common people do not get involved in the development activities, as they lack confidence in asserting their entitlements. Although the scenario has been changing for the better, the pace of change is very slow. Confidence of rural poor and marginalized section needs to be enhanced and the people need to be reassured that social audit is not a fault-finding system rather a system of transparency, certification and inclusion. To conclude, it may be reiterated that social audit has potential to deliver a meaningful impact on the effectiveness of the MGNREGS for which Gram Sabhas are to be empowered across the country with institutional framework and infrastructure for achieving good governance.

## Notes

<sup>1</sup>SSAAT stands for Society for Social Audit, Accountability and Transparency.

<sup>2</sup> As per Annexure 5K,6C, 7C, 7G, 7I, 7J,7K, 7L,7M etc. of Performance Audit of Mahatma Gandhi National Rural Employment Guarantee Scheme, Report no 6 of 2013, Tripura is one of the other states that do not suffer from the challenges as pointed out in the audit observations.

<sup>3</sup> These include, Job Card Register, Register for Gram Sabha Meeting, Register for Demand for work etc., Register for work, Fixed Asset Register, Complaint Register, Material Register.

<sup>4</sup>Financial audits assess whether the information in the agency's financial records is fairly presented while Governmental audits also include financial statement audits performed under *Government Auditing Standards* on entities such as states, local governments etc.

<sup>5</sup>Government of Tripura



## References

- Bhowmik, Indraneel. 2013. 'MGNREGS in Tripura - A Study on Efficiency and Equity', V.V. Giri National Labour Institute, Sector 24, Noida, UP.
- Financial Express*, 2016, <http://www.financialexpress.com/economy/mgnregascheme-3-n-e-states-on-top-two-at-bottom/244193/>(accessed on 28/9/2017)
- GOI, MoRD. 'Mahatma Gandhi National Rural Employment Guarantee Audit of Scheme Rules,2011,
- The Gazette of India: Extraordinary* [Pm II—Sec. 3(i)],, the 30th June, 2011., New Delhi.
- GOI, MoRD. 2013. 'Mahatma Gandhi National Rural Employment Guarantee Act, 2005,Operational Guidelines'. New Delhi.
- GOI, MoRD,2017. 'M6. Master Circular /New Asset Register/Seven Register Status'[http://mnregaweb4.nic.in/netnrega/master\\_circular\\_report.aspx?lflag=eng&fin\\_year=2016-2017&source=national&labels=labels&Digest=DaNMcKCT4HZjxosanIifuQ](http://mnregaweb4.nic.in/netnrega/master_circular_report.aspx?lflag=eng&fin_year=2016-2017&source=national&labels=labels&Digest=DaNMcKCT4HZjxosanIifuQ), (accessed on 29/9/2017)
- GOI, MoRD. 2017. M14.Report on Verification of Job cards. [http://mnregaweb2.nic.in/netnrega/state\\_html/JC\\_Ver\\_report.aspx?lflag=local&state\\_code=30&state\\_name=TRIPURA&page=S&fin\\_year=2016-2017&Digest=5UgynU8nMqft/VEsNFLcbA](http://mnregaweb2.nic.in/netnrega/state_html/JC_Ver_report.aspx?lflag=local&state_code=30&state_name=TRIPURA&page=S&fin_year=2016-2017&Digest=5UgynU8nMqft/VEsNFLcbA),(accessed on 28/9/2017)
- GOI, MoRD.2017, R10.2. Complaint Register. [http://mnregaweb4.nic.in/netnrega/citizen\\_html/citipoattend\\_rep.aspx?source=national](http://mnregaweb4.nic.in/netnrega/citizen_html/citipoattend_rep.aspx?source=national)(Accessed on 29/9/2017).
- GOI, MoRD.2017. 'Summary of National Level Monitoring, Common Review Mission & Internal Audit on MGNREGA', <http://nrega.nic.in/Netnrega/WriteReaddata/Circulars/2243findings.pdf>, (accessed on 29/9/2017.
- GOT.2013, Report of the Comptroller and Auditor General of India for the year 2011-12, Report 1, 2013, pp -46.
- GOT..2014, Report of the Comptroller and Auditor General of India for the year 2012-13. Report 1, 2014. Pp- 13 -14.
- GOT. 2016, Tripura a Glance, <http://ecostat.tripura.gov.in/At-A-Glance-2015-16.pdf>.
- Government of Assam, <http://rural.assam.gov.in/sites/default/files/11.SocialAudit.SocialAuditDetails.pdf>, (accessed 26/12/2015)
- Office of the Comptroller and Auditor General of India .2010. 'Report of the Task Group on Social Audit', <http://www.karmayog.org/anticorruption/upload/31366/Social%20Audit.pdf>, accessed on 3/1/2016.
- Planning Commission .2005. 'Final Report on Social Audit: Gram Sabha and Panchayat Raj', Government of India, New Delhi.p-21.

- Roy, Sanjoy.2010, Implementation of NREGS in Tripura—An Evaluation, *The NEHU Journal*, Vol VIII, No. 1, January,2010.
- Roy, Sanjoy. 2016. Financial Inclusion in Tripura – An assessment, *Journal of Rural Development*, Volume 35, Issue 2, April-June.
- Roy, Sanjoy.2015. Direct Benefits Transfer: A Study on MGNREGS in Tripura, *Tripura Journal of Social Science*, Vol II, Number 1, January, 2015.
- Sarangi , Aparajita .2017, Appointment of Ombudsman and formulation of Grievance Redressal Mechanism, letter no J-11011,21/2008/Re-VII, GOI, MoRD, New Delhi, dated 10<sup>th</sup> March , 2017.
- Sinha, Amarjeet.2016. MoRD, GOI, ‘7 Registers to be maintained mandatorily by Gram Panchayats under MGNREGA ( A good governance initiative), [http://nrega.nic.in/netnrega/writereaddata/Circulars/18067\\_Register\\_Formats\\_for\\_GP\\_Final.pdf](http://nrega.nic.in/netnrega/writereaddata/Circulars/18067_Register_Formats_for_GP_Final.pdf). (accessed on 29/9/2017).
- SoSSMBC. Tripura PPT presented at National at National workshop, [mnrega.web4.nic.in/netnrega/SocialAudit/.../Tripura-%20PPT%20presented%20at%20](http://mnrega.web4.nic.in/netnrega/SocialAudit/.../Tripura-%20PPT%20presented%20at%20), accessed on 13/12/2015.
- SoSSMBC. 2015. ‘Social Audit of MGNREGS’, Gomati District Report, Quarter IV, 2014-15, Tripura.
- SSAAT, Government of Andhra Pradesh ‘Social Audit in MGNREGS- Power to People and Accountability to Governance, [http://socialaudit.ap.gov.in/SocialAudit/LoadDocument?type=download&docName=pdf\ssaat\\_MGNREGS.pdf](http://socialaudit.ap.gov.in/SocialAudit/LoadDocument?type=download&docName=pdf\ssaat_MGNREGS.pdf) , accessed on 31/12/2015.
- SSAAT. Government of Andhra Pradesh, ‘What is Social Audit’ <http://socialaudit.ap.gov.in/SocialAudit/wages/WSA.jsp>, (accessed on 31/12/2015)
- Tripurainfo.com.2016. High Court orders reaudit in all 58 blocks, appeal to SC likely, <http://www.tripurainfo.com/tinfo/pgDetailsNews.aspx?WhatId=18263>, (accessed on 19/11/2016)

## **Irrigation System and Pattern of Crop Combination, Concentration and Diversification in Barddhaman District, West Bengal**

KSHUDIRAM CHAKRABORTY\* & BISWARANJAN MISTRI\*\*

### **Abstract**

*In West Bengal, 53% of Net Shown Area (NSA) is cultivated under paddy. In Barddhaman, 97% of Gross Cropped Area (GCA) is used for cultivation of paddy and there is also an inter-block difference in the pattern of combination, intensification and diversification of crops. Using District Statistical Handbook, 2013 and Census report of Barddhaman, 2001, an attempt is made in this paper to find out the suitable cropping pattern in Barddhaman, West Bengal. The paper argues that the type of irrigation and soil health determine the combination of crop in the district.*

**Keywords: Crop Combination, Crop Concentration, Crop Diversification, Groundwater irrigation and Fertility of Soil**

### **1.0. Introduction**

Agriculture plays a dominant role in economic development through supplying food for the nation, generating opportunities of employment, and sharing of national GDP as well as providing raw materials for agro-based industries (Johnstone and Mellor, 1961). In India, 60% of people are dependent on agriculture (Paul, 2015). After green revolution in India (1966-67), chemical fertilizer is being used to improve productivity along with high yield variety seeds, pesticides and irrigation (Snapp et al., 2010; Chattopadhyey, 1984). During this period, mono-crop cultivation has been over emphasized which in turn destroyed the traditional crop sequence, crop calendar and crop rotation

*\*Kshudiram Chakraborty (kshudiram0@gmail.com), is a Ph.D. Research Scholar in Department of Geography, University of Burdwan, Burdwan, West Bengal.*

*\*\*Biswaranjan Mistri (brmistri@gmail.com), is an Assistant Professor in Department of Geography, The University of Burdwan, Burdwan, West Bengal.*

(Thapar, 1973). Consequently, agricultural land use has drastically been changed from multicrop (cereals, oil seeds, pulses) to mono crop (paddy or wheat). In pre-green revolution period, rice was the dominant crop of West Bengal in general and of Bardhaman in particular. Noticeably, gram was found as second dominant crop in the district in 1950-52 (Bhatia, 1965). But, in 2013, 97% of gross cropped area in Bardhaman is earmarked only for rice through obliterating earlier cropping system of oil seed and pulses.

Crop rotation and diversification were practiced in traditional system of farming to control weeds, pest and soil erosion, and to maintain soil fertility (Singh and Sidhu, 2004; Jodha and Singh, 1990; El-Nazer and McCarl, 1986; Battese and Fuller, 1972; Brust & Stinner, 1991; Sumner, 1982; Leibman & Dyck, 1993; Blanco-Canqui & Lal, 2004). Diversity of crops helps to sustain functional capacity and resilience in agro-ecosystem through increasing biodiversity along with performance of genotype in different niches (Vandermeer et al. 1998; Brust and Stinner, 1991; Sumner, 1982). Diversification of crops includes all crops other than rice (Husain, 1996; Metzler and Ateng, 1993) whereas horizontal diversification of agriculture involves various activity or cultivation of different crops in a calendar (Taylor, 1994). Level of crop diversification is dependent on geo-climatic or agro-climatic, socio-economic and technological advancement of a region (Husain, 1996; Quasem and Rehman, 1993; Singh and Dhillon, 1984).

During 1965-71, 49.7% area under pulses declined in Punjab to flourish wheat-paddy system (Thapar, 1973). Adverse consequences of this system are deceleration in productivity, unemployment in agriculture, over exploitation of ground water and declination in soil fertility (Sidhu and Johl, 2002; Singh et al., 1997). Recently, crop diversification has been mooted in Punjab to replace winter wheat with oil seed or pulse to restore nitrogen balance in soil and sound economic as well as societal benefit (Editorial, EPW, 2002).

The study of combination of crops is an important tool to assess the distribution of cropping system to assess suitable combination of crops (Weaver, 1954). Greater the dominance of a crop, the lesser is the competition among crops in an areal unit (Bhatia, 1965; Singh and Dhillon, 1984). Specialization of crop is not desirable as it leads to loss of productivity, decline of fertility of soil, outbreak of pest and pathogen (Quasem and Rahman, 1993; Husain, 1996; Lin, 2011; Singh and Dhillon, 1984; Zohir, 1993). Hence, combination, concentration and diversification of crops are important tools in agricultural regionalization to find out the specificity of crops, causes of

specialization and remedies for agro-ecosystem. The objectives of the research study are to find out the combination of crops, concentration and crop land occupancy of rice (*aman* and *boro*) and potato along with diversification of crops in Bardhaman District.

## 2.0 Study Area

The geographical area of Bardhaman District is 7024 sq km. The district is constituted of six sub-divisions and 31 C.D. Blocks. During last five decades, population density has been increased 342% from 312 persons/sq. km in 1961 to 1099 persons/sq. km in 2011 (Census of India, 1951, and 2011). The principal crop of the district is rice which is cultivated in 97% of the gross cropped area. The net sown area is 4328 sq. km (61.61%) with physiological density of 79 cultivators/sq km.

## 2.0. Materials and Method

### Materials

The research study has been done using secondary data of District Statistical Handbook of Burdwan, (2013), collected from Bureau of Applied Economic and Statistics, Government of West Bengal. The data on facilities of irrigation has been taken from village directory of Census of India, Government of India, (2001).

### Methods

#### Calculation for Regionalization of Agriculture

The collected data have been calculated to find out the regions of agriculture on crop combination (Weaver, 1954), concentration, diversification and intensity using following equations.

$$CC = \frac{\sum d^2}{n} \text{ where, } CC = \text{Crop combination}$$

"d<sup>2</sup>"= difference between the actual crop percentage in a given unit and the percentage in the theoretical distribution,  
n= the number of crops in a given combination (Weaver, 1954; Singh and Dhillon, 1984).

$$Ci = \frac{P_{ae}}{P_{ar}} \times 100 \text{ where, } C = \text{crop concentration}$$

Ci= crop concentration index

P<sub>ae</sub>=% of the crop 'a' to the total harvested area in an enumeration unit

P<sub>ar</sub>=% of crops a to the total harvested area in the entire region

$$CD = \frac{c}{n} \text{ where, } CD = \text{Crop diversification}$$

$c$  = % of total harvested area under 'n' crops

$n$  = crops are those which individually occupy 5% or more of the total harvested area (Singh, 1984)

$$CI = \frac{\sum a_{ij}}{\sum a_{io}} \times \frac{N_i}{N_o} \quad \text{where, } a_{ij} = \text{area under the } i^{\text{th}} \text{ crop in the } j^{\text{th}} \text{ year}$$

$a_{io}$  = area under the  $i$ th crop in the base year

$N_i$  = net area shown in the  $j^{\text{th}}$  year

$N_o$  = net area shown in the base year, (Hasain, 1996)

$$Cci = \frac{aci}{til} \times 100 \quad \text{where, } Cci = \text{Sharing of canal irrigation}$$

$aci$  = area under canal irrigation

$til$  = total irrigated land

$$Cgr = \frac{agr}{til} \times 100 \quad \text{where, } Cgr = \text{Sharing of ground water irrigation}$$

$agr$  = area of ground water irrigation

$til$  = total irrigated land

### Representation

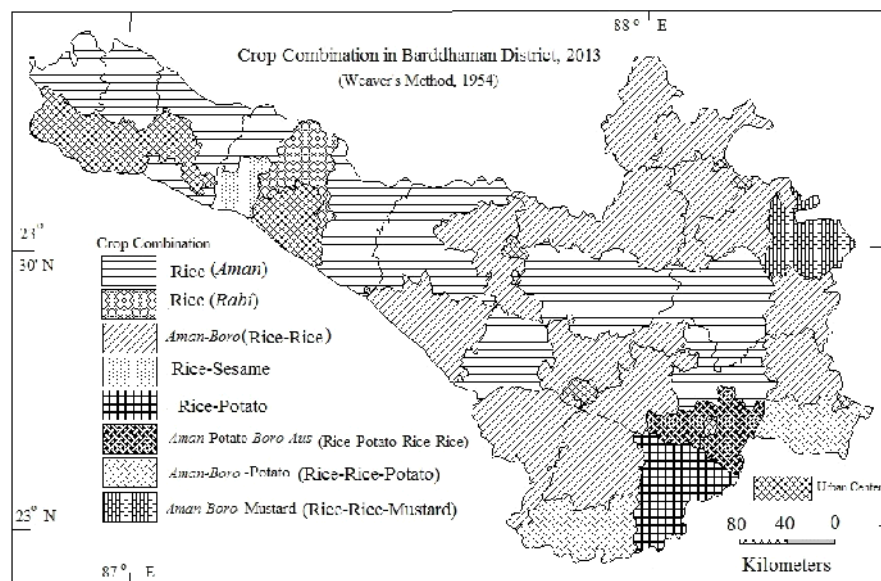
Linear and multiple regression have been done in MS excel, 2007 and Statistica 10.0 respectively. Thematic maps is prepared using Map Info 7.0. Correlation between variables has been calculated and tested its significance at N-2 degree of freedom [N-2=(31-2)=29].

## 3.0. Results

### 3.1. Crop Combination in Barddhaman District

After detail analysis of crop combination in Barddhaman District, only rice (*aman*) has been found as suitable crop in Salanpur, Barabani, Jamuria, Pandabeswar, and Raniganj Blocks where cultivation of rice is marginal with rain water and cultivation in *rabi* is not possible due to availability of water and low fertility of soil. Only rice (*boro*) has been observed as favourable combination in Faridpur-Durgapur Block because *boro* cultivation is dominant with tank irrigation. Rice (*aman*) is the convenient combination of crop in Kanksa, Ausgram - II, Bhatar, Galsi - II, Manteswar and Memari II due to sharing of more than 70% of GCA in *aman*. Rice-rice (*aman-boro*) is the pertinent crop combination in Burdwan I, Burdwan II, Raina I, Kalna I, Purbasthali I, Ketugram - I, II, Katwa I, II, Mangolkote and Galsi - II because

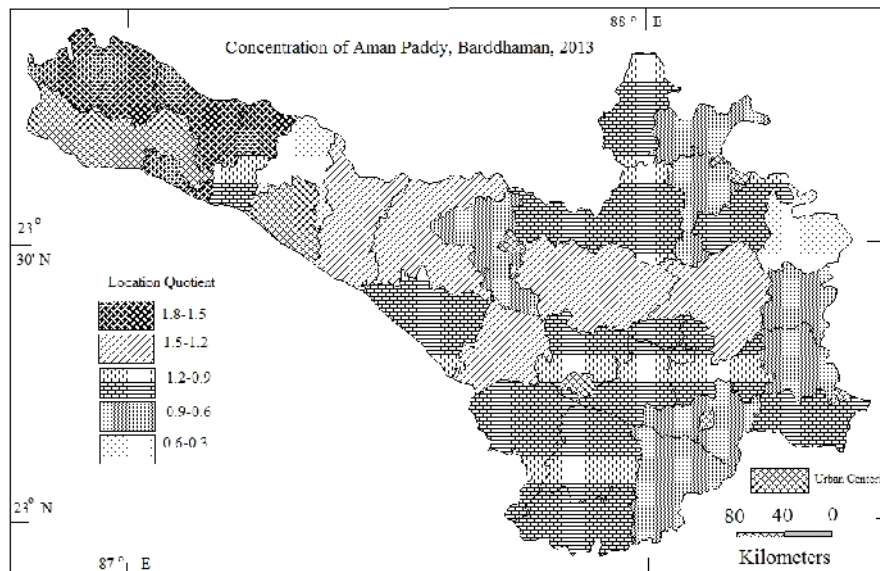
of sharing of more than 80% NSA in both *kharif* and *rabi* season. Rice-sesame is the convenient combination of crops in Andal because 62% and 36% of GCA are under rice and sesame respectively. In Jamalpur, rice-potato is found as suitable combination of crop due to sharing of 51% in rice and 37% of GCA in potato. The combination of rice (*aus*, pre-monsoon)-rice (*aman*, monsoon)-potato-rice (*boro*, post-monsoon) have shown the lowest deviation in Memari-I, where 48%, 25%, 13% and 10% of GCA are cultivated with *aman*, potato, *boro* and *aus* respectively. In Raina -II, rice-rice-potato has been found as favourable combination because 56%, 19% and 18% of GCA are practiced by *aman*, *boro* and potato respectively. In this context, cropping season and weather condition should to be considered for potato cultivation. In Purbasthali II, rice-rice-mustard is the suitable combination of crops for sharing of 36%, 27%, and 20% of GCA under *aman*, *boro*, and mustard respectively (Map No.1). Grossly, in Bardhaman, 40.148% and 33.75% crop lands are used for the combination of *aman-boro* and *aman* respectively. Unfortunately, only 4.06%, 6.16% and 2.96% areas come under the combination of *aman*-potato, *aman-boro*-potato and *aman-boro*-mustard respectively.



Map No.1: Crop Combination, Bardhaman, 2013

### 3.2. Concentration of *Aman*

*Aman* is cultivated in 61.08% of GCA of the district. Location Quotient (LQ) value of 0.6-0.3 has been found in Faridpur-Durgapur due to sharing of 19% GCA in *aman*. LQ of 0.9-0.6 is noticed in Ausgram I, Ketugram - II, Katwa-I, Purbasthali-I, Kalna-I, Memari-I, and Jamalpur. Higher concentration of *aman* than average of the district (LQ 1.2-0.9) is observed in Burdwan- I, II, Raina-I, II, Khandoghosh, Memari-II, Kalna-II, Galsi - I, Mangolkote, Ketugram - I and Katwa-II due to intense canal irrigation system (Map No.2). Highest LQ (1.64) has been observed in Salanpur, Barabani, Jamuria, Pandabeswar, Raniganj because of lowest cropping intensity (100).



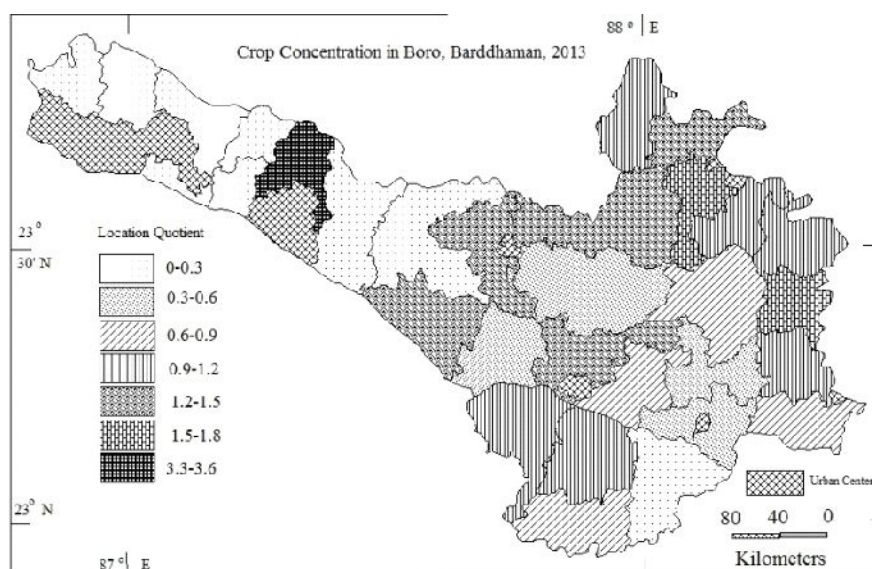
Map No. 2: Concentration of *Aman* Paddy, Bardhaman, 2013

### 3.3. Crop Concentration in *Boro*

Cultivation of *boro* is widely varied in Bardhaman due to insufficient supply of canal irrigation and availability of submersible irrigation in *rabi*. In this district, 23.88% of GCA is practiced with *boro* (65.2% of NSA in *rabi*). *Boro* paddy has not been cultivated in Salanpur, Jamuria, Andal, Barabani, Raniganj, Pandabeswar due to unavailability of water (0% and 9% land under canal and groundwater irrigation respectively). The lowest LQ (0-0.3) is found in Kanksa and Ausgram-II in spite of having higher canal irrigation (>80%). LQ is under 0.3-0.6 in Memari- I and II Blocks because potato is



cultivated in 26% and 9% of GCA in these blocks. Again, Galsi - I and Bhatari categorized under 0.3-0.6 due to sharing of 33% and 11% of GCA in *boro*. LQ of 0.6-0.9 is noticed in Monteswar, Burdwan -II, Raina -II and Kalna- II. LQ of higher than district's average(1.2-1.5) is in Galsi - II, Ausgram -I, Burdwan- I, Mangolkote, and Ketugram - II. Katwa -I, and Purbasthali-I Block are under LQ 1.5-1.8 where in 37% and 38% of GCA are cultivated in *boro*. Exceptionally, in Faridpur-Durgapur, LQ is 3.3-3.6 which is 3.5 times of district's concentration of *boro* (Map No.3).

