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Mangaldai College

EXPANDING HORIZONS

A Multidisciplinary Approach to Research

Editors

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Preface

“Expanding Horizons: A Multidisciplinary Approach to Research” is an interdisciplinary compilation that provides a wide range of academic works from multiple subjects, bridging disciplinary barriers. We take readers on an intellectual trip through a variety of research subjects in this anthology, all of which advance our comprehension and knowledge.

This book’s chapters showcase the combined work of skilled scholars, each of whom brings a distinct viewpoint to the discussion. This collection explores the wide landscape of current research, covering topics such as the sustainability of agro-waste management, the empowerment of women in many contexts, emerging trends in celiac disease, and the complexities of urban open spaces.

The range of subjects addressed, which includes the investigation of religious tourism, women’s economic empowerment, and the function of mechanical engineering in waste management, emphasizes the multidisciplinary character of contemporary research projects. Every chapter adds to the overall endeavor of expanding knowledge, whether it is by exploring the subtleties of soil water holding capacity or exploring the philosophical nuances of the mind.

We sincerely thank all of the contributors for giving of their time and knowledge to this joint project. We sincerely hope that this collection will serve as a catalyst for additional interdisciplinary discussions, provide new directions for research, and demonstrate the seemingly endless possibilities that arise when academics from various backgrounds collaborate to investigate, learn from, and broaden the boundaries of human comprehension.

Editors

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Plant based products as pesticides-A review

**Afrida Hussain
Hemaprabha Saikia**

Abstract

This comprehensive review explores the historical trajectory and hazards associated with pesticide use, emphasizing the shift towards biopesticides as eco-friendly alternatives. Tracing back to ancient civilizations, the use of plant-derived pesticides, such as nicotine and fungi, marked the early attempts at biological control. The detrimental environmental impact and resistance issues associated with synthetic pesticides have prompted the exploration of plant-derived alternatives. Plant secondary metabolites, including phenolics, alkaloids, saponins, terpenes, and sulfur-containing compounds, exhibit pesticidal properties. *Azadirachta indica* (neem) stands out as a prominent biopesticide source, owing to its potent antifeedant azadirachtin. The rich history of pesticide development unfolds, revealing the crucial role of plant-derived products in pest management. Despite global advancements in biopesticide adoption, the specific scenario in Assam highlights the persistent reliance on chemical pesticides. Addressing awareness gaps and ensuring the efficacy of biopesticides will be instrumental in promoting sustainable agriculture practices in the region.

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Keywords: *Biopesticides, sustainable agriculture, plant derived pesticides, pest management*

Introduction

A pesticide is a substance that kills or destroys any pests. They can be categorized broadly into two types based on their preparations- synthetic pesticides and biopesticides. Synthetic pesticides are a combination of chemicals whereas biopesticides are mostly the products of plants. The use of synthetic pesticide started with the advent of green revolution but it becomes a failure in terms of sustainable agriculture. M.S. Swaminathan, who is the pioneer of green revolution in India, himself, admitted that, it becomes a threat for the existing environment and creates great havoc (Kesavan and Swaminathan, 2008). But synthetic pesticides are very common as compared to biopesticides because they are easily available.

The rise in population has overburdened us and compelled us to increase the agricultural output. Agriculture plays a significant role in India's economy as more than 50% of Indian population is dependent on agriculture for livelihood. India accounts second worldwide in terms of agricultural output. But plant diseases are very common in nature that leads to decrease in agricultural productivity. So, it is needless to say that use of pesticide became an important weapon for mankind. But pesticide use has many pitfalls. The chemicals present in them contaminate soil, water and the atmosphere. To overcome the menace of chemical pesticide, plant-derived pesticides can be chosen over them for a pollution free environment. Plants are the rich source of bioactive molecules that can act as antifeedant, insecticide,

pesticide, fungicide, nematicide, etc (Souto *et al.*, 2021). Due to the presence of these molecules' plants can be utilized as a novel pest control agent.

History of Pesticide Use

Sumerians, around 4500 years ago used sulfur compounds as pesticides for the first time to control insects and mites (Umetsu and Shirai, 2020). The Chinese used plant derived pesticides 3200 years ago. Greeks and Romans on the other hand used fumigants, mosquito nets, sticky bands on trees and pesticide sprays and ointments. Chinese people were more concerned and continued to develop strategies to reduce pests. By 300 AD, they established nests of ants in citrus orchards to control caterpillars and large boring beetles as biological control. A revolution of insect pest control took place during the Second World War. At that period insecticide dichlorodiphenyltrichloroethane (DDT) and the herbicide 2,4-dichlorophenoxyacetic acid (2-4-D) were developed (Matthews, 2018). This is followed by the synthesis of organophosphates by Germany and carbamates by Swiss workers in 1940s. Though the development of pesticides was initially for vectors of human disease, but after the Second World War, it rapidly expanded to agriculture. However, in India it started with the establishment of a plant for benzene hexachloride (BHC) in Calcutta in 1952. Now, India stands at second place within Asia and over the world it ranks twelfth in manufacturing pesticides (Nayak and Solanki, 2021).

Pesticidal Hazards

The chemicals present in the pesticides are non-biodegradable

and usually remain in soil, water and air for several years. Their long persistence contaminates the environment and also insect's pest develop resistance against them. Apart from this the chemicals present in the pesticides are also harmful for non-target organisms which imbalances the ecosystem. In order to make the environment free from contaminants and to maintain the ecological balance, an alternative ecofriendly way is required. Plant derived products used to eradicate pests is a better choice against synthetic pesticides.

Plants as Pesticides against Plant Diseases

A Brief History

Plants used to kill pests are as old as 17th century, when nicotine is used to control plum beetles and other pests. In 1835, biological control was done by Agostine Bassi against lepidopteran pests with a fungus *Beauveria bassiana*. Spores of the bacteria *Bacillus thuringiensis* (Bt) is the first and most widely used biocontrol agent till date. Bt was isolated in 1901 from a diseased silkworm by Japanese biologist Shigetane Ishiwata (O'neal *et al.*, 2018). During 1920s, Bt was used as a biological insecticide by the French. In 1938, France developed first commercially available Bt product, Sporeine. The widespread use of Bt as biocontrol took place in the US also during 1950s. India, not lagging behind in biopesticide preparation and leaps forward for its development when chemical insecticides failed to control *Helicoverpa armigera*, *Spodoptera litura* and other pests of cotton as it is an economically valuable plant (Mishra *et al.* 2020).

Why do plants act as pesticides?

Plants contain a wide variety of secondary metabolites that are

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produced in response to pathogens, herbivores or competitors (Pang *et al.*, 2021). They can be exploited for their potential chemical components. Thus, they are widely studied for their pharmacological, toxicological and medicinal properties (Kurek, 2019). It has been cited that more than 3 lakh plant species have pesticidal properties. Among these, 2400 species have been identified till now (Reddy and Chowdary, 2021).

The most abundantly and frequently used plant is *Azadirachta indica* (neem). It is the presence of limonoid, azadirachtin which is an antifeedant that makes them lethal for a variety of insects. Apart from neem that belongs to family *Meliaceae*, plants of *Rutaceae*, *Compositae*, *Leguminosae*, *Papaveraceae*, *Araceae*, *Platycodoniaceae*, *Solanaceae*, *Chenopodiaceae*, *Zingiberaceae*, *Lamiaceae*, *Loniceraceae*, *Umbelliferae*, *Polygonaceae*, *Euphorbiaceae*, *Ranunculaceae*, *Amaryllidaceae*, etc possess innumerable secondary metabolites that have pesticidal properties (Ngegba *et al.*, 2022).

Plant secondary metabolites beneficial for pesticide formulations

The secondary metabolites of plants are organic compounds that are synthesized as secondary products. They did not participate in the mainstream of metabolism and have no direct function in growth and development of plants. But these molecules help in plant defense against herbivores and pathogens. They also act as attractants for pollination and seed dispersal. Sometimes these molecules even show allelopathic effect. These features allow some plants to be useful for pesticide formulations.

The secondary metabolites can be categorized based on their different chemical structures. These are- phenolics, alkaloids, saponins, terpenes and terpenoids, and sulfur-containing metabolites (Ahmed et al. 2017). The phenolic compounds are the second abundant metabolite found in plants after carbohydrates (Kougan *et al.*, 2013). Their structures possess an aromatic ring with one or more hydroxyl substituents. The phenolics are further classified into- simple phenolics, tannins, coumarins, flavonoids, chromones and xanthenes, stilbenes and lignins. These compounds safeguard the plants against a variety of pathogens, abiotic stress like drought, salinity and UV radiation and also herbivorous insects (Kumar *et al.*, 2020). Thus, presence of these compounds makes them favourable for biopesticide formulations.

Alkaloids are one of the largest groups of secondary metabolites (Srivasatava, 2022). They are structurally diverse consisting of more than twenty different classes including pyrrolidines, pyrrolizidine, quinolizidine, tropanes, piperidines, pyridines, etc. The only common feature is that they are all nitrogen-containing basic compounds (Ali *et al.*, 2019; Srivasatava, 2022). Alkaloids are toxic to pathogens and predators. Hence, they act as defense compounds in plants (Matsuura & Fett-Neto, 2015). Because of their deterrent behavior they can be explored for pesticidal preparations.

Saponins are glycoside containing organic compounds that have surface active properties. When dissolved in water, they form colloidal solutions that foam upon shaking (Sparg *et al.*, 2004). Structurally saponins have one or more hydrophilic glycoside

sugar moieties (glycone) linked with a lipophilic aglycone moiety by glycosidic bonds. Depending upon the aglycone moiety saponins can be divided into three classes-triterpenoid glycosides, steroid glycosides and alkaloid glycosides (El Aziz *et al.*, 2019; Rai *et al.*, 2021). Saponins are haemolytic in nature and are toxic to cold-blooded animals (Teoh, 2016). As reported by Shinoda *et al.* (2002), Hussain *et al.* (2019) and Tian *et al.* (2021) plant saponins have pesticidal role. According to Pradhan *et al.* (2017) and Tmakova *et al.* (2015) plant saponins are natural surfactants that have better and superior emulsifying quality than the synthetic ones. Thus, they can be used as stable emulsifiers in biopesticide formulations.

Terpenes are another large group of secondary metabolites. Their structure has one or more isoprene units that assemble in different ways. They can be classified based on the number of isoprene units, such as, hemiterpenes, monoterpenes, sesquiterpenes, diterpenes, sesterterpenes and triterpenes (Hussein and El-Anssary, 2018). Terpenes act as allelochemicals, as defensive toxins and also as deterrent towards herbivores (Divekar *et al.*, 2022). Plant essential oils that are relatively common compounds now-a-days in biopesticide formulations are 90% terpenes or terpenoids (Tripathi *et al.*, 2009; Boncan *et al.*, 2020). This group of secondary metabolites is common because they can enter the body of a large number of insects and cause biochemical dysfunction and mortality (Ibrahim, 2019).

The sulphur-containing metabolites are another group of secondary metabolites that provide protection to the plant from pathogenic microbes and herbivores (Burow *et al.*, 2008; Divekar

et al., 2022). Most of the registered pesticides for agriculture contain sulphur in their composition (Nwachukwu *et al.*, 2012). Even in Western Europe, at the end of 1980, due to clean air acts, the atmospheric sulphur gets reduced which lead to certain diseases of crop plants (Kunstler *et al.*, 2020). So, the role of Sulphur in disease prevention is inevitable for a large group of plants. S-containing secondary metabolites that can be used for biopesticide formulations are-glutathione, glucosinolates, phytoalexins, and allinin. All of these can play important role for disease prevention. Glutathione, glucosinolates and phytoalexins are commonly found in Cruciferous plants (Ahmed *et al.*, 2017; Divekar *et al.*, 2022). Phytoalexins are also found in family Orchidaceae and Fabaceae (Teoh, 2016). Whereas, allinins are the characteristic S-containing compounds of family Liliaceae (Ahmed *et al.*, 2017).

Therefore, all these plant secondary metabolites can be used against pests to control plant diseases safely. There is an immediate need for replacing the synthetic pesticides with the biopesticides to make our environment free from pollutants and also towards the health hazards.

Conclusion

The agricultural sector's vitality directly impacts the livelihoods of millions, emphasizing the need for sustainable practices and innovative solutions to ensure food security and economic stability. Thus, biopesticides play a crucial role in sustainable agriculture. They offer environmentally friendly solutions, reducing the impact of chemical residues on crops, soil, and ecosystems while still managing pests and diseases. Their usage

promotes healthier farming practices and contributes to a more balanced and sustainable agricultural system in the long run. According to the latest data of Directorate of plant protection, quarantine and storage, Government of India, the biopesticide consumption is increasing from 7203 metric ton (M.T) to 7248 M.T. Whereas, the consumption of chemical pesticides is decreasing by 7204 M.T. But, if we consider the data of biopesticide use in Assam, then it is not gaining much attention. The demand for chemical pesticide is still very high in Assam which was estimated to be 472 M.T in 2023-24. In contrast to this data, the demand for biopesticide is projected to be 282 M.T in 2023-24. This may be because of lack of awareness among farmers and doubts regarding their effectiveness towards pests. So, identifying and understanding the biology of the pest is very important to formulate one effective biopesticide. Further, a quality biopesticide have to be easily biodegradable, should have low toxicity, good in efficacy, affect only the targeted pests, must be a cheaper one and also the one that is difficult for the pests to develop resistance against them. All these demands can be easily fulfilled by biopesticides at a time, but not by chemical pesticides.

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Rising Trends in Celiac Disease Globally and the Impact of Gluten-Free Foods

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Abstract

Celiac disease impacts 1% of the global population, with the highest prevalence in Europe at 1 in 50 individuals, necessitating a strict gluten-free diet for effective management. Advances in diagnostic tools contribute to increased early intervention. The microbiome's potential role in celiac disease development influences immune responses, gluten metabolism, and intestinal permeability. While gluten-free foods significantly enhance celiac patients' quality of life, challenges like cross-contamination persist. The growing gluten-free products market, driven by increased awareness, demands ongoing education, labeling, and technological advancements. Improved well-being in celiac patients results from early diagnosis, expanded gluten-free options, and strong support networks, emphasizing the importance of maintaining product quality. Addressing rising celiac disease trends requires heightened public awareness, expanded gluten-free options, and ongoing research, fostering collaborative efforts across medical, scientific, and food industries in the evolving gluten-related disorders landscape.

Keywords: *Gluten, celiac disease, awareness, impact, nutrition.*

Introduction

Celiac disease, also known as celiac sprue or gluten-sensitive enteropathy, is a chronic autoimmune condition characterized by an adverse reaction to gluten, a protein present in wheat, barley, and rye. Gluten-containing foods cause an immunological reaction in people with celiac disease that destroys the lining of the small intestine, particularly the villi, which are crucial for nutrient absorption (Parzanese *et al.*,2017). As a result, those who are afflicted may present with a variety of symptoms, such as gastrointestinal problems, exhaustion, weight loss, and even skin rashes. Malnutrition and long-term health problems might result from celiac disease if it is not treated. The main treatment for celiac disease is a rigorous gluten-free diet, which requires eliminating all gluten-containing foods from one's diet to reduce symptoms while promoting intestinal healing.

Prevalence of celiac disease globally

Around 1% of the world's population has been identified to have celiac disease (Gujral *et al.*,2012). Although the frequency of celiac disease varies from nation to nation, it has been estimated to impact 1 in 100 persons worldwide. In Europe, where it is estimated that 1 in 50 persons have the disease, it is most common. Asia has the lowest prevalence of celiac disease, with a 1 in 250 estimated prevalence there (Ashtari *et.al.*, 2021). Additionally, a variety of elements, including genetics, diet, and exposure to the environment, might influence the occurrence of celiac disease.

Importance of gluten-free diet for celiac patients

For people with celiac disease, avoiding gluten is essential for several crucial reasons:

- **Relief of Symptoms:** The only cure for celiac disease is to switch to a gluten-free diet. Celiac disease sufferers can significantly reduce their symptoms of exhaustion, skin rashes, abdominal pain, bloating, diarrhoea, and constipation by eliminating gluten from their diet.
- **Intestinal Healing:** In those with celiac disease, eating gluten causes an immunological reaction that harms the lining of the small intestine. The intestine can mend when a strict gluten-free diet is followed, which enhances nutrient absorption and general gastrointestinal health.
- **Preventing complications:** If celiac disease is left untreated, it can result in major long-term problems such as malnutrition, anemia, osteoporosis, infertility, and a higher chance of developing specific forms of cancer. These potential health problems can be avoided by eating gluten-free.
- **Improved Quality of Life:** It greatly improves their quality of life by alleviating discomfort, fatigue, and emotional challenges related to the diet's limitations, allowing them to lead fulfilling and healthy lives.
- **Avoiding Cross-Contamination:** Being vigilant about cross-contamination becomes crucial, as even tiny amounts of gluten can trigger symptoms. As a result,

celiac patients must carefully examine food labels, inquire about restaurant ingredients, and maintain gluten-free food preparation areas.

- **Supporting Healing of Other Health Conditions:** A gluten-free diet can also benefit those with other gluten-related conditions, such as gluten sensitivity or dermatitis herpetiformis, by effectively managing their symptoms.
- **Promoting Awareness:** Adopting such a diet plays a pivotal role in raising awareness about celiac disease and gluten intolerance, fostering better community understanding and support while encouraging the food industry to offer more gluten-free options (Das S., 2022).

Rising Trends in Celiac Disease

Increased diagnosis rates

Increased awareness, better diagnostic equipment, and focused screening programmes have all contributed to an increase in celiac disease diagnosis rates in recent years. With a better understanding of the symptoms and risk factors, more people seek medical testing and evaluation, which results in prompt and precise diagnosis. The diagnostic procedure has been improved by blood tests and genetic testing, allowing for quicker implementation of a gluten-free diet and optimal management for better health outcomes and increased quality of life (Adriaanse *et al.*, 2015).

Advancements in diagnostic tools and techniques

The effectiveness and precision of detecting celiac disease have

considerably increased due to advances in diagnostic equipment and methods. Here are a few key developments:

- **Serological Examinations:** Blood tests that evaluate certain antibodies linked to celiac disease have improved in sensitivity and specificity. Anti-endomysial antibody (EMA) and tissue transglutaminase antibody (tTG-IgA) tests are the two most popular serological examinations. These tests can assist in identifying people who are most likely to have celiac disease, triggering additional testing (Silvester *et al.*,2017).
- **Total IgA Measurement:** Measurement of total immunoglobulin A (IgA) levels in the blood is crucial for ensuring the validity of serological testing. IgA deficiency is a condition that some people with celiac disease have, and it can cause serological testing to come out falsely negative. The interpretation of serological test results is aided by total IgA measurement (Rostom *et al.*,2005).
- **Genetic Testing:** The assessment of the risk for celiac disease can be aided by genetic testing for human leukocyte antigen (HLA) markers, particularly HLA-DQ2 and HLA-DQ8. One or both genetic markers are present in the majority of celiac disease sufferers. It is crucial to remember that having these markers does not guarantee that a person will acquire celiac disease (Siddiqui K *et al.*,2021).
- **Capsule Endoscopy:** Although intestinal biopsies

continue to be the gold standard for determining whether a person has celiac disease, capsule endoscopy has become a popular non-invasive imaging method that can show the small intestine. In some circumstances, it might be especially helpful if a standard endoscopy and biopsy are inconclusive or impractical (Spada C *et al.*,2008).

- **Point-of-Care Testing:** Certain celiac disease point-of-care tests have recently developed, which facilitates quick diagnosis in the doctor's office or even at home. Although their accuracy and reliability may still be improved, these tests provide convenience and rapid results.
- **Telemedicine and Remote Patient Monitoring:** Advances in telemedicine and remote patient monitoring have made it easier for celiac disease patients to connect with healthcare professionals, discuss symptoms, and undergo diagnostic tests remotely, improving access to medical care.

Improved awareness and education about celiac disease

By promoting awareness of celiac disease, we can reduce the number of cases that go undetected and guarantee prompt medical attention. The necessity of early testing, identifying symptoms, and risk factors should be the emphasis of educational programmes. Furthermore, educating people about gluten-containing foods and promoting gluten-free alternatives might help them make educated dietary decisions. Leading awareness efforts, busting misunderstandings, and eradicating stigmas related to celiac disease are crucial tasks for medical

professionals, local authorities, and advocacy groups. We can create a more helpful and understanding environment for people living with celiac disease, improving their quality of life and their overall well-being.

Environmental factors

The development of celiac disease is significantly influenced by environmental variables. In those who are genetically predisposed, exposure to gluten during infancy and childhood, as well as aspects like breastfeeding duration, timing of gluten introduction, and gut microbiota composition, can affect the likelihood of developing the illness (Lionetti E *et al.*, 2015).

Potential role of microbiome in celiac disease development

The potential role of the microbiome in the development of celiac disease has drawn more attention in recent years. The term “microbiome” describes the diverse population of microbes, such as bacteria, viruses, and fungus, that live in and on the human body, particularly in the gastrointestinal system. The development of the immune system, digestion, and pathogen defense are just a few of the physiological functions that these microorganisms are essential for.

- **Immune System Influence:** The gut microbiota has a crucial role in the growth and control of the immune system. The proper development and maturation of immune cells depend on early interactions between the growing immune system and the gut flora. When someone has celiac disease, their immune system reacts abnormally to gluten, causing inflammation and small

intestinal damage. In people who are genetically predisposed to developing celiac disease, the composition of the gut microbiota may have an impact on the immune response to gluten (Zheng D *et al.*, 2020).

- **Gluten Metabolism:** Some types of intestinal bacteria include enzymes that can fragment the proteins in gluten into smaller peptides. These gluten-derived peptides can elicit an immunological response in people with celiac disease. The quantity and activity of these bacteria in the gut may have an impact on the amounts of peptides generated by gluten and the subsequent immune response (Wei G *et al.*, 2020).
- **Intestinal Permeability:** The intestinal barrier's health is regulated by the gut flora. Changes in the gut microbiota's makeup may have an effect on intestinal permeability, sometimes known as "leaky gut." The development of celiac disease may be influenced by increased intestinal permeability, which may allow for more significant exposure to gluten and other possible causes (Fasano A, 2020).
- **Gut Microbiota Dysbiosis:** Studies have revealed that, in comparison to healthy people, people with celiac disease frequently exhibit dysbiosis of the gut microbiome. Even after starting a gluten-free diet, these changes could not go away. The microbial imbalance known as dysbiosis may contribute to the onset and progression of disease (Chibbar R *et al.*, 2019).

- **Influence on Gluten Sensitivity:** After eating meals containing gluten, some people who do not already have celiac disease might begin experiencing some symptoms of celiac disease. Non-celiac gluten sensitivity is the medical term for this condition. The composition and function of the gut microbiome may have an impact on these people's sensitivity to gluten.

Impact of Gluten-Free Foods

Gluten-free foods have a major beneficial effect on people who have celiac disease, wheat allergies, or non-celiac gluten sensitivity, providing symptom relief as well as promoting intestinal healing. Following a gluten-free diet is essential for the general health and wellbeing of these people. However, gluten-free items can be more expensive and may be deficient in some nutrients, which could cause dietary imbalances if not carefully controlled (Niland B *et al.*, 2018).

Market growth

The gluten free products market is a dynamic and growing market exists for gluten-free goods. Due to the rising prevalence of celiac disease, gluten sensitivity, and gluten intolerance as well as the increased acceptance of gluten-free eating habits, the market is anticipated to expand over the coming years. The worldwide market for gluten-free products is predicted to increase at a 9.5% CAGR from 2022 to 2030 (Market research, 2023). The market is being pushed by a rising incidence of celiac disease and gluten sensitivity, as well as the increasing popularity of gluten-free diets.

General Mills, Inc., Kellogg Company, The Kraft Heinz Company, Hero AG, Barilla G.E.R., Fratelli S.P.A., Seitz Glutenfrei, Freedom Foods Group Limited, Ecotone, and Vantage Specialty Foods are the key participants in the gluten-free product market (EIN Press wire, 2022).

Health and well-being

For those with celiac disease, their health and wellbeing are their primary concerns. Patients with celiac disease must strictly follow a gluten-free diet to effectively manage their health because it is a lifelong autoimmune condition that is brought on by consuming gluten. So, they can lessen bothersome symptoms and avoid long-term complications. To maintain their physical and mental well-being, celiac patients need proper education, support from medical professionals, and access to gluten-free resources.

Improved quality of life for celiac patients

In recent years, celiac patients have experienced a remarkable improvement in their quality of life, thanks to significant advancements and increased awareness surrounding celiac disease. The rate of early diagnosis has risen, allowing quick implementation of a gluten-free diet and lowering the risk of complications. A wide variety of safe and delectable gluten-free products have been made available by the growth of the gluten-free food industry, making it simpler for patients to follow their dietary restrictions without sacrificing flavour or variety Raiteri *A et al.*,2022). Patients can choose foods with greater confidence thanks to programmes for certification and clear gluten-free

labelling. Celiac patients now have access to a more robust network of resources thanks to improved support from medical professionals, greater public awareness, and the availability of online and in-person support groups.

Reduction of symptoms and complications associated with celiac disease

Although there is currently no cure for celiac disease, it can be effectively controlled by adhering to a strict gluten-free diet. The following are some methods to lessen celiac disease symptoms and complications:

- **Diet:** Maintaining a strict gluten-free diet is the most important part of managing celiac disease. Avoid or steer clear of any food products made from wheat, barley, rye, and their derivatives. It's important to carefully read food labels and be aware of the risks of cross-contamination in shared cooking environments because gluten can hide in unexpected places.
- **Nutritional Support:** Some nutrients, including iron, calcium, vitamin D, and B vitamins, may occasionally be insufficient in a gluten-free diet. To ensure adequate nutrition, a dietitian can assist in creating a balanced meal plan and suggest suitable gluten-free alternatives.
- **Medication and Supplements:** In some situations, specific medications or supplements may be recommended to treat certain celiac disease complications, such as acid reflux, nutrient malabsorption, or deficiencies.

- **Regular Checkups:** To track the development of the condition and identify any potential complications, routine checkups with a healthcare provider are imperative. Blood tests can be used to evaluate nutrient deficiencies and measure antibody levels.
- **Avoid Cross-Contamination:** To prevent cross-contamination in the kitchen, use distinct cutting boards, toasters, and cooking utensils for foods that are gluten-free. Inform your family and roommates of the value of preventing cross-contamination.
- **Support Groups and Counselling:** For emotional support and advice on how to live with the condition, joining a celiac support group or seeking counselling may be helpful.

Drugs and dietary supplements: It's extremely important to remember that any drugs or supplements should only be taken on the advice and prescription of a recognized healthcare specialist.

- **Enzymes:** there were ongoing analyses on enzymes that specifically break down gluten in the digestive tract. These enzymes are designed to aid in the digestion of gluten and lessen any potential negative effects. It is important to realise that these enzymes are not a replacement for a gluten-free diet and are not meant to allow the consumption of gluten-containing foods. As of my most recent update, they are still regarded as investigational and have not yet been approved or widely

used (Wei G *et al.*,2020).

- **Lactase Supplement:** Due to damage to the small intestine, some people with celiac disease may also be lactose intolerant. Supplemental lactase can assist in the digestion of lactose, the sugar present in milk and dairy products, and can also help with associated digestive symptoms (Alkalay M. 2021).
- **Supplements for iron, calcium, and vitamin D:** People with celiac disease may experience nutrient deficiencies like iron, calcium, and vitamin D because of malabsorption. In order to address these deficiencies and advance general health, supplements may be prescribed (Di Nardo *et al.*,2019).
- **Probiotics:** People with celiac disease may experience a disruption in the normal balance of gut bacteria, which can be helped by taking probiotic supplements. Probiotics may have some advantages in treating celiac disease, although research into this topic is still in progress.
- **Immune-suppressing medications and steroids:** Corticosteroids or other immune-suppressing drugs may be considered in severe cases of celiac disease or in refractory celiac disease (when symptoms continue despite a strict gluten-free diet) to reduce inflammation and manage symptoms. Usually, these drugs are taken for short-term treatment under close medical supervision (Shammeri O *et al.*,2008).

Challenges and Opportunities

In the field of gluten-free products, maintaining product quality and avoiding cross-contamination are difficult tasks. However, the growing demand for gluten-free options presents opportunities for innovation and development. There is room for improvement in gluten-free products thanks to advancements in food technology and alternative ingredients. An increasing number of gluten-free options for consumers is made possible by rising market opportunities due to increased awareness of and support for celiac disease and gluten sensitivity.

A. Cross-contamination and labelling issues

- **Cross-contamination:** For people with celiac disease or gluten sensitivity, cross-contamination and labelling are crucial issues because even minute amounts of gluten can cause negative reactions. Cross-contamination can happen when gluten-free products come into contact with gluten-containing ingredients or surfaces at different stages of production, from farming to distribution (Wieser H *et al.*,2021).
- **Gluten-Free Certification:** Many gluten-free products seek certification from reputable organizations like GFCO or Coeliac UK Crossed Grain symbol in order to address cross-contamination. These certifications guarantee adherence to stringent requirements and testing, capping the amount of gluten in products at a maximum permissible level, frequently 20 parts per million in the US (Wieser H *et al.*,2021).

- **Allergen Labeling Laws:** Many countries have labeling regulations that call for common allergens, including wheat, to be clearly identified on food packaging. Celiac disease sufferers can use this to find possible gluten sources.
- **Consumer Education:** Information for consumers is crucial. To avoid ingredients containing gluten, people with gluten-related disorders must become knowledgeable about the dangers of cross-contamination and how to read food labels correctly.
- **Advancements in Technology:** As testing technology improves, it makes it possible to detect gluten with greater sensitivity, assisting manufacturers in adhering to gluten-free standards and boosting consumer confidence in the safety of the products.

B. Nutritional considerations:

Patients with celiac disease need to adhere to a strict gluten-free diet and stay away from wheat, barley, and rye. Along with fruits, vegetables, lean proteins, and dairy alternatives, nutrient-rich gluten-free substitutes like quinoa and rice should be used. It's crucial to keep an eye on nutrient levels, especially those for iron, calcium, vitamin B12, and vitamin D. It is recommended to consult with a nutritionist to develop a customized gluten-free meal plan.

Here are a few dietary recommendations for people with celiac disease (Srilakshmi B, 2019):

- **Gluten-Free Diet:** Eliminating all sources of gluten from the diet is a key component of managing celiac disease. This entails staying away from items made from wheat, barley, and rye. It's crucial to carefully read food labels and be aware of hidden sources of gluten because gluten can be found in many processed foods, sauces, and condiments.
- **Nutrient-Rich Substitutes:** Substitute nutrient-rich gluten-free grains such as quinoa, rice, corn, oats (which are certified gluten-free), millet, sorghum and buckwheat with grains that contain gluten. These grains supply important fiber, vitamins, and minerals.
- **Fruits and Vegetables:** Encourage people to eat numerous servings of fruits and vegetables because they are naturally gluten-free and include important vitamins, minerals, and antioxidants.
- **Lean Proteins:** To meet protein requirements and maintain physical health, include lean protein sources such as poultry, fish, eggs, lentils, and nuts in your diet.
- **Dairy or Dairy Alternatives:** If lactose sensitivity is present, pick lactose-free dairy or dairy substitutes like almond milk, soy milk, or coconut milk.
- **Iron and calcium:** Celiac disease can cause iron and calcium malabsorption. Include foods high in iron, such as beans, lean meats, and fortified cereals. Include dairy products, fortified non-dairy substitutes, leafy greens, and calcium-enriched foods in your diet for calcium.

- **Vitamin B12 and D:** Vitamins B12 and D should be monitored because celiac disease may interfere with their absorption. If necessary, on the advice of a healthcare professional, think about taking supplements.
- **Gluten-free fiber:** To promote digestive health, make sure you consume enough fibre from gluten-free sources such fruits, vegetables, gluten-free grains, nuts, and seeds.

Addressing potential nutrient deficiencies associated with gluten-free foods

Gluten-free diets may lead to nutrient deficiencies due to reduced intake of fortified wheat products. Common deficiencies include fiber, iron, calcium, and B vitamins.

Here are several possible vitamin deficiencies linked to gluten-free foods and how to address.

- **Iron:** Gluten-free foods often contain low levels of this mineral, which is crucial for the body's ability to transport oxygen. Iron deficiency anaemia may be more common in people who avoid gluten in their diet. Iron-rich foods including leafy green vegetables, beans, lentils, and fortified cereals should be consumed often to prevent iron deficiency (Srilakshmi B , 2015).
- **Calcium:** Gluten-free foods frequently have low calcium content, even though calcium is essential for maintaining healthy bones and teeth. Osteoporosis risk may be higher for those who consume no gluten in their diet. Consuming

a variety of calcium-rich meals, such as dairy products, leafy green vegetables, and seafood, is crucial to preventing calcium shortage (Krupa Kozak *et al.*,2016).

- **Zinc:** A essential mineral for both immune system wellness and wound healing, gluten-free diets are frequently low in zinc. A gluten-free diet may raise the risk of zinc insufficiency in some people. Consuming a lot of zinc-rich foods, such as oysters, cattle, poultry, and legumes, is essential to preventing zinc insufficiency (Saper R.B. *et al.*,2009).
- **Folate:** A crucial vitamin for pregnant women, but gluten-free diets are often lack of folate. Pregnant women who avoid gluten may be more likely to experience a folate deficit. Consuming a lot of foods high in folate, such as leafy green vegetables, beans, lentils, and citrus fruits, is crucial to preventing folate insufficiency (Houk V.N *et al.*,1992).
- **Vitamin B12:** Gluten-free diets are frequently deficient in vitamin B12, a necessary vitamin for nerve and energy production. People who follow a gluten-free diet may be at increased risk of vitamin B12 deficiency. Eat adequate number of foods that are rich in vitamin B12, such as meat, fish, eggs, and dairy products, to prevent vitamin B12 deficiency (Wierdsma N.J. *et al.*,2013).

Conclusion

In conclusion, the global prevalence of celiac disease has been steadily increasing. This rise calls for greater awareness and

understanding of the condition and the importance of adhering to a gluten-free diet. Gluten-free foods play a crucial role in managing celiac disease, as they help alleviate symptoms and prevent long-term complications. However, there are challenges associated with potential nutrient deficiencies in gluten-free diets, necessitating careful attention to balanced nutrition.

As research in this field advances, future directions should focus on enhancing diagnostic methods, including the development of non-invasive and accurate testing techniques. Moreover, further exploration into the underlying mechanisms of celiac disease and its interaction with gut microbiota can shed light on potential therapeutic interventions. Additionally, investigating the impact of gluten-free diets on other health aspects and exploring alternative grains and food sources can aid in optimizing nutrient intake.

Overall, addressing the rising trends in celiac disease demands a comprehensive approach involving increased public awareness, improved gluten-free food options, and continuous research efforts to enhance diagnosis and management strategies. By joining forces across medical, scientific, and food industries, we can strive towards better outcomes and a higher quality of life for individuals living with celiac disease.

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3

Agro-Based Waste Management and Sustainable Development: A Review

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Abstract

This review paper aims to provide an overview of agro-based waste management strategies and their contribution to sustainable development. Agro-based waste, generated from agricultural and food processing activities, poses significant environmental and health challenges. However, by adopting sustainable waste management practices, these agricultural residues can be effectively utilized to create economic value, reduce environmental pollution, and promote sustainable development. This paper explores various agro-based waste management techniques, including recycling, composting, bioenergy production, and bioremediation, and discusses their potential benefits, challenges, and future prospects. The review highlights the importance of adopting integrated waste management approaches that prioritize sustainability, resource recovery, and circular economy principles.