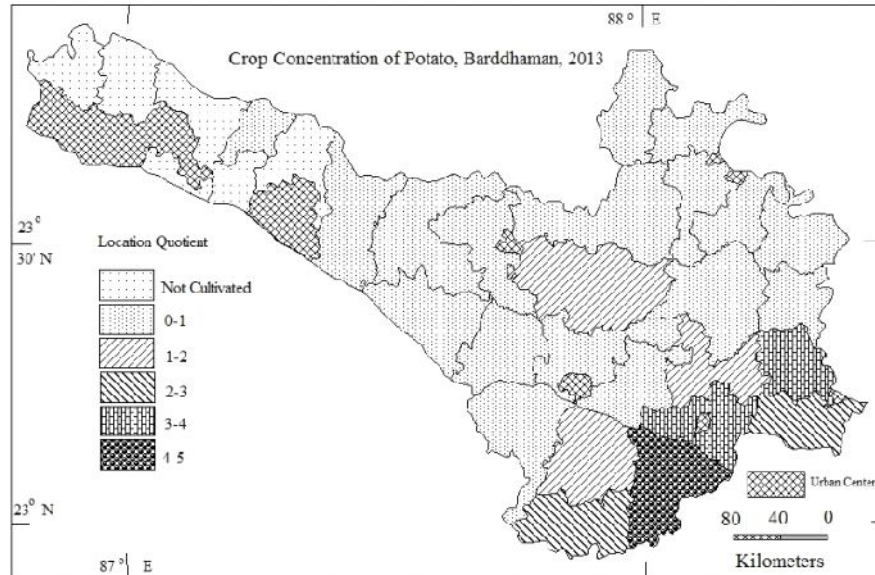


Map No.3: Crop Concentration in *Boro*, Bardhaman, 2013

### 3.4. Crop Concentration of Potato

Cultivation of potato is confined mainly in south-eastern part of the district. In general, soil texture (mainly coarse texture) controls the cultivation of potato through water holding capacity, compactness and air-water circulation. Potato is not cultivated in Salanpur, Barabani, Jamuria, Pandabeswar, Raniganj, and Faridpur-Durgapur (19.6% of land). In Bardhaman, sharing of GCA in potato is 8%. Mangolkote, Ketugram -I, II, Katwa-I, II, Purbasthali-I, and II are categorized in the lowest LQ of 0-1 which is lower than average of the district. In Bhatar, Memari-II, and Raina- I, the LQ value is 1-2 which is double than the district's average. In Raina II, potato is cultivated three times of (LQ 2-3) district's average. Memari- I and Kalna- I are categorized under

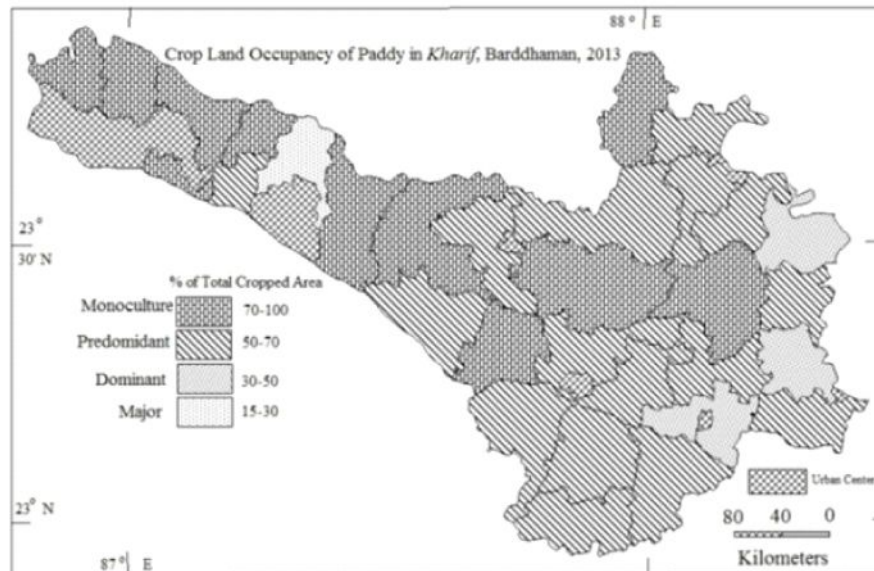
LQ of 3-4 where 26% and 30% of GCA are under potato cultivation. In Jamalpur, the LQ of concentration of potato is 4-5 which is five times of district's average because 38% of GCA is used for cultivation of potato using groundwater (Map No.4).



Map No.4: Crop Concentration, Bardhaman, 2013

### 3.5 Crop Land Occupancy of Paddy in *Kharif* Season

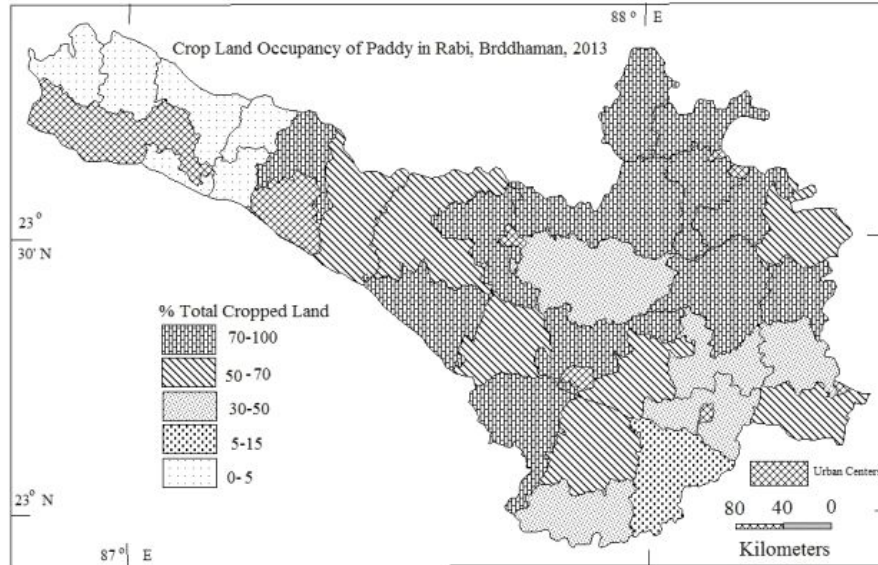
This is an indicator for assessing the percentage of land in a particular crop and more than 70% of crop land occupancy is called monoculture. In Salanpur, Barabani, Jamuria, Pandabeswar, and Raniganj Block, *aman* is cultivated in 100% of GCA. So, there is monoculture in *kharif* season. Again, in 36.73% area of the district, monoculture is also practiced in Kanksa, Ausgram - II, Galsi - II, Bhatar, Monteswar, and Ketugram - I. Predominant category (50-70%) is found in Galsi - I, Ausgram - I, Mangolkote, Katwa-I, II, Ketugram - II, Burdwan- I, II, Memari - II, Khandoghosh, Raina - I, II, Jamalpur and Kalna- II. Memari - I, Kalna- I, and Purbasthali- II are identified as dominant land occupancy (30-50% of GCA). Major land occupancy (15-60%) in *kharif* has been noticed in Faridpur-Durgapur (Map No.5). The occupancy of crop land of paddy is negatively related with diversification of crops ( $r=0.6797$ ,  $p<0.01$ ).



Map No. 5: Crop Land Occupancy of *Aman* Paddy in *Kharif*, Bardhaman, 2013

### 3.5. Land Occupancy of *Boro* Paddy

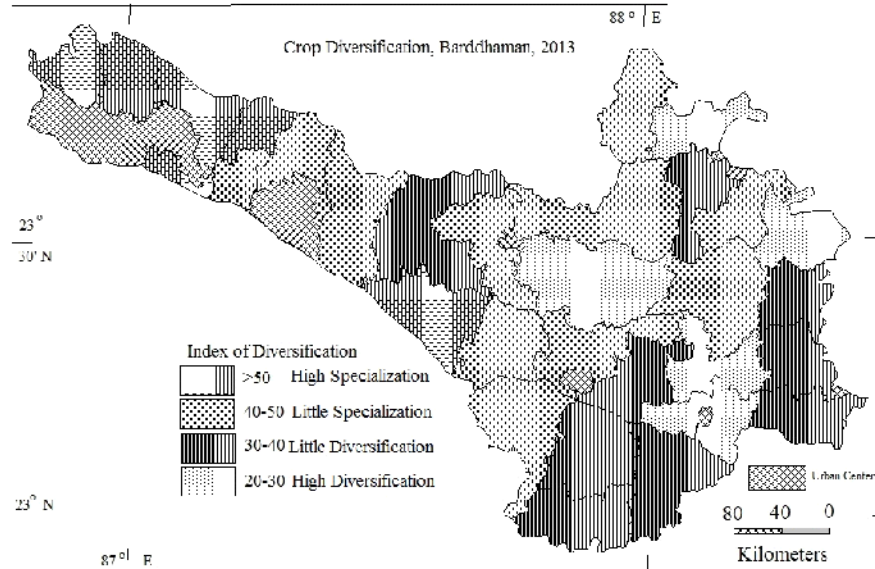
This is an index showing the sharing of area of paddy in *rabi* season. In this season, paddy is not cultivated in Salanpur, Barabani, Jamuria, Raniganj, Pandabeswar, and Andal. In Jamalpur, secondary land occupancy (5-15% land) has been observed in *boro*. Dominant category (30-50% of NSA in *rabi*) is noticed in Raina- II, Memari- I, II, Kalna-I, and Bhatar due to predominance canal irrigation. Predominant category (70-50%) has been observed in Kanksa, Ausgram - II, Raina- I, Burdwan- II, Kalna- II, and Purbasthali-II. Monoculture is practiced in 41.03% land of Galsi-I, Ausgram-I, Burdwan- I, Khandoghosh, Manteswar, Ketugram - I, II, Katwa-I, II, Purbasthali-I, and Faridpur-Durgapur (Map No.6). The crop land of *borois* positively related with canal irrigation ( $r=0.3082$ ,  $p<0.1$ ).



Map No. 6: Crop Land Occupancy of *Boro* Paddy, Barddhaman, 2013

### 3.6. Diversification of Crops

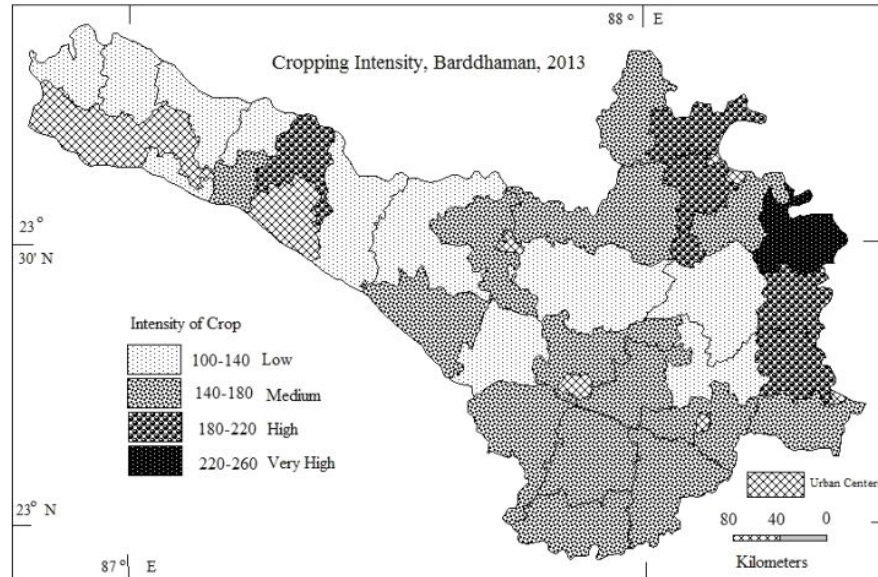
Generally, Barddhamanis specialized in cultivation of paddy but there is an inter-block difference in the diversification or specialization of crops. The specialization ( $>50$ ) is highest in Salanpur, Barabani, Jamuria and Pandabeswar where only *aman* is cultivated. The little specialization (40-50) has been observed in 35.48% land of Kanksa, Andal, Faridpur-Durgapur, Ausgram-I, Mangolkote, Ketugram - I, Katwa- II, Manteswar, Burdwan-I, Galsi-II, and Khandoghosh. Little diversification index (30-40) is found in Ausgram-II, Raina- I, II, Jamalpur, Burdwan-II, Purbasthali-I Kalna- I, II, Katwa- I wherein three crops are cultivated. High diversification index (20-30) has been obtained in Bhatar, Memari-I, II, Ketugram - II, and Purbasthali-II (18% area) where four crops are cultivated. Highest diversification is observed in Purbasthali-II (22.8) due to sharing of 95% of GCA in groundwater (Map No.7). So, in these four blocks, cultivation of crops is most diversified and shown suitable for multi-crops in a crop calendar.



Map No. 7: Crop Diversification, Bardhaman, 2013

### 3.7. Cropping Intensity

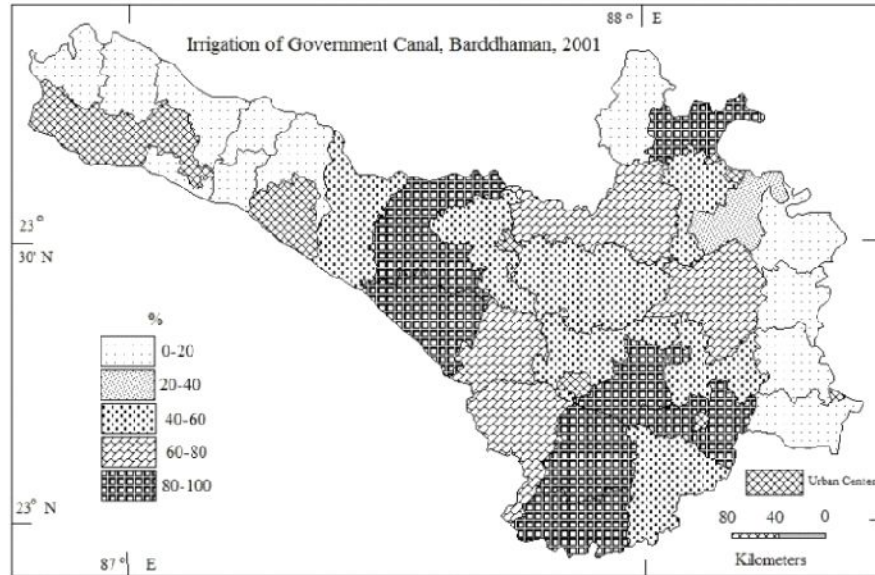
This is the index to show the multiple use of agricultural land in different crops. The cropping intensity is lowest (100) in Salanpur, Barabani, Jamuria, and Raniganj where only *aman* crop is cultivated. But low intensity of crops (100-140) is found in Pandabeswar, Kanksa, Ausgram - II, Galsi - II, Bhatar, Manteswar and Memari -II due to unavailability of canal irrigation as well as groundwater irrigation (<25% land). The correlation between canal irrigation and cropping intensity is negative ( $r=-0.118$ ,  $p=>0.1$ ). Medium cropping intensity (140-180) has been found in Galsi - I, Ausgram -I, Mangolkote, Ketugram - I, Khandoghosh, Raina- I, II, Burdwan -I, II, Memari- I, Jamalpur and Kalna-II where >50% irrigation comes from government canal (GC) and these blocks are specialized for *aman* and *boro*. High cropping intensity (180-200) is noticed in Faridpur-Durgapur, Ketugram - II, Katwa- I, Purbasthali- I, Kalna I because of higher irrigation facility (>40% of irrigated land). Purbasthali-II has been categorized under very high cropping intensity (200-260) due to intensive ground water irrigation facility (>90% NSA) (Map No.8).



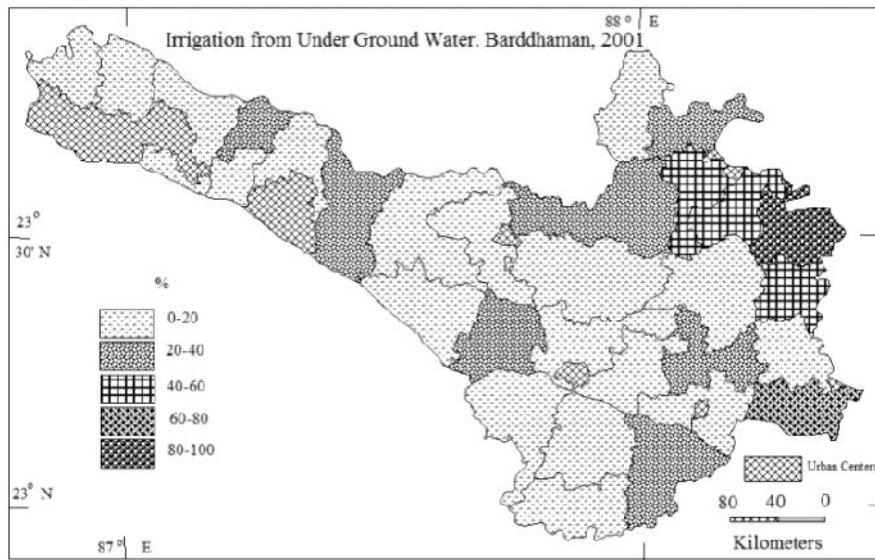
Map No.8: Cropping Intensity, Bardhaman, 2013

### 3.8. Sharing of Canal Irrigation

The water of Damodar is diverted into canal to irrigate the crop lands in Bardhaman District. But the sharing of canal irrigation is not uniform. In Salanpur, Barabani, Jamuria, Pandabeswar, Raniganj, Andal, Faridpur-Durgapur in the west and Purbasthali-I, II, Kalna- I, and II in the east of the district, less than 20% of NSA is under canal irrigation. In the east, establishment of canal is not possible for intense river system (tributary of River Ganges). In Kanksa and Katwa- II, 20-40% land comes under canal irrigation. In Jamalpur, Burdwan- I, Memari -II, Bhatar, Ausgram- I, and Katwa -I, 40-60% of total irrigated land is served by canal. In Khandoghosh, Galsi - II, Manteswar, and Mangolkote, canal (GC)serves 60-80% of total irrigated land. The highest sharing of GC irrigation (80-100) has been found in Raina -I, II, Burdwan- II, Memari- I, Ketugram - II, Ausgram - II and Galsi - I where left bank main canal, Damodar main canal, and Eden canal serve water for irrigation in arable land (Map No.9).



Map No. 9: Irrigation of Government Canal, Bardhaman, 2001



Map No.10: Irrigation of Ground Water, Bardhaman, 2001

### 3.9. Groundwater Irrigation

Well, with electric connection, and tube well with or without electric connection have been considered as source of groundwater for irrigation. The lowest ground water irrigation (<20%) is found in 63.54% area of the district. In Mangolkote, Ketugram - II, Memari -II, Jamalpur,Galsi - II, Kanksa, and Pandabeswar, 20-40% land is under groundwater irrigation. In Kalna-II and Purbasthali -II, 60-80% and 80-100% of land are irrigated with groundwater respectively (Map No.10). So, in eastern part of the district where establishment of canal is not possible, groundwater is an alternative source of irrigation.

### 4.0. Discussion

#### 4.1. Factors of Crop Combination

Crop combination of the district is controlled with soil health ( $r=0.4837$ ,  $p<0.01$ ) and irrigation facility ( $r=0.4245$ ,  $p<0.05$ ) (Fig. No. 1&2). Lateritic soil and low nutrient content in western part of the district leads to single crop combination.

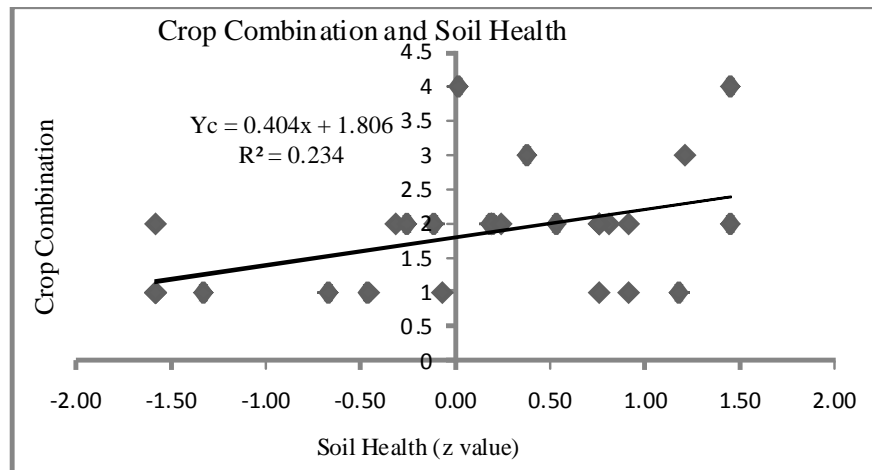


Fig. No. 1: Crop Combination and Soil Health



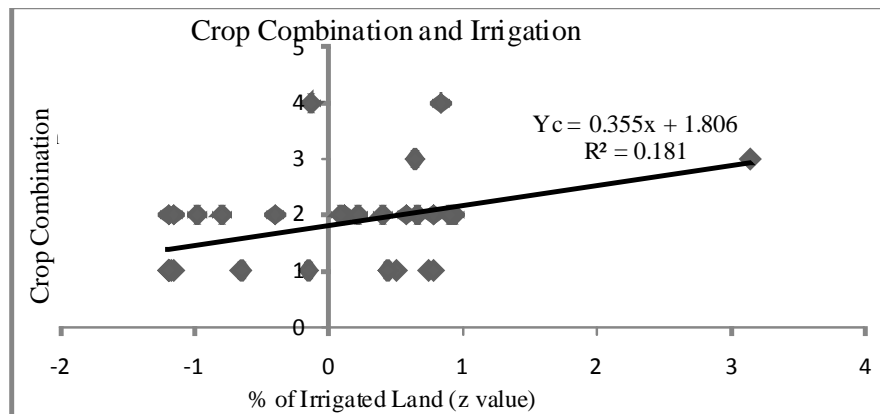


Fig. No.2: Crop Combination and Irrigation

Multiple regression has been calculated for combination of crop (CC) with soil health (SH), irrigation facility (IR) and diversification of crops (D). The equation is  $CC = 1.80662 + 0.194 \times SH + 0.1393 \times IR - 0.2027 \times D$ ,  $r = 0.5488$ ,  $R = 0.3012$ ,  $p = 0.0198$ .

Highest coefficient value has been found in diversification of crops ( $r = 0.48$ ,  $p < 0.01$ ). The correlation value of multiple regression ( $r = 0.5488$ ,  $p = 0.0198$ ) is explained with 30.12 per cent of variance of crop combination (Fig. No. 3). Positive residuals has been found in Memari -I, Purbasthali -II, Kalna- II, Raina- II and Andal where small land holding, high agricultural density and irrigation facility in *rabi* are the factors of multiple crop combination. Again, negative residual has been found in Bhatar, Manteswar, Galsi - II, Memari -II, Ausgram - II and Kanksa where unorganized market facility for *rabi* crops and or canal irrigation may restrict the cultivation in *aman*.

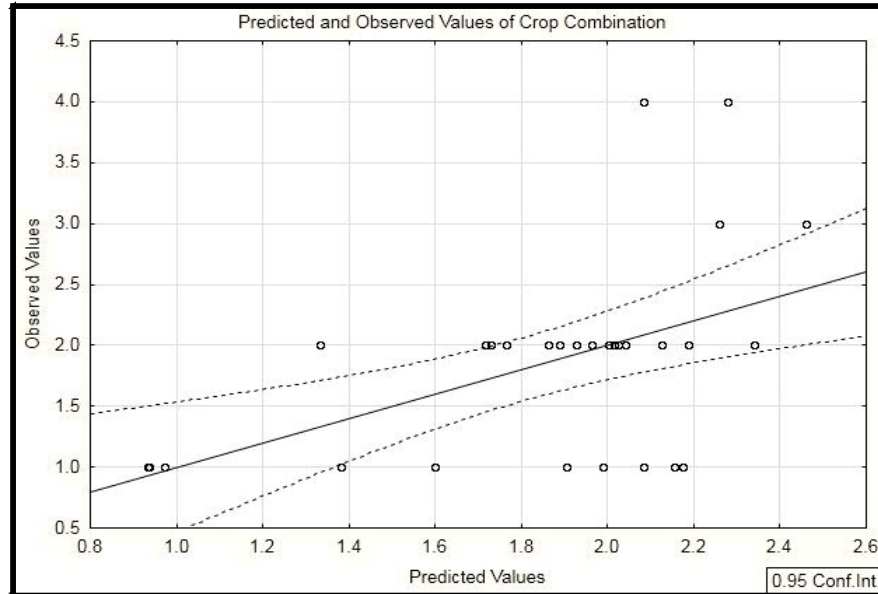


Fig. No 3: Predicted and Observed Values of Crop Combination

#### 4.2. Crop Diversification and Irrigation of GroundWater

The signified positive correlation has been found between diversification of crops and use of groundwater ( $r=0.411$ ,  $p<0.05$ ) (Fig. No.4). The use of groundwater, regulated as well as judicious use and or minimum loss of water, are the ways for higher potentiality of irrigation to cultivate different types of crops according to fertility of soil rather than cultivation of mono crop which inturn leads to minimize risk in agro-ecosystem and soil fertility.

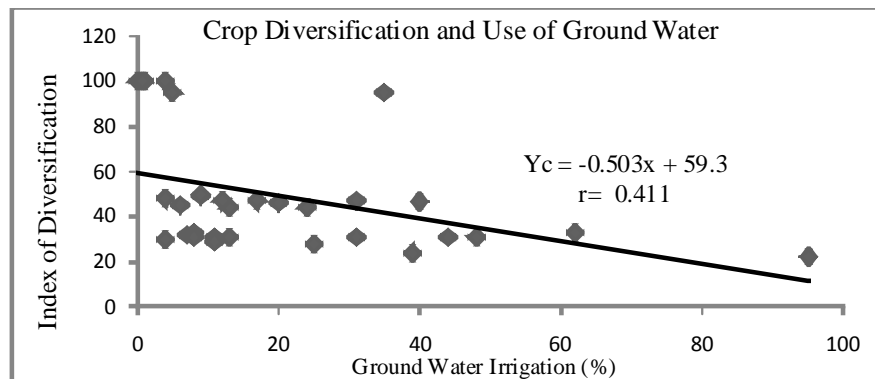


Fig. No. 4: Crop Diversification and Use of Ground Water

### 4.3. Cropping Intensity and Irrigation Facility

The correlation between cropping intensity and canal irrigation ( $-0.118$ ,  $p > 0.1$ ) is not satisfactorily signified for enhancing potential as well as multiple use of agricultural land in Bardhaman. The correlation between cropping intensity and use of groundwater irrigation is signified at 99% level ( $r = -0.5329$ ,  $p < 0.01$ ) because farmers can cultivate different types of crops as per their requirement using groundwater (Fig. No.5 and 6). Alternatively, farmers generally follow the supply of water from DVC and they are compelled to cultivate paddy. But without the supply of canal water (like as *aman* cultivation in 2015), the production and agricultural system may be collapsed. Higher cropping intensity is also increased with increasing diversification of crop ( $r = 0.1581$ ,  $p > 0.1$ ) (Fig. No.7).

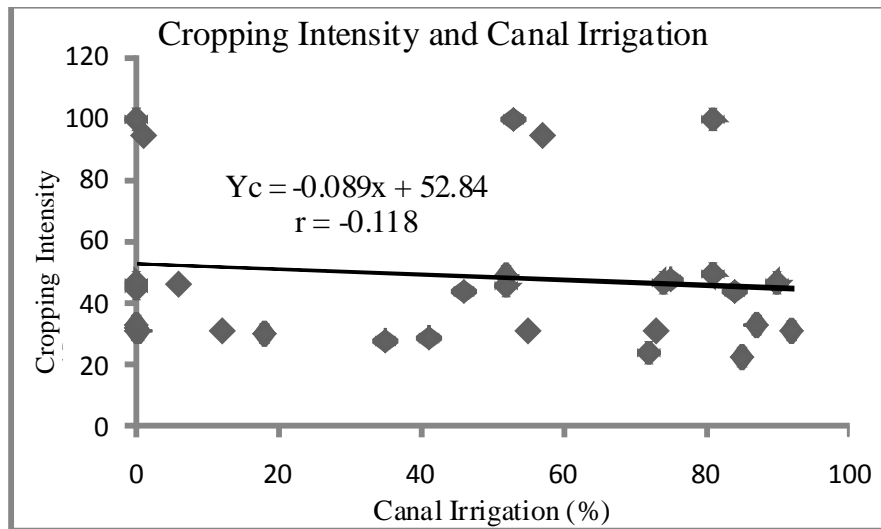


Fig. No. 5: Cropping Intensity and Canal Irrigation

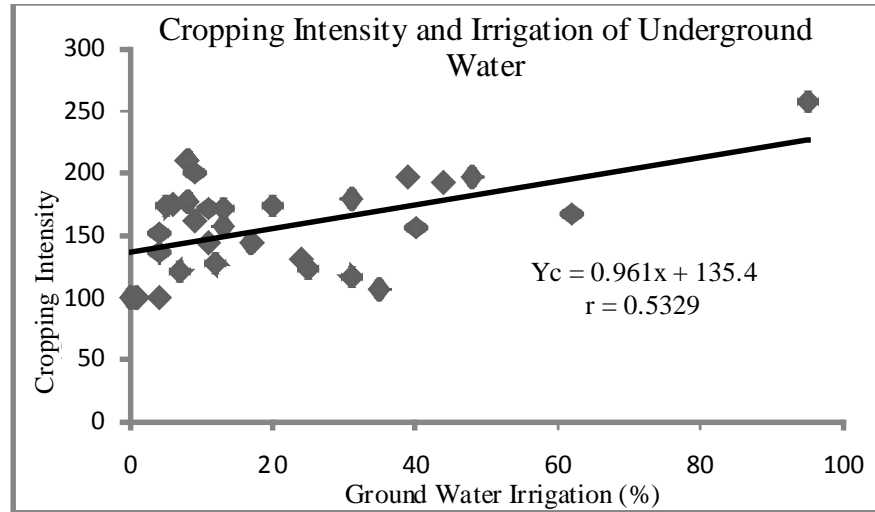
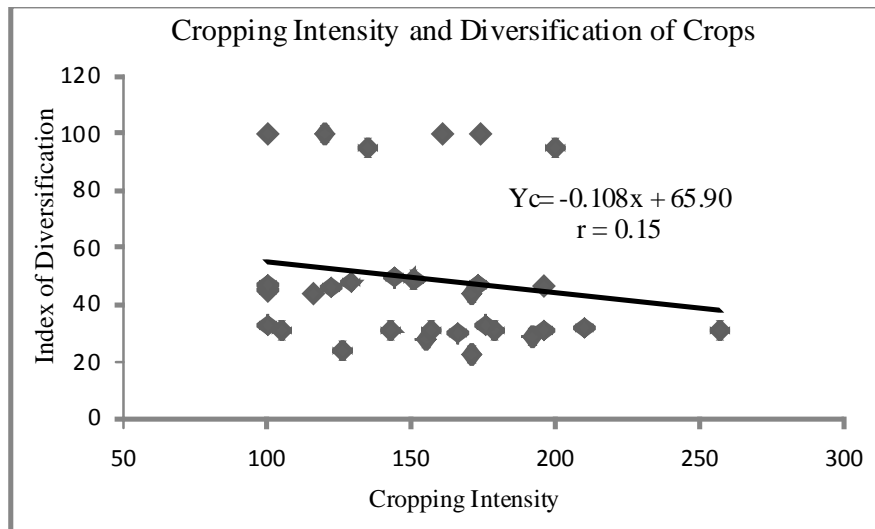


Fig. No. 6: Cropping Intensity and Irrigation of Ground Water

Fig. No. 7: Canal Irrigation and Crop Land Occupancy in *Boro*

### 5.0. Conclusion

From this investigation, soil health and irrigation have been found as dominant factors of the crop combination. More than 70% of cultivable land is used for mono crop cultivation. Diversified crops are practiced in Memari-I and

Purbasthali- II using ground water irrigation and in Jamalpur, Memari-I, and Kalna-I, potato is the main crop. As crop rotation and diversification improve stability of production, soil fertility and agro-economic scenario, diversified combination of crop is to be practiced in Barddhaman to avoid unprecedented negative effects on agriculture as in Punjab after green revolution.

### References

- Battese, G.E. and Fuller, W.A. 1972. 'Determination of Economic Optima from Crop-Rotation Experiments', *Biometrics*, 28(3):781-792.
- Bhatia, S.S. 1965. 'Patterns of Crop Concentration and Diversification in India', *Economic Geography*, Clark University, 41(1):39-56.
- Blanco-Canqui, H. and Lal, R. 2004. 'Mechanisms of Carbon Sequestration in Soil Aggregates', *Critical Reviews in Plant Sciences*, Taylor & Francis, 23(6):481-504, DOI: 10.1080/07352680490886842.
- Brust, G. E. and B. R. Stinner. 1991. 'Crop rotation for insect, plant pathogen, and weed control', in D. Pimentel, (ed). *Handbook of Pest Management in Agriculture*, 2<sup>nd</sup> edition. CRC, Boca Raton, FL: 217-236.
- Chattopadhyay, M. 1984. 'Transformations of labour use in Indian agriculture', *Cambridge Journal of Economics*, 8(3): 289-296.
- El-Nazer T. and McCarl B.A. 1986. 'The Choice of Crop Rotation: A Modelling Approach and Case Study', *American Journal of Agricultural Economics*, Oxford University Press, 68(1):127-136.
- Editorials, 2002. 'Problems in Punjab', *Economic and Political Weekly*, 37(29):2969.
- Husain, M. 1996. *Agricultural Geography*, Rawat Publications, Jaipur: 213-251.
- Jodha, N. S. and Singh, R. P. 1990. 'Crop Rotation in Traditional Farming Systems in Selected Areas of India', *Economic and Political Weekly*, 25(13):A28-A35.
- Johnston, B. F. and Mellor, J. W. 1961. 'The Role of Agriculture in Economic Development', *American Economic Review*, Vol. 51, in Kurosaki T. 2002. 'Agriculture in India and Pakistan, 1900-95: A Further Note', *Economic and Political Weekly*, 37(30): 566-93.
- Liebman, M. and E. Dyck. 1993. 'Crop rotation and intercropping strategies for weed management' *Ecol. Appl.* 3:92-122. In: Brainard, D.C., Bellinder, R.R., Hahn, R.R. and Shah, D.A., (2008). Crop Rotation, Cover Crop, and Weed Management Effects on Weed Seed banks and Yields in Snap Bean, Sweet Corn, and Cabbage, *Weed Science*, 56(3) pp. 434-441, Retrieved on 16-02-

2016 12:55 UTC.

- Lin, B.B. 2011. 'Resilience in Agriculture through Crop Diversification: Adaptive Management for Environmental Change', *Bio-Science*, 61(3), Oxford University Press.
- Metzel, J. & Ateng, B. 1993. 'Constraints to Diversification in Bangladesh: A Survey of Farmers' Views', Bangladesh Institute of Development Studies, Retrieved on 16-02-2016 12:47 UTC.
- Paul, A. 2015. *Banglar Krishi O Krishak Samasya O Sombhabana*, Naya Udyog Publication, Kolkata.
- Quasem, A. and Rahman, L. 1993. 'Agricultural Research and Crop Diversification in Bangladesh', Bangladesh Institute of Development Studies, Retrieved on 16-02-2016 12:39 UTC.
- Sidhu, R. S. and S.S. Johl, 2002. 'Three Decades of Intensive Agriculture in Punjab: Socio-Economic and Environmental Consequences' In: Johl, S. S. and Ray, S. S. (eds.), *Future of Punjab Agriculture*, Centre of Research in Rural and Industrial Development, Chandigarh.
- Singh, J. and Sidhu, R.S. 2004. Factors in Declining Crop Diversification: Case Study of Punjab, *Economic and Political Weekly*, 39(52).
- Singh, J. and Dhillon, S.S. 1984. *Agricultural Geography*, Tata McGraw-Hill, Delhi.
- Singh, J., G. S. Dhaliwal, and N. S. Randhawa 1997. *Changing Scenario of Punjab Agriculture: An Ecological Perspective*, Centre for Research in Rural and Industrial Development, Chandigarh
- Singh, J. and Sidhu, R.S. (2004). Factors in Declining Crop Diversification: Case Study of Punjab, *Economic and Political Weekly*, 39(52).
- Snapp, S.S., Blackie, M.J., Gilbert, R.A., Bezner-Kerr, R., Kanyama-Phiri, G.Y. and Kates, R.W. (2010).
- Biodiversity can support a greener revolution in Africa Source: Proceedings of the National Academy of Sciences of the United States of America, 107(48).
- Sumner, D. R. 1982. Crop rotation and plant productivity, in M. Rechcigl, ed. *CRC Handbook of Agricultural Productivity*, Boca Raton, FL: CRC:273-313.
- Tangley, L. 1987. 'Beyond the Green Revolution', *Bio-Science*, Oxford University Press, 37(3).
- Taylor, D. C. 1994. 'Agricultural Diversification: An Overview and Challenges in ASEAN in the 1990s', *ASEAN Economic Bulletin*, 10(3), Institute of Southeast Asian Studies.
- Thapar, R. 1973. Backwash of Green Revolution, *Economic and Political*

*Weekly*,8(34).

- Vandermeer, J., van Noordwijk, M., Anderson, J., Ong, C., and Perfecto, I. 1998. 'Global change and multi-species agro-ecosystems: Concepts and issues'. *Agriculture, Ecosystems and Environment* 67(1):22.
- Weaver, J.C. 1954. 'Crop-Combination Regions for 1919 and 1929 in the Middle West', *Geographical Review*, American Geographical Society,44(4).
- Zohir, S. 1993. 'Problems and Prospects of Crop Diversification in Bangladesh', *The Bangladesh Development Studies*, 21(3).





## Buddhist 'Theory of Meaning' (Aphavāda) as Negative Meaning

SANJIT CHAKRABORTY\*

### Abstract

*The paper concentrates on the most pressing question of Indian philosophy: What is the exact connotation of a word or what sort of entity helps us to identify the meaning of a word? The paper focuses on the clash between Realism (Nyāya) and Aphavāda (Buddhist) regarding the debate whether the meaning of a word is particular/universal or both. The paper asserts that though Naiyāyikas and Mīmāṃsakas challenged Buddhist Aphavāda, yet they realized that it is difficult to establish an opinion in support of a word that conceptually denotes a negative meaning first.*

**Keywords:** *Aphavāda, Jāti-śaktivādin, Universal, Negation, Transcendental illusion, Kumarila, Dignāga.*

A bigger part of Indian Philosophy concerns about the sheer analysis of language at both semantic and syntactical levels. As per semantic aspect is concerned, the analysis remains centred around meaning that in some way hooked with the external objects and non-existent objects too. The concept of the word, meaning and word-meaning relation seems not only intriguing but one of the most intricate issues in Indian Philosophy. The analysis of word and meaning relation stands for reference fixation that may correspond to our sense data in general. My concern does not focus on the query whether an external fact can resolve the meaning of a word properly or not. The question that I stress here is what kind of entity assist us to identify the meaning of a word or 'Is the meaning actual or ideal?'

Words are the primary sources of knowledge. The analysandum of a complex sentence is possible due to the analysis of it through the elemental words, which stand for sense data. When a person enters into the field of

\*Sanjit Chakraborty (cogitosanjit@gmail.com) is a Research Fellow in Department of Philosophy, Jadavpur University.

Indian Philosophy, he/she apparently covers that the meaning theory (*ArthaVāda*) is a vexing topic concerning an immense area. A few prominent Indian philosophical schools like the Nyāya, the Buddhist and the Mīmāṃsakas focus on the meaning theory from their own perspective. Pāṇjāli, in his *Mahābhāṣya*<sup>1</sup> stresses on the idea that a word seems particular and this opinion is familiar with the name of *Vyakti-śakti-vādin*. Pāṇjāli clarifies that the meaning is related to a nominal kind that is called a particular object. This doctrine is much close to the western theory of reference (the causal theory of reference), a dynamic theory once propounded by Hilary Putnam, Saul Kripke and the followers. In short, this externalist appeal considers meanings of the natural or non-natural kind terms as external that are not situated in the brain of the speakers. The content of our beliefs or more precisely the meaning of the word is not only determined by the external objects but also shared by the other minds that the traditional descriptive theory of meaning overlooks. Theory of description believes in the descriptive use of the term that concentrates on the meaning of a term through its descriptive properties. Externalists hold a naturalistic turn when they preserve meaning as part of a human endeavour that emerges in the world by implying externalism about the mind. I hesitate describing in detail the thesis of internalism which also argues that the meaning of the terms can be determined through the conceptual role of semantic, an internal facade of mind that is beyond of any causal linkage to the external objects. Meaning for them is intentional content that depends on the psychological modes of the speakers. I think, "A parallel between language and mental states can be drawn in terms of the contribution of the mind, rather than language. The mind imposes intentionality on language purposely, and here, the purpose is obviously to meet a condition that expresses a psychological state upon it."<sup>2</sup> We also know that mental states don't have meaning, only the words have meaning. The conception of the Buddhists aligned to the imports of the words does not fit with internalism as the internalists by no means deal with the exclusion or the opposition theory of meaning. Internalists in western school like Fodor, Searle, Chomsky and Frank Jackson mainly consider that meaning is indeed the conceptual matter that is not located where the believers are. They never put forward any thought like the import of the words. Meanings are neither subjective nor objective but we may consider it a fiction as once the Buddhist urged. I will discuss the issue very soon.

The Nyāya-Vaiśeṣika and the Mīmāṃsakas, the realist schools of Indian philosophy, actually believe in a sentence that may be affirmative or

negative but have a direct factual relation (reference) to the objects. They get rid of the thesis of subjective edifice of reality that hinges towards conceptual schemata. Besides, there is a different view which claims that the meaning of a word is universal. They urge that the meanings related to the nominal kind have universal properties. This theory gives prominence on the aspect of general features of the meaning of a particular term or word. They are often called *Jāti-śaktivādin* (meaning generalist). Kumārila and the other Mīmāṃsakas are the prominent followers of the *Jāti-śaktivāda*. However, the problem arises when some critics ask, ‘What is the precise connotation of a word? Or ‘Whether is it universal/particular or maybe both?’ In *Slokavārtikam*, the Mīmāṃsaka argues that a word directly denotes a genus and indirectly connotes to the individual. In the *NyāyaSūtra*<sup>3</sup>, the Naiyāyikas hold that a word can denote a particular object qualified by a universal (*Jāti-ākritivisistavyākti*).

I would like to clarify here that both the realist schools (Nyāya and Mīmāṃsa) uphold that a universal resides in many particulars and without recognizing particulars we cannot grasp the sense of universal. This descriptive approach claims for the concept of universal through conjoining the mere particulars. The presentation of the Nyāya and the Mīmāṃsa theory of meaning are pretty diverse, but these philosophers further defend that our perceptual experience is cognizant of the particular and the universal both at one sweep. Dignāga considers that the world has immense particulars that are interlinked with external objects, but the concept of universal seems mind-dependent unable to fulfil any reference fixation. The Universal as an intellectual fiction can be utilized as propositional attitudes that maybe relevant in the case of ‘negative purposes of exclusion’ having no relation with the import of a word. Gaurinath Sāstri writes, “The negation of the opposite is the common element in the meaning of the word, and this is falsely interpreted and hypostatized as a positive universal. This is made possible by a transcendental illusion, which cannot be avoided, but can be made harmless by criticism.”<sup>4</sup>

My effort here is to make out how the Buddhist theory of meaning or ‘ApohaVāda’ aims to rebut the realist’s point that I have discussed earlier. The crucial query is, ‘What is the meaning of the term *Apoha*?’ The literal meaning of the term *Apoha* is nothing but ‘exclusion’ or ‘differentiation’, i.e. a particular thing is excluded or differentiated from other things. As a supporter of the theory of momentariness, the Buddhist cannot accept that a particular object has some stable entities. As *Upādhi* is the source of similar judgment,

they conclude that a universal does not exist. Through the concept of a momentary entity like particular, one cannot construct a conceptually apprehended property (which is common to all particulars), that is called universal. Besides, Buddhist refutes the idea of universal by arguing that an ultimate real entity must be causally efficient. The causal efficiency leads to a change, but the idea of change is very unsuited with the universal. If the concept "cowness" leads to a chance, then it would be something other than 'cow'. Bimal Krishna Matilal claims, "For the Buddhists, the purpose of applying a general name or, perhaps, any name, is differentiation or exclusion. The Dignāga School seems to treat any name or term not as a genuine proper name, but as a general name signifying a 'class exclusion'... Thus, by emphasizing the 'exclusion' aspect of naming (which we may also call the negative aspect of our naming act) the Buddhist expected to avoid the consequence of admitting universals as meanings of general terms."<sup>5</sup>

Secondly, the Buddhist principal idea is to rebut the realist's idea of the referential theory of meaning. They assert that words cannot connote an objective reference or our words do not have any reference to reality. For them, words can be regarded as mental images. The import of the word is beyond of subjective-objective dispute. Meaning is associated with a mental act of reference, but meaning has no referential directness to the world or facts. The universal is an intellectual fiction that occupies a distant extraction from the external facts. Gaurinath Sastri says, "The Buddhist answers the question by positing that the import of a word is neither a subjective idea nor an objective reality but a fiction. The speaker thinks that he is presenting an objective fact to the hearer while the hearer is deluded into thinking that the import is an objective reality. So the import of a word is a mental construction which is hypostatized as an objective reality existing in its own right independently of the thinking mind."<sup>6</sup>

The third appealing characteristic of '*ApohaVāda*' is that some of the *ApohaVādin* considers 'meaning' as a relation between the word and the mental image of the objective. They actually uphold a 'subjective construction of reality'.

The most outstanding exponent of '*ApohaVāda*' delimits the outline of conventional theories of meaning in the following ways:

First, *ApohaVādin* argues that the realist's dispute of a word can refer to a particular that does not serve any relevant purpose in philosophy. They argue that as it is impossible for an agent to perceive all the particulars,

similarly it is also an irrelevant presupposition for an agent to assume that the particulars are conceptually apprehended and labelled, by a common name and properties, which are regarded as a 'universal'. If they support the principle then it would be a collapse for the realist's own referential theory of meaning. It is because the conventional relations of the common properties may encourage us to admit the conceptual construction that has no referential attachment with the particular objects.