Keywords: *Agro-based waste, sustainable development, waste management, recycling, composting, bioenergy, bioremediation, circular economy.*

Introduction

Agro-based waste management is a critical aspect of gaining sustainable development goals in the field of agriculture. The rapid growth of agricultural activities and food processing industries has led to the generation of a significant amount of waste, posing environmental challenges and sustainability concerns. However, through the adoption of effective waste management strategies, agro-based waste can be harnessed as a valuable resource, promoting sustainable agricultural practices, mitigating environmental impacts, and creating economic opportunities (Ajila C.M. *et al.*,2012). However, the proper management of agro-based waste is essential for several reasons which includes unmanageable waste from agricultural and food processing activities which can contribute to environmental pollution, including soil degradation, water contamination, and air pollution. Moreover, the improper disposal of agricultural residues and by-products can result in the emission of greenhouse gases, exacerbating climate change. Additionally, the accumulation of waste poses health risks and impacts biodiversity and ecosystem health (Madurwar M.V. *et al.*,2013, Maraveas C, 2020, Jana K., *et al.*,2016).

To address these challenges, innovative and sustainable waste management practices have emerged, offering solutions that reduce the negative environmental impacts of agro-based waste and promote sustainable development (Zafeer M.K. *et al.*,2023).

These practices encompass waste reduction at the source, valorization through resource recovery and recycling, and the adoption of circular economy principles in agricultural systems (Federici F., *et al.*,2009).

Waste reduction techniques focus on minimizing waste generation by promoting sustainable agricultural practices, precision farming, and efficient use of resources (Kutty A. *et al.*,2020). This includes optimizing fertilizer and pesticide applications, implementing precision irrigation techniques, and adopting integrated pest management strategies. By reducing waste at its source, these practices not only minimize environmental impacts but also improve resource efficiency, leading to cost savings for farmers (Ai-Obadi M. *et al.*,2009).

Agro-based waste valorization involves converting waste materials into useful products or energy sources (Ngoc U.N. *et al.*,2022). Through composting, organic fertilizers can be produced, enriching soil health and fertility. Anaerobic digestion processes convert waste into biogas, a renewable energy source, and nutrient-rich digestate that can be used as organic fertilizer. Biomass from agro-based waste can be utilized for heat and electricity generation, contributing to energy diversification and reducing dependence on non-renewable resources (Sala S. *et al.*,2017).

The implementation of sustainable waste management practices in the agricultural sector offers numerous economic, social, and environmental benefits. Agro-based waste valorization can create new revenue streams and employment opportunities, particularly in rural areas, thereby contributing to local economic

development. These practices also reduce the environmental footprint of agriculture, improving air and water quality, conserving natural resources, and mitigating climate change by reducing greenhouse gas emissions (Singh N *et al.*,2015, Amran M.A. *et al.*,2021, Mateus A. *et al.*,2021, Jhariya M.K. *et al.*,2019).

While significant progress has been made in the field of agro-based waste management, several challenges and barriers persist. Technical constraints, such as the availability of appropriate technologies and infrastructure, need to be addressed. Economic viability and market demand for recycled or valorized products require further exploration. Furthermore, institutional and policy frameworks must support sustainable waste management practices, including regulatory standards, financial incentives, and awareness campaigns (Kumar V *et al.*,2023, Kharola S. *et al.*,2022, Nagariya R. *et al.*,2022)

In the context of sustainable development, the current status, trends, and difficulties of agro-based waste management are examined and analysed in this study. It examines the various waste management strategies and their potential advantages for socioeconomic advancement as well as environmental sustainability. This research aims to offer perceptions and suggestions for policymakers, researchers, and stakeholders to improve waste management systems and foster sustainable agricultural practises by identifying successful case studies and best practises.

Overall, effective agro-based waste management is crucial for achieving sustainable development in the agricultural sector. By

converting waste into valuable resources, minimizing environmental impacts, and promoting economic opportunities, sustainable waste management practices can contribute significantly to a more resilient, resource-efficient, and environmentally friendly agricultural system.

Importance of agro-based waste management for sustainable development

It solves environmental concerns, enhances resource efficiency, and generates economic opportunities, agro-based waste management is critical to accomplishing sustainable development goals (Kumari S. & Jeble S., 2020). Agricultural waste, such as crop leftovers, food processing byproducts, and animal manure, is generated in significant quantities at various phases of production. This waste, if not managed properly, can have a negative impact on the environment, human health, and the general sustainability of agricultural systems. Agro-based waste, on the other hand, can be turned into valuable resources by employing sustainable waste management practises, contributing to sustainable development in a variety of ways (Giroto F. *et al.*, 2015, Nagendran R, 2011).

i. Environmental Sustainability

Agro-based waste management is critical to environmental sustainability. Unmanaged agricultural waste can cause soil deterioration, water contamination, and air pollution (Koul B. *et al.*, 2022). Agricultural wastes can be transformed into organic fertilisers, biogas, and bio-based commodities by using suitable waste management practises such as composting, anaerobic

digestion, and recycling. These practises help to conserve soil fertility, protect water quality, and minimise greenhouse gas emissions, all of which help to mitigate climate change and environmental deterioration (Hanafi F.H. *et al.*,2018).

ii. Resource Efficiency

Waste management that is effective enhances resource efficiency in the agricultural sector. Agro-based waste is rich in nutrients, organic materials, and energy potential. Waste can be changed into valuable inputs for agricultural production, such as nutrient-rich fertilisers and renewable energy sources, by utilising these resources through composting, anaerobic digestion, and biomass conversion. This decreases the need for synthetic fertilisers, fossil fuels, and other non-renewable resources, resulting in more sustainable and effective resource use (Wilts H. *et al.*, 2016).

iii. Circular Economy

Agro-based waste management adheres to the concept of the circular economy, which considers trash to be a useful resource that may be reintegrated into the production cycle. Agricultural wastes can be turned into new products or inputs through waste valorization and recycling, lowering the requirement for virgin materials and reducing trash output. Agro-based waste management promotes a circular economy approach by closing the waste loop, which maximises resource efficiency, minimises waste, and promotes sustainable production and consumption habits (Fernando Y. *et al.*,2022 Kazancoglu Y. *et al.*,2018).

iv. Economic Opportunities

Sustainable waste management practices in agriculture create economic opportunities and contribute to rural development. Agro-based waste valorization generates revenue streams by producing marketable products such as organic fertilizers, bio-based materials, and renewable energy. Additionally, the establishment of waste management infrastructure and value-added processing facilities can create job opportunities, particularly in rural areas where agricultural activities are prevalent. These economic benefits contribute to poverty reduction, livelihood improvement, and the overall socio-economic development of agricultural communities (Koul B. *et al.*,2022).

v. Food Security and Safety

Proper waste management in the agro-based sector enhances food security and safety. Unmanaged waste can attract pests, harbor pathogens, and contaminate water sources, leading to the spread of diseases and compromising food safety. By implementing waste management practices that minimize waste accumulation and reduce the risk of contamination, the quality and safety of agricultural products can be ensured. This, in turn, safeguards public health, supports sustainable food systems, and contributes to food security (Tapsir S. *et al.*,2019, Siwar C. *et al.*,2022).

Thus, the agro-based waste management is of utmost importance for sustainable development in the agricultural sector. By effectively managing agricultural residues and by-products, we can mitigate environmental impacts, optimize resource utilization, promote circular economy principles, create

economic opportunities, and enhance food security and safety. The implementation of sustainable waste management practices in agriculture is essential to ensure the long-term viability, resilience, and sustainability of agricultural systems while contributing to broader sustainable development goals (EL-Ramady *et al.*, 2022).

Environmental and health impacts of unmanaged agro-based waste

Unmanaged agro-based waste poses significant environmental and health risks, impacting ecosystems, natural resources, and human well-being. Agricultural activities, including crop cultivation, livestock farming, and food processing, generate substantial amounts of waste, such as crop residues, animal manure, and food by-products (Kuthiala T. *et al.*, 2022). When left unmanaged, this waste can have detrimental consequences, exacerbating environmental degradation and endangering public health (Das S. *et al.*, 2023). Understanding the environmental and health impacts of unmanaged agro-based waste is crucial for implementing effective waste management strategies and promoting sustainable agricultural practices.

i. Soil Degradation

Unmanaged agro-based waste can lead to soil degradation, negatively affecting soil fertility and productivity (Figaredo A.T. *et al.*, 2018). When agricultural residues are left to decompose in the field without proper management, they can contribute to the buildup of organic matter, leading to nutrient imbalances, soil acidification, and reduced water-holding capacity (Florence

F.F. *et al.*, 2016). Additionally, the accumulation of waste can create physical barriers that impede seed germination, root growth, and nutrient uptake by plants. Soil degradation resulting from unmanaged waste can ultimately lead to reduced crop yields, decreased agricultural productivity, and land degradation (Singh V.K. *et al.*, 2020).

ii. Water Pollution

Agricultural waste, if not adequately managed, can affect water sources such as rivers, lakes, and groundwater, which are the major sources of water for consumption. Pollutants such as pesticides, fertilisers, and diseases can be carried into surrounding water-bodies by runoff from farms where agricultural leftovers are poorly handled. Excess nutrient discharge, especially from animal dung, can induce eutrophication, which can result in algal blooms, oxygen depletion, and the destruction of aquatic ecosystems. Pathogens found in unmanaged garbage can contaminate water supplies, causing health dangers when consumed or utilised for irrigation (Tewari P.K. *et al.*, 2009, Sivaranjane R. *et al.*, 2022).

iii. Air Pollution

Unmanaged agro-based waste contributes to air pollution through the emission of greenhouse gases (GHGs), volatile organic compounds (VOCs), and particulate matter. Decomposition processes of organic waste generate methane (CH₄) and nitrous oxide (N₂O), potent GHGs that contribute to climate change. Additionally, open burning of agricultural residues, a common practice in some regions, releases smoke, ash, and pollutants

into the atmosphere, leading to air pollution. Particulate matter from burning waste can have adverse respiratory effects, causing respiratory illnesses and exacerbating respiratory conditions in nearby populations (Abdullah A.R., 1995, Haryanto A., 2012, Vergnet L. *et. al.*, 1996).

iv. Biodiversity and Ecosystem Impacts

The accumulation of unmanaged agro-based waste can harm biodiversity and disrupt ecosystems (Kmar A., 2006). Improper waste disposal can alter soil microbial communities, affecting nutrient cycling processes and soil biodiversity (Sahu N. *et al.*, 2021). Additionally, water pollution resulting from waste runoff can harm aquatic organisms, leading to a decline in fish populations and disruption of aquatic ecosystems. The loss of biodiversity and disruption of ecosystems have broader implications for ecosystem services, including pollination, nutrient cycling, and natural pest control, which are essential for sustainable agricultural production (Saha P. *et al.*, 2023).

v. Public Health Risks

Unmanaged agro-based waste poses direct and indirect risks to public health (Das S. *et al.*, 2023). The presence of pathogens in agricultural waste can contaminate water sources, leading to waterborne diseases such as diarrheal illnesses (Kumar A and Agarwal A, 2020). Air pollution from the burning of waste can exacerbate respiratory conditions, especially in communities located near agricultural areas. Additionally, exposure to chemical contaminants, such as pesticides and heavy metals, present in unmanaged waste can have adverse health effects on

both agricultural workers and nearby communities (Balogun O.L. *et al.*, 2017, Rakhmania *et al.*, 2022).

vi. Addressing the Environmental and Health Impacts

To mitigate the environmental and health impacts of unmanaged agro-based waste, effective waste management practices are essential. Implementing sustainable waste management strategies, such as composting, anaerobic digestion, and recycling, can help reduce pollution, improve soil health, and mitigate climate change. Proper waste treatment and disposal methods, including the use of engineered systems and the promotion of best management practices, are necessary to prevent contamination of water sources. Additionally, raising awareness, providing training, and implementing regulatory frameworks can contribute to reducing the negative impacts of agro-based waste on public health.

Thus, the unmanaged agro-based waste poses significant environmental and health risks. Soil degradation, water pollution, air pollution, biodiversity loss, and public health risks are some of the consequences of inadequate waste management practices. Addressing these impacts requires the adoption of sustainable waste management strategies, regulatory frameworks, and public awareness campaigns. By managing agro-based waste effectively, we can mitigate environmental degradation, protect public health, and promote sustainable agricultural practices that contribute to a more resilient and environmentally friendly food system

Agro-Based Waste Management Techniques

Agro-based waste management systems are critical for promoting sustainable farming practises, reducing environmental impact, and optimising resource utilisation. With a greater emphasis on sustainability and the circular economy, good waste management is critical for reducing waste output, conserving natural resources, and lowering environmental pollution (Gupta S. *et al.*, 2019, Asadu C.O. *et al.*, 2019). Here are a few examples of prominent agro-based waste management techniques:

i. Composting

Composting is a popular process that includes decomposing organic waste items such as crop leftovers, animal manure, and food scraps into nutrient-rich compost (Shukor J. *et al.*, 2018, Abu Qdais H, 2016, Pepe O. *et al.*, 2013). The procedure entails providing an ideal environment for microbial activity to break down the waste, yielding a beneficial soil supplement. Composting not only reduces waste volume, but it also increases soil fertility, water retention, and the demand for commercial fertilisers (Singh S. *et al.*, 2012, Leung D.Y. and Wang J., 2016).

ii. Anaerobic Digestion:

Anaerobic digestion is a biological process that converts organic waste into biogas and nutrient-rich digestate. It involves the decomposition of waste in an oxygen-free environment, carried out by a consortium of microorganisms (Vaid V. *et al.*, 2013). Biogas produced during anaerobic digestion can be used as a renewable energy source for heating, electricity generation, or as a vehicle fuel. The digestate can be used as a nutrient-rich fertilizer, returning valuable nutrients to the soil (Hoo P. Y. *et*

al., 2017, Zou R. *et al.*, 2022).

iii. Biomass Conversion

Agro-based waste can be converted into various forms of biomass energy, including solid biofuels, liquid biofuels, and biogas. Biomass conversion technologies such as pyrolysis, gasification, and bioethanol production utilize different processes to transform waste biomass into energy. These techniques contribute to the production of renewable energy, reducing reliance on fossil fuels and minimizing greenhouse gas emissions (Pappu J.S & Gummadi S.N., 2022, Sarkar N. *et al.*, 2012, Srumsiri S., 2007).

iv. Animal Feed Production

Certain agro-based waste materials can be processed and utilized as animal feed. Crop residues, such as straw or corn stover, can be processed into nutritious feed ingredients. Similarly, by-products from food processing industries, such as fruit pulps or oilseed meals, can be utilized as feed supplements. Proper treatment and processing methods ensure the safety and nutritional adequacy of the feed, reducing waste while supporting livestock production (Ajila C.M. *et al.*, 2012, Yaradoddi J.S. *et al.*, 2022).

v. Bioplastics and Biofibers

Agro-based waste, such as agricultural residues or plant fibers, can be utilized for the production of bioplastics and biofibers. Through innovative processes, waste biomass can be transformed into sustainable alternatives to conventional plastics and

synthetic fibers. These bio-based materials offer reduced environmental impact and promote the utilization of renewable resources (Wei L., 2016, Fernando Y. *et al.*, 2022).

vi. Waste-to-Energy Plants

Large-scale waste-to-energy plants utilize advanced technologies, such as incineration or gasification, to convert agro-based waste into electricity or heat. These facilities provide a solution for waste management while simultaneously generating renewable energy. Stringent emission control systems are employed to minimize the environmental impact of the combustion process (Singh R. *et al.*, 2021, Sivakumar D.*et al.*, 2022, Dagar S. *et al.*, 2023).

vii. Integrated Waste Management Systems

Integrated waste management systems combine multiple techniques to effectively manage agro-based waste. These systems incorporate a hierarchy of waste management strategies, including waste reduction, reuse, recycling, and energy recovery. By integrating various approaches, waste can be managed more efficiently, reducing the overall environmental footprint (Dagar S. *et al.*, 2023, Le T.H. *et al.*, 2016).

Implementing these agro-based waste management techniques requires collaboration among farmers, industries, waste management agencies, and policymakers. Proper infrastructure, education, and awareness programs are necessary to facilitate the adoption of sustainable waste management practices. By efficiently managing agro-based waste, we can minimize environmental pollution, conserve resources, and contribute to

the development of a more sustainable and circular agricultural system.

Conclusion

By addressing environmental issues, boosting resource efficiency, and supporting the circular economy, agro-based waste management plays a critical role in accomplishing sustainable development goals. The relevance of appropriate waste management strategies in the agriculture industry and their impact on sustainable development has been stressed in this review.

If crop wastes, animal manure, and food manufacturing byproducts are not managed properly, they represent substantial environmental and health problems. These waste materials, however, can be turned into useful resources through the use of various waste management techniques such as composting. By adopting composting practices, organic waste can be converted into nutrient-rich compost, enhancing soil fertility and reducing the need for synthetic fertilizers. Anaerobic digestion offers the dual benefit of generating renewable biogas for energy production while producing nutrient-rich digestate for use as a fertilizer. Biomass conversion technologies enable the conversion of agro-based waste into biofuels, reducing dependence on fossil fuels and minimizing greenhouse gas emissions.

Additionally, agro-based waste can be utilized in the production of animal feed, bioplastics, biofibers, and other value-added products, promoting resource efficiency and supporting the

circular economy. Waste-to-energy plants contribute to the generation of renewable energy while ensuring proper waste disposal and minimizing environmental impact. Integrated waste management systems that combine multiple techniques offer comprehensive and sustainable solutions for agro-based waste management.

To achieve sustainable development in the agricultural sector, farmers, industries, waste management agencies, and policymakers must work together. Adequate infrastructure, education, and awareness programmes are required to ensure that sustainable waste management practises are widely adopted. Furthermore, strict laws and enforcement procedures are required to ensure proper garbage disposal and prevent damage of the environment.

Finally, proper agro-based waste management is critical for long-term growth. We can minimise environmental deterioration, save resources, reduce greenhouse gas emissions, and promote the efficient use of waste materials by applying sustainable waste management strategies. Waste management practises integrated into agricultural systems help to produce a more sustainable and resilient agricultural industry. Continued research, innovation, and stakeholder participation are required for further breakthroughs in agro-based waste management.