Secondly, those who consider that the words have reference to the conceptual image may commit a mistake as the conceptual images are not linked to any external reference. Conceptual images are located in the intrinsic mood of an agent's mind. One may have the conceptual images of 'Golden Mountain' or 'Hare's horns' but in these cases the reference fixation is not possible at all. A cognitive judgment becomes trifling if the subject does not hold any objective properties or it would be better to say that the reference fixation of a sentence would not be possible in the case of some representing sentences where the subject term resonates as non-existent.

Thirdly, philosophers may perhaps allege that we can undefine the meaning of a word as there is a lack of a specific determination of meaning. When we hear a word 'dog' then it connotes to something to which the name cow is affixed. In this case, we are unable to find out any form that has an effect to be a purely existential referent. These types of fortitude of such contexts are purely a matter of belief. The linguistic users of a word cannot refer to a vague reference; it needs to have an objective value. Here 'the concept of dog' denotes that 'something exists' but that does not confirm that this existence would be an indefinite concept.

Fourthly, some thinkers believe that an external object can endorse the reference of a subjective content. If we believe in a subjective fact, then the thought of reality cannot be causally productive. Hence the theorists crack down on the intricate issues that focuses on the mere ideas or the objects that has a linkage to the import of words. Here the ideas are impinged upon the reality that causes it. This outlook is quite similar to Buddhist's '*ApohaVāda*'. But there is a considerable disparity we find here, the Buddhist theory of *Apoha* holds that the import of words is a subjective idea hypostatized as an objective fact, but this objectivity is an ungrounded illusion as it is neither purely subjective nor objective. According to the Buddhist, it is actually a fiction. However, the present theory holds that the idea is an exact measure of the reality and it is in fact superimposed upon an objective datum

to which it refers. But we know that the Buddhist opposes the idea of factual meaning of a word as they favour for mental images.

We can sum up the Buddhist '*ApohaVāda*' in this way:

- a) This theory sustains that a word does not mean either a particular or a universal. The reason is that those particulars are self-contained and has nothing to do with their context. Moreover, a universal is a subjective fiction.
- b) '*ApohaVāda*' rejects the idea of objective reference of the words.
- c) '*ApohaVāda*' refutes the pluralistic conception of reality that accepts the universal as real. They oppose that a real will not be '*Śalaksana*' that is beyond the propositional operation. The object of a judgment can be a flux, but not momentarily real. Actually all kind of verbal expressions denote to the thesis of differentiation.

The question that may perhaps get prominence is, 'If a word does not signify any real object, then what is its significance?' The Buddhists say that what is signified by a word is neither subjective nor objective but is something unreal. Prof. Satkari Mookerjee in his famous book *The Buddhist Philosophy of Universal Flux*, clarifies it when he says, "The fact of the matter is that both the speaker and the hearer apprehend in fact and reality a mental image, a subjective content and not any objective fact; but the speaker thinks that he presents an objective fact to the hearer and the hearer too is deluded into thinking that the presented meaning is not a mental image, but an objective verity."<sup>7</sup>

There is an inclination to call '*ApohaVāda*' as a 'negative approach towards meaning' or 'negativism'. A few non-Buddhist scholars like Udayana and Kumārilaraised this type of objection to the opponent Buddhist. However, in Buddhist Philosophy, the negative characteristic of verbal import has two-fold aspects – Firstly, as an absolute negation, it has no positive reference. For an instance, 'the book is not non-book'. This sentence is called a simple and a pure negative sentence. Secondly, a relative negation may have a 'positive reference' and its negative value seems connected with an indirect sense. Actually, this relative negation collaborates to a past affirmation. Moreover, because of the relation to others, the past affirmation might compel to transform into negation. Satkari Mookerjee also considers, "So when Dignāga declared that word imports a negation and neither an objective universal nor a particular, he only emphasised this negative implication of

verbal import. He did not mean that negation was the primary and apparent connotation. But Uddyotakāra and Kumārila misunderstood the real significance of Dignāga's doctrine and raised objections which were uncalled for and irrelevant."<sup>8</sup>

In *PramānaVārttika*, Dharmakīrti amends Dignāga's claim about negation. For him *Apoha* means an opposition or *Virodha*. The ground is that Buddhist philosophy does not rebuff the concept of meaning rather they called it momentary. Dharmakīrti considers that negations are rooted in opposition. They can be divided into two groups:

- a) An efficient opposition (*sabhābviruddha*) like hot and cold.
- b) Logical contradiction like blue, non-blue.

In the first case, two facts can subsist in parallel without opposing each other. Their opposition becomes efficient when they are placed together in one space-time. This opposition actually talks about the negation of entities. Besides, in the second case (logical contradiction) without excluding the other in the case of logical contradiction we cannot define two opposed facts in general. In the case like 'Blue' and 'non-blue', here the essence consists in exclusion of the others. Logical contradiction mainly deals with the reference of negation of a proposition. Dharmakīrti claims that '*ApohaVāda*' does not bring a negative approach to reality; rather it shows the dialectical approach that depends on the law of opposition. For example, a term 'Blue lotus' not only exclude the lotuses that are non-blue, but it also excludes the blue things that are not lotus. Uddyotakara, in his *Nyāya-Vārtika* opposes Dignāga's *Apoha* theory by arguing that a plain contradiction may apprehend in Dignāga's '*ApohaVāda*'. If negation itself signifies negation without correlating with others, then the principal statement like, 'A word signifies its meaning by negating the meaning of other words' might express 'A word only can signify another word without signifying itself' would be a self-contradictory proclamation.

In a broader way, the Buddhist comprehends the thesis that a word does not denote a negative idea first. A word has a positive concept of meaning and the concept of negative import is a consequence of cognition. Ratnakīrti also attempts to sort out the misunderstanding of Dignāga's claim. He argues that the words mostly designate the negative concept first as it does not have any positive reference. Ratnakīrti in his *Apohasiddhi* infers a perspective of a realist and claims that a conceptual image can be qualified

by a negation of the opposite entities. He believes in the intricacy of connoted words like the Naiyāyikas. For Ratnakīrti, a word 'cow' is predictably dissimilar from a 'non-cow'. Here the 'non-cow' is considered as much as the 'cow' is considered, since here the negative and positive factors are much more comparable. Dhammakīrti and Ratnakīrti emphasise the modified '*ApohaVāda*' as the objective reality which is unable to articulate the precise connotation of a word. A subject has the conceptual image of a word in his/her mind and this image is hypostatized as an external fact. As an explicit context, it constructs periphery delineation from the other concepts related to the external facts. This negative approach is treated as 'constitutively' of 'individuality' of the concepts. We can precise it by saying in Dignaga's tune that a word can express a concept and the concepts are unable to characterize certainly the concept of particulars as realist Naiyāyikas proposed. Matilal adds, "...but it can NEGATIVELY disqualify the particular from being claimed by other fictions or concepts. Since all concepts are fictions, a particular has equal claim to be associated with just any one of them. But in our construction or naming activity, we reject or exclude association with all other concepts except the concept expressed by the name. Thus, construction and verbalization are to be understood as exclusion of all rival claims."<sup>9</sup>

### Some words

We know that the *Naiyāyikas* put forward the conception of universal as an ontologically real entity that consistently and pervasively belong to the particulars whereas the Buddhist argue against this type of ontological real entities as universal. Kumārila resists the Buddhist arguments on universal by claiming that an object consists of two different characteristics - specific and generic. This specific characteristic assists us to discriminate an object from the rest of the objects. Besides, its generic properties help us to comprehend all objects as one. If we agree to the Buddhist outlook that an object is solely particular, then it cannot generate any general idea in our mind. Moreover, if we accept that an object is merely universal, then it cannot produce the idea of differentiation in our mind. It would lead to an absurdity to accept the view that these two ideas are constructed by our imagination. The notion of particularity and generality produced by an object is never contradicted. If we admit that *Apoha* means opposition, then we should pore over the specific meaning of the term *Apoha*. It will positively stand for the exclusion of '*Non-Apoha*'. Here the problem raised is: What is the nature of '*Non-Apoha*'? We are aware that if the Buddhist claims in favour of every word denote to an *Apoha*, then '*Non-Apoha*' would undoubtedly be



an unidentified object. If the Buddhist replies that '*Non Apoha*' is unfeasible, then one can solicit 'How do you know the negative particles like 'not', 'non' etc?' Following the *Naiyāyikas*' stand, it seems to me that it is very difficult for the Buddhist to establish the argument that a verb denotes a negative meaning. If the Buddhist believes that only common nouns signify *Apoha*, then they should admit the common properties of the same noun and this will in turn collapse their basic theory of discarding universal.

One can decline the Buddhist's *Apoha* theory and insist that the conceptual images are not at all exposing to prove an opposition or exclusion properly. The conceptual images require an objective plea to initiate its claim. The awareness of exclusion entails three different factors. First, it refers to an object, which is excluded. Secondly, the excluded object is also excluded from other objects. And thirdly, the objective ground of exclusion cannot be a conceptual image or delusion. Gaurinath Sâstri claims, "The Buddhist does not deny that the meaning of a word is felt as a positive reality, which is at bottom negation of negation and a concept without an objective basis."<sup>10</sup>

The Buddhist defines universal as a functional property that means *an exclusion of what is other than that*. Here 'that' infers to the particulars which are consisted in the domain of class names. The functional property of the exclusion excludes the particular things that are not located in the domain of the defining class like in the case of 'cow', the functional properties will exclude the non-cows from the class of cow. It seems to me true that the Buddhist approaches on this view emphasize both negative and positive purports. Negative purport possesses the elimination or the exclusion of the universal that I discussed earlier while the positive purport upholds the particulars, the positive element of our ordinary language. I agree with Matilal when he says, "Since the Buddhist phenomenalism admitted only momentary particulars as real entities there was an obvious problem of naming and talking about them in language, for linguistic description ordinarily presupposes recurrence or persistence of the objects described."<sup>11</sup>

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## Notes

- <sup>1</sup>Patanjali. 1954, 35-38.  
<sup>2</sup>SanjitChakraborty, 2016, 36.  
<sup>3</sup>Gautama, 1939, 2.2.68.  
<sup>4</sup>GaurinathSastri, 1959, 143.  
<sup>5</sup>Bimal Krishna Matilal, 2005, 39.  
<sup>6</sup>Sastri, 1959, 142.  
<sup>7</sup>SatkariMookerjee, 1980, 116.  
<sup>8</sup>ibid, 118.  
<sup>9</sup>Matilal, 2005, 22.  
<sup>10</sup>Sastri, 1959, 143.  
<sup>11</sup>Matilal, 1992, 39.

## References

- Bhattacharyya, K. 1965. *Philosophy, Logic and Language*. Allied Publishers, Bombay, New Delhi, Calcutta.
- Chakraborty, S. 2016. *Understanding Meaning and World: A Relook on Semantic Externalism*. Cambridge Scholars Publishing, London.
- Dhammakīrti, 1953. *Pramānavārttika*, (ed.), Rahul Sankrityayana. K.P. Jayaswal Research Institute, Patna.
- Gautama. 1939. *Nyāya Śūtra*, with *Nyāyabhāṣya* of Vātsyayana. (ed.) G. Jha, Oriental Series 58, Poona.
- Kripke, S. 1980. *Naming and Necessity*. Harvard University Press, Harvard.
- Kumārila. 1898. *Mīmāṃsā-Īlokavārttikam* with Commentary of Parthasarathi Mīśra. Chowkhamba, Kashi Sanskrit Series 11, Benaras.
- Matilal, B. K. 1990. *The Word and the World, India's Contribution to the Study of Language*. Oxford University Press, New Delhi.
- Matilal, B. K. 2005. *Epistemology, Logic, and Grammar in Indian Philosophical Analysis*. Oxford University Press, New Delhi.
- Mookerjee, S. 1980. *The Buddhist Philosophy of Universal Flux*. Motilal Banarsi Press, Benaras.

- McCulloch, G. 1995. *The Mind and Its World*. London, New York, Routledge.
- Patânjali. 1954. *MahâBhaysâ*. Banaras, Kanshi Sanskrit Series.
- Putnam, H. 1975. *Mind, Language and Reality: Philosophical Papers Vol. 2*. Cambridge, Cambridge University Press.
- Ratnakîrti. 1957. *RatnâkîrtiNibandhavali*. (ed.), Anantalal Thakur. Patna, K.P. Jayaswal Research Institute, 1957. Sastri, G. 1959. *The Philosophy of Word and Meaning*. Calcutta, Sanskrit College.
- Sastri, G. 1980. *A Study in the Dialectics of Sphota*. Delhi, Motilal Banarsidass.
- Stalnaker, R. C. 2008. *Our Knowledge of the Internal World*. Oxford, Clarendon Press.



## Negation in Nyishi

MOUMITA DEY\*

### Abstract

*The language 'Nyishi', spoken in Arunachal Pradesh in the lower Subansiri district, is a Tibeto-Burman language of the agglutinating type, with an SOV word-order. Placed post-verbally, negation in Nyishi is expressed by attaching the negative suffix '-ma' to the roots of main verbs. It is this negative marker that bears the information about the realis-irrealis mode in Nyishi, in the absence of explicit tense markers. The present paper examines the different functions of this negative morpheme '-ma' that functions as a negative suffix, as a negative word, and also as the negative constituent marker in the grammar of Nyishi.*

**Keywords: Negation, Nyishi, Realis mood, Negative morpheme, Tibeto-Burman**

### 1. Introduction

The paper aims to present a descriptive account of negation in Nyishi, a Tibeto-Burman language, spoken in the state of Arunachal Pradesh, India. The focus of the paper is to show how negation is syntactically structured in the grammar, the specifications of the notable negative morphemes and also examine the various forms of negation with respect of tense, aspect, mood – where we will see how the phonological realization of the negative morpheme changes with the change of these categories, and whether a generalized pattern of negation in Nyishi can be sketched. The paper will also deal with the aspects of constituent negation in the language and show how it is affected by the negative morpheme. The questionnaire for data elicitation was prepared based on various sample sentences, available in the existing literature on negation such as those in Buragohain (2004); Abbi (2001); Bhatia (1995).

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\*Moumita Dey (smoumitadey@gmail.com) is Head, Department of English, Holy Cross College, Agartala, Tripura.

The paper is divided into the following sections: § 2 gives an overview of Nyishi language, region and people, §3 introduces the negation in Nyishi, its form and syntax, §4 deals with the description of negation in relation to tense and aspect in Nyishi, § 5 shows how negation affects the moods in the language, § 6 deals with negation in conditional clause types, § 7 illustrates how constituent negations are marked, § 8 describes the two other negative words in the language while § 9 shows the different polarity items in Nyishi. § 10 shows negation in relation to quantifiers, questions and comparatives §11 deals with the scope of negation and finally, § 12 concludes, giving a brief summary of the results of the previous sections.

## 2. Introducing ‘Nyishi’

‘Nyishi’, meaning ‘the land of people – the human beings’ happens to be the mother tongue of the Nyishi tribes of Arunachal Pradesh, India. ‘Nyishi’ is the cover term, used to refer to all the Tani languages – the generic name - of the area and includes a number of dialects, namely, Aka Lel, Bangni, Nishang, etc. The speakers of the language are known differently by names such as Dafla, Nissi, Lel, Nyishi, Nyishing and Bangni. According to the census of 1991, there are about 173,791 Nyishi/Dafla speakers, which make them the most populous tribe of Arunachal, after the combined population of Adi and Galong tribes. On the other hand, the census of 2001, reports that there are 211,485 Nyishi/Dafla speakers, out of which there are 118,111 speakers who claim Nyishi to be their mother-tongue. However, in the *People of India*, vol IX, (Singh and Manoharan 1993) it is reported that the census of 1981 stated the number of Nyishi speakers to be 140,986, and that they belong to the NEFA group (the Nefamese community). Nefamese is said to be a pidgin, which was used as a *lingua franca* for intergroup communication by certain tribal communities in Arunachal. Some of the other languages which are included in the NEFA group are Tagin, Milang, Miri, Mishing, Pasi, Bangni, Pangi, Ramo, Sherdukpen. Though the report needs to be revised today, yet it is one of the important landmarks as far as language census and language grouping based on communities and families are concerned.

### 2.1. Region and Language

Belonging to the Tibeto-Burman family of languages, Nyishi is an isolating-agglutinating language. Primarily, they belong to the Indo-Mongolian race and lived in the Papum Pare districts of Arunachal Pradesh. Today, the major concentration of Nyishi population is found in the lower and upper Subansiri, east Kameng, Papum Pare, Kurung Kume districts of Arunachal Pradesh

and in the Darrang and Lakhimpur districts of Assam (Abraham 2005). The 2001 census reports that though the bulk of Nyishi speakers are still found in Arunachal, yet, many of them are found in different states of India, owing to various socio-economic and educational purposes, in the last decade, which marks their efforts and zeal towards progress and development.

Nyishi is mutually intelligible with the neighbouring languages of Adis, Apatanis, Hill Miris, Tagins, Galos and others. These languages are said to belong to a common ancestor – the Abotani group – from which they have descended and developed their separate identities.

Nyishis are basically agriculturists, but some are also engaged in the small-scale handicrafts and handloom works. It is reported that all these languages show remarkable similarities in their phonological, lexical and grammatical systems and because of this genetic link, they are together grouped as the Tani languages (Abraham 2007). This analysis is further strengthened in Post (2009), where a sketch of the possible branching of the languages of the Tani group is elaborately presented and these languages are clubbed under the broad western Tani group.

## 2.2. A Glimpse of Nyishi's Linguistic Features

Certain salient features make Nyishi an interesting language to study, such as the presence of the four basic nasal sounds from bilibials to the velar: /m/, /n/, /ŋ/, /ŋ/. There are five back vowels, out of which /ʌ/ and /ɑ/ are most notable. The three others being: /u/, /o/, /ɔ/. Interestingly, words undergo frequent nasalisations and the voiceless sounds sometimes seem to be unreleased in the language, especially in the word final position, like in 'hitapɿ', 'book', where /p/ is sometimes unrealised. Similar to most other languages of the region, Nyishi has rich a stock of classifiers, deictic items and expressives, besides having compound verb constructions like: *kakYr kátá*, 'see properly' and reduplicated structures such as: *ribá ribá*, 'fast fast'.

The language has mainly the SOV word order, typical of Indian languages. However, there are varieties which show both SOV and SVO word orderings, such as those spoken in central parts of Arunachal. The language has a complete range of pronominal system that not only categorises the three persons – first, second and third, - but also differentiates between the three numbers – singular, dual and plural as in: (table 1).<sup>1</sup> Abraham (2007) gives a detailed account of the pronominal systems of some of the languages

of the Tani group<sup>2</sup>. Owing to such similarities, some linguists tend to count these languages as variations or dialects of one Tani or Apatani language, to be considered broadly.

<b>Table 1</b>			
<b>Example of Nyishi Pronominal System</b>			
Person/number	Singular	Dual	Plural
First person	<i>no</i>	<i>nuni</i>	<i>nul</i>

### 3. Negation and its types

Negation implies opposing the sense of affirmation, that which is held to be correct. Linguistically, a negative particle, may it be the insertion of a negative word in a sentence or attaching a negative affix to a word, owes the property of negating the word, phrase, part or whole of the proposition, depending upon its scope, in defined contexts.

Negation is of two types, namely, sentential negation and affixal negation. The former negates the given affirmative sentence, using a negative word such as *not*, *never* as in English or *mYt*, *nYhi*, meaning 'not' as in Hindi. On the other hand, affixal negation constitutes attaching a negative affix to a word, negating its sense, such as the negative prefixes 'ku-', 'du+'-', in Bangla, Hindi like in: (table 2). (Abbi, (2001); Bhatia, (1995)

<b>Table 2</b>		
<b>Example of Affixal Negation</b>		
Bangla (prefix)	Words	English
<i>duʃ-</i>	<i>duʃcinta</i>	Bad/ill thoughts
<i>ku-</i>	<i>kuʃɔŋoti</i>	Bad company
Hindi (prefix)		
<i>ə-</i>	<i>əʃanti</i>	Chaos
<i>ku-</i>	<i>kukərmə</i>	Bad deed



### 3.1. The Negative Morpheme in Nyishi

The primary negative morpheme identified in Nyishi is the monosyllabic morpheme - ‘*ma*’, which tends to bear the job of negating any given contentful element in the grammar of Nyishi. Similar to Nyishi, even Tagin, a neighbouring language, employs this sole morpheme to negate anything and everything in its grammar. From the typological perspective as reported in Post (2009), the Tani sub-family uses some or the other phonological variation of the single morpheme ‘*ma*’ as the negative morpheme, like *maa*, *maK*, *moK*, *mãã*, and such others.

Interestingly, the feature of the presence of a sole negative morpheme is specific to the grammar, for the grammar exhibits characteristics, which are unique in themselves, probably to the Tani sub-family as suggested by Post (2009). It is noteworthy that a single negative morpheme - a negative particle – serves as a word in sentential negation and as a suffix in affixal negation in the grammar, and also modifies its form, along with the modification of the verbal stem to which it attaches, in certain cases, as we will see in the data ahead.

### 3.2. Syntagmatic Position of the Negative Morpheme

In Nyishi, the negative morpheme is realized in the post-verbal position, as a negative suffix, attached to the verbal root. Apart from indicating the sense of negation, this negative suffix, also carries the information about the realis-irrealis mode. The structure of the main verb in Nyishi is as in (1) and (2), where the aspectual morphemes ‘-*pan*’ and ‘-*dYn*’ follow the verbal root, and also carry the information about the realis-irrealis mode. As Moscati (2006) reports there are agglutinating languages, of other language families, as well, like Turkish, which show similar structural configurations of their verbal stem, in which the negative morpheme ‘-*me*’ is suffixed to the verbal root, which is then followed by the tense-agreement markers. It is thus, not an uncommon feature, for there are languages having specific inflectional projections, which tend to host the negative sentential morpheme – the cliticised morpheme of negation.

- |     |                        |       |                       |
|-----|------------------------|-------|-----------------------|
| (1) | soma                   | hitap | <b>bəa-pan</b>        |
|     | soma                   | book  | <b>bring-perf.rls</b> |
|     | Soma brought the book. |       |                       |
| (2) | mi                     | bimin | <b>bi-dən</b>         |
|     | 3p.s                   | song  | <b>sing-hab.rls</b>   |
|     | She sings song.        |       |                       |

On negating (1) and (2), the negative suffix, ‘-*ma*’, is inserted in the verbal stem, such that the verbal root is followed by the negative suffix, which is then followed by the aspect marker as in (3) and (4). Here, the aspectual morphemes carry the realis-irrealis mode information, which raises the question as to why the negative suffix is also marked as carrying the mode information, the answer to which will be sorted out as we move on to the next sections, where we deal with data on irrealis mode.

- |     |                                |                               |
|-----|--------------------------------|-------------------------------|
| (3) | <i>soma hitap</i>              | <b><i>bəa-ma-pan</i></b>      |
|     | soma book                      | <b>bring-neg.rls-perf.rls</b> |
|     | Soma has not brought the book. |                               |
| (4) | <i>mi bimin</i>                | <b><i>bi-ma-dən</i></b>       |
|     | 3p.s song                      | <b>sing-neg.rls-hab.rls</b>   |
|     | She does not sing song.        |                               |

#### 4. Tense and Aspect

Similar to Galo (Post 2009), Nyishi makes two way distinctions for reference to time – the realis mode and the irrealis mode, and probably this would be the case in other languages of the Tani sub-family, if not of the entire Tibeto-Burman family at large.