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4

Empowering Women in Cyberspace: A Holistic Approach to Ensuring Safety

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Abstract

This research paper examines the imperative need for ensuring the safety of women in cyberspace, presenting a comprehensive and holistic approach to empower women online. In an era dominated by digital interactions, women encounter unique challenges, including cyberbullying, online harassment, and privacy breaches. This paper advocates for a multifaceted strategy encompassing digital literacy programs, strengthened cybersecurity measures, legislative enhancements, and the promotion of online civility. The research emphasizes the importance of community engagement and dedicated support platforms for fostering a secure and inclusive digital environment. By addressing the digital gender gap and implementing proactive measures, this paper envisions a cyberspace that reflects values of equality, respect, and security. The findings contribute to ongoing discussions on women's rights and digital empowerment, providing a valuable resource for researchers, policymakers, and advocates alike.

Keywords: *Cyberspace security, online harassment, privacy concerns, cybersecurity measures, digital literacy cyber threats, Cyber Laws.*

Introduction

In an era marked by the pervasive influence of technology, the digital landscape serves as both a gateway to unprecedented opportunities and a potential breeding ground for challenges, particularly for women. As our lives become increasingly intertwined with the virtual realm, concerns about the safety and empowerment of women in cyberspace have come to the forefront of societal discourse. This research embarks on an exploration of the intricate dynamics shaping the experiences of women online, aiming to unravel the complexities and advocate for a holistic approach to ensure their safety.

The digital revolution has undoubtedly democratized information access and communication, yet it has also given rise to a unique set of vulnerabilities, with women often finding themselves disproportionately impacted. Cyberbullying, online harassment, and privacy infringements constitute formidable barriers to the full and equitable participation of women in the digital sphere. The manifestation of a digital gender divide underscores the urgency of addressing these challenges, not merely as isolated incidents but as systemic issues that demand a comprehensive and interconnected strategy.

This paper contends that a nuanced understanding of the multifaceted nature of women's safety in cyberspace is essential

to developing effective solutions. As such, it advocates for a holistic approach that encompasses digital literacy programs to empower women with the skills to navigate the digital landscape safely. Additionally, the paper explores the role of strengthened cybersecurity measures, legislative enhancements, and the cultivation of online civility in fostering an environment where women can participate without fear of harassment or discrimination.

Furthermore, recognizing the importance of community engagement and support, this research underscores the need for dedicated platforms that provide women with resources, assistance, and a sense of solidarity in the face of online challenges. By addressing these issues collectively, we aim to contribute to a vision of cyberspace that reflects principles of equality, respect, and security, ensuring that women can fully harness the benefits of the digital age.

Literature Survey

Hinduja, S., & Patchin, J. W. (2015). "Cyberbullying and Online Harassment Prevention." This book offers insights into preventive measures and strategies to address cyberbullying and online harassment (Taddeo, M., & Floridi, L. 2018). "How AI can be a Force for Good." A scholarly article discussing the ethical considerations and positive applications of artificial intelligence, including its impact on gender issues in cyberspace (UN Women. 2019). "Turning Promises into Action: Gender Equality in the 2030 Agenda for Sustainable Development." This report from UN Women provides a broader perspective on gender equality, including digital gender divides and empowerment (Bauer, J.

M., & Latonero, M., 2015). "Stolen Future, Broken Present: The Human Trafficking Market in the United States." A research paper highlighting the intersections of online threats, including cyberbullying and harassment, with broader issues such as human trafficking (OECD, 2019). "Online Platforms and Digitalisation: Implications for Privacy and Consumer Protection." A report by the Organisation for Economic Co-operation and Development (OECD) exploring the challenges and recommendations related to privacy in the digital era (Suler, J. 2016). "The Online Disinhibition Effect." A psychological perspective on online behavior, helping to understand the disinhibition effect in digital interactions (Inter-Parliamentary Union, 2020). "Parliamentary Primer on Online Violence against Women in Politics." This primer offers insights into online violence against women in politics, providing a political and legislative perspective (Namie, G., & Namie, R. 2009; Bauer, J. M., & Latonero, M. 2015; Suler, J. 2016).

Challenges Faced by Women in Cyberspace

Cyber bullying and Online Harassment

Definition: Persistent, unwanted, and harmful behaviors carried out online.

Challenge: Women often experience cyberbullying and online harassment, including sexist remarks, threats, and the spread of false information, impacting their mental health and well-being.

Privacy Violations

Definition: Unauthorized access or misuse of personal

information online.

Challenge: Women are disproportionately targeted for privacy infringements, including doxxing and unauthorized sharing of personal information, leading to potential offline harm.

Gender-Based Discrimination

Definition: Discrimination based on gender identity or sex.

Challenge: Women face gender-based discrimination in various online spaces, limiting their opportunities and subjecting them to biased treatment.

Digital Literacy Gaps

Definition: Disparities in digital literacy skills and knowledge.

Challenge: Some women may lack the necessary skills to navigate the digital world safely, leaving them more vulnerable to online threats.

Online Stalking

Definition: Unwanted and obsessive attention or monitoring online.

Challenge: Women may be targets of online stalking, which can escalate to offline stalking, creating significant safety concerns.

Revenge Porn

Definition: Non-consensual sharing of intimate images.

Challenge: Women are often victims of revenge porn, leading to emotional distress, reputational damage, and potential legal

consequences.

Inadequate Legal Protections

Definition: Insufficient laws and regulations to address online gender-based violence.

Challenge: Legal frameworks may not adequately protect women from various forms of online harassment, and enforcement can be challenging.

Preventive Measures

In the ever-evolving landscape of cyberspace, women must take proactive measures to safeguard their online well-being. A fundamental precaution is digital literacy; staying informed about online risks, participating in educational programs, and understanding the nuances of online security are paramount. Implementing strong passwords and enabling two-factor authentication enhance account protection, while regularly updating privacy settings mitigates the risk of unauthorized access. Adhering to safe browsing habits, avoiding suspicious links, and using secure Wi-Fi connections contribute to a secure online experience. Regularly backing up important data and keeping devices updated with the latest security patches add layers of resilience against potential threats. Familiarity with reporting tools on various platforms empowers women to address instances of cyberbullying or harassment promptly (Taddeo, M., & Floridi, L. 2018).

Cultivating support networks, both online and offline, allows for shared experiences and assistance in navigating challenging

situations. Legal awareness is crucial; understanding local laws related to online harassment and cybercrimes provides a foundation for seeking legal recourse if necessary. Ultimately, trusting one's instincts, staying vigilant, and incorporating these precautions into daily online practices empower women to navigate cyberspace with confidence and resilience, fostering a safer digital environment (Dreibelbis, R., & Dawson, M. 2019, UN Women. 2019).

Conclusion

In conclusion, the empowerment of women in cyberspace requires a holistic approach that combines education, technological precautions, and a supportive community. As digital interactions continue to shape our lives, it is imperative for women to stay informed and literate about online risks. Strengthening digital literacy through educational programs and adopting strong cybersecurity measures, such as secure passwords and updated devices, serves as a foundational step. Furthermore, the importance of cultivating a supportive network cannot be overstated. Creating spaces for open communication and sharing experiences helps women navigate challenges effectively. Legal awareness is crucial, as understanding and advocating for robust legal protections contribute to a safer online environment. While the challenges in cyberspace persist, the proactive adoption of precautions outlined in this research empowers women to assert their digital presence with confidence. As we move forward, it is essential for individuals, communities, and policymakers to collaboratively work towards fostering a cyberspace that is

inclusive, respectful, and secure for everyone, regardless of gender. By embracing these measures, women can actively contribute to shaping a positive and empowering digital future.

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5

Study of the functional groups present in waste citrus bio-mass applying drying treatment

Pallabi Saikia

Abstract

Citrus peel contributes highly to varied industries due to its vivid usage in everyday life. In the present study, we explored the composition of essential oil, which was extracted from waste pomelo, orange, lemon and kinnow dried peel by an innovative eco-friendly process using hexane as an extraction solvent. The maximum amount of the oil was extracted from oven-dried while the minimum was found in fresh peel samples. The most prevalent chemical constituent was d-Limonene, detected in all the essential oils studied.

Keywords: *Peel oils, d-Limonene, Monoterpenes, Citrus fruits*

Introduction

India is the second largest producer of fruits and vegetable and contributes 10.9 percent and 8.6 percent respectively. It is sixth in citrus production in the world (Kamal *et al.*, 2011). Citrus fruits are known to be of great use in many fields such as in preparing wines, medicinal industry, culinary purpose etc. Citrus fruits contain carbohydrates such as sucrose, glucose, and fructose (Palazzolo *et al.*, 2013). The ratio of sucrose, glucose, and fructose in mandarins is found to have as 2:1:1. Organic acids found in citrus fruits are citric acid, malic acid, oxalic acid, succinic acid, and malonic acid (Vasudeva *et al.*, 2013, Bozkurt *et al.*, 2017, Ramgopal *et al.*, 2016). The thick peel in citrus fruit is called hesperidium and it is mostly thrown away and remains unused. Some fruit peels are discarded even if they are safe for consumption. The peels of oranges, grapes, apples etc. are edible while, those of banana, papaya, pomelo etc. are not consumed due to high tannin content (Al-Snafi, 2016, Dosoky *et al.*, 2018, Sikdar *et al.*, 2017).

Fruit peels are rich in essential oils giving characteristic aroma to the fruit (Giwa *et al.*, 2018). The oil glands are quite prominently found in citrus fruits like pomelo, lemon, orange, kinnow etc. The fruit peels are rich source of vitamin A, B-complex, and minerals like calcium, selenium, manganese, zinc, etc. several fold more than the pulp content. Also, these peels are low in calories, sugar, and fats and free from cholesterol.

These compounds contain rough dietary fibers also known as NSP (Non- Starch Polysaccharide) such as hemi-cellulose, pectin, tannin, etc. which prevent constipation by reducing gastrointestinal transit time (Moosavy *et al.*, 2017, Rivas-Cantu *et al.*, 2013).

Here are the few facts and applications of some of the citrus fruits:

Pomelo

Pomelo is the largest citrus fruit which belongs to the Rutaceae family. It contains 61 mg per 100 g of vitamin C. One quarter of pomelo provides 130 percent of daily requirement of vitamin C. It is a low-calorie fruit. The pomelo peel is very similar to other citrus fruits except that the peel is much thicker. The peel consists of cellulose (16.5 % based on dry matter), hemi-cellulose (6.86 %), pectin (35.42 %), lignin (3.16 %), soluble sugars (12.62 %) and ash (4.14%).

Peel of pomelo is generally candied, used for production of marmalades or consumed in combination with chocolate. It is used as seasoning for dishes made of meat and in industry of perfumes. It treats gastrointestinal disorders, cough, sore throat, fever, fatigue and insomnia. The essential oil extracted from pomelo has antibacterial properties.

Orange

Orange peel holds rather higher levels of vitamin C (Ascorbic acid) than its juice. 100 g of fresh orange peel provides 136 mg per 100 g of Vitamin C while its flesh contains just about 71 mg

per 100 g.

Orange peel is great option to get rid of skin troubles and good for reducing digestion problems. Orange peel consists of alkaloids, flavanoids, resins, sugars, tannins, phenolic compounds, terpenes and steroids (Ciriminna *et al.*, 2015).

Lemon

Lemon is rich source of vitamin C and is mostly used in culinary purposes, fermentation-based processes, and as cleansing agent. Every 100 g of lemon peel contains 129 mg of vitamin C.

The essential oil extracted from lemon is used in aromatherapy. Lemon juice contains nearly twice the citric acid of grapefruit juice and about five times the amount found in orange juice. Lemon consists of numerous phytochemicals including polyphenols, terpenes (Limonene, β -pinene, γ -terpinene, linalyl acetate and linalool and tannins. It contains vitamin A, β -carotene, folate, calcium, magnesium and potassium (Fidalgo *et al.*, 2016). It helps in decreasing cholesterol levels, eradicates toxins from the body, prevents heat related condition, promotes weight loss, fights skin related condition, prevents cancer, maintains oral and bone health, boosts immunity and digestion, etc.

Kinnow

Kinnow is a hybrid between two citrus cultivars that is 'King' (*Citrus Nobilis*) and 'Willow leaf' (*Citrus Deliciosa*). Per 100 gm of kinnow, 20 mg of vitamin C is present. It is good for intestine, relieves constipation, and used for anti- poison

treatment. Kinnow is highly rich in roughage and 2.5 times of calcium is present compared to other citrus fruit. The dried peel of kinnow is used in herbal cosmetic products and considered as effective home remedy to treat skin troubles like blackhead. It aids in digestion, relieves acidity, lowers cholesterol and has anti-cancer and anti-HIV properties. Kinnow contains vitamin A, limonene, pectin etc. The kinnow peel consists of ascorbic acid, reducing sugars, ash, flavanoids, vitamin B, vitamin C, carotenoids, β -carotene, and fats. Kinnow peel contains oil used in cosmetic industry and the peel is also used to make kinnow candy (Bafrani, 2010).

Materials and methods

General experimental Procedure for processing of peels

The citrus fruits were collected and thoroughly washed with distilled water. The peels were removed from the fruits and only the yellow flavedo layers were cut out and kept. The peels were again washed with distilled water to remove any form of dirt or impurities and cut into smaller pieces and then sundried for 3-4 days. These were then kept in oven for 1 hr. to dry. The dried peels were made into particle size using mortar and pestle and then stored in container (figure 1, 2).

General experimental Procedure for extraction of essential compounds from the peels

The Peels were weighed in a weighing machine and filled in an extraction chamber. The extraction chamber was placed in a round bottom flask half filled with hexane. The round bottom flask is then heated to about 60-70°C for about 2 and half hours.

After the extraction was completed, the round bottom flask was fitted with the distillation setup for separation of oil from the solution. The distillation was done until the oil and hexane gets separated completely. The TLC was monitored from time to time by taking aliquot of the oil in a test tube. Then the oil was stored in small vials. The procedure was repeated for Pomelo, Orange, Kinnow and Lemon separately. The summary of the processing of the peels of each citrus fruits are shown in the table 1.

Results and discussion

The extraction from the peels resulted with their respective oils. The TLC study showed clear spots on each experiment (figure 3). The products obtained from the all the processes were purified and submitted for IR and NMR analysis.

Characterization of functional groups of the compounds present in the Fruit Peels

FT-IR study

In the IR spectra corresponding to the Pomelo peel as shown in figure 4A the appearance of sharp peaks at 3389, 2924 and 1650 cm^{-1} in IR region corresponds to $-\text{OH}$, $-\text{C}=\text{C}-\text{H}$ and $\text{C}=\text{C}$ stretching frequencies, respectively. IR spectrum of Pomelo peel also exhibited peaks at 2924 cm^{-1} ($-\text{C}=\text{C}-\text{H}$), 1650 cm^{-1} ($\text{C}=\text{C}$), 1436 cm^{-1} ($=\text{CH}_2$), and 888 cm^{-1} ($=\text{C}''\text{H}$).

The FT-IR spectra corresponding to the orange peel is shown in figure 4B. The IR spectrum of orange peel exhibited sharp peaks at 3425, 2925 and 1631 cm^{-1} in IR region corresponds to $-\text{OH}$, $-\text{C}=\text{C}-\text{H}$ and $\text{C}=\text{C}$ stretching frequencies, respectively. Also, the

peaks appear at 2925 cm^{-1} (-C=C-H), 2853 cm^{-1} (C-H), 1631 cm^{-1} (C=C), 1463 cm^{-1} (=CH₂), and 887 cm^{-1} (=C''H).

FT-IR spectra corresponding to the Kinnow peel is shown in figure 4C. The appearance of sharp peaks at 3402, 2941 and 1631 cm^{-1} in IR region corresponds to -OH, -C=C-H and C=C stretching frequencies, respectively. Also, peaks arrived at 2941 cm^{-1} (-C=C-H), 1631 cm^{-1} (C=C), 1464 cm^{-1} (=CH₂), and 887 cm^{-1} (=C''H).

NMR study

In the ¹H NMR spectrum corresponding to the Pomelo peel (figure 5A) the signals at δ ppm: 7.4 for CDCl₃, 5.4 represents the double bonded CH protons in the ring, 5.1 denotes the terminal double bond, 2.1 is for the CH₂ groups present in cyclohexene ring, 1.8 indicates the terminal methyl group, and 1.25 for the methyl group in the cyclohexene ring.

The ¹H NMR spectrum corresponding to the orange peel (figure 5B) shows signals at δ ppm: 7.3 for CDCl₃, 5.4 represents the double bonded CH protons in the ring, 4.7 denotes the terminal double bond, 2.1 is for the CH₂ groups present in cyclohexene ring, 1.6-1.8 indicates the terminal methyl group, and 1.2 for the methyl group in the cyclohexene ring.

The ¹H NMR spectrum corresponding to the Kinnow peel displayed signals (figure 5C) at δ ppm: 7.3 for CDCl₃, 5.4 represents the double bonded CH protons in the ring, 4.7 denotes the terminal double bond, 2.1 is for the CH₂ groups present in cyclohexene ring, 1.2-1.6 indicates the terminal methyl group, and 0.9 for the methyl group in the cyclohexene ring.

Thus, the essential oil of the fruit peel contains numerous terpenes, Flavanoids, etc and the common components in all of the studied peels are shown in table 2.

Conclusion

In general, the essential oils from the selected citrus peel species were basically contain highest amount of limonene. The citrus essential oils tested mainly consists of monoterpene hydrocarbons. Other components found were sabinene, α -pinene, mycrene, linalool, α -terpineol, citronellol, geraniol and other monoterpene. More advanced research to evaluate outcome of dry peel treatments of essential oils is recommended to traverse their probable utilization in food and pharmaceutical applications.

Supplementary



A

B

C

Fig 1A. *Drying the Peel in Sunlight. B. Grinding of the dried-up peel using Mortar and Pestle C. The oven dried peels*



Fig .2. *Processed peels from various citrus fruits grinded and accumulated in vial*

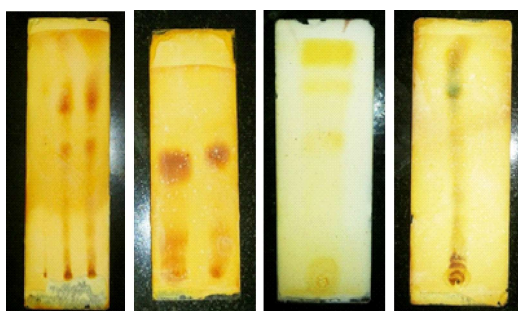


Fig 3. *TLC plate showing spots of A. Pomelo B. Orange C. Lemon D. Kinnow oils*

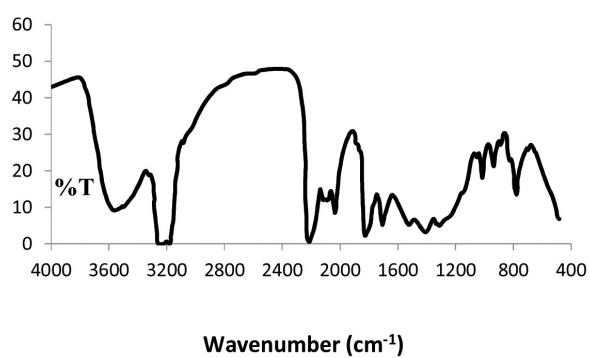


Fig 4A. *IR spectra of Pomelo oil*
//96//

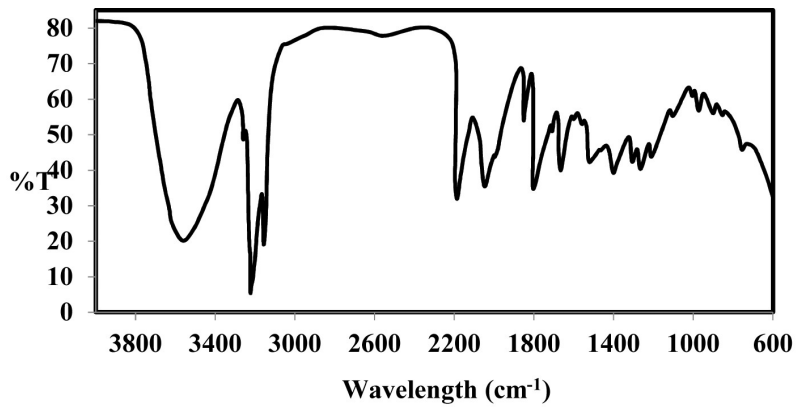


Fig 4B. IR spectra of orange oil

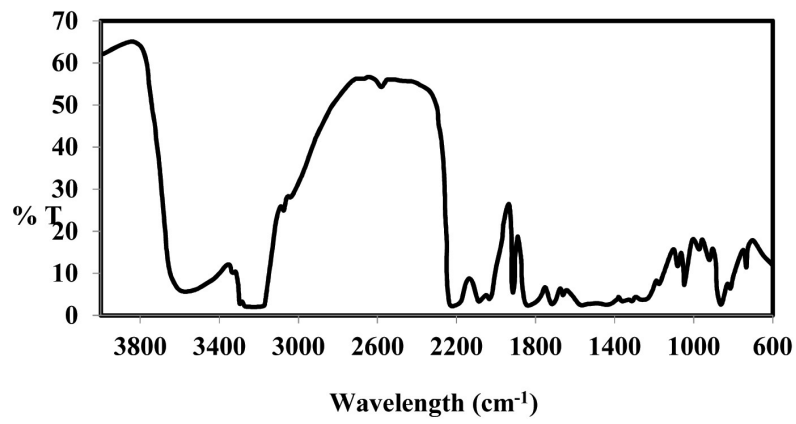


Fig 4C. IR spectra of Kinnow oil

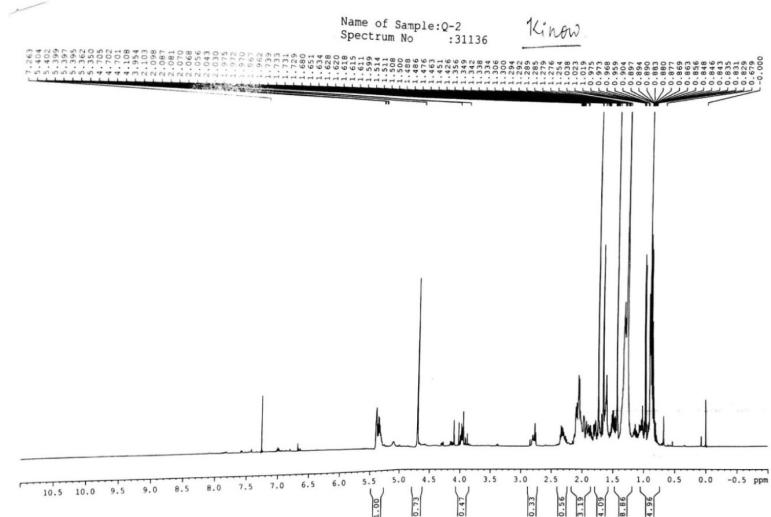
































Fig 5C. ¹H NMR spectra of Kinnow oil

Table 1. The summary of the processing of the peels

Sl. No	Name of the Peel	Tem ^r	Time	TLC spot	Result	Amount (peel)	Amount Obtained (oil)
1	Pomelo	68 ^o C	2 and ½ Hours	Spot shown	Positive	75.45 gm	37.09 ml
2	Orange	68 ^o C	2 and ½ Hours	Spot shown	Positive	61.78 gm	23.54 ml
3	Lemon	68 ^o C	2 and ½ Hours	Spot shown	Positive	42.43 gm	17.39 ml
4	Kinnow	68 ^o C	2 and ½ Hours	Spot shown	Positive	67.61 gm	28.69 ml

Table 2: The common components of fruit peels

Name of the Fruit Peel	Name of the probable compound present							
	Limonene	Sabinene	α -pinene	Myrcene	Linalool	α -terpineol	Citronellol	Geraniol
Pomelo								
Orange								
Lemon							-	
Kinnow								-

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6

The role of mechanical engineering in community-based waste management solutions

Abhinash Baishya

Himakshi Baishya

Abstract

Amid escalating urbanization, the surge in global waste production underscores the critical need for efficient and sustainable waste management. This study delves into the nexus of mechanical engineering principles and community-centric strategies, emphasizing innovative waste management approaches. From smart waste collection systems and inventive sorting technologies to decentralized waste treatment systems, mechanical engineering emerges as a pivotal force reshaping waste management. The chapter explores sustainable packaging design, coupled with community engagement initiatives, demonstrating how mechanical engineering not only tackles technical challenges but also instills a sense of responsibility and environmental stewardship. The collaborative fusion of technology and community involvement showcases the transformative role of mechanical engineering in reducing waste, promoting resource recovery, and cultivating resilient, sustainable communities.

Keywords: *urbanization, waste management, community-centric, waste reduction, resource recovery.*

Introduction

Waste is one of the major environmental threats that has the ability to contaminate land, water, and air alongside being hazardous towards the living world. Human activities like industrial production, agriculture, pollution emissions, consumption, and waste disposal are mostly responsible for its generation (Cheng Y. *et al.*, 2022).

In an era marked by rapid urbanization and burgeoning populations, the management of waste has emerged as a critical challenge affecting communities as well as the environmental health globally (Khan S. *et al.*, 2022). The consequences of inadequate waste management are far-reaching, encompassing environmental degradation, public health hazards, and social inequities. As societies grapple with mounting waste volumes, the imperative for effective, sustainable and novel waste management solutions becomes increasingly evident (Farooq M. *et al.*, 2021). The 21st century has seen an unparalleled rise in waste generation, driven by industrialization, urbanization, and shifting consumption habits. The World Bank estimates that if current trends continue, there will be a 70% increase in waste creation worldwide by 2050. There will be a tremendous increase in waste generation from 2.01 billion tons of waste produced worldwide at present is expected to rise to 3.4 billion in the upcoming 30. Traditional waste management techniques are frequently insufficient as waste streams grow more complex and diversified, which causes environmental degradation and public

health emergencies. Marginalized populations are frequently disproportionately affected by inappropriate waste disposal and lack of access to basic waste management services (Bui T.D. *et al.*, 2020).

This study will highlight novel waste management, illuminating the pivotal role of mechanical engineering in developing innovative and effective solutions. As communities grapple with the escalating consequences of improper waste disposal, the integration of mechanical engineering principles emerges as a transformative solution. This collaboration not only addresses the technical intricacies of waste management but also empowers communities to actively engage in the process, fostering a sense of ownership and responsibility. From smart waste collection systems and advanced sorting technologies to waste-to-energy conversion and sustainable packaging design, mechanical engineering stands at the forefront of shaping a future where communities play a central role in creating cleaner and healthier environments. This exploration navigates the intricate web of challenges and opportunities within community-based waste management, showcasing the dynamic synergy between mechanical engineering and the collective effort towards sustainable and resilient communities.

The Role of Mechanical Engineering in Community-Based Waste Management

Mechanical engineering emerges as a linchpin in the paradigm of community-based waste management solutions, offering a myriad of innovations that address the unique challenges faced by localities. From the collection and sorting of waste to its disposal or conversion into valuable resources, mechanical engineering interventions are pivotal in transforming the waste

management landscape as illustrated in figure-1. With advancements in technology, the waste generated can be handled in an easy and effective manner.

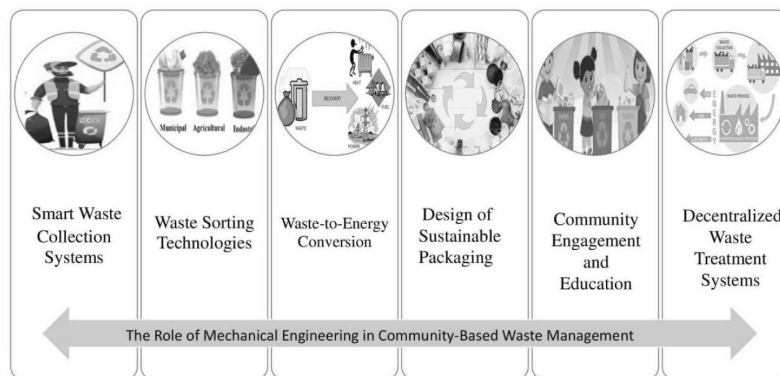


Figure 1: The role of mechanical engineering in community-based waste management

The following sections explore key areas where mechanical engineering plays a transformative role:

Smart Waste Collection Systems

Mechanical engineers contribute to the design and implementation of smart waste collection systems that optimize the gathering of waste from households and businesses. Intelligent sensors, route optimization algorithms, and automated collection technologies enhance the efficiency of waste collection processes, reducing fuel consumption and operational costs (Barth L. *et al.*, 2023).

Waste Sorting Technologies

The efficient sorting of waste is fundamental to effective recycling. Mechanical engineering innovations in waste sorting technologies, such as automated sorting machines and robotics, streamline the separation of recyclable materials from mixed waste. This not only increases the recycling yield but also reduces the burden on landfills (Dodamegama S. *et al.*, 2023).

Waste-to-Energy Conversion

Mechanical engineering plays a crucial role in the development of waste-to-energy technologies. From incineration systems to anaerobic digestion and pyrolysis, these technologies convert waste into energy, reducing dependence on traditional fossil fuels and mitigating the environmental impact of landfills (Zhang H. *et al.*, 2022).

Design of Sustainable Packaging

Engineers contribute to the reduction of waste at the source by designing sustainable packaging solutions. From eco-friendly materials to innovative packaging designs that minimize waste generation, mechanical engineering principles guide the development of packaging that aligns with the principles of the circular economy (Jagoda S. *et al.*, 2023).

Community Engagement and Education

Mechanical engineers are instrumental in developing outreach programs and educational initiatives that raise awareness about proper waste management practices within communities. By fostering a culture of responsible waste disposal and recycling,

these programs empower individuals to actively contribute to waste reduction efforts.

Decentralized Waste Treatment Systems

Mechanical engineering innovations extend to the design of decentralized waste treatment systems that can be tailored to the specific needs of communities. These systems include small-scale composting units, decentralized recycling facilities, and modular waste treatment technologies that enhance the resilience of local waste management infrastructure (Gong F. *et al.*, 2023).

Conclusion

As we explore the dynamic intersection of community-based waste management and mechanical engineering, it becomes evident that a holistic and collaborative approach is paramount. The amalgamation of technological innovations with community engagement not only transforms waste management practices but also fosters sustainable, resilient communities. By embracing the role of mechanical engineering in shaping the future of waste management, we embark on a journey towards cleaner environments, healthier populations, and socially inclusive, sustainable communities.

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Digital Literacy in India: Current Landscape, Challenges, and Opportunities

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Abstract

This paper explores the status of digital literacy in India, navigating the complexities of technological advancements, socio-economic inequalities, and cultural diversity. Assessing current challenges, including uneven access to digital technologies and demographic disparities, highlights the need for targeted interventions. Opportunities for improvement are evident, with government initiatives, NGO contributions, and corporate involvement shaping a more digitally inclusive future. Case studies emphasize the significance of community engagement and a tailored, multi-pronged approach for success. In conclusion, achieving comprehensive digital literacy demands collaborative efforts, and recommendations derived from successful initiatives guide the creation of a robust ecosystem. Fostering a digitally literate populace becomes essential in India's ongoing digital transformation for an inclusive and empowered society.

Keywords: *Digital literacy, IT, internet, economy, digital payment*

Introduction

In the backdrop of India's dynamic socio-economic landscape, digital literacy has emerged as a linchpin for inclusive growth and empowerment. The rapid proliferation of digital technologies, coupled with the country's diverse demographics, underscores the importance of understanding the current state of digital literacy. This paper embarks on an exploration of digital literacy in India, seeking to unravel its multifaceted components and shed light on the prevailing challenges. As technology becomes increasingly ubiquitous, disparities in access and education have given rise to a digital divide. Bridging this gap is not merely an aspiration but a strategic imperative to ensure that all segments of the population can harness the opportunities presented by the digital era. In this context, examining the existing challenges, such as inadequate infrastructure and socio-cultural factors, becomes crucial for formulating targeted interventions. Moreover, identifying opportunities for improvement, including government initiatives, NGO efforts, and corporate contributions, can pave the way for a more digitally inclusive India. As the nation undergoes a profound digital transformation, fostering digital literacy emerges not only as a goal but a prerequisite for building an empowered and inclusive society that thrives in the digital age.

Background

India's recent digital revolution, spurred by the "Digital India" initiative and technological advancements, has transformed the

socio-economic landscape. This shift, while bringing unprecedented opportunities, has also exposed disparities in digital literacy. Digital literacy extends beyond basic skills, encompassing the ability to navigate the digital world critically. In a nation characterized by diverse demographics, varying access levels, and socio-economic disparities, understanding the nuances of digital literacy is crucial. This background establishes the context for a detailed exploration of the current state of digital literacy in India, aiming to uncover challenges and opportunities. The goal is to contribute insights that will facilitate a more inclusive and digitally empowered society.

Objectives

The main Objectives of this paper are:

- ▲ Assess the current landscape of digital literacy in India.
- ▲ Identify challenges faced by various demographics in acquiring digital skills.
- ▲ Explore existing digital literacy initiatives and their impact.
- ▲ Propose recommendations and opportunities for enhancing digital literacy.

A. Digital Literacy Overview

Definition and Components

Digital literacy is more than the ability to operate a computer; it involves skills such as information literacy, media literacy, and critical thinking. In the Indian context, it means being adept at navigating digital platforms, discerning reliable information from

online sources, and utilizing technology for personal and professional growth.

Significance in India

Digital literacy is a catalyst for individual empowerment and economic development. It plays a pivotal role in education, employability, and civic engagement. In a country as diverse as India, where socio-economic gaps persist, digital literacy serves as a bridge to ensure equitable participation in the digital era.

Understanding the components and significance of digital literacy lays the groundwork for dissecting its current state in India. The subsequent sections will delve into the challenges faced by different demographics, assess the impact of existing initiatives, and propose recommendations for a digitally literate India.

B. Current State of Digital Literacy in India

Access to Digital Technologies

Access to digital technologies is a critical factor in determining digital literacy levels. India has witnessed a significant increase in internet penetration, particularly in urban areas. However, rural areas still face challenges related to infrastructure, connectivity, and device availability. Disparities in access contribute to a digital divide, where certain segments of the population are excluded from the benefits of digital literacy.

Demographic Disparities

Digital literacy levels vary across different demographics. Age, gender, and socio-economic status influence an individual's

exposure to and proficiency in digital technologies. Younger generations often exhibit higher digital literacy, but disparities persist among older age groups. Additionally, gender-based differences in access and usage patterns are notable, emphasizing the need for targeted interventions to ensure inclusivity.

Educational Initiatives

Numerous digital literacy programs have been initiated by the government, non-governmental organizations (NGOs), and private entities. These programs aim to equip individuals with essential digital skills. However, the effectiveness of these initiatives varies. Some urban areas benefit from comprehensive programs, while rural areas may have limited access to structured digital literacy education.

Understanding the nuances of digital literacy across different regions and demographics is crucial for formulating targeted interventions and ensuring a more equitable distribution of digital skills. The next section will explore the challenges hindering the widespread adoption of digital literacy in India.

C. Challenges in Digital Literacy Adoption

Infrastructure Challenges

While India has witnessed remarkable progress in digital infrastructure, challenges persist, especially in rural areas. Inadequate internet connectivity, low bandwidth, and sporadic electricity supply hinder seamless access to digital resources. Addressing these infrastructure gaps is crucial to ensuring that all segments of the population can actively participate in the digital landscape.

Socio-cultural Factors

India's diverse cultural landscape brings with it unique socio-cultural challenges. Attitudes towards technology, especially in conservative communities, may impede the acceptance and adoption of digital literacy initiatives. Overcoming these barriers requires culturally sensitive approaches, acknowledging and respecting diverse perspectives on technology use.