##### 4.1. Negation in Realis-irrealis Mode

So far we have seen that the negative morpheme ‘-*ma*’ has been marked as representing the realis mode. In case of irrealis mode of event, Nyishi uses the negative morpheme ‘-*rYm*’, which is also suffixed to the verbal root, similar to ‘-*ma*’. Sentence (5) shows the structure of the verbal stem in an affirmative sentence, where the morpheme ‘-*tain*’ marks the irrealis mode, which gets realised as zero, on negating the sentence, using the negative suffix ‘-*rYm*’, as in (6), the negative counterpart of (5).

- |     |                              |                      |
|-----|------------------------------|----------------------|
| (5) | <i>ŋo sija</i>               | <b><i>ə-tain</i></b> |
|     | 1p.s now                     | <b>go-irrl</b>       |
|     | I will go now.               |                      |
| (6) | <i>ŋo sija</i>               | <b><i>ə-rəm</i></b>  |
|     | 1p.s now                     | <b>go-neg.irrl</b>   |
|     | I will not go now.           |                      |
| (7) | <b><i>rəmən siti</i></b>     | <b><i>he-rəm</i></b> |
|     | raman letter                 | write-neg.irrl       |
|     | Raman will not write letter. |                      |

#### 4.2. Negation and Aspect

Though the realis-irrealis mode is differentiated in the negation, with the different negative suffixes of ‘-ma’ and ‘-rem’, still the grammar of Nyishi makes a distinction between the present time and the past, which is not apparently visible, in the presence of the negative suffix ‘-ma’. Sentence (8) and (11) shows the information in the realis mode with reference to the present time of event, where, the **habitual markers** are overtly present in the negative constructions, but are realized as zero in (9) and (10), which refer to the simple past actions. Finally, as in sentence (6)-(7), so in (12), the irrealis mode in the negative constructions are represented by ‘-rYm’, with the habitual marker, ‘-dYn’, being realized as zero.

(8)	rəmən siti	he-ma-dən
	raman letter	write-neg.rls-hab.rls
		Raman <b>does</b> not write letter.
(9)	rəmən siti	he-ma
	raman letter	write-neg.rls
		Raman <b>did</b> not write letter.
(10)	mi bimin	bi-ma
	3p.s song	sing-neg.rls
		She <b>did</b> not sing song.
(11)	mi bimin	bi-ma-dən
	3p.s song	sing-neg.rls-hab.rls
		She <b>does</b> not sing song.
(12)	mi bimin	bi-rəm
	3p.s song	sing-neg.irrl
		She <b>will</b> not sing song. [habitual]

As in (12), where the habitual marker is realised as zero in the irrealis mode, similarly, all other aspect markers get realized as zero morphemes in the irrealis mode, when Nyishi negates the given affirmative statements, like in (14) and (16). The grammar does not make distinctions with regard to different aspects in the negative irrealis mode, but uses lexical words, adverbial or prepositional phrases to mark the intended differences, like the use of *in the morning ortomorrowas* in (14).

- |      |        |        |   |
|------|--------|--------|---|
| (13) | ɲo     | arəm   | ə-tain                                      |
|      | 1p.s   | tomrrw | go-irrl                                     |
|      |        |        | I will be going tomorrow.                   |
| (14) | ɲo     | arəm   | ə-rəm                                       |
|      | 1p.s   | tomrrw | go-neg.irrl                                 |
|      |        |        | I will not be going tomorrow. [progressive] |
| (15) | ɲul-əm | hasti  | pai-tain                                    |
|      | 1p.pl  | punish | get-irrl                                    |
|      |        |        | We will be punished.                        |
| (16) | ɲul-əm | hasti  | pai-rəm                                     |
|      | 1p.pl  | punish | get-neg.irrl                                |
|      |        |        | We will not be punished. [simple future]    |

However, the case with realis mode is different, for the aspectual morphemes of the progressive type and of the perfective type are overtly realised. Unlike in the case of the habitual aspect, where the present and past time of reference is further differentiated in the realis mode, it is not done so in the present cases of **progressive and perfective aspects**, as can be seen in (17)-(19) and (20)-(22), respectively. Further, the progressive morphemes are preceded by the **imperfective morpheme**, which is used in cases where the speaker stresses the fact that the action has not completed as yet.

- (17)  $\eta\text{o}$      $\text{pori-l-do-m}\alpha$   
 1p.s    read-impf-prog.rls-neg.rls  
 I am not reading.
- (18)  $\eta\text{o}$      $\text{\textcircled{a}-l-do-m}\alpha$   
 1p.s    go-impf-prog.rls-neg.rls  
 I was not going.
- (19)  $\text{ram}$      $\text{kuppa?}$                        $\text{d}\text{\textcircled{a}-du}\eta\text{-do-m}\alpha$   
 $\text{ram}$      $\text{banana}$                               eat-impf-prog.rls-neg.rls  
 Ram is not eating a banana.
- (20)  $\text{ram}$      $\text{kuppa?-k}^{\text{h}}\text{\textcircled{a}m pi-m}\alpha\text{-p}\alpha$   
 $\text{ram}$      $\text{banana-acc}$     cut-neg.rls-perf.rls  
 Ram had not cut the banana.
- (21)  $\eta\text{o}$      $\text{pori-m}\alpha\text{-p}\alpha\text{\textcircled{n}}$   
 1p.s    read-neg.rls-perf.rls  
 I have not read.
- (22)  $\text{no}$      $\text{pori-m}\alpha\text{-p}\alpha\text{\textcircled{n}}$   
 2p.s    read-neg.rls-perf.rls  
 You had not read.

The northern variety of Nyishi uses ‘-duK’ as the imperfective morpheme as in (19), while the southern variety uses ‘-l-’ for the same as in (17)-(18). Similarly, the perfective morpheme is ‘-pán’ in southern Nyishi, while ‘-pá’ in the northern variety. ‘-do’ is the progressive aspectual morpheme in both the varieties.

## 5. Negation Hortative and Imperative Moods

### 5.1. Hortative Statements

In Nyishi, the Hortative mood is expressed using the reduplicated structure in the sentence – ‘*kuj-tuj/-nej*’, out of which ‘*kuj*’ begins the sentence and ‘*-tuj/-nej*’ ends it, by being suffixed to the verbal stem word finally. The ‘*-tuj*’ morpheme is used in the southern variety while the ‘*-nej*’ morpheme in northern Nyishi, like in (23) and (24), respectively.

- |      |                            |                  |                            |  |
|------|----------------------------|------------------|----------------------------|--|
| (23) | kuj                        | səje             | ə-tuj                      |  |
|      | hort                       | now              | go-hort                    |  |
|      | Let us go now.             |                  |                            |  |
| (24) | kuj                        | səje             | əŋ-nej                     |  |
|      | hort                       | now              | go-hort                    |  |
|      | Let us go now.             |                  |                            |  |
| (25) | kuj                        | ui-kəm           | nicniy ɲi-mα-buj           |  |
|      | hort                       | enemies-acc      | harm do- <b>neg</b> -hort  |  |
|      | Lets not harm our enemies. |                  |                            |  |
| (26) | kuj                        | αα-kəm           | əmα-mə-mα-buj              |  |
|      | hort                       | other-acc        | lie-caus- <b>neg</b> -hort |  |
|      | Lets not lie others.       |                  |                            |  |
| (27) | kuj                        | αyɔŋ-ri-mα-buju  |                            |  |
|      | hort                       | late-do-neg-hort |                            |  |
|      | Lets not be late.          |                  |                            |  |
| (28) | *kuj                       | ui-kəm           | nicniy ɲi-buj              |  |
|      | hort                       | enemies-acc      | harm do-hort               |  |
|      | Lets not harm our enemies. |                  |                            |  |

The negative hortative statements are also similarly expressed using the reduplication, but here instead of the reduplicated morpheme, ‘-tuj/-nej’, in the sentence final position, it is the negative hortative morpheme ‘-buj/-buju’ that is used, respectively, in the two varieties, as in (25) and (27).

Interestingly, it must be noted that the reduplicated morpheme ‘-buj/-buju’ at the end of the hortative statements implies the sense of negation, inherent in it, but in spite of this inherent negative sense, the presence of the negative suffix ‘-má’ is essential, else the sentences become unacceptable as in (28). Therefore, it can be so concluded that it is ‘-má’ that marks negation in these constructions and the final reduplicated morpheme ‘-tuj/-nej’ in the environment of negation, becomes ‘-buj/-buju’.

## 5.2. Imperative Statements

The imperative mood marker in Nyishi is the morpheme ‘-to’, which is suffixed to the verbal root. On negating such imperative affirmation sentences, the imperative ‘-to’ morpheme is realized as ‘-má-b’ morphemes, where ‘-má’ marks negation, to which is suffixed ‘-b’, the ‘negative imperative, + honorific’ morpheme as in (29). Such imperative negative constructions are used in cases of politeness, humbleness and when said with some kind of respect towards the hearer. In other cases, where imperative negative statements are used to command, to order or in casual speech, then instead of two different morphemes ‘-má’ and ‘-b’, each assigned with individual functions, Nyishi uses a single morpheme ‘-yo’. Similar to the other case, ‘-yo’ is suffixed to the verbal stem and it not only marks the negative imperative mood but also carries the sense of negation, with ‘- honorific’ value like in (30).

(29) sikir-ho log leŋ-**má-b**  
cold-loc out go-**neg.imp.hon**

Do not go out in the cold.

(30) sikir-ho log leŋ-**yo**  
cold-loc out go-**neg.imp**

Do not go out in the cold.

(31) arəm ayuŋ ha-**yo**  
tomrrw late come- **neg.imp**

Do not come late tomorrow.

Thus, the imperative negation has two ways of expression in the grammar. The morpheme *-b* is the + honorific, negative imperative morpheme, which marks the imperative mood in negative sentences, and remains suffixed to *'-ma'*, the negative morpheme. On the other hand, *'-yo'* seems to be the – honorific, negative imperative morpheme, marking three values, those of negation, imperative mood and the – honorific sense. Putting it the other way round, we can conclude, that the negative suffix *'-ma'* in the environment of imperative mood, with –honorific value, becomes *'-yo'*. Since commands and orders are in general, given to someone at a level lower than the speaker's, the regular negative imperative morpheme is *'-yo'*. While, commands and orders, with the sense of politeness are special cases, so to indicate such instances, the combination of the two morphemes of *'-ma-b'* is used.

## 6. Negation in Conditionals Statements

### 6.1. Unless..not

To express 'unless..not' statements, the conditional morpheme *'-dáb'* is used, which remains attached to the verbal stem, carrying the negative morpheme with it. Probably, it is the sequence of the two morphemes of *'-má-dáb'*, which stands for the word, 'unless', in the language. This negative conditional morpheme is then conjugated to the conditioning verbal stem, like in (32), where it is suffixed to the verbal stem, *fill*, leaving the conditioned verb, to take just the negative suffix.

- |      |   |                           |                           |                         |                        |
|------|---|---------------------------|---------------------------|-------------------------|------------------------|
| (32) | ηο  | kepo-ηə                   | dəje- <b>mα-dáb</b>       | ηο                      | gorup- <b>rəm</b>      |
|      | 1p.s  | stomach-nom               | fill- <b>neg.rls-cond</b> | 1p.s                    | stand- <b>neg.irrl</b> |
|      | Unless my stomach is filled, I will not get up. |                           |                           |                         |                        |
| (33) | αciη-əm   | nu- <b>mα-dáb</b>         | ηul                       | də- <b>pi-rəm</b>       |                        |
|      | food-acc  | cook- <b>neg.rls-cond</b> | 1p.pl                     | eat-do- <b>neg.irrl</b> |                        |
|      | Unless the food is cooked, we cannot eat.       |                           |                           |                         |                        |

### 6.2. Negative Linker: Neither..nor

The negative linker 'neither..nor' links two negative clauses into one. Some languages use two different words always in pair to construct such sentences like in English. There are languages like Hindi, which uses a single negative



word, *nahi*, twice in a sentence to construct such sentences (Shopen 1985; Bhatia 1995).

Nyishi uses a slightly different strategy for such constructions. There are no negative linker words present in the grammar, and negation is expressed by '*má*' suffixed to the verbal stem but uses conditional markers/morphemes to construct sentences of the 'neither..nor' types. There are two ways which are employed for such constructions. In one case, the language has the single conditional participle '*lá*', meaning 'or' and 'and', which joins the two negative clauses into one as in (34).

(34)	ηo-gə	la	mi-gə	name	ogum-ho	do- <b>mα</b>	
	1p.s-gen	<b>or</b>	3p.s-gen	home	near-loc	be- <b>neg</b> .rls	
	Neither I nor her home is nearer						
(35)	sita	la	rita	okum-ho		ə- <b>pi-rəm</b>	
	sita	<b>or</b>	rita	party-loc		go-be- <b>neg</b> .irrl	
	Neither Sita nor Rita can go to the party.						
(36)	sita	<b>kəm</b>	rita	<b>kəm</b>	okum-ho	ə- <b>pi-rəm</b>	
	sita	<b>at all</b>	rita	<b>at all</b>	party-loc	go-be- <b>neg</b> .irrl	
	Neither Sita nor Rita can go to the party.						
(37)	ηo-gə	<b>kəm</b>	mi-gə	<b>kəm</b>	name	ogum-ho	do- <b>ma</b>
	1p.s-gen	<b>at all</b>	3p.s-gen	<b>at all</b>	home	near-loc	be- <b>neg</b> .rls

In the other case, they use the co-ordinating particle '*-kYm*' twice, one each with the two doers individually. '*-kYm*' conveys the sense of 'at all' in the grammar and tends to link the two clauses into one as in (36). In all these cases, it is the sole morpheme '*-má*', suffixed to the verbal stem, which expresses the sense of negation again.

## 7. Constituent Negation

Here again, the same negative morpheme '*ma*' is used for negating a given constituent, may it be a nominal phrase or a verbal phrase. As we have seen, that '*ma*' as a negative suffix attaches to the verbal root, so given the **verbal constituent** to be negated, '*má*' does as expected. For example, given two verbs in a sentence, if we wish to negate the former verb *buy*, Nyishi needs to suffix the negative morpheme to its verbal stem, as in (38), but if we have

to negate the latter action, then the negative suffix has to be attached to the latter verbal stem, irrespective of the ordering of the two verbs, in the sentence, as in (39).

- |      |  |                        |                     |                  |                     |
|------|--|------------------------|---------------------|------------------|---------------------|
| (38) | <i>mi</i>  | <i>acin</i>            | <b><i>rə-ma</i></b> |                  | <i>mə-pan</i>       |
|      | 3p.s   | food                   | <b>buy-neg.rls</b>  |                  | make-perf.rls       |
|      | He did not buy the food, but cooked (made).      |                        |                     |                  |                     |
| (39) | <i>mi</i>  | <i>acin</i>            | <i>rə-pan</i>       | <i>hebejekəm</i> | <b><i>mə-ma</i></b> |
|      | 3p.s   | food                   | buy-neg.rls         | but              | <b>make-neg.rls</b> |
|      | He has bought the food, but did not cook (make). |                        |                     |                  |                     |
| (40) | <i>mi</i>  | <b><i>ə-ma</i></b>     | <i>sija</i>         | <i>ə-tain</i>    |                     |
|      | 3p.s   | <b>go-neg.rls</b>      | now                 | go-irrl          |                     |
|      | He did not go, but will go now.                  |                        |                     |                  |                     |
| (41) | <i>ram</i>                                       | <b><i>ma</i></b>       | <i>sita</i>         | <i>hitap-əm</i>  | <i>ji-pan</i>       |
|      | ram  | <b>neg</b>             | sita                | book-acc         | give-perf.rls       |
|      | Ram not Sita gave the book.                      |                        |                     |                  |                     |
| (42) | <i>soma</i>                                      | <b><i>hitap ma</i></b> | <i>magjin</i>       | <i>bəa-pan</i>   |                     |
|      | soma   | <b>book neg</b>        | magazine            | bring-perf.rls   |                     |
|      | Soma brought not the book, but magazine.         |                        |                     |                  |                     |

On the other hand, when a given **noun constituent** is to be negated, say an object or a person, the negative morpheme, serving as a negative word, is placed after that specific noun constituent, for example, as in (41) ‘*ma*’ is positioned after *Ram* and in (42), after *book*.

### 8. Other Negative Words

As far as the common negative words, such as ‘no’, ‘never’, ‘without’, found in most of the world’s languages are concerned, once again Nyishi leans upon the negative morpheme ‘*ma*’. As stated, ‘*má*’ is the primary negative morpheme in Nyishi, having multi-purpose usage. Apart from the above uses of ‘*má*’, this negative morpheme is also used to serve the function of the word ‘no’ in the grammar, like in (43).

(43)	ma	ŋo	sija	ə-rəm
	no	1p.s	now	<b>go-neg.irrl</b>
	No, I will not go now.			

### 8.1. The Case of ‘Never’

In Nyishi, one specific word for ‘never’ does not exist but depending upon the type of verb in the construction, certain particles are used, which are followed by the morpheme ‘-kŷm’, meaning ‘at all’. ‘*icir-*’ is used with verbs like allow, talk.

(44)	ŋo	mi-əm	<b>icir-kəm</b>	ji-ŋi-rəm
	1p.s	3p.s-acc	<b>never prt-at all</b>	allow-do-
	<b>neg.irrl</b>			
	I can never allow this.			
(45)	rəhul	ŋul-əm	<b>lig-kəm</b>	
		logku-rəm		
	rahul	1p.pl-acc	<b>never prt-at all</b>	meet-
	<b>neg.irrl</b>			
	Rahul will never meet us.			
(46)	ŋo	sim	<b>hidlo-kəm</b>	ji-ŋi-rəm
	1p.s	this	<b>never prt-at all</b>	allow-do-
	<b>neg.irrls</b>			
	I can never allow this.			

Beside ‘*icir-*’, the other particles that are used to signify the sense of ‘never’ are ‘*lig-*’ (sing, run, meet). This is typical of the southern variety of Nyishi, for the choice of the ‘*never*’- particle seems to be pragmatically determined by the verb in a given instance. However, in the northern variety, they use the particle ‘*hidlo-*’ (meet, allow) for ‘never’ with all verbs, unlike the southern variety, as in (46). Apart from this, the language has the negative suffix, in the verbal stem in all cases, to complete the sense of negation, as in Hindi, Bangla and other Indian languages.

### 8.2. The Only Other Negative Morpheme: ‘*Apalaila*’ (*without*)

Though Nyishi uses the negative morpheme ‘*ma*’ in almost all the cases of negating a constituent, the exceptional case is of the word *without*, for which the lexicon has a separate word – ‘*ápálái*’ in the southern variety and ‘*ápá?láilá*’ in the northern.

(47)	mi	ɲul-ə <b>m</b>	<b>apalɔi</b>	bɔjar	<b>ən-ba</b>
	3p.s	1p.pl-acc	without	market	go-perf
	He went to the market without us.				
(48)	mi	ɲul-ə <b>m</b>	<b>apá?láilá</b>	bəjar	<b>əŋi-ba</b>
	3p.s	1p.pl-acc	without	market	go-perf
	He went to the market without us.				
(49)	əm	<b>apalɔi</b>	<b>tir-ŋi-mə</b>		
	fire	without	smoke-be-neg.rls		
	Without fire smoke cannot be				

### 9. Negative Polarity Items

For the expression of words for negative polarity items, such as ‘nobody’, ‘none’, ‘nowhere’, ‘nothing’, ‘wh’-words and affirmative items, followed by the morpheme ‘*-kYm*’, meaning ‘*at all*’ are placed in pre-verbal position. The use of ‘*-kYm*’ seems to be an essential requirement as is the use of ‘*b<sup>hi</sup>*’ in Hindi, for the very use of ‘*-kYm*’ and ‘*b<sup>hi</sup>*’ brings in the sense of the polarity sensitive item (Vasishth 1999).

However, for the sense of negation, the negative morpheme ‘*-má*’ is suffixed to the verbal stem as usual. Nyishi employs techniques similar to Indo-Aryan and other Indian languages for the expression of negative polarity words. Examples (50)-(51) illustrate the construction of such sentences and a list of the words of negative polarity in Nyishi is given in: (table 3).

(50)	ŋo 1p.s	roŋu-ho ground-loc	<b>hiyənə-kəm</b> <b>somebody-at all</b>	kα-mα see-neg.rls
I saw <b>nobody</b> at the ground.				
(51)	mi 3p.s	<b>huglo-kəm</b> <b>where-at all</b>	əs-do-mα roam-be-neg.rls	

Table 3 Negative Polarity Words		
English words	Nyishi morphemes	Polarity elements
None	<i>hiyə (who)</i>	<i>hiyə-kəm</i>
Nowhere	<i>huglo (where)</i>	<i>huglo-kəm</i>
Nothing	<i>hoggo (something)</i>	<i>hoggo-kəm</i>
Nobody	<i>hiyənə (somebody)</i>	<i>hiyənə-kəm</i>

### 9.1. The Use of ‘-kYm’

The use of ‘-kYm’ seems to be an essential requirement in those cases, where the sense of a negative word is partially reflected by some morpheme in the grammar, such that the semantics of these morphemes are insufficient in conveying the sense of negation completely, like in the cases of words like ‘nothing’, *nobody*, etc. as in (50)-(51) in §9 and also in §6 from examples (36)-(37) as in conditional statements and in the expression of other negative words, as in §8, such as for *no*, *never*, etc.

But the morpheme ‘-kYm’ is not used with the word ‘without’ where probably the sense of negation is fully specified in the word ‘*ápálái*’ / ‘*ápá?láilá*’, as in §8.2.

## 10. Negative Quantifiers, Comparatives and Questions

### 10.1. Negative Quantifiers

A common trend of expressing negation by negating the quantifier in a sentence is seen across languages. In the languages with pre-verbal negation, the quantifier is positioned beside the negative particle in a sentence. However,

in languages with post-verbal negation, a stress is applied on the quantifier to ensure the sense of negation on the quantifier (Bhatia, 1995).

This latter trend is what is visible in Nyishi as can be seen in sentence (52).

(52) **mɔlə** istuden-ə            so-ma  
**all**    student-nom    play-neg.rls  
 All students did not play.

(53) nalego ɲɲ-gə            do-ma-pan  
 many    people-gen            be-neg.rls-perf.rls  
 Not many people were present.

Irrespective of the type of quantifier, whether high-ranking quantifier or low-ranking, when greater emphasis is laid on the quantifier in a sentence, the quantifier stands to be negated in the grammar. Also a typical dialectal difference is visible in the use of negative quantifiers, which is the interchangeability of the position of the quantifier with that of the subject. In the northern variety, as in sentence (54), the quantifier follows the subject, while in the southern, the quantifier precedes the subject, as in (52), that is the quantifier is placed in the sentence-initial position. In the Minimalist Theory, this interchangeability of positions can be accounted for by raising the negative quantifier to some position, adjoined to spec TP, similar to that of AgrsP.

(54) himi **mɔlə-ŋe**    so-ma  
 child    **all-nom** play-neg.rls  
 All students did not play.

(55) ɲɲ    ma?ləŋ            do-ma-pan  
 people    many    be-**neg.rls-perf.rls**  
 Not many people were present.

### 10.2. Negative Comparative Sentences

As in other cases of negation in the grammar, so also for negating comparative sentences in Nyishi, a simple technique is used. The comparative morpheme 'than' in Nyishi is 'ya', to which when the negative suffix '-ma' is attached, it forms the resultant negative comparative morpheme 'yama', which means 'than not'. This morpheme follows the adjectival word in the given sentence to express negative comparative sentences.