Education System

The formal education system plays a pivotal role in shaping digital literacy. However, outdated curricula and a lack of emphasis on practical digital skills are common issues. Integrating digital literacy into the education system, starting from primary levels, is essential for fostering a culture of continuous learning and adaptability.

Identifying and understanding these challenges is crucial for crafting effective strategies to enhance digital literacy across the nation. The subsequent sections will delve into ongoing initiatives and explore potential opportunities for improvement, paving the way for a more digitally inclusive India.

D. Opportunities for Improvement

Government Initiatives

India's government has undertaken several initiatives to promote digital literacy, including the flagship program "Digital India." Evaluating the effectiveness of these initiatives, identifying gaps, and expanding outreach to underserved regions can further enhance their impact. Collaborative efforts with local

communities and leveraging public-private partnerships can maximize the reach of government-led programs.

Role of Non-Governmental Organizations (NGOs)

NGOs play a pivotal role in grassroots-level interventions. Engaging with NGOs that focus on digital literacy, especially in rural and marginalized communities, can bring about meaningful change. These organizations often have a deep understanding of local challenges and can tailor programs to address specific needs, contributing to a more inclusive digital literacy landscape.

Corporate and Industry Contributions

The private sector, including technology companies, can contribute significantly to digital literacy. Corporate social responsibility initiatives that prioritize digital education, training programs, and partnerships with educational institutions can bridge existing gaps. Industry-sponsored mentorship programs and scholarships can also encourage students to pursue careers in technology, fostering a skilled workforce for the digital age.

As we explore these opportunities, it becomes evident that a multi-stakeholder approach involving government, NGOs, and the private sector is essential. The subsequent sections will provide case studies of successful digital literacy initiatives, drawing lessons from them, and culminate in recommendations for a comprehensive strategy to advance digital literacy in India.

Case Studies

Successful Digital Literacy Initiatives

Case Study 1: *Pradhan Mantri Gramin Digital Saksharta*

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Abhiyan (PMGDISHA)

PMGDISHA is a government-led initiative aimed at making 6 crore rural households digitally literate. By providing access to digital training, the program has empowered individuals in remote areas with essential digital skills. Evaluating the success of PMGDISHA in terms of increased participation, improved skills, and subsequent socio-economic impacts can offer insights into scalable models for rural digital literacy.

Case Study 2: *The Akshaya Project, Kerala*

The Akshaya Project in Kerala focuses on digital literacy and digital empowerment, particularly among women. Through community-oriented digital education centers, the project has successfully addressed gender disparities in digital literacy. Analyzing the factors contributing to its success, such as community engagement and localized content, can provide valuable lessons for similar initiatives.

Lessons Learned

Community Engagement: Successful programs actively involve local communities, understanding their unique needs and challenges.

Customized Content: Tailoring digital literacy content to address specific demographics and cultural nuances enhances effectiveness.

Multi-Pronged Approach: Combining online and offline methods, including community workshops and mentorship programs, contributes to a holistic learning experience.

These case studies illustrate the diversity of successful digital literacy initiatives in India. The subsequent sections will leverage insights from these cases to formulate recommendations for policymakers, educators, and stakeholders involved in advancing digital literacy across the nation.

Conclusion

In conclusion, the paper underscores the pivotal role of digital literacy in India, shaped by technological advancements, socio-economic disparities, and cultural dynamics. Despite progress, persistent gaps in access and demographic disparities emphasize the need for targeted interventions. Challenges, including inadequate infrastructure and socio-cultural factors, highlight the complexity of the digital literacy landscape. Amid challenges, abundant opportunities for improvement exist. Government initiatives, NGO efforts, and corporate contributions collectively shape the path towards a more digitally inclusive India. Case studies have provided valuable insights, emphasizing community engagement and a tailored, multi-pronged approach as key success factors. In essence, achieving comprehensive digital literacy requires a collaborative and synergistic approach involving various stakeholders. Recommendations derived from successful case studies aim to guide policymakers and stakeholders in fostering a robust ecosystem for digital literacy. As India advances in its digital transformation, cultivating a digitally literate populace becomes not only a goal but an essential requirement for building an inclusive and empowered society.

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A comparative assessment of structural parameters of physically and chemically deposited CdSe thin films

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Abstract

By means of both physical vapour deposition (PVD) technique and chemical bath deposition (CBD) technique CdSe thin films were deposited separately. Structural assessment of the deposited films was done by means of x-ray diffraction technique. For both the deposition techniques large scale variation of crystalline size was noticed with the change of different deposition parameters. For PVD films variation of crystalline sizes of the films was studied with the change of deposition temperature whereas in case of CBD films the same study was conducted with the change of molarity of the solution used for film deposition. In general, PVD technique was observed to be good for the deposition of larger crystalline size films whereas CBD technique was found to be suitable for the deposition of smaller crystalline size films.

Keywords: *CdSe thin films, deposition temperature, crystalline size*

Introduction

CdSe is a compound semiconductor and is being regarded as a prominent member of II-VI group of materials. It is being widely used in the fabrication of different optoelectronic devices such as low-cost and high-performance hybrid solar cells [1], photoelectrochemical cells [2], sensors [3], green light-emitting diodes [4] etc. It is observed that optoelectronic properties of CdSe thin films are highly structure sensitive which in turn influence the device performance. The structures of thermally deposited CdSe thin films are governed by the rate of deposition, substrate temperature, film thickness etc. The chemical bath deposition (CBD) [5] technique is found to be one of the relatively inexpensive, simple and convenient techniques. The structure of chemically deposited CdSe thin films is mainly governed by the molarity of the solution, rate of stirring, deposition temperature etc. Considering these aspects, an experimental study of both thermally as well as chemically deposited CdSe thin films have been undertaken and a preliminary report of this correlative study regarding the variation of grain size with deposition parameter has been presented in this paper. Though in both the techniques there are several deposition parameters, only the variation of substrate temperature in case of PVD technique and the variation of molarity for CBD technique has been taken into consideration here.

Experimental Details

Thin films of CdSe of constant thickness, t , (2000Å) were deposited at different substrate temperatures, T_s (473-623K), on chemically and ultrasonically cleaned glass substrates with the help of a Hind High Vacuum Coating unit at a vacuum better than 10^{-5} torr. The source to substrate distance was maintained at 6.5cm for all the cases. The prepared films were annealed in vacuum at elevated temperature for an hour. Pure (99.999%) bulk CdSe sample was used as the source material. Thin tantalum boats of proper size and shape were used as the source heater. Masks of proper sizes were used to have CdSe thin films of required sizes. A suitably designed and assembled multiple beam interferometer was used to measure the thickness of the films with an accuracy of $\pm 15\text{Å}$.

CdSe films were deposited on chemically and ultrasonically cleaned glass substrates by CBD method using solution of cadmium acetate, liquor ammonia and freshly prepared sodium selenosulphate solution. The sodium selenosulphate solution was prepared by mixing selenium powder with anhydrous sodium sulphite in double distilled water using a refluxing unit where constant refluxing of the solution at higher temperature was done.

The deposition bath contained the cadmium acetate, and ammonia solution was slowly added to it with constant stirring at room temperature. Initially, the bath solution becomes milky and then turbid. Further addition of excess ammonia to the bath dissolves the turbidity and makes the solution clear as well as transparent. Cadmium acetate solution of different molarities

was used to get such solution mixtures. Freshly prepared sodium selenosulphate solution was slowly added to each of such cadmium acetate solutions and constant stirring of it was done. The pH of the final reaction mixture was properly maintained.

The bath solution, kept at room temperature, was stirred for a few seconds and then chemically cleaned glass substrates were inserted vertically into it using specially designed sample holder. The substrates coated with CdSe thin films were removed at suitable intervals and then thoroughly washed and rinsed with doubly distilled water and then dried in air at room temperature. Films were allowed to deposit on the both surface of the glass slides.

X-ray diffractogram of CdSe thin films were taken by using Philips X-ray diffractometer (Philips X'Pert Pro) with $\text{CuK}\alpha$ radiations of wavelength 1.54\AA . The diffractometer was operated at 40 KeV and 30mA. The line profile was chart recorded at a scanning rate of $(0.01^{\circ}-0.07^{\circ})\text{ s}^{-1}$ with a Phillips automatic recorder. X-ray diffractogram analysis including the peak search was done by computer programming (Philips X'pert software) with minimum peak significance 0.65. XRD pattern of all the CdSe films were taken from 10° to 70° .

Structural parameters

Lattice constant

The lattice parameter, a , for cubic phase structure $[hkl]$ is determined by the relation

$$d_{hkl} = a/(h^2+k^2+l^2)^{1/2} \quad (1)$$

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where $N = h^2+k^2+l^2$ is a number. Observing the distribution of N values, the type of the cubic lattice may be determined [6].

From the Bragg's law, $\lambda = 2a \sin\theta / (h^2+k^2+l^2)^{1/2}$

$$\Rightarrow \sin^2\theta = (\lambda^2/4a^2)(h^2+k^2+l^2) = \lambda^2N / 4a^2 \quad (2)$$

For hexagonal crystals; the lattice constants, a , and, c , are evaluated from the following relations

$$1/d^2 = [(4/3)\{(h^2+hk+k^2)/a^2\}] + (l^2/c^2) \quad (3)$$

From Bragg's law

$$\sin^2\theta = [(4/3)\{(h^2+hk+k^2)/a^2\}] + (\lambda^2l^2/4c^2) \quad (4)$$

According to Vegard's law, the lattice parameters of hexagonal unit cell are nearly related to cubic lattice parameters of same material by [7]

$$a_{\text{hex}} = (1/2)^{1/2}a_{\text{cubic}} \quad c_{\text{hex}} = (4/3)^{1/2}a_{\text{cubic}} \quad (5)$$

Hence for 'ideal' Wurtzite lattice, the relation [8] between the two lattice parameters is

$$c_{\text{hex}} = (1.633)a_{\text{hex}} \quad (6)$$

which can be used for the calculation of lattice parameters of CdSe thin films.

There are several possible sources of error like divergences of X-ray beams, refraction and absorption of X-rays by the specimen etc in the measurement of θ and d values. So, accuracy in the determination of lattice constant is dependent upon the accuracy of their measurements. We have

$$d = (\lambda/2) \operatorname{cosec}\theta \quad (7)$$

$$\text{So } \delta d = - (\lambda/2) (\operatorname{cosec}\theta \cot\theta) \delta\theta$$

$$\text{For } \theta = 90^\circ, \delta d / d = 0$$

The most accurate value of lattice parameters are estimated from the Nelson-Riley plot [9] when $\theta = 90^\circ$. It is plotted between calculated lattice constant values (a and c) for different planes and the error function

$$f(\theta) = (1/2) \{(\cos^2\theta/\sin\theta) + (\cos^2\theta/\theta)\} \quad (8)$$

Grain Size

The grain size (D_{hkl}) for the thermally evaporated CdSe thin films is evaluated for the preferred planes [hkl] using the Scherrer formula [10]

$$D_{hkl} = k\lambda / \beta_{2\theta} \operatorname{Cos}\theta \quad (9)$$

with $k = 0.94$, where θ is the Bragg's angle, λ is the wavelength of X-rays used, $\beta_{2\theta}$ is the width of the peak at the half of the maximum peak intensity. *Average strain*

The origin of strain is related to lattice 'misfit' which in turn depends upon the growing conditions of the films. The micro strain (ϵ) developed in the thin films can be calculated from the relation [11]

$$\epsilon = (\beta_{2\theta} \cot\theta) / 4 \quad (10)$$

where θ and $\beta_{2\theta}$ has their same significances.

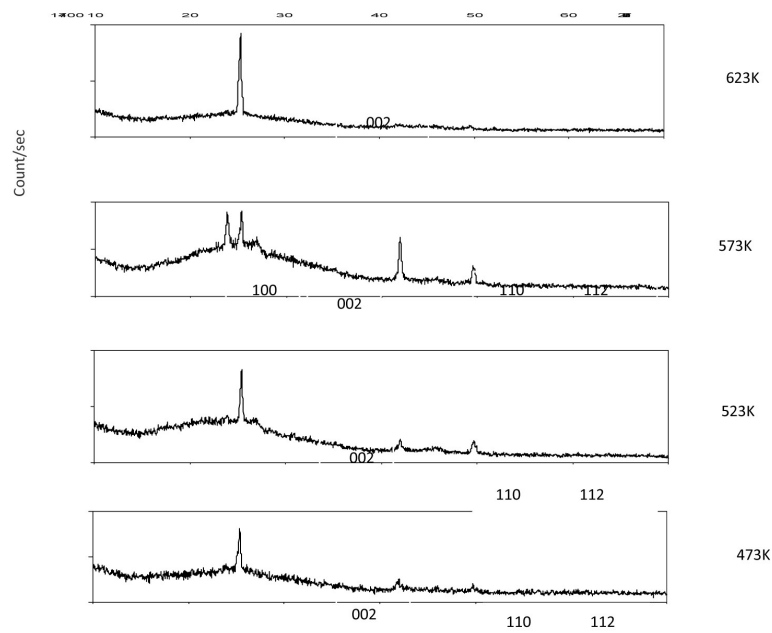
Dislocation Density

Dislocations are an imperfection in a crystal associated with misregistry of the lattice in one part of the crystal with respect to another part. Unlike vacancies and interstitial atoms, dislocations are not equilibrium imperfections. In fact, growth mechanism involving dislocation is a matter of importance. The dislocation density of thin films is given by the Williamson and Smallman's relation [12]

$$\delta = n / D^2 \quad (11)$$

where n is a factor, which equals unity giving minimum dislocation density and D is the grain size.

Results and discussions



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Figure 1. XRD patterns of PVD CdSe thin films same, $t=2000$ Å but deposited at different T_s .

The X-ray diffraction profiles of CdSe thin films (figures 1) of constant thickness, t , (2000Å) reveal that films grown at room temperature are amorphous (not shown in figure) and those grown at elevated substrate temperatures, T_s (473-623K) are polycrystalline having hexagonal ZnS type structure. This is confirmed by comparing the observed 'd' values of the XRD patterns of the films with the standard 'd' values of JCPDS X-ray powder file data [13]. In these films [002] plane is very clear and abundant. However small percentage of orientations of [110], [112] & [100] planes are also observed depending upon T_s . For the film deposited at 573K diffracted intensity from [100] and [110] is comparable to the corresponding intensity for [002] plane. The dominance of [002] hexagonal reflection indicates that the preferential growth of crystallite is in this particular direction.

The broad hump that is observed in the background of XRD is due to the amorphous glass substrate and also possibly due to some amorphous phase present in the CdSe thin film.

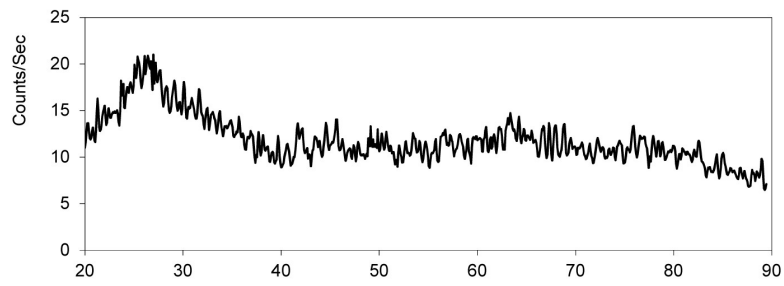
Different structural parameters of the CdSe thin films of constant, t and different T_s are calculated by using relevant formulae and are systematically presented in table 1. The data

of the table shows variations in the structural parameters with deposition temperature, and also along different orientation. The corrected values of lattice constants are estimated from Nelson-Riley plots (not shown here) which are found to be in the range (4.286-4.304Å) for, a, and (6.992-7.020Å) for, c. There is a change in lattice constants for the deposited thin films over the bulk values, which suggest that film grains are strained. This may be due to change of nature and concentration of the native defects. The density of the films is therefore expected to change in accordance with the change of lattice constant [14]. The standard values of, a, and, c, for strain free bulk CdSe sample are 4.299Å & 7.010Å respectively [13]. Thus, it is observed that value of, a, and, c, are slightly greater for films deposited at $T_s = 523\text{K}$ and 573K than their bulk counterparts whereas the values nearly coincide for film deposited at 623K and $t = 2000\text{Å}$. The values of, a, and, c, are less than the lattice parameters of the bulk CdSe for films deposited at $T_s = 473\text{K}$ and $t = 2000\text{Å}$.

The grain sizes of the films corresponding to [002] hexagonal reflection have been found to increase with T_s . With increase of T_s the crystallinity of the films improves substantially. At higher T_s in the formation process of the films, ad-atoms possess greater mobility along direction parallel to the substrate surface, which thus contribute to improvement of the crystallization processes.

Table 1. Calculated values of the structural parameters of CdSe thin films of same $t = 2000\text{\AA}$ but deposited at different T_s

T_s (K)	hkl	a(\AA)	Corrected a(\AA)	c(\AA)	Corrected c(\AA)	D_{hkl} (\AA)	$\epsilon \text{in} 10^{-3}$	δ in 10^{11} cm^{-2}
623	002	4.298	-	7.011	-	350	4.70	0.81
	100	4.307		7.025		268	6.52	1.39
	002	4.310		7.029		308	5.35	1.05
573	110	4.306	4.304	7.024	7.020	295	3.42	1.14
	112	4.306		7.023		253	3.40	1.56
	002	4.296		7.006		283	5.80	1.24
523	110	4.297	4.302	7.008	7.017	301	3.34	1.10
	112	4.301		7.015		201	4.26	2.47
	002	4.303		7.018		280	5.90	1.27
473	110	4.297	4.286	7.008	6.992	253	3.97	1.56
	112	4.293		7.003		221	4.17	2.04



(111) 0.5M (220)

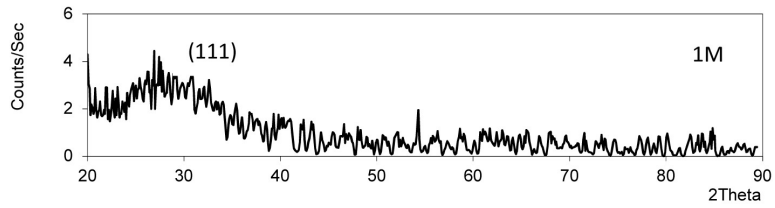
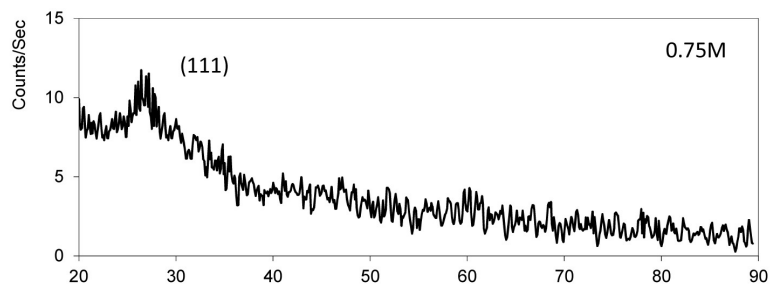


Figure 2. XRD patterns of CBD CdSe thin films at 0.5M, 0.75M and 1.0M at room temperature

CdSe films of thickness of 280 nm were deposited by the CBD method at room temperature by using cadmium acetate solutions of different molarities, namely 0.50 M, 0.75M and 1 M. The X-ray diffractograms of typical 'as-deposited' films (0.5 M) are shown in figure 2. The diffraction peaks can be indexed to diffraction from the (111) plane of zincblende structure of CdSe. The lattice constant 'a' from XRD pattern is found to be in between 5.642 and 5.844Å. This is almost in agreement with the standard data 6.077Å obtained from JCPDS [15]. It is seen that value of 'a' is less than its bulk value 6.08Å. This indicates that the films are under some strain. The full width at half maximum (FWHM) as obtained from the diffractograms of figure 2 was found to decrease with increase of molarity indicating there by that there is a decrease in lattice imperfections due to decrease in strain and an increase in crystallite size [16] which are found to be in the range of 38 nm to 56 nm for the said CBD CdSe thin films.

With the increase of molarities of the solutions larger number of Cd²⁺ and Se²⁻ ions react to form the deposit resulting in the increase of crystallite sizes. The negative value of internal strain for deposited films indicates the compressive strain. The compressive strain may be generated at the film substrate interface due to bond formation between very small crystallites and substrates during impurity free deposition. Also due to sufficient thickness of the prepared films, the compressive strain may be generated in the grain boundary when the adjacent surfaces of two grains come into contact during low temperature

(300 K) of film growth. The origin of compressive strain may be due to the adhesive forces between glass material and film when deposited at lower temperature.

In this regards it may be mentioned that the calculated values (not presented here) of dislocation densities are also found to decrease with molarity. Due to low deposition temperature the film growth is based on slow release of Cd^{2+} and Se^{2-} ions in the solution. As a result, a smaller number of ions participates, in a given time, in the formation of crystallites. This means reaction becomes slower due to slow rate of deposition which causes decrease in dislocation density. It indicates the formation of higher quality films at relatively higher molarities.

It is observed that after heat treatment (air annealing at 473K for 1 hour), a greater number of X-ray peaks appear (not shown here), showing the formation of the polycrystalline films. The intensities of the (220) and (311) peaks are very low in comparison with (111) indicating the dominant orientation of the grains along the [111] direction. The broad peaks imply the small crystalline nature of the films [17].

Conclusions

CdSe thin films deposited by PVD technique are of polycrystalline nature having hexagonal ZnS type structure. The films are found to have preferred orientation along (002) plane and some small percentage of growth along (100), (110) & (112) are also observed depending upon the substrate temperature of deposition. The crystallinity of the films improves with the increase of substrate temperature of deposition. At any deposition

temperature, there is a variation in lattice constants of the grown thin films over the bulk suggesting that built-in strains are present in the film grains. The built-in microstrains and dislocation density of the deposited films are found to be dependent on the growth temperatures.

CdSe thin films deposited by CBD technique are of nanocrystalline nature having zincblende structure. The films are found to have preferred orientation along (111) plane and some small percentages of growth along (220) are also observed depending upon molarity of the deposited solution. With the decrease of molarity, there is an increase in lattice imperfections due to increase in strain and a decrease in crystallite size. With the increase of molarity in the bath solution, the internal strain and dislocation density of the prepared films are also found to decrease.

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Soil Water Holding Capacity and Associated Physical Characteristics under Different Land Use Patterns of Behali, Assam, North East India

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Dr. Debashree Kakati**

Abstract

Present study was conducted in major land use patterns prevalent in Behali, Biswanath district of Assam e.g. paddy field, home garden, bamboo garden and forest. Sampling, sample processing and laboratory experiments were conducted as per the standard methodologies. Significant variations in different parameters such as water holding capacity, water content, porosity, soil textures etc. were found during the investigation. Variation in soil physical properties in different land use patterns might be due to dynamic interactions among environmental and management factors such as climate, parent material, topography, soil management, crop management, tillage patterns etc.

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Keywords: *Anthropogenic, forest cover, litter fall, mineralization, soil erosion.*

Introduction

Soil serves as a storage reservoir for nutrients and water needed for plant growth. These soil properties are essential to crop production. Soil is a mixture of minerals, organic matter, gases, liquids, and countless organisms that together support life on Earth. Soil characteristics control relationship between soil constituents and plant productivity (Khattak, 1996). Soil and vegetation have complex interrelationships because they develop together over again restoration of nutrients to the soil properties (Singh et al., 1986; Bhuyan & Laskar, 2020). Concentration of micro elements in the soil is a good indicator of their availability to plants. Crop production potential is greatly influenced by the physical and chemical properties of soils. These same properties also influence related activities such as tillage, erosion, drainage, and irrigation. Important agronomic soil properties include the soil water-holding capacity, infiltration rate, aggregation, temperature, organic matter content, and nutrient availability. It consists of water, minerals, air and soil organic matter. It is often classified in terms of their physical properties like texture, structure porosity and fraction of pore space, affected by composition and proportion of the soil components. On the other hand, these properties air and water movement in the soil and thus the soil's ability to function. When the soil moisture content is optimal for plant growth, the water in the large and intermediate size pores can move about in the soil and be easily used by plants.

The amount of water remaining in a soil drained to field capacity and the amount that is available are functions of the soil type. Sandy soil will retain very little water, while clay will hold the maximum amount (Chen, 2015).

Materials and Methods

Study Site

Present study was conducted in selected agricultural fields prevalent in Behali, Biswanath district of Assam. It is located in the Biswanath district of Assam state, northeastern India between 26°52'20.083 N and 26°57'23.173 N, and 93°11'23.583 E and 93°23'21.093 E. It experiences a tropical monsoon, with 1800 mm mean annual precipitation and 24.8°C mean annual temperature (Nath and Sarma, 2008). The elevation ranges between 90 m a.s.l. and 110 m asl, comprising mostly plains, with some undulating hillocks on the north (Nath and Sarma, 2008).

Sampling and sample processing

The soil samples were collected from four different selected land use pattern such as paddy field, home garden, bamboo garden and forest. First, the detritus (grass and litter) at each sampling were cleared from ground surface and the soil was dug with a spade and a dao. The soil samples were collected from three locations of each LUP randomly from the two depths i.e. the upper 0-15 and the lower 15-30cm. Subsamples of each soil were mixed thoroughly, air dried and sieved through a 2 mm mesh sieve to remove the stone pieces and large root particles and these samples were used for analyzing different soil physical

characters.

Methods

Water holding capacity of the soil samples was determined by the method suggested by Mishra (1968). Soil texture was measured and calculated by the Boyoucou hydrometric method (Allen et al., 1974). Soil Moisture Content was determined by following the standard method given by Mishra (1968). Bulk density was measured by taking an undisturbed block of soil (by metal cylinder) for determining its volume. The exact volume of the soil taken by a metal cylinder was determined by measuring the cylinder volume. The soil samples were dried and weighed.

The Bulk Density was calculated by the formula

Bulk Density (BD) = $\frac{W}{V}$

$V, \text{ gm/cm}^3$ Where, W is the oven dried weight of soil and V is the volume of the soil

Porosity (P) is expressed in per cent by volume and was calculated from the bulk density (BD) and particle density (PD) of soil as per Brady (1996).

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Results and Discussion

Water holding capacity (WHC)

The maximum and minimum percentage of water holding capacity of four different land use pattern i.e. paddy field, home garden, bamboo garden and forest site came out to be 36%,

53.34%, 36%, 34.67% respectively of the top surface of the soil while sub surface layer of the soil came out to be 43.34%, 31.34%, 36%, 32.67% respectively (figure 1). The highest water holding capacity was 53.34 % (0-15cm) obtained from home garden and 43.34% (15-30cm) obtained from paddy field whereas the lowest percentage was 34.67 % (0-15cm) obtained from forest and 31.34% (15-30cm) obtained from home garden. The highest water holding capacity of home garden might be because of the tightly packed soil particles. Water holding capacity had positive correlation with soil organic carbon and significant positive capacity of sub surface soil layer was found to be greater than the surface layer. This may be due to presence of low amount of humus in upper surface of the soil. Water holding capacity increases with soil depth which might be due to high amount of organic carbon and clay in the sub surface soils, which promote formation of aggregates soil particle and retention of water. WHC decreases with soil depth which might be due to high amount of organic carbon and clay in the surface than sub-surface soils, which promote formation of aggregates and retention of water (Gupta et al., 2010).

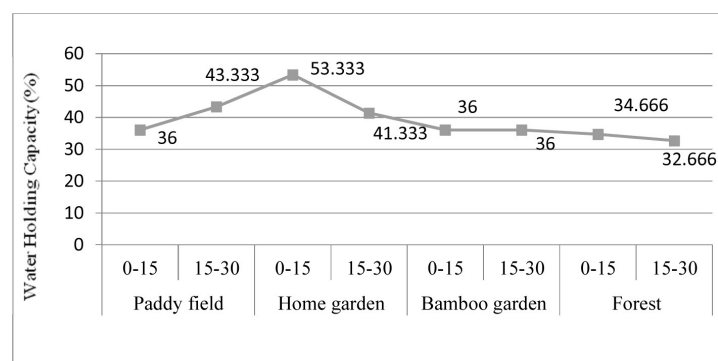


Figure 1: Water holding capacity of different land use patterns of Behali, Assam

Soil Moisture content

The maximum percentage of soil moisture content was 37.10% (0-15cm) recorded at paddy field while the minimum percentage of soil moisture content was 18.63% (0-15 cm) recorded at bamboo garden. The soil moisture content at different soil depth of study site i.e. paddy field, home garden, bamboo garden and forest came out to be 37.1%, 25.93%, 18.63%, 21.6% respectively of the top surface of soil while its sub surface of soil layer came out to be 36.06%, 25.4%, 22.9% and 21.66% respectively (figure 2). The high moisture content in the cultivated land soil serves to protect the roots from drying. It also allows the expansion and penetration of roots into soil as well as uptake of water and nutrient from the soil (Edena et al, 2011). The minimum moisture content in bamboo garden soils could be due to the presence of hydrocarbons and polycyclic aromatic hydrocarbons, which can cause an increase in soil hydrophobicity, which leads to a decline in the water holding capacity of soil (Balks et al, 2002). It also might be due to more slope percentage which enhances the soils to runoff of water from the study area. The soil moisture content increases with the progressive increase of restored sites which may be due to vegetation over the surrounding areas. Thus, they prevent the direct exposure of soil surface and loss of soil water through evaporation. The accumulation of vegetation biomass influences the vegetation growth and soil properties in the mining area. The outcome of the successful eco-restoration usually depends on the nature of plant distribution in the restored sites (Eamus et al. 2005). Thus, the soil physical property increases

with increasing age of restoration providing succession restoration in the land use system areas.

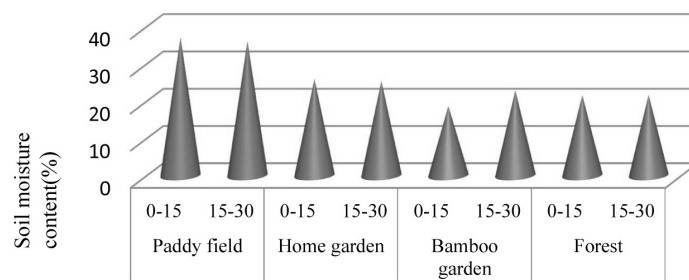


Figure 2: Soil moisture content (%) of different land use pattern in study sites

Soil Textures

The soil textures were silt loamy mostly and silt clay loamy in nature among the sites. percentage of sand in all the agricultural land i.e. the paddy field, bamboo garden, home garden and forest sites came out to be 61.33%, 78%, 74.66%, 78.33% respectively for the top surface of the soil while for the sub-surface the percentage was 54.66%, 74.66%, 78%, 74.66% respectively. The soil was dominant by silt content and very less accumulation of finer particles (clay). Soil texture was determined by Boyoucou Hydrometric method given by Allen et al. (1974). The highest amount of sand content (78.33%) (0-15 cm) was recorded in at the surface layer while the lowest value (54.66%) (15-30 cm) was observed in forest and paddy field site. sand content decreases with increase in soil depth except with increasing soil depth. The maximum silt content of 26.666 % (0-15 cm) was observed at paddy field in the surface layer while

the minimum content of silt (14.33%) was observed at forest in surface (0-15 cm). The variation in silt contents might be due to the effect of erosion and runoff (Khan et al., 2007) in the entire study site, soil texture is dominated by silt loam with a very less amount of clay.

Table 1. Soil physical properties of different land use patterns of Behali, Assam

Land use pattern	Depth in(cm)	Soil moisture	Water holding capacity	Porosity
Paddy field	0-15	37.1	36	39.3
	15-30	36.066	43.333	40.37
Home garden	0-15	25.933	53.333	36.31
	15-30	25.4	41.333	29.87
Bamboo garden	0-15	18.6333	36	39.9
	15-30	22.9	36	42.51
Forest	0-15	21.6	34.666	54.2
	15-30	21.666	32.666	47.61

Porosity

The highest porosity (54.2) has been observed in the surface (0-15cm) of forest land (Table.1). Followed by bamboo garden (39.9), paddy field (39.3) and home garden (36.31). While maximum soil porosity might be due to minimum tillage or other cultivation practices in that soil. However, decline in porosity leads to reduced pore size distribution. (Bhuyan et al., 2014). The surface layer content of porosity for different land use pattern *i.e* paddy field, home garden, bamboo garden and forest land came out to be 39.3, 36.31, 39.9 and 54.2 respectively. While the sub-surface layer came out to be 40.37, 29.87, 42.51, and 47.61 respectively. Total soil porosity and pore size distribution

were negatively affected by the intensity of land use (years of cultivation). The decline in total porosity was the result of a reduction in pore size distribution. Porosity and structure are not constant and can be altered by management, water and chemical processes.

Variation in soil physical properties in different fields might be due to dynamic interactions among environmental factors such as climate, parent material, topography and land cover/land use (Dengiz *et al.*, 2006). Higher concentration of sand might be due to the effect of a nearby stream and land filling by relatively coarser materials. Clay content was highest (15%) at the sub-surface (15-30 cm) soil layer of the paddy field and lowest clay content (1%) at both surface and sub-surface soil layer of the home garden. This may be due to the intensive and continuous cultivation which might cause compaction on the surface that reduces translocation of silt and clay particles within the different layers and due to mixing up by tillage activities in agreement with the findings reported by Wakene (2001) and Jaiyeoba (2001).

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10

Toxicity of *Citrus limon* essential oil on two common household pests *Crematogaster cerasi* and *Odontotermes sp.*

**Bikash Rabha
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Tunuja Boro
Krishna Das**

Abstract

Essential oils extracted from citrus plants shows promising insecticidal properties against household pests. In this study an attempt is made to study the efficacy of essential oil from *Citrus limon* on *Crematogaster cerasi* and *Odontotermes sp.*, two common household pests. C. limon EO showed greater efficacy on *C. cerasi* with LC50 value 2.5 μ l than on *Odontotermes sp.* with LC50 value 7.5 μ l. The citrus EOs can be considered having good insecticidal potency and can be used as commercial green pesticides for both indoor and outdoor insect pest control.

Keywords: *Citrus limon*, insecticidal potency, green pesticides

Introduction

Essential oils (EO) offer a natural and biodegradable alternative to the synthetic insecticides. The use of citrus essential oils in insect pest control aligns with the growing demand for sustainable and eco-friendly pest management practices. EO from *Citrus limon*, derived from the fruit peel is recognized for aromatic qualities and potential applications in insect pest control. These oils contain a complex mixture of bioactive compounds, including limonene, citral, and linalool, which contribute to their insecticidal properties. One of the primary components found in citrus essential oils is limonene, a monoterpene known for its strong insecticidal and repellent activities. Limonene disrupts the insect's nervous system, leading to paralysis and ultimately death. The broad-spectrum activity of limonene makes EO of *Citrus limon* effective against various insect pests, mosquitoes, ants, and household pests. Citral and linalool are other two major components in the essential oils which also exhibits potent insecticidal properties. Because of these properties EO of *Citrus limon* is considered to test its effect on two important household pests *Crematogaster cerasi* and *Odontotermes sp.*

Crematogaster cerasi, commonly known as the acrobat ant, can become a household pest, causing nuisance and potential problems for homeowners. These small, light-brown to black ants are characterized by their ability to lift their abdomen over their head, resembling an acrobat's posture. They are attracted

to sweet substances, proteins, and moisture, making kitchens and food storage areas particularly vulnerable. They establish colonies within wall voids, insulation, or other hidden spaces, potentially causing damage over time. Additionally, acrobat ants have been known to protect honeydew-producing insects like aphids, further complicating their presence in and around homes.

Odontotermes sp., can pose significant challenges as household pests. These insects are notorious for their ability to consume wood and other cellulose-based materials, making them a threat to the structural integrity of homes. Termites often enter households through soil contact or underground tunnels, seeking wood, paper, and other plant-based materials for sustenance. Signs of termite infestation may include mud tubes along walls, discarded wings near windows, doors, or light sources, and hollow-sounding wood.