- |      |                                       |            |           |                  |
|------|---------------------------------------|------------|-----------|------------------|
| (56) | ram-ətə                               | ab-ham     | ayo       | ya-ma            |
|      | ram-gen                               | father-acc | taller    | than-neg         |
|      | Ram is not taller than his father.    |            |           |                  |
| (57) | sita                                  | rita-nən   | ən-ɲa     | ya- <b>ma</b>    |
|      | sita                                  | rita-abl   | beautiful | than- <b>neg</b> |
|      | Sita is not more beautiful than Rita. |            |           |                  |

### 10.3. Negative Question Markers

A negative interrogative sentence employs an intonation, specially a rising tone, to mark it different from a negative assertive sentence in Nyishi, as in most other Indian languages. To express a negative question sentence, the verb, with the negative morpheme, suffixed to it, is uttered with the rising tone. It is simply the application of the rising tone on the verbal word, bearing the negative morpheme, in the sentence final position that marks the sense of question in a given situation, as in the case of 'yes-no' question sentences.

- |      |                             |                |      |          |
|------|-----------------------------|----------------|------|----------|
| (58) | mi                          | hac-ma         |      |          |
|      | 3p.s                        | arrive-neg.rls |      |          |
|      | Hasn't he arrived?          |                |      |          |
| (59) | solmoi                      | no-gə          | ga   | al-ma    |
|      | these days                  | 2p.s-gen       | body | well-neg |
|      | Aren't you well these days? |                |      |          |

### 11. Scope of Negation

The simplest way to check the scope of negation is to move the negative morpheme ‘*má*’ across a given sentence and note how the interpretation of the sentence changes each time, as we position the negative morpheme at various places in the sentence. Basically, the negative morpheme ‘*má*’ scopes over the word or the morpheme, which it follows or is attached to as a suffix, respectively. As such, it has a narrow scope in the grammar – scopes over the element or word in question only.

If suffixed to the verbal stem, ‘*-má*’ negates the verbal action in question. Like as in (60), when ‘*-má*’ is suffixed to the verbal stem *bring*, it negates the action of bringing. Similarly, if the negative suffix ‘*-má*’ is suffixed to the verbal stem ‘read’, it negates the action of reading the book, now as in (61), and not the earlier action of bringing.

When ‘*ma*’ follows a nominal element, the latter gets negated, irrespective of the fact that the concerned nominal is the subject or the object in the given sentence. In (62), ‘*má*’ is placed after ‘book’ and the sentence is interpreted as ‘there was certainly an action of bringing something, but definitely not ‘books’’. On the hand, if we move the negative morpheme further and place it just after the subject *Sitá*, the sentence is now interpreted as ‘Sita did not bring the book bur rita brought it’. Here, the use of ‘*hebejekYm*’ is optional in such a sentence, that is to say, irrespective of the presence or absence of ‘*hebejekYm*’ in the sentence, the sentence would mean the same as in (63).

(60)	sita	la	rita	hitap	pori-pan	bəα-mα-pən
	sita	and	rita	book	read-perf.rls	<b>bring-neg.rls-rls.perf</b>
	Sita and Rita have read, <b>not brought</b> the book.					
(61)	sita	la	rita	hitap	<b>pori-mα-pən</b>	bəα-pən
	sita	and	rita	book	<b>read-neg.rls-perf.rls</b>	bring-rls.perf
	Sita and Rita have <b>not read</b> , (but) brought the book.					



(62)	sita	la	rita	hitap-əm	<b>ma</b>	<b>bəa-pən</b>
	sita	and	rita	book-acc	<b>neg</b>	<b>bring-rls.perf</b>
	Sita and Rita have <b>not</b> brought <b>the book</b> .(but something else, other than book.)					
(63)	<b>sita</b>	<b>ma</b>	hebejekəm	rita	hitap-əm	bəa-pən
	<b>sita</b>	<b>neg.rls</b>	but	rita	book-acc	bring-rls.perf
	Sita not, but Rita have brought the book.					
(64)	<b>ma</b>	sita	la	rita	hitap-əm	bəa-pən
	<b>neg</b>	sita	and	rita	book-acc	bring-rls.perf
	No, Sita and Rita have brought the book.					

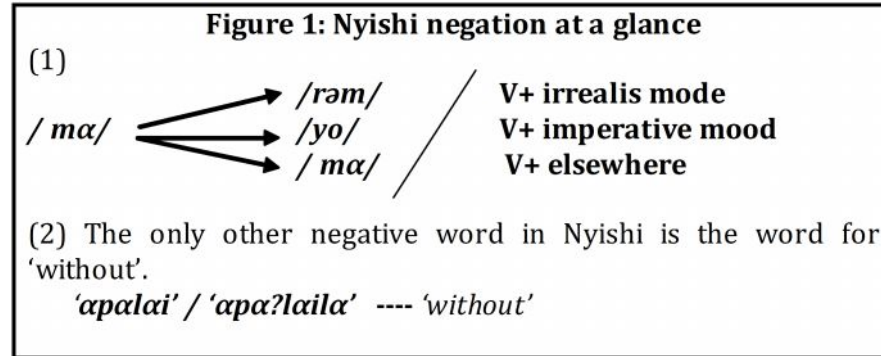
In all these cases, the negative morpheme, whether it functions as a negative suffix as in (61) or as a negative word as in (62), always follows the constituent it scopes over, thus, has a narrow scope over it. Finally, as in (64), when ‘*má*’ is placed in the sentence initial position, the sentence gives the meaning in affirmation, that is, it means ‘Sita and Rita have definitely brought the book’, and there is possibly no chance of denying the fact. Thus, ‘*má*’ scopes over the entire sentence in this case, negating the proposition.

## 12. Conclusions

The semantic diversity of ‘*má*’ in Nyishi is such that a single morpheme can negate anything and everything in the grammar. It can negate any activity or proposition in the language. It is the same morpheme ‘*má*’, which functions as a negative suffix and as a negative word, as per the need, thus having a wide and varied semantic range. Thus the morpheme ‘*ma*’ has three allomorphs, as illustrated in figure [1].

The only other negative morpheme in the grammar happens to be for the word ‘*without*’, beside the special case of ‘*never*’.

Negation in Nyishi can be summed up in the following way: there are two basic negative morphemes:



Thus it is the negative morpheme 'ma' that functions as the standard negative marker, negating words and constituents as a negative word; negating tense, aspect and mood as negative affix, and also negating comparisons and quantifiers, as a negative particle. Thus, the negative morpheme '-ma' is a poly-functional morpheme in the Nyishi.

### Notes

<sup>1</sup> Abraham (2007) illustrates the phonological and lexical similarities of the pronominals of as many as seven Tani languages, including Nyishi, Tagin, Galo. (pp. 188-189.)

## Menstruation Pollution Taboos and Gender Based Violence in Western Nepal

PRAKASH UPADHYAY\*

### Abstract

*Menstruating women practicing Chaupadi (Menstrual pollution taboos practice) in western Nepal are banished from home, restricted to eat nutritious food, treated as untouchables to partake in social activities under the constant fear of disasters in the family if this tradition is breached. Supported by Hindu religious, cultural and orthodox patriarchal gender norms of womanhood, this tradition has negatively influenced human rights, health and safety of women and has augmented the process of gender based violence in Nepali society.*

**Keywords: Ritual Pollution, Violent practice, Patriarchal**

### Introduction

The biological and social-cultural comprehension of issues and problems embedded with gender and sexuality differs according to societies and cultures. Social-cultural norms and practices explaining gender and sexuality are deeply entrenched in every level of society, and frequently influence the human rights, the decisions of legislative and judicial bodies, law enforcement, and health care services. Human rights initiatives have increasingly encompassed sexuality, gender, and issues surrounding these topics (FWLD, 2007). However, the problem of menstruation discriminations remains grim because all societies do not treat menstruation as natural biological phenomena because of the perceived ritual uncleanness of menstruation. Anthropologist Douglas (1966) argues that the concept of *Pure* and *Ritual uncleanness* (impure) exists in every society and pollution beliefs can be of relative categories. What is clean in relation to one thing may be

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\*Prakash Upadhyay (prak-socio@hotmail.com) is an Associate Professor in Anthropology, Tribhuvan University, Pokhara, Nepal.

unclean in relation to another and vice versa. For example, in many cultures common pollution beliefs is that menstrual blood is polluting hence menstruating women are debarred from various kinds of social and religious activities. Linked with numerous misconceptions, myths, superstitions, ill practices and even celebrations throughout different societies, menstruation, in practice is more social and cultural than a biological process. Sociologist Durkheim (1898) argued that human religion in its entirety emerged originally in connection with menstruation and a flow of blood periodically ruptured relations between sexes. As it is terrible hence all sorts of cultural taboos are instituted to prevent contact with it. During menstruation, females would exercise a type of repulsing action which keeps the other sex far from them.

In her study on rural Hindu women from a village in Tamil Nadu India, Kapadia (1995) assert that though the women in South India have more power and higher status in comparison to the North which is severely patriarchal, still the menstruating women in South India are considered filthy and are alienated from the rest of her family, by prohibiting physical intimacy. She rejects conventional claims that the villages are characterized by a deep-seated cultural consensus shaped by dominant groups. Her argument was that oppressed women groups produce distinctive cultural representation to create for themselves a normative world in which they have dignity, self-respect and power. Contrary to this, in the name of menstruation pollution, Hindu high caste Brahmin-Chhetri women and girls in many remote Hindu villages of Nepal are exposed to a variety of forms of violence (SAATHI, 1997; WOREC, 2002; Deuba et al. 2005; Puri et. al., 2012). Owing to bizarre practices and taboos of menstruation, women live undignified, disrespectful and powerless lives and are subject to violation of human rights, numerous gynecological and infection problems. Bennett (1983) in her study on Hindu women of Nepal looks at the ways in which the social and symbolic roles of high-caste (Brahmin-Chhetri) Nepali women combine to define their position in patrilineal Hindu society. She delineated the themes of cultural opposition and provided the framework of analysis- purity versus pollution, asceticism versus fertility, articulated through the symbolic conception of female body and female reproductive process. Ingrained in the concepts of purity versus pollution, menstrual stigma and taboos are manifestations of wider gender and social relations. Though menstruation is natural, it becomes the subject of various religious, cultural and gendered discriminative norms concerning purity, decency, responsibilities, taboos and stigma that manifest in the loss of gender rights and human lives.

Entrenched in values of asceticism and purity, menstrual taboos practice known as *Chaupadi* (in local lexis) hut practice, is prevalent in far west and some parts of mid-west region in Nepal in Achham, Bajura, Kailali, Doti, and Bajhang districts (administrative division) among all castes and groups of Hindus; more severe among the Brahmin and Chhetri castes. Menstruating females in these districts are considered impure ritually. It is believed that the gods and goddesses become infuriated if a woman stays at home during menstruation. Under this belief women and girls are considered as impure and polluted during their period of menstruation and child birth and prohibited to live inside the home and kept out of touch and face various social restrictions. There is a legend related to its origin. According to Hindu religious myths, *Indra*, the King of Heaven was accused for his sins viz. killing a Brahmin (High caste Hindu) and having illicit sexual acts with women during his quest. Hence, to repent his sin, all women were said to be punished through menstruation and menstrual taboos.

Despite a ban imposed by the Supreme Court of Nepal on *Chaupadi* in 2005 and the Ministry of Child and Social Welfare's guidance in 2008 and strict laws to eradicate *Chaupadi*, this practice endures. In recent years Nepal has witnessed drastic political changes -people's movement for multi-party democracy and democratic constitution of 1990, Maoist insurgency and popular movement of 2006, state transformation into democratic republic, Constitutions of 2006 and 2015 - that ensured equal rights to all citizens. However, large bulk of female population from remote regions still survives in nastiest conditions during menstruation despite all changes. Baskota et al. (2001) argued that Nepali Maoist models for women's empowerment negotiate between overarching Maoist ideologies and the existing particularities of gender discrimination in Nepali society. However, there are noticeable gaps between rhetoric and practice. The fundamental changes in gender relations that the Maoists assert may not be the intentional result of their policies, but rather the largely consequences of the conflict that emerge in relation to the existing socio-cultural practices and forms of gender discriminations.

Uprety and Bhandari (2010) argue that among all the cultural practices that oppress Nepali women, none is as degrading as the *Chaupadi* culture. This practice has negatively affected health/reproductive health and safety of adolescent girls. *Chaupadi* is one of the reasons for increasing cases of uterus prolepses and poor reproductive health of women and girls. This practice directly affects adolescent girls and women as well as their children because women bring their babies to the *Chaupadi Goth* (huts/sheds) where they

have to stay during their menstruation. As the powerless, meaningless, entrenched, callous and voiceless condition of women is reflected in *Chaupadi* tradition hence, the issue of *Chaupadi* is needed to be studied to look at the situation of women from the vantage point of human rights, health and safety in a region which is extremely remote and socially and economically very least developed. Hence, the prime objective of this paper is to explore how the notion of menstruation pollution in the form of *Chaupadi* hut practice has augmented the process of gender based violence in patriarchal culture of discrimination and how this has impinged on the human rights, health and safety of women in Far-West Nepal.

Methodologically, the study takes a qualitative approach. Fieldwork took place in Bhagyaswori Village Development Committee (VDC) a remote rural hilly village with 242 households and a population of 1091. This village is located in Achham district which is a hilly district of Far-Western Development Region (FWDR) in Far-West Nepal where *Chaupadi hut* culture practice is deeply rooted. Achham district, a part of *Setizone* which is one of the fourteen zones of Nepal, with its district headquarters at Mangelsen, is one of the 75 districts of Nepal. This district is one of the remotest, backward and least developed districts of Nepal in terms of human development indicators and ranks 72<sup>th</sup> position in overall composite index, 74<sup>th</sup> in poverty deprivation index, 75<sup>th</sup> in socioeconomic and infrastructural index, and 68<sup>th</sup> in women's empowerment index and 73<sup>rd</sup> in gender discrimination index out of 75 districts of Nepal. The district accounts high discriminatory practices (*Chaupadi* hut practice) against women during menstruation and therefore has been chosen as study district. According to Achham District Women's Development Officer, more than 95% women in this district are practicing discriminatory *Chaupadi* practices despite the Awareness Programme and legal measures against *Chaupadi*.

This study uses qualitative descriptive study design in which women aged 15-49 within the reproductive age was the universe of the study. At the first stage of sampling, household listing was done to identify the eligible respondents within the designated area. After household listing, 190 women were found eligible. At the second stage, 32 Brahmin and Chhetri castes women (22 married and 10 unmarried) (17.0 percent of universe) were selected randomly as an ultimate sample for the study on the ground that menstruation pollution is more severe in these two Hindu groups. Only one woman from each household was chosen for interview. All respondents were requested to share feelings, experiences and practices since their menarche

to the date of survey. Data was collected by semi-structured individual interview (both closed and open-ended questions). Closed ended questions were used for the collection of household and individual information, while open ended questions were used to understand the menstrual practices. Three types of techniques: *case study*, *key informant interview* and *participant observation* were used to gather information. The measure of reliability was obtained by administering the same test twice over a period of time to the respondents. The scores from Time 1 and Time 2 were correlated in order to evaluate the test for stability over time. Physical condition of menstrual (*Chaupadi* hut) and the activities performed during menstrual period was studied through participant observation. Using a panel of key informants familiar with the construct was the way in which the validity was assessed. Out of 32 sampled women, 6 women participated for case study. Four key informants- school teacher, leader of women rights group, local health worker and Hindu priest were selected. The key informants were selected on the principles that most members of any society do not know the full repertory of forms, meanings and functions of their culture as claimed by Sjoberg and Nett (1968). As such, key informants, as a result of their personal skills, or position within a society, are able to provide more information and a deeper insight into what is going on around them.

The field work for data collection was accomplished during October 1-24, 2016. The ease of access of the researcher to the field was difficult with tedious walk of hours (in rugged hills) from the district headquarters Mangelsen. There were various difficulties and challenges in carrying out interviews about such socially legitimate but legally illicit *violent practice*. The first challenge was to face and accept this *new* reality. Two local females and one male were chosen as research assistants for collecting field data. There were different gender challenges involved in carrying out fieldwork. In this part of the world, usually every morning and evening, men folk used to gather at local tea stalls for gossiping on current local issues and for sipping tea, and cultural norms are such that women of good character are expected to shun this. Such patriarchal notion of avoidance from males are taught and socialized to a girl child even before her marriage. These notions are not contested out of fear of disgrace, esteem loss, or because of internalization of these norms. These norms restrict women mobility and their interaction. Due to such norms young unmarried girls and brides virtually pulled out from interview sessions at first, but they were convinced by the research assistants. Understanding the local language was a problem which was solved with the

help of research assistants. Ethical approval in the form of verbal consent was obtained from each respondent before administering the interview and each respondent was convinced of the confidentiality of the identity of the respondents.

### **Menstrual Pollution as Gender Based Violence: Paradox of Powerful Goddess vs. Feeble Women**

According to the population census of Nepal 2011, there are 26.5 million Hindus (81.3 percent Hindu), out of which 48.5 percent are male and 51.5 percent female. Despite this huge percentage of female population and gender rights embarked in Constitution, Hindu religious norms and taboos constrain the activities of women and there is often overt discrimination against the women. The unscientific practice of *Chaupadi* prohibits menstruating Hindu women in Bhagyaswori village to enter the house. They reside in *Chaupadi* huts for nine days when an adolescent girl has her first period, and five days for every following one. Menstruating females cannot enter or reside inside houses, and are not allowed to enter kitchen, temple, touch other person, livestock, green vegetables and plants, or fruits.

There are altogether 45 *Chaupadi Goth* or sheds/huts in the study area. Fourteen huts were randomly selected to observe their physical conditions. These mud-walled huts about twice the size of a standard doghouse are outbuildings far from their homes (20-25 meter far) aside of cow/buffalo sheds. Huts are in the form of small size rooms. Many of the huts are dilapidated, narrow, tight and congested. The mean length, breadth and height of the huts were 208.6 (SD± 54.5), 130.9 (SD± 30.1) and 125.4 (SD±21.6) centimeters respectively. There was no door in many huts and they were open. In those huts with doors, the average size of door was very small. Neither of the huts had a single window and any means of ventilation. Almost all huts were not only unfit for human dwelling in terms of their physical condition, but also unhygienic and unsafe. Due to small size, the women were unable to sleep comfortably. During rainy seasons, water seeps from the roof of the huts. On an average, about four menstruating women were compelled to be sheltered within each hut because there are only 47 *Chaupadi* huts for 242 households. Under the constant fear of rape and assaults by drunkards, attack of wild animals (leopard, fox, wolf), snake and scorpion bite, women prefer staying in group for safety. A school teacher (key informant) informed that few *Chaupadi* huts were destroyed under the pressure of Maoist insurgents during more than a decade long Maoist



insurgency (1994-2006). However, in many cases elderly women following the suggestions of local priests built the huts and started using them again.

**Menstruation, Fear of Gods and Religion:** Historically *Chaupadi* is integral to practice of Hinduism in Nepal that defines the idea of femininity and woman's role and responsibilities within the home. All women are supposed to possess four basic virtues: faithfulness, purity, domesticity, and submissiveness. Menstruation as a tradition insists faithfulness on the part of menstruating women by obediently following the *Chaupadi* traditions without questioning its consequences. In Hindu pantheon, goddesses are regarded powerful and pure. Regarded as the root cause of creation, sustenance and annihilation, they are pure power (referred to *Shakti* in Hindu religious texts). It is believed that if the menstruating women touch sacred things and ascetic persons, then it brings disaster in the community. Religious prohibitions made the women believe from their teenage that if they fail to follow their monthly restrictions, the community has to face calamities, animal attacks, crop failures and droughts.

**Menstruation and Prohibitions:** Menstruating women were restricted to drink milk or eat milk products. Cows are regarded sacred and venerated in Hindu religion as mother goddess hence menstruating women are prohibited to touch them. The women practicing *Chaupadi* can only bathe or wash clothes in a *Chaupadi dhara*- which is separate well, stream or small rivulets near the village. Their access to water taps and wells is strictly restricted. They should only eat flatbread with salt, are deprived of nutritious food during periods and are not allowed to eat together with family members. The health implications of *Chaupadi* are severe. There is neither registered physician nor medicine in the Health posts. In the cases of snake and venomous scorpion bites, menstruating women have high chance of death because social taboo hinders their fast treatment keeping out them from people's touch. However, nowadays, owing to raising awareness and strict legal provisions against *Chaupadi*, in critical cases of illness or serious cases, now they are allowed to move outside and touch other people. They cannot read or write during their menstruation. It is the belief that *Saraswati*, the Hindu Goddess of education will be infuriated if women read, write, and touch books or go to school during her menstruation period. She is supposed to remain within the premises of *Chaupadi* hut. This domesticity results in girls' attendance at school being interrupted, increase the gap between girls and boys in education and augment discriminations over the long term. Many women employee miss offices five days every month during their menses. Women who rebuff

the custom must adhere to it because it's firmly entrenched in their patriarchal society and a violation is implausible.

**Menstruation and Patriarchy:** Dhakal (2008) argues that the Gender Based Violence (GBV) rooted in *Chaupadi*, is driven by social, cultural, religious and gender norms compounded by years of political conflict which has increased the risk of insecurity and violence. Menstruation subjects the women to a sort of imprisonment and banishment. This maltreatment of women is rooted in a patriarchal culture of discrimination that denies women equal status with men. Prevailing local social, cultural and Hindu religious norms identify women as the chattels of men, relate women's chastity with family reputation and hence legitimize discriminatory violence against women. Under the *Chaupadi* hut tradition, menstrual women are not allowed to attend to any guest and their movements inside and outside the home are restricted. Entrenched in patriarchic yokes, the women and girls spend all time for household chores that restrain them from getting education and awareness against *Chaupadi*. Nearly 89 percent respondents said that very few opportunities exist for them to obtain information and acquire skills and knowledge to fight against this inhuman tradition. Because of the patriarchal values that they have imbibed, even the elderly women, especially mother, mothers-in-law and elderly aunts compel the young women to follow *Chaupadi* practices strictly. If they dare to shatter the tradition, they are ostracized by the family and village.

**Consequences of Chaupadi Practices:** Based on her research on *Chaupadi* hut practice, Robinson (2015) has testified that during the winter in the mountain villages of Nepal, temperatures at night drop below freezing point. About 92 percent of women respondents claimed that there are often cases of women becoming critically ill owing to the horrific conditions of *Chaupadi* sheds where menstruating women are subjected to the cold extremities (heavy blankets are restricted) and dangerous risk of various infectious diseases. It was reported that out of 32 women, 9 married women suffer from prolepses. One key informant (local health worker) informed that poor nutrition during menstruation, lack of care in pregnancy and delivery are responsible for such cases. Many women and young girls die due to health problems caused by sleeping in dirty, cold conditions. Exposure, increased vulnerability to wild animals and snakebites, and higher risks of rape are just a few dangers faced by women practicing *Chaupadi*. There are also cases where the women become feeble because of diarrhea and respiratory diseases and also malnutrition. Of the menstruating females are

forced to wear strained unwashed cloths due to the lack of awareness on the use of sanitary pads.

Occasionally, they become victims of wild animals, snakes and scorpion bites. Alcoholics sometimes enter *Chaupadi* sheds secretly and sexually abuse, even molest the women staying there. Such incidents are hardly ever reported due to social stigma and women are the *silent sufferers*. Throughout the menstrual banishment period women are proscribed from involvement in cultural rituals. Eighty-eight percent women said that they do not attend any cultural ceremony as guest during menstruation. Likewise, 12 percent respondents reported that only in urgent cases they attend secretly and return back immediately. Of the respondents, 91 percent say that while practicing the *Chaupadi*, they experience the feelings of diffidence, insecurity, guilt and humiliation, as well as sadness and depression.