In the current study the effectiveness of the *Citrus limon* EO is tested against *Crematogaster cerasi* and *Odontotermes sp.*, expecting to find promising effects in the management household insect pests.

Methodology:

To evaluate insecticidal properties of essential oil *Citrus limon*, was extracted from fruit peel collected from Mangaldai, Darrang, Assam (26.463°N, 92.0322°E) in May, 2023. Essential oil from fresh peels were extracted by hydro-distillation using Clevenger's apparatus. After 6 hours, essential oil was collected and anhydrous sodium sulfate was added to absorb traces of moisture and was stored at 4^o C till its use. The adults of *Crematogaster*

cerasi naturally existed colony in the campus of Mangaldai College and the worker termites of *Odontotermes sp.* from natural existed colony mould nest (Gerimari, Mangaldai) built by *Odontotermes sp.* were considered for the assessment.

Fumigant toxicity of these oil was assessed by following the method described by *Hu et al.* (2017) Six different concentrations viz 0.25 µL, 0.5 µL, 0.75 µL, 1 µL, 1.5 µL and 2.5 µL of each essential oil was individually loaded in 1.5ml centrifuged tube with help of micropipette, evaporation of essential oil was allowed by making small five holes of 50 ml properly cleaned borosilicate conical flask. A total of 25 workers ant were taken per flask in triplicates and the flask was covered buy aluminium foil to prevent the loss of volatile compounds. Control set was also placed in triplicates without EO.

For *Odontotermes sp.*, each concentration of essential oil was individually added in petri dished. Whatman filter paper was placed at the bottom of the petri dishes. A total of 25 worker termites were taken per petri dishes in triplicates and the petri dishes were tightly closed to prevent the loss of volatile components. Control set was also placed in triplicates without EO. The environmental temperature range was 26-29°C and relatively humidity range 72-90% during the experiment period. The percent mortality [Percent mortality = (Total no. of dead ants / Total no. of treated ants) x 100] data were recorded after 24 h of treatment. The ants were considered to be dead if touched with a needle but did not show any movement. Based on the result sublethal concentration was determined using probit analysis with the help of SPSS software.

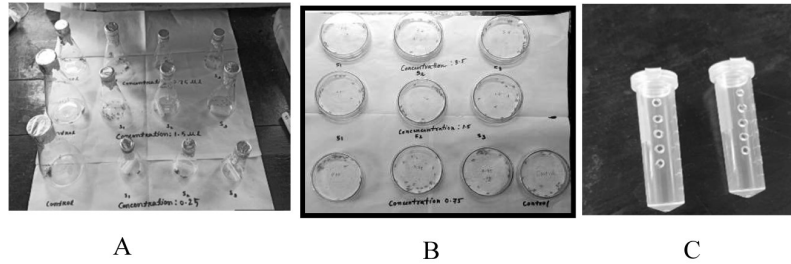


Fig.1: Experimental setup: - A- *Crematogaster cerasi*, B- *Odontotermes sp.*, C- Fumigation vial.

Results:

After 24h of treatment with *Citrus limon*, 100% was recorded at concentration of 2.5 μ l for *Crematogaster cerasi* and 7.5 μ l treatment for *Odontotermes sp.* SPSS analysis showed the LC50 values to be 0.71 μ l for *Crematogaster cerasi* and 0.86 μ l for *Odontotermes sp.*

Table1: Percentage mortality *Crematogaster cerasi* at 24h.

Concentration	Mortality rate%
0.25 μ l	8%
0.5 μ l	40%
0.75 μ l	60%
1 μ	68%
1.5 μ l	88%
2.5 μ l	100%

Table2: Percentage mortality of *Odontotermes sp* at 24h.

Concentration	Mortality %
0.25 ul	4%
0.5 ul	40%
0.75 ul	48%
1 ul	64%
1.5 ul	76%
2.5 ul	88%
3.5 ul	92%
5 ul	94%
7.5 ul	100%

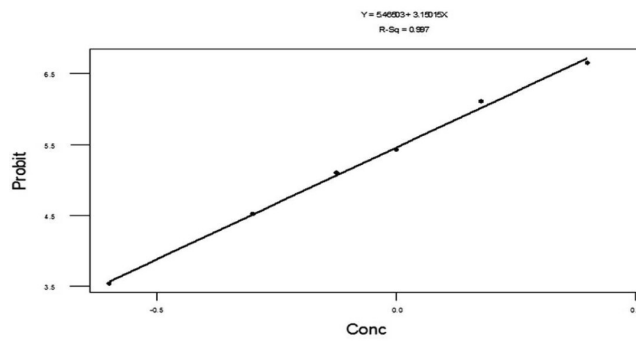


Fig2: Regression Plot for *Crematogaster cerasi*

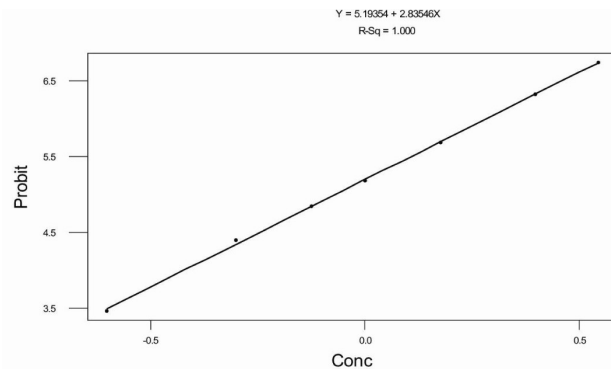


Fig 3: Regression Plot for *Odontotermes sp.*

Discussion:

A study conducted by Kanikor *et al.* (2018) for the toxicity assessment on worker termite *Odontotermes feae*, treating it with essential oil of *Citrus grandis* and *Citrus paradisi* concluded with promising termicidal efficacies of both the Eos. Pandey *et al.* (2023) showed the toxic effect of *C. maxima* EO against Indian White Termite *Odontotermes obesus*. Mensah *et al.* (2014) evaluated insecticidal properties of *Citrus limon* with proficient insect mortality. But Guerra *et al.*, (2011) recorded only 15% mortality on application against ant species this finding showed essential oil is effective against controlling household pets. All plant extracts exhibited considerable mortality of insect is concentration dependent and increases along with time interval. A study for toxicity assessment of *Citrus limon* essential oil by filter paper impregnation method showed toxicity of *Citrus limon* 90% mortality at 24h treatment against carpenter ant, *Camponotus nearcticus*. A study for toxicity assessment of *Citrus*

limon essential oil by filter paper impregnation method showed 90% mortality against carpenter ant, *Camponotus nearcticus*. Guerra *et al.*, comparatively showed toxicity of *Citrus limon* 15% mortality against Black carpenter ant, *Camponotus pennsylvanicus*. Khanikor *et al.* (2020) recorded 95% mortality of carpenter ant *Camponotus pennsylvanicus* at 7.5 μ l using essential oil *Citrus limon*. *Citrus limon* essential oil showed promising potential against *Crematogaster cerasi*. All these studies reveal the effectiveness of *Citrus limon* essential oil against the two studied insect species.

Conclusion:

With the increasing awareness of consumers for ecofriendly products and at the same time increasing resistance of insect pests against insecticides, the demand for novel, safe and effective products is increasing. As discussed above, the existing literature revealed presence of a good number of terpene compounds in different citrus species which are present in different ratios although in most cases limonene is the predominant constituent. Both the crude oil as well as individual compounds possess good insecticidal and repellent properties against diverse insect pests, both indoor and outdoor. This experiment showed promising potential against *Crematogaster cerasi* and *Odontotermes* using essential oil of *Citrus limon*. It is expected that in near future citrus plant essential oils with their pleasant aroma and array of chemical compounds shall take leading space in development of insecticidal and repellent products to be used in both indoor and outdoor pest management practices against insect pests.

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Cultivating Success: The Transforming Impact of Mathematics in Agriculture

**Jintu Mani Nath
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Abstract

This study recognizes that agriculture has been the backbone of the nation's economy, providing food for a growing population as well as raw materials for industry. It's still evident that using mathematics to advance agriculture is both necessary and beneficial. Thus, the article concentrates on the ideas of mathematics and agricultural development, together with the prerequisites and a variety of mathematical applications for agricultural development.

Keywords: *Mathematics, agricultural development, technology*

Introduction

Mathematics appears as a quiet architect, creating a transformational symphony across the vast fields of agriculture, where the interplay of nature and human action builds the foundation of our food. A new era of accuracy, sustainability, and resiliency in agriculture has begun with the use of mathematical ideas that go beyond conventional farming methods. This thorough investigation explores multiple ways that mathematics has an impact on the agriculture industry, including statistical analysis, logistics efficiency, precision farming, and organic methods. It also reveals the ways that mathematical models foster success in these domains.

More recent advances in the mathematical sciences have helped improve our ability to predict the weather, to measure the effects of environmental hazards, and to study the origin of the universe (Aguale L.I. & Usman K.O. 2007). This is very important in the current trend of climate change phenomena in the entire world today. Ajai and Imoko (Ajai I.J. & Imoko T.B., 2022) pointed out that the applications of science and technology to agriculture, whose foundation is mathematics, have completely changed the face of agriculture through the introduction of mechanical devices for planting, tending, harvesting, and processing of various food crops. Research has not only through hybridization by plant/animal breeders resulted in improved varieties of food crops and animals and other food products, but has boosted yields through the use of fertilizers and pesticides. All these have been possible courtesy of mathematical modeling, an aspect of

computational mathematics. (Melodia, A., & Small, T. 2002).

Efficient Agriculture and Crop Simulation

The beneficial combination of mathematics and technology contributed to a paradigm change in agricultural techniques known as precision farming. Precision farming is an information-driven discipline that utilizes mathematical models to explore a variety of data streams. It is an aspect of agriculture that builds on traditional methods.

To construct spatially precise simulations of fields, mathematical algorithms utilize information from climate predictions, telescopic photos, and soil monitors. With the implementation of these scenarios, farmers will better comprehend the variability on their property and implement focused actions that maximize resource use. Math permits farmers to identify options that maximize agricultural yields while reducing their detrimental effect on the environment, from targeted insect management to accurate fertilizer and irrigation application.

Implementing algorithms to simulate and forecast the development of crops is known as crop modeling, and it is a highly mathematically based area of agricultural research. To predict crop growth, these models take into account elements like temperature, precipitation, soil composition, and mineral levels. Farmers may predict difficulties and improve management techniques by modeling various scenarios, which eventually raises agricultural production as a whole.

Furthermore, the best planting and harvesting schedules are determined using quantitative optimization approaches. These

optimizations take into account variables like resource accessibility, consumer demand, and climatic patterns to make sure farmers can maximize yields while still using resources effectively.

Data Mining and System for Supporting Decisions

Similar to multiple other sectors, the agricultural industry is undergoing a data revolution, producing enormous volumes of information. To provide farmers with the tools they need to make decisions, mathematics, and specifically data analytics, is at the forefront of obtaining useful insights from this data stream.

Machine learning algorithms, a subset of data analytics, sift through historical data to identify patterns and trends. In agriculture, these algorithms can predict crop diseases, optimize irrigation schedules, and forecast market prices. By leveraging mathematical models, farmers gain a deeper understanding of their operations, enabling them to adapt and respond to dynamic conditions.

Decision support systems, enhanced by mathematical algorithms, provide farmers with real-time information and recommendations. These systems consider multiple variables, such as weather forecasts, market prices, and soil conditions, to assist farmers in making strategic decisions. Whether choosing the right crop variety or deciding on optimal planting times, these systems enhance efficiency and overall farm management.

The advent of the Internet of Things (IoT) further amplifies the impact of data analytics in agriculture. Sensors embedded in farm equipment, drones, and even crops themselves generate

continuous streams of data. Mathematical models process this data to provide insights into crop health, soil moisture levels, and overall farm conditions, enabling farmers to take proactive measures.

Logistics Optimization and Supply Chain Management

The journey of agricultural products from the farm to the consumer involves intricate logistics and supply chain processes. Mathematics, through its optimization techniques, plays a crucial role in ensuring that these processes are efficient, cost-effective, and environmentally sustainable (Parr, B. A. *et al.*, 2006).

Routing algorithms, a prime example of mathematical optimization, assist in planning the most efficient transportation routes for agricultural products. By minimizing travel distances and optimizing delivery schedules, these algorithms not only reduce transportation costs but also lower the carbon footprint associated with the transportation of goods. This is particularly crucial for perishable goods, where efficient logistics are essential for preserving product quality (Adah, O. C. *et al.*, 2015).

Inventory management, another critical aspect of supply chain optimization, relies on mathematical models to determine optimal stocking levels, reorder points, and distribution strategies (Miller, I., 1930). These models account for factors such as market demand, shelf life of products, and storage costs, ensuring that agricultural products are consistently available to meet consumer needs while minimizing excess inventory and associated costs.

Moreover, the integration of blockchain technology, often

underpinned by cryptographic algorithms, adds a layer of mathematical sophistication to supply chain management in agriculture. Blockchain enables transparent and secure record-keeping of every transaction, from farm to table, ensuring traceability and accountability in the supply chain.

Sustainable Agriculture Practices

The imperative for sustainable agriculture has never been more critical, considering the environmental challenges and resource constraints faced by the global farming community. Mathematics emerges as a guiding force in the adoption of sustainable practices, providing insights into practices that prioritize ecological balance, soil health, and biodiversity (Nguyen, H. K., 2021.)

Crop rotation and cover cropping considered fundamental sustainable practices, find their roots in mathematical modeling. These models assess the impact of these practices on soil fertility, pest control, and overall crop health. By understanding the mathematical dynamics of diverse planting strategies, farmers can enhance resilience, reduce reliance on chemical inputs, and improve long-term soil sustainability (Kennedy, J. O., 2012).

Agroecology, a holistic approach to farming that mimics natural ecosystems, integrates mathematics into its design. Agroecological modeling considers the interactions between crops, pests, and beneficial organisms to create balanced and resilient agricultural ecosystems. By leveraging mathematical principles, agroecology promotes biodiversity, reduces the need for synthetic inputs, and fosters a more sustainable and

regenerative approach to farming.

Furthermore, mathematical optimization techniques contribute to the design of sustainable farming systems. From optimizing water usage through precision irrigation to designing agroforestry systems that enhance carbon sequestration, mathematics guides the development of agricultural practices that balance productivity with environmental stewardship.

Conclusion

The way that Mathematics has transformed agriculture is like a subtle revolution that permeates all of the fields, farms, and food systems. A new era of precision-driven, data-informed agriculture has begun, when farming is no longer just a practice but rather a science. This is evidenced by the incorporation of mathematical principles into everything from data analytics and logistics optimization to sustainable practices and precision farming.

As the world grapples with the challenges of feeding a growing population in the face of climate change and resource constraints, the role of mathematics in agriculture becomes increasingly pivotal. The synergy between mathematical models and agricultural practices not only enhances productivity and resource efficiency but also contributes to the development of a more sustainable and resilient global food system.

Farmers, armed with mathematical insights, can navigate the complexities of climate variability, market fluctuations, and resource constraints. The integration of mathematics in agriculture is a testament to its ability to drive innovation, foster sustainability, and ensure that the agricultural sector evolves to

meet the demands of a changing world. As we continue to explore the intersection of mathematics and agriculture, the potential for further advancements and positive impacts on global food security remains vast and promising.

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Millet cultivation in Assam: A short review

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Manash Pratim Baruah**

Abstract

The cultivation of millets in Assam, although traditionally less prominent, is gaining attention through initiatives like the Assam Millet Mission (AMM). Millets, such as Finger millet, Foxtail millet, and Proso millet, offer nutritional benefits and are gradually being integrated into Assamese agriculture. The AMM, aligned with the International Year of Millets, focuses on a seven-year plan to increase millet cultivation by nearly 8 times, demonstrating millets on 25,000 hectares and targeting 15 priority districts. While the government emphasizes educating farmers about millet benefits, challenges like low market demand and insufficient linkages hinder profitability. The success of this initiative relies on overcoming consumption habits, market dynamics, and ensuring economic viability, ultimately shaping the future of millet cultivation in Assam.

Keywords: *Millet cultivation, Assam millet mission, sustainable agriculture*

Introduction

Millets are a diverse group of small-seeded grasses produced globally as cereal crops, fodder, and food. Millets mostly belong to the Paniceae tribe, however some can also be found in other taxa. Millets are a staple grain crop. They are also known as nutri-cereals or dry-land cereals. Millets, also known as Smart Food, are abundant in calcium, zinc, iron, have a low glycemic index, and are gluten free. Millets are essential for subsistence agriculture in the Himalayan region, where small farmers are the majority. Millets are mostly utilised for food and beverages, with little usage as fodder or bird feed. Millet consumption varies throughout northeastern states and has either remained consistent or decreased over time. In Arunachal Pradesh, millets such as foxtail millet, proso millet, finger millet, pearl millet, and other edible plants grown under jhum cultivation provide a variety of indigenous food items for ceremonies, occasions, and celebrations throughout the year.

Assam, located in India's Northeastern region (NER), is the largest state in terms of people and second in land. Assam has an area of 78,438 km² (30,285 sq mi). The state borders Bhutan and Arunachal Pradesh in the north, Nagaland, Arunachal Pradesh, and Manipur in the east, Meghalaya, Tripura, Mizoram, and Bangladesh in the south, and West Bengal in the west. Assam is rich in natural resources, including minerals, forests, water, and agricultural resources. The State has a diverse range of ecosystems, including tropical rainforests, deciduous forests,

riverine grasslands, bamboo orchards, and wetlands. Assam has a large amount of woods and hills. Agriculture is the most important domestic sector in Assam, generating over a third of the state's income and employing over 69% of the population. Assam is the world's largest tea growing region, accounting for approximately 50% of the country's total tea production.

Millet cultivation in Assam

Millet cultivation is not so famous in Assam. Traditionally, three types of millets namely Finger millet (Maruadhan), Foxtail millet (Koni Dhan), and/ Proso millet/ (Cheena Bajra) are