### **Conclusion**

The government of Nepal has legally banned the practice of *Chaupadi*. Still due to factors like ignorance, superstitions, cultural norms and remoteness of the region, the practice is prevalent in different parts of Nepal. Religious and cultural meanings emanating from Hindu notions of pollution and purity have shaped the local society and the lives of menstruating women. Embedded within the religious notions of the virtues of womanhood-faithfulness, purity, domesticity, and submissiveness, the *Chaupadi* tradition insists on faithful adherence on the part of menstruating women to the conventions of *Chaupadi*. The practice has negatively influenced health, safety and human rights of women and has augmented the process of gender based violence in Nepali society.

With firmstate laws against *Chaupadi* and raising awareness of common village folks against the malevolence of this tradition, the attitudes regarding *Chaupadi* regulations are gradually changing, but this barbaric tradition continues to subsist in some form due to religious sanction. Hence, apart from the strict enforcement of the laws, peoples' awareness and resistance are essential to eliminate *Chaupadi*. Elimination of this tradition requires educating the local communities of the physical and psychologically detrimental effects of this practice. People's attitude (especially the women's attitudes) and beliefs need to be changed through education and awareness. Solutions lie in communication with the younger generation and empowerment of the women. Alongside legal and ethical awareness and enforcement at both micro (local) and macro (national) levels, it is necessary to impart

education and awareness about female biology, reproductive health and vulnerabilities of women during menstruation and delivery. Only when the empowered women realize menstruation as a normal organic phenomenon, this practice will subside easily.

## References

- Banskota, Amrita et al. 2001. 'Where there are no men: women in the Maoist insurgency in Nepal,' in R.Manchanda(ed.), *Women, War and Peace in South Asia*, Sage Publications, New Delhi: 26-33.
- Bennett, Lynn 1983. *Dangerous wives and sacred sisters: Social and symbolic roles of high-caste women in Nepal*. Columbia University Press: 13-29.
- Central Bureau of Statistics. 2011. *National Population and Housing Census (NPHC)*, Vol. 2, Kathmandu, Nepal.
- Deuba, A.R. & P.S. Rana 2005. 'A study on linkage between domestic violence and pregnancy'. ASAMANTA- Institute for Social & Gender Equity, Kathmandu, Nepal.
- Dhakal, S. 2008. 'Nepalese women under the shadow of domestic violence', *Lancet*, (8):71:79.
- Douglas, Mary 1966. *Purity and danger, an analysis of the concepts of pollution and taboo*. Routledge, New York: 21-46.
- Durkheim, Emile 1898. *Incest: The nature and origin of the taboo*. Stuart, New York: 48-70.
- Forum for Women Law and Development (FWLD). 2007. *Women and Sexuality in Nepal: A Study Report*. Kathmandu: 138.
- Kapadia, Karin 1995. *Siva and her sisters: Gender, caste and class in rural India*. Boulder Westview, Colorado: 57-86.
- Nepal Human Development Report (NHDR) 2015. *Beyond Geography, Unlocking Human Potential*. National Planning Commission, UNDP, Kathmandu.
- Puri, M., Forst, M, Tamang, J. Lamichhane, P. and Shah, I. 2012. 'The prevalence and determinants of sexual violence against young married women by husbands in rural Nepal', *BMC Research Notes*, 5, Kathmandu: 291.
- Robinson, Hannah 2015. 'Chaupadi: The affliction of menses in Nepal', *International Journal of Women's Dermatology*, (1):193-194.
- SAATHI. 1997. 'A situational analysis of violence against women and girls in Nepal'.

The Asia Foundation.[http://saathi.org.np/uploads/images/reports/VAWG\\_and\\_girls\\_nepal.pdf](http://saathi.org.np/uploads/images/reports/VAWG_and_girls_nepal.pdf), accessed on 17/10/2011.

Sjoberg G, Nett R. 1968. *A Methodology for Social Research*. Harper and Row: 6-23.

Uprety, A and Bhandari, R. 2010. 'Midterm review of Chaupadi Elimination Project in Achham. Kathmandu', Save the Children: 46.

Women's Rehabilitation Centre (WOREC) 2002. *Breaking the silence: needs identification of victims of gender-based violence*, Kathmandu, Nepal.



## Knowledge of ICT and Computer Proficiency in College and University Teachers: A Survey

KUHELI BISWAS DAS\*, QUENDARISA KHARBULI\* & BAPHIMON RYNJAH\*\*

### Abstract

*The purpose of this paper is to describe trainee teachers' ICT literacy and computer proficiency. Data is collected through questionnaires administered to 475 Assistant Professors and Assistant Librarians who attended Orientation Programmes and Refresher Courses conducted by the UGC-Academic Staff College, North-Eastern Hill University, Shillong during the academic session 2011-2012; Data obtained was statistically analysed. Findings from this study contribute to our understanding on their computer proficiency and competencies and required institutional support, etc.*

**Keywords: Academic Staff College, ICT, Assistant Professors, Assistant Librarians, Higher Education**

### Introduction

In higher education, where technological innovations have transformational impact on teaching and learning, the increased technological literacy among faculty is of central importance (Mayberry et al., 2012; Zarei, et al., 2014). It is seen that computer-based systems have great potential for generating teaching and learning resources. The rapid development of Information and Communication Technology (ICT), particularly the internet, is one of the most fascinating phenomena characterizing the Information Age (Sarkar, 2012). The emancipatory and transformative potentials of ICT in higher education in India have helped increase the country's requirement of higher education through part-time and distance-learning schemes. ICT

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\*Kuheli Biswas Das and Quendarisa Kharbuli are in UGC-Human Resource Development Centre, NEHU, Shillong.

\*\*Baphimon Rynjah, Deputy Registrar (Academics), in NEHU, Shillong.

has the potential to remove the barriers that are causing the problems of low rate of education in any country. It can be used as a tool to overcome the issues of cost, less number of teachers, and poor quality of education, as well as to overcome time and distance barriers (McGorry, 2002). By its very nature, ICT calls for innovation and it is about exploiting the full capabilities of technology to open new perspectives for teachers. Success of ICT-based education depends upon the teacher's ability to keep pace with the developments since teachers are responsible for quality control, improvement of learning and the aggregate effectiveness of the learning process (Balasubramanian and Clarke-kah, 2009).

The importance of teachers' ICT capabilities has been recognized in a variety of countries, with many researchers arguing that "Teachers need to be able to handle the technology with confidence" (Preston, et al., 2005). One of the main rationales for the development of teachers' ICT-related capabilities is the improvement of students' learning outcomes and the enhancement of their ICT literacy (Markauskaite, 2007). There is a continuing debate on the balance between teachers' confidence with ICT as a technology and teachers' confidence with ICT as a tool for enhancing the quality of teaching and learning in their subject. Various studies on trainee teachers have shown that a very high proportion enter universities being already competent and confident ICT users (Albion, 2001; Simpson, et al., 1999). However, other studies have demonstrated that the level of the technical capabilities to use ICT is highly overestimated (Forster, et al., 2005; Taylor, 2003; Watson, 1997).

The history of using computer technology for learning is replete with promises and disappointments (Rosenberg, 2001); computer technology has not fulfilled its potential to bring significant and desirable changes in education (Ginserb and McCormick, 1998), and remains mostly underutilised, as it has not been implemented in appropriate, effective and creative ways.

### **Objectives:**

The present study undertaken through a survey, seeks to gain insight into the teacher's perception of integration of ICT in their professional development. The objective of our study is to:

- a) understand the general awareness amongst teachers about ICT in general and their capabilities in using ICT in teaching-learning.
- b) examine the institutional support provided to teachers in adopting ICT in their professional development.



**Methodology:**

A survey questionnaire was designed and prepared (Keengwe and Anyanwu, 2007; Gallivan, et al., 2005) to collect primary data pertaining to our study. The first section of the questionnaire included demographic information. The second section consisted of questions for assessing the degree of computer related capabilities, and the third section consisted of questions for assessing the ICT awareness and its integration in instructions to enhance students learning. The data obtained in the study were analyzed statistically.

The questionnaires were distributed to 488 Assistant Professors and Assistant Librarians from almost all states of the country, who attended the Orientation Programmes (OPs) and Refresher Courses (RCs). Altogether five OPs and fifteen RCs (in Library and Information Science, Hindi, Education, Botany, Economics, Geography, Political Science, History, Commerce, Zoology, Philosophy, Tribal Studies, Mathematics, English and Chemistry) were conducted by the University Grants Commission (UGC)-Academic Staff College (ASC), North-Eastern Hill University (NEHU), Shillong during the academic session 2011-2012. Of the 488 surveys distributed, 475 completed surveys were received, yielding a response rate of 97%.

**Results and Discussions:**

The descriptive statistics performed on the demographic information for the six variables i.e. gender, age, category, designation, qualification and nature of appointment were obtained in percentage. In the OPs there were 61.27% male and 38.73% female participants, whereas in the RCs there were 59.68% male and 39.68% female participants, between the age group of 25-55 years (Table 1; Fig. 1a). It was observed that for both OPs and RCs most of the participants belonged to the Scheduled Tribe (ST) category, followed by General (Gen), Other Backward Classes (OBC) and Scheduled Caste (SC) respectively (Table 1; Fig. 1b). The majority of the respondents in both OPs and RCs are teachers in the level of Assistant Professors who were appointed on a regular basis and having a minimum qualification of Masters Degree (P.G) (Table 1; Fig.1c).

Information on computer related capabilities of the respondents are represented in a tabular form (Table 2 and 4), and through bar charts (Fig. 2). We find that, respondents who owned a computer were 89.60% for OP, and 85.71% for RC, whose purpose of use was mainly for MS-office, internet and others (Table2; Fig. 2a, b). A significant difference was observed in users for MS-office between participants who attended the OP and RC as

indicated by t-value equal to 3.48 at  $p < 0.05$  (Table 4; Fig. 2b), suggesting that there are more MS-office users amongst the OP participants, than in the RC. Similarly, there is a significant difference in the number of users for internet between OP and RC respondents, whose t-value equal to 2.91 at  $p < 0.05$  (Table 4; Fig.2b), suggesting the same trend as above. The use of internet for mailing purposes, downloading documents and research work between OP and RC respondents, also shows a significant difference at t-value equal to 3.41, 3.09 and 2.86 respectively and  $p < 0.05$  (Table 4), indicating that participants of OP utilize the internet more for the above three reasons, as compared to the participants of RC. The amount of time spent on the internet i.e. <30 minutes, between 30-60 minutes, and >90 minutes, is found to be almost similar between the participants of the OPs and RCs (Table 2). However, a significant difference is observed at t-value equal to 3.48 and  $p < 0.05$  (Table 4.) on the amount of time spent for the 60-90 minutes duration (Table 2), indicating that participants of the OPs spent more time on the internet as compared to the other group. The result obtained for duration of use of internet (Table 2; Fig. 2d) more or less supports the results obtained for amount of time spent on the internet showing that there is not much difference between the two groups, for the four responses i.e. Every day, Several times a week, Several times a month and Rarely. As indicated in Table 2; Fig. 2e, the comfort level in using the computer or internet is almost similar between the participants of OPs and RCs, and from their responses it is clear that they were excellent as well as satisfactory in their comfort level for using computers. However, a significant difference was observed between the participants of OPs and RCs, in their response to good comfort label at t-value equal to 3.53 and  $p < 0.05$  (Table. 4). From the mean value, which is also the highest as compared to all the three responses i.e. excellent, good and satisfactory we can conclude that participant of OPs are more comfortable in using the computer or internet, when compared to the participant of RCs (Table 4).

Information on ICT awareness and the integration of ICT in teaching are represented in a tabular form (Table 3 and 4), and through bar charts (Fig.3). As seen in table 4, a significant difference was observed between the participants of OPs and RCs, in the manner in which knowledge was acquired in using ICT. We find a t-value of 4.76 and  $p < 0.001$  for knowledge through IT training, a t-value of 3.30 and  $p < 0.05$  for knowledge acquired by self-instruction, and at t-value of 2.82 and  $p < 0.05$  for knowledge acquired from work place, respectively. It is very much evident from the results that

in both groups (OPs and RCs), majority of the participants acquired knowledge on ICT by self-instruction (Table 3; Fig. 3a)

Also, a high significant difference is observed at t-value of 4.71 and  $p < 0.01$ , for the role played by ICT in making professional work easier between the participants of the OPs and RCs (Table 4; Fig. 3b). It was also observed, that there is a significant difference at t-value equal to 2.75 and  $p < 0.05$ , in the number of participants using ICT for preparing reading material (Table 3 and 4). Similarly, there is a significant difference in the number of participants using ICT for making Power Point presentation for lectures between participants of the OPs and RCs at t-value of 3.83 and  $p < 0.05$  (Table 3 and 4). These results certainly indicate that participants of OPs are more aware of ICT and more proficient in using it in their professional development. We also find a high significant difference at t-value of 4.40 and  $p < 0.001$ , between the responses of OPs and RCs participants, in the role of ICT in the world of teaching with respect to revolutionizing teaching profession (Table 3 and 4; Fig. 3c). There is also a significant difference between the participants of the OPs and RCs, in the response that the implementation of ICT awareness in the college or university is satisfactory at t-value of 5.10 and  $p < 0.001$  (Table 4; Fig. 3d). The results obtained in Table 2 and Table 3 for their response on Place of internet access; Rating ICT awareness in college/university; and Lack in their use/implementation of ICT in teaching, strongly points out that the Institutional support in ICT is not satisfactory, as also indicated by Ginserb and McCormick, 1998. Furthermore, a very high significant difference in the response of the participants of the OPs and RCs was observed at t-value of 4.33 and  $p < 0.001$ , for the awareness courses conducted on ICT by the Academic Staff College, NEHU (Table 3 and 4), thus indicating strongly that sessions on ICT were conducted more in the OPs than RCs. Both the participants of the OP and RC agreed that ASC should conduct more awareness courses on ICT.

### **Conclusion**

In conclusion, we can say that the present work based purely on the responses received from the respondents, strongly indicate that participants of the Orientation Programmes are more competent and confident ICT users than those of the Refresher Courses. Various studies on trainee teachers have shown that a very high proportion who enter universities are already competent

and confident ICT users (Albion, 2001; Simpson, et al., 1999), while some researchers argue that trainee teachers enter teacher education programs with variable computer skills (Drenoyianni, 2004) and some trainees' confidence and ICT expertise stop at the level of basic technical skills (Watson, 1997). Since participants of Orientation Programmes are mostly new entrants, in the age group of 30-40 years, we can probably class them as digital natives in comparison to the participants of Refresher Courses, comprising of teachers in the age group of 35-50 years, and having more teaching experience, as digital immigrants. The result obtained regarding ICT awareness is quite worrisome, though 80% of them are aware of ICT which they have acquired it through self-instruction. The question that poses in our mind is "Is self-taught well taught?" 90% of the respondents, who agreed to the need for training, supports our training programme as a platform for their enrichment in ICT.

Teachers are a key component in the learning environment and therefore the impact of ICT on teachers and the strategies they employ to facilitate the environment are critical. This research paper is a humble beginning in giving us an insight to the concept that teachers hold about ICT. The results generated indicate inadequacies in their knowledge and skills regarding ICT, thus prompting us to further our research, so that we can work out on strategies to improve our training programmes. Moreover, the research models presented in this paper may serve as a platform for researchers and practitioners interested in training, learning and IT usage in higher education.

## References

- Albion, P. R. 2001. Some factors in the development of self-efficacy beliefs for computer use among teacher education students, *Journal of Technology and Teacher Education*, 9(3): 321-347.
- Balasubramanian K. & Willie Clarke-kah, 2009. ICTs for higher education. Background paper from the common wealth of learning UNESCO, World Conference on Higher Education, Paris.
- Drenoyianni, H. 2004. Designing and implementing a project-based ICT course in a teacher education setting: Rewards and pitfalls, *Education and Information Technologies*, 9(4): 387-404.
- Forster, P. A., Dawson, V. M. & Reid, D. 2005. Measuring preparedness to teach with ICT, *Australasian Journal of Educational Technology*, 21(1): 1-18.

- Ginserb, R. & McCormick, V. 1998. Computer use in effective schools, *Journal of Staff Development*, 19(1): 22-25.
- Keengwe, J. and Anyanwu, L. O. (2007). Computer Technology-Infused Learning Enhancement, *Journal of Science Education and Technology*, 16(5): 387-393.
- Markauskaite, L. (2007.) *Educational Technology Research and Development*, 55(6), 547-572.
- Mayberry, J., Hargis, J., Boles, L., Dugas, A., O'Neill, D., Rivera, A., et al. 2012. Exploring teaching and learning using an iTouch mobile device. *Active Learning in Higher Education*, 13(3): 203–217. doi: 10.1177/1469787412452984.
- McGorry, S. Y. 2002. 'Online, but on target? Internet-based MBA courses: A case study', *The Internet and Higher Education* 5(2): 167-175.
- Gallivan, M. J., Spitzer, V. K. and Koufaris, M. 2005. Does Information Technology Training Really Matter? A Social Information Processing Analysis of Coworkers' Influence on IT Usage in the Workplace, *Journal of Management Information Systems*, 22(1): 153-192.
- Preston, C., Danby, M. & Wegerif, R. 2005. A formative evaluation of ICT skills training in context, ECDL for Educators, UK: Mirandanet International Research Centre.
- Rosenberg, M. 2001. E-learning: Strategies for delivering knowledge in the digital age, New York: McGraw Hill.
- Sarkar S. 2012. Role of ICT in higher education for the 21st century, *Science Probe*, 1(1): 30-41, ISSN-2277-9566
- Simpson, M., Payne, F., Munro, R. & Hughes, S. (1999). Using information and communications technology as a pedagogical tool: Who educates the educators? *Journal of Education for Teaching*, 25(3): 247-262.
- Taylor, L. 2003. ICT skills learning strategies and histories of trainee teachers. *Journal of Computer Assisted Learning*, 19(1): 129-140.
- Watson, G. 1997. Pre-service teachers' views on their information technology education, *Journal of Information Technology for Teacher Education*, 6 (3): 255-269.
- Zarei, E., Kheiri, M. & Yazdgerdi, N. A. 2014. The level at which accounting professors use information technology at universities. *Journal of Accounting Research*, 4(2): 159–174.

**Table 1 : Demographic Information in Percentage**

			<b>Orientation Programme</b>	<b>Refresher Courses</b>
1.	Gender	Male	61.27	59.68
		Female	38.73	39.68
2.	Category	ST	44.51	44.44
		SC	7.51	3.49
		OBC	17.34	12.38
		General	29.48	33.02
3.	Qualification	P.G	50.29	54.92
		M.Phil	22.54	16.51
		Ph.D	25.43	23.81
4.	Designation	Teachers	92.49	90.16
		Librarian	2.31	6.03
5.	Nature of Appointment	Regular	97.69	91.11
		Part time	0.00	0.32
		Adhoc	0.00	1.90
		Contract	1.16	1.59
6.	Age	25-30yrs	5.78	2.86
		30-35yrs	38.15	18.73
		35-40yrs	27.17	33.33
		40-45yrs	12.14	18.73
		45-50yrs	5.78	9.52
		50-55yrs	1.16	2.22

**Table 2 : Computer Related Capabilities in Percentage**

			Orientation Programme	Refresher Courses
1.	Own a computer	Yes	89.60	85.71
		No	9.83	11.11
2.	Purpose of use of computer	MS-Office	81.50	72.70
		Internet	82.66	81.27
		Others	37.57	32.70
3.	Internet access	Yes	74.57	73.97
		No	24.28	20.32
4.	Place of internet access	University/College	21.97	20.00
		Cafe	12.72	16.51
		Others	10.98	0.32
5.	Duration of use of internet	Everyday	56.07	42.54
		Several times a week	24.28	32.70
		Several times a month	14.45	15.24
		Rarely	4.05	5.71
6.	Purpose of use of internet	Email	75.72	64.13
		Research	83.81	73.65
		Document download	75.144	67.94
		Social Networking	44.50	33.33
		Others	15.60	8.57
7.	Amount of time spent on internet	<30mins	8.67	12.38
		30-60mins	32.37	37.46
		60-90mins	40.46	32.70
		>90mins	16.18	12.06
8.	Comfort level of using internet	Excellent	15.03	13.02
		Good	43.35	35.56
		Satisfactory	36.42	43.81
		Poor	4.62	2.86

**Table 3 : ICT Awareness and Integration in Teaching in Percentage**

			<b>Orientation Programme</b>	<b>Refresher Courses</b>
1.	ICT Awareness	Yes	85.55	80.00
		No	9.83	12.70
2.	ICT Awareness through	IT training	20.23	14.29
		Self instruction	68.79	64.13
		Work place	35.84	33.33
		Others	8.67	8.57
3.	ICT makes work	Pleasurable	39.88	37.14
		Easier	78.61	66.98
		Avoid using	0.00	3.49
		Others	2.31	3.49
4.	ICT is used for	Preparing material	65.32	68.25
		PPT	60.69	43.49
		Others	14.45	12.06
5.	ICT development to	Revolutionize teaching	82.08	71.11
		Replace textbook	5.20	12.70
		Others	12.14	8.89
6.	ICT lack due to	Hardware	40.46	28.89
		Pedaware	12.72	8.57
		Software	54.34	51.75
		Others	9.83	7.62
7.	Rating ICT college/university awareness	Excellent	10.98	15.56
		Satisfactory	61.27	55.87
		Poor	26.01	24.76
8.	ICT training conducted by ASC	Yes	95.95	68.89
		No	1.73	23.17
9.	ICT should be introduced by ASC	Yes	75.72	85.08
		No	20.23	6.98



**Table 4 : Statistical Analysis**

FACTORS CONSIDERED	Orientation Programme		Refresher Course		t-value
	Mean	stdev	Mean	stdev	
Accessing the Internet	25.80	8.79	15.53	3.78	2.54
<b>Purpose of using the Computer</b>					
1. MS-office	28.20	7.92	15.27	4.40	3.48*
2. Internet	28.60	8.56	17.07	4.04	2.91*
Internet access from University/College	7.60	5.13	4.20	1.86	1.45
<b>Use the Internet for the following purposes:</b>					
1. For sending & receiving mails	26.20	8.11	13.47	3.46	3.41*
2. For downloading document	26.00	8.15	14.27	4.10	3.09*
3. For Research work	29.00	10.34	15.47	3.93	2.86*
<b>Time spent on the Internet per session</b>					
1. Up to 30minutes	3.00	2.92	2.60	1.88	0.29
2. 30-60minutes	11.20	4.44	7.87	4.00	1.49
3. 60-90minutes	14.00	4.24	6.87	1.30	3.48*
4. More than 90minutes	5.60	4.39	2.53	1.30	1.54
<b>Comfort Level in using the Internet/Computer</b>					
1. Excellent	5.2	2.86	2.733	2.09	1.78
1. Good	15	4.53	7.47	2.59	3.53*
1. Satisfactory	12.6	3.05	9.2	3.67	2.05
<b>Acquired Knowledge of using ICT</b>					
1. Through IT-training	7.00	1.41	3.00	2.14	4.76***
2. By self-instruction	23.80	6.72	13.47	3.38	3.30*
3. In work place	12.40	3.78	7.00	3.48	2.82*
<b>Role of ICT in professional work</b>					
1. Make work more pleasurable	13.80	6.38	7.80	2.11	2.07
2. Make work easier	27.20	5.93	14.07	3.31	4.71**
<b>Implementation of ICT in teaching</b>					
1. For preparing reading material	22.60	6.35	14.33	3.87	2.75*
2. For making PowerPoint presentation for lecture	21.00	6.56	9.13	3.89	3.83*
<b>Role of ICT in the world of Teaching</b>					
1. Revolutionize teaching	28.40	6.58	14.93	3.24	4.40***
2. Replace textbooks and no major change	1.80	1.30	2.67	1.59	1.22
<b>Implementation of ICT awareness in college/University</b>					
1. Excellent	3.80	3.03	3.27	1.58	0.38
2. Satisfactory	21.20	3.42	11.73	4.06	5.10***
3. Poor	9.00	5.15	5.20	2.70	1.58
Academic Staff College, NEHU is giving awareness courses on ICT	33.20	9.12	14.47	5.63	4.33***
Academic Staff College, NEHU should gave more awareness courses on ICT	26.20	7.56	17.87	3.40	2.38

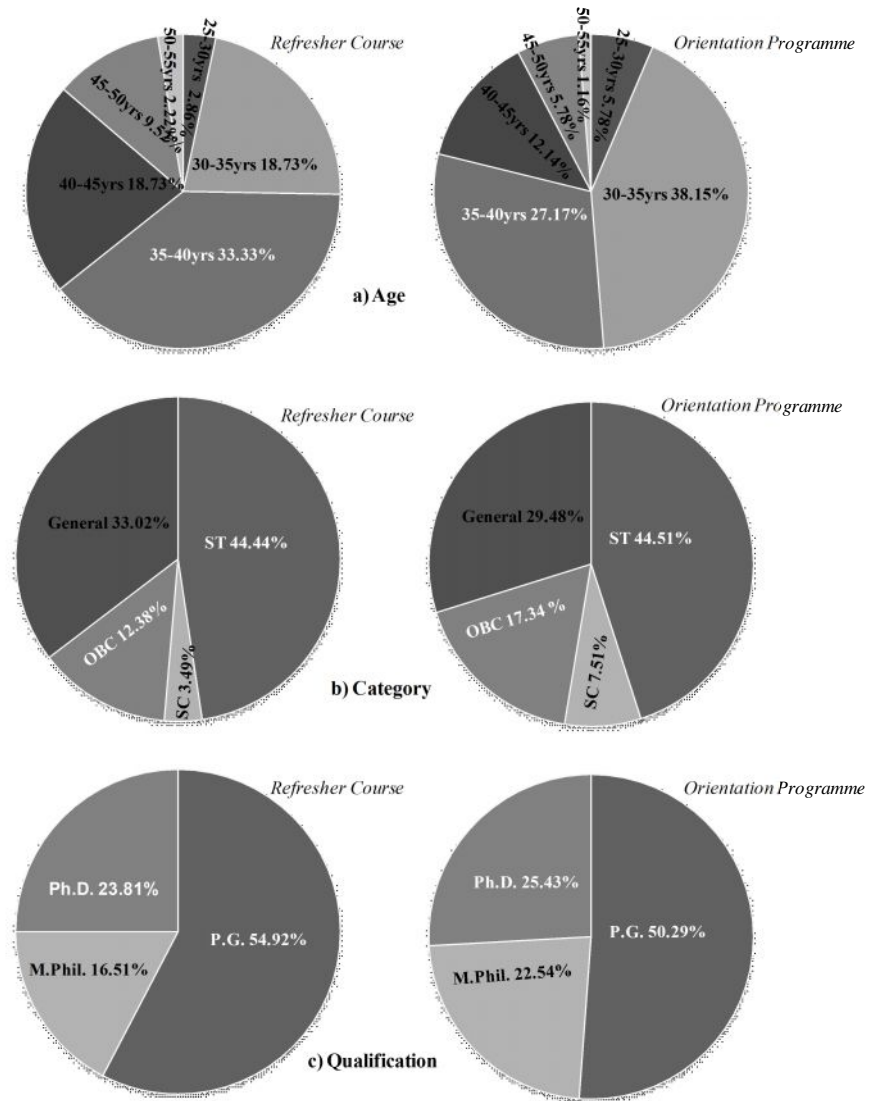


Fig 1: Demographic Information

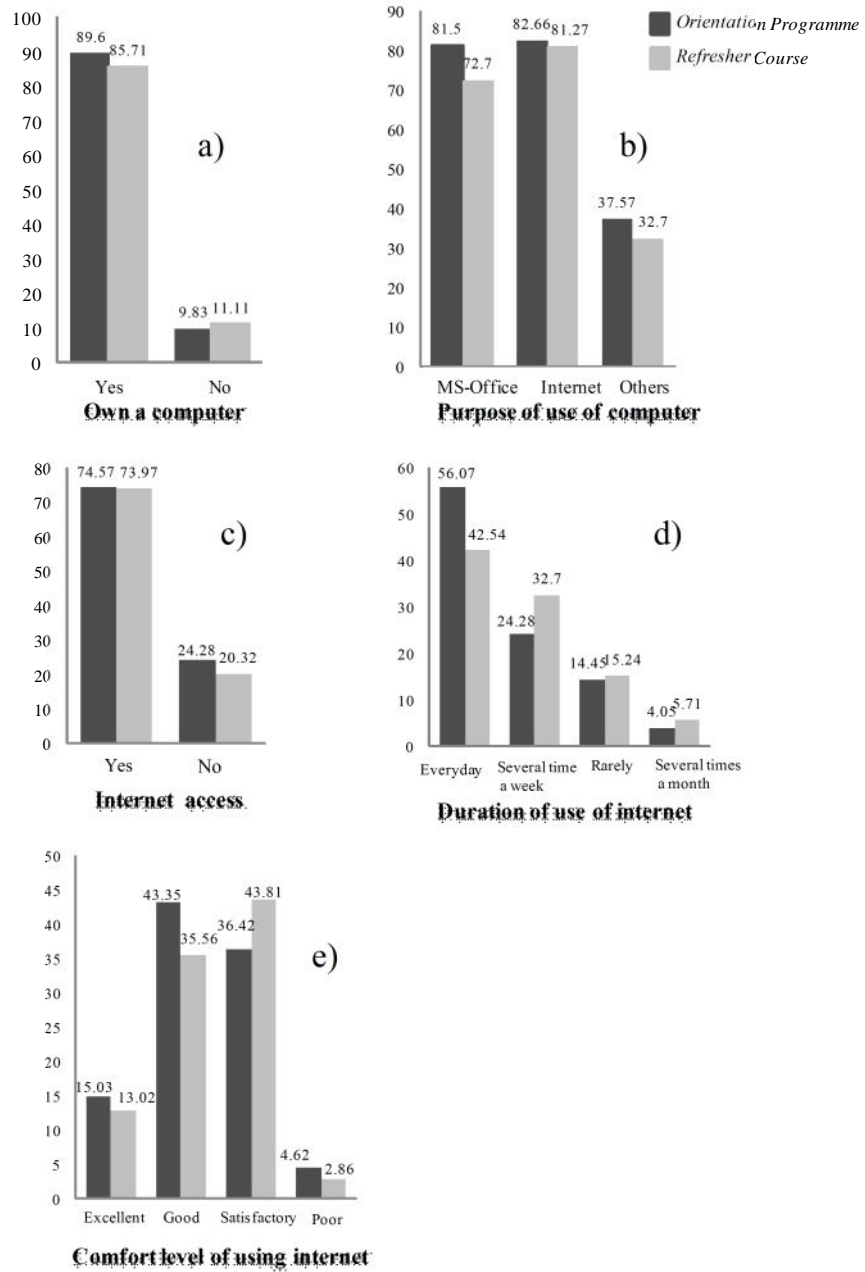


Fig 2: Computer Related Capabilities

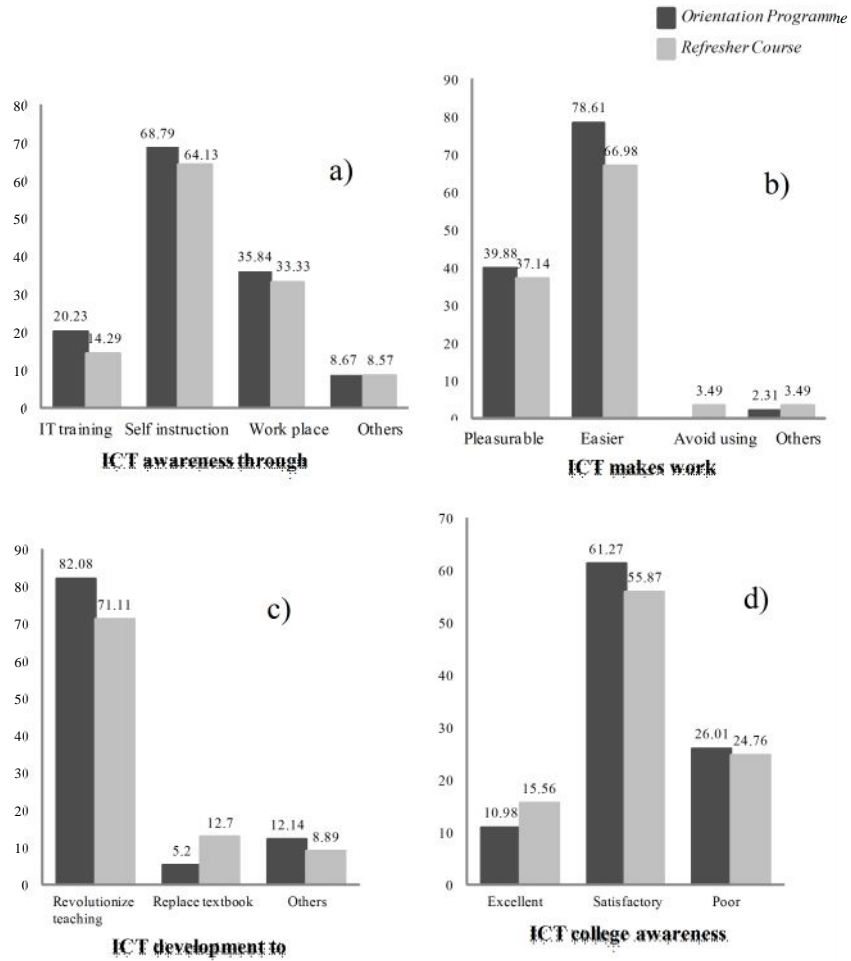


Fig 3: ICT Awareness and Integration in Teaching

## Kepler's Third Law, Dimensional Analysis and More

ANINDYA KUMAR BISWAS\*

### Abstract

*Kepler's third law states "The square of the period of a planet is proportional to the cube of its mean distance from the sun". Isaac Newton was the first person to derive this law using calculus, his laws of motion and the law of universal gravitation. We derive the Kepler's third law using dimensional analysis and plausibility arguments. Moreover, in the same way, we deduce the time period of closed orbits due to attractive linear forces.*

**Keywords: Kepler's third law, Newton's law of gravitation, Hooke's law, Dimensional analysis, Coulomb's law**

### A Historical Introduction

Aristotle (384-322 BC), pioneered occidental astronomy by constructing immovable celestial model of Universe. Claudius Ptolemy (2nd century AD) developed geometric model of geocentric universe. Taken together, these two models assume that planets, moons, sun are moving around earth; circular motion is the basic form of motion; beyond moon each and everything is unchanging. Contrasting heliocentric model of the universe was put forward much later by Nicolaus Copernicus (1473-1543 AD). With invention of better and better instruments, in 1500-1600 AD, varieties of models emerge within the extremes of geocentric and heliocentric viewpoints. One such model, the Tychonic system (Brahe T. 1588), proposed that all planets excepting earth are revolving about sun, but sun in turn is rotating in circle about earth.

Tycho Brahe challenged the unchanging celestial, Aristotelian, perception by taking recourse to meticulous observation of the sky, night

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\*Anindya Kumar Biswas (anindya@nehu.ac.in) is a member of the Department of Physics, NEHU.

after night, through year after year. He discovered supernova SN1572<sup>1</sup>(Brahe 1573) ripping through the conception of unchanging cosmos. Brahe, a Danish nobleman (wiki/Tycho\_Brahe), devoted his career to science, was a naked eye astronomer, built a self-sufficient astronomy research institute (West 2001) in the island of Hven in Øresund, did research in herbal medicine, published research papers based on celestial observations having been printed in his printing press, corresponded with his peers in and around Europe. He strived for accuracy of the order of minute of arc<sup>2</sup>. His data on Martian orbit were accurate upto two minutes of arc. He left Hven towards the end of sixteenth century, developed observatory at Prague. There in the year 1600, Kepler joined him as an assistant. He died almost accidentally, on 24<sup>th</sup> October, 1601, leaving the onus of publication of Martian Data to Johannes Kepler. Before death Tycho catalogued position of 1000 stars and also left behind an epitaph for himself, "He lived like a sage and died like a fool".

Kepler was a German and an avid Copernican (wiki/Johannes\_Kepler). The data collected by T. Brahe had its fruition in the hand of the mathematician Kepler. On fitting Tycho's all data to orbit, keeping the sun almost at the center, Kepler found that the Martian orbit is elliptical with the sun in one focus. All data excepting one were falling nicely on a circle. The exceptional data was at eight minutes of arc deviation from prevailing circular expectation. Kepler went ahead to generalize and put forward two laws in 1609 (Kepler 1609) and the third law in 1619 (Kepler 1619). The trend-setting three laws are as follows:

First law: The orbit of each planet is an ellipse, with the sun at one of its foci.

Second law: The line joining the planet to the sun sweeps out equal areas in equal times.

Third law: The square of the period of a planet is proportional to the cube of its mean distance from the sun.

Kepler's three laws were descriptive not explanatory. One day in 1685 (Bate et al 1971), Edmund Halley, well known through Halley's Comet, with two of his contemporaries Christopher Wren and Robert Hooke, was toying with possible reasons for planetary motions. They speculated that a force like magnetism, falling off inversely with square of distance might not be behind the elliptical shape. Hooke volunteered to come with a proof but could not come up with one. Many months later, Halley was visiting Isaac

Newton at Cambridge. He casually posed a question to Newton, ‘If the sun pulled the planets with a force inversely proportional to the square of their distances, in what paths ought they to go?’ Newton replied instantly, ‘Why, in ellipse, of course...’. He was referring to his work, done twenty years earlier. In 1666, during a long break at Cambridge due to plague outbreak, Newton, then twenty-three years old, conceived the laws of motion, the law of gravitation, and developed differential calculus. Moreover, he derived three laws of Kepler. Newton went ahead with the assumption of inverse square law force between two bodies, coupled with his laws of mechanics, to vindicate and supply the correct proportionality constant in Kepler’s third law. At the advice of Halley, he wrote and published his work in 1687 (Newton 1687), ‘The Mathematical Principles of Natural Philosophy’ or, simply ‘Principia’. The three laws of motion as enunciated in Principia are as follows:

First law: Everybody continues in its state of rest or of uniform motion in a straight line unless it is compelled to change that state by forces impressed upon it.

Second law: The rate of change of momentum is proportional to the force impressed and is in the same direction as that force.

Third law: To every action there is always opposed an equal reaction.

Expressed mathematically, the second law appears as  $F=ma$  where,  $F$  is force impressed,  $m$  is mass and  $a$  is the produced acceleration respectively. Acceleration is change in velocity in unit time interval. Velocity is change in position in unit time interval.

Besides the three laws of motion in Principia, Newton described the law of universal gravitation which states as follows:

Any two bodies attract one another with a force proportional to the product of their masses and inversely proportional to the square of the distance between them. Expressed mathematically the law of gravitation reads as

$$F = \frac{Gm_1 m_2}{r^2} = \frac{k}{r^2}.$$

The derivation of the third law of Kepler by Newton goes as follows (Chandrasekhar 1995): derive equation of ellipse under the gravitational force law, find the rate of temporal change of area vector, then integrate and put the area of ellipse equal to  $\pi ab$  where,  $a$  and  $b$  are semi-major and semi-

minor axes of the ellipse respectively. One deduces  $a^3 = \frac{1}{4\pi^2} \frac{k}{\mu} T^2$ , where,  $\mu$  is reduced mass<sup>3</sup> and T is orbital time period.

### Orbit Due to Force Law of Hooke

Robert Hooke proposed the linear force law, which is the rule in case of a spring or, for elastic material, for small elongation. As in inverse square law force of attraction, for linear force also we get stable non-circular closed orbits, (Bertrand 1873, Goldstein 2002). Again following the steps as outlined in the previous paragraph, one arrives at for the closed orbits due to linear attractive force,

$$1 = \frac{1}{4\pi^2} \frac{k}{\mu} T^2.$$

Academic investigations on various fronts surrounding Kepler's third law went for centuries. It is going on unabated till today. We may get a feeling of recent researches, by looking into, (Dmitrasinovic et al 2015) for Kepler's third law for three body orbits, (Gorringe et al 1993) for elliptic orbits in presence of drag force, (Laskin 2013) for Kepler's third law in the context of deformed Newtonian Mechanics.

Can we avoid calculus and derive Kepler's third law in another way? If so, does the procedure work for another intervening force law, say, linear force law of Robert Hooke? We elaborate on one such heuristic approach as follows, after spending few lines here on dimensional analysis.

Mass, time and length are considered as fundamental quantities and rest other are considered as derived from these three. As a result, dimension of a derived quantity can be expressed as some power law function of dimensions of mass[M], time[T] and length[L]. Any equation in physics has to be dimensionally consistent i.e. both sides of an equation have to have the same dimension. From knowledge of dimension of one side knowing the dimension of other side is the essence of dimensional analysis. For details, see references (Halliday 2003, Bohren 2004). Apart from elementary aspect, dimensional analysis plays important role in advanced areas of physics like mechanical similarity in mechanics (Landau L. D.), renormalization group analysis (Goldenfeld N. 2005) etc.

### Kepler' Third Law

Newton's law of gravitation is  $F = \frac{G m_1 m_2}{r^2} = \frac{k}{r^2}$  magnitudewise.



Simple dimensional analysis of the law of gravitation suggests, (Halliday 2003, Bohren 2004, Mungan 2009),

$$[M][L][T]^{-2} = [k][L]^{-2} \text{ implying } [L]^3 = \frac{[k]}{[M]} [T]^2 \text{ where, } F = ma \text{ and } [a] = [L].$$

Now, for two body problem, in the C.O.M frame, relevant mass is the reduced mass,  $\mu$ ; relevant length is semi-major axis length,  $a$ ; relevant time is orbital time period,  $T$ , respectively. Hence,. What is the proportionality constant?

For closed orbit, it's two-dimensional motion i.e. one slice of spherical angle,  $\Theta$ , which ranges from 0 to  $\delta$ . Hence, the proportionality factor is  $\frac{1}{\pi}$  multiplied by something else. To find that something else, we compare with electrostatic force rule in S.I. unit (Griffiths 1999, Jackson 1996, Spavieri 2004),  $F = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$ .

In physical relationship what appears  $\epsilon_0$  not  $4\delta\epsilon_0$ , say, in the Clausius-Mossotti formula. In physical relationship we divide  $4\pi\epsilon_0$  by  $4\pi$ .

Analogue of  $4\delta$  in the case of Newton's law of gravitation is  $G$ , universal constant of gravitation. Hence, in the physical relation,

say, in the relation between semi-major axis length and time period,

we should divide  $G$  by  $4\delta$ . Hence is that something else. Therefore,

=

which is Kepler's third law, (Goldstein 2002).

Another way, we can deduce the The first mass is using one point out of  $4\delta$  solid angle through which gravitational field lines are emanating from the second mass, at any point of time. Hence, effective coupling istimes that of  $k$ .

Again, for Hooke's law, (Sommerfeld 2003),  $F = kr$ , magnitude wise.

Simple dimensional analysis suggests

$$[M][L] = [k][L] \text{ implying } 1 = .$$

Now, for two body problem, in the C.O.M frame, relevant mass is the reduced mass,  $\mu$  and relevant time is orbital time period,  $T$ . Hence,

1 What is the proportionality constant?

Plausibility arguments along the same line as in the previous section suggests that the proportionality constant is .

Hence,  $1 =$  .

This is the relation exhibiting length-scale independence of time-period of two body orbiting under mutual attractive force of Hooke's law type.

### Conclusion

We provide heuristic dimensional arguments for time periods, for closed orbits, in case of inverse square law and linear forces for two body motion, using few steps. The expressions are Kepler's third law and its analogue for harmonic oscillator potential. It will be interesting if arguments espoused here to fix the pre factor, can be used in other cases, say in three body problem.

This work may be useful for classroom teaching.

### Acknowledgement

The author would like to thank M.Sc. physics students of NEHU for listening to the subject of the paper, from the author.

### Notes

1 SN1572 is 7500 light-years away from earth.

2 For example, instrument for measurement of angle of one degree between two inclined planes costs Rs. 700, whereas instrument for measurement of angle of one minute between two inclined planes costs around Rs.30000. Precision comes at the cost of rise of price. Sometimes, one order of increase of accuracy costs one order of price rise.

3 Reduced mass = .

### References

Bate R.R, Mueller D. D. and White J. E. 1971. *Fundamentals of Astrodynamics*. Dover.

- Bertrand J. 1873. *Comptes Rendus* 77: 849
- Bohren C. F. 2004. *Am.J.Phys*,72:534
- Brahe T. 1573. *De Nova Stella* (On the New Star).
- Brahe T. 1588. *De Mundi Aetherei Recentioribus Phaenomenis liber Secundus* (Recent Phenomena in the Celestial World).
- Chandrasekhar S. 1995. *Newton's Principia for the Common Reader*, Ch.4. Oxford University Press.
- Dmitrasinovic V. and Suvakov M. 2015. *Phys.Lett.A*,379: 1939.
- Goldenfeld N. 2005. Lectures on phase transitions and the Renormalization group. Ch.1,10. Levant Books, Kolkata, by arrangement with Perseus Books, USA.
- Goldstein H. and Poole C. and Safko J. 2002. *Classical Mechanics*. Pearson Education Inc. and Doling Kindersley Public Inc., India
- Gorringe V. M. and Leach P. G. L. 1993. *Am.J.Phys*,61:991.
- Griffiths D. J. 1999. *Introduction to Electrodynamics*. Prentice-Hall Inc., New Jersey: 3rd ed.
- Halliday D. and Resnick R. and Krane K. S. 2003. *Physics*. John Wiley and Sons, Singapore: 5th ed.
- [https://en.wikipedia.org/wiki/Johannes\\_Kepler](https://en.wikipedia.org/wiki/Johannes_Kepler)
- [https://en.wikipedia.org/wiki/Tycho\\_Brahe](https://en.wikipedia.org/wiki/Tycho_Brahe)
- Jackson J. D. 1996. *Classical Electrodynamics*. Wiley Eastern Limited, New Delhi: 3<sup>rd</sup> ed.
- Kepler J. 1609. *Astronomia Nova*.
- Kepler J. 1619. *Harmonice Mundi*.
- Landau L. D. and Lifshitz. *Mechanics: Course of Theoretical Physics*, Vol 1, p22, Butterworth-Heinemann, Elsevier, Oxford, U.K.
- Laskin N. 2013. *Eur. Phys. J. Special Topics*,222: 1929.
- Mungan C. E. 2009. *Phys.Teach*,47:502.
- Newton I. 1687. *Principia*. Motte's translation revised by Cajori. Vol. 1 Berkeley and Los Angeles, University of California Press, 1962.
- Sommerfeld A. 2003. *Lectures on Theoretical Physics: Mechanics*. Levant Books, Kolkata: 45, 242.
- Spavieri G, Gillies G. T. and Rodriguez M. 2004. *Metrologia*,41 S159.
- West M. L. 2001. *Physics Today*. August issue.

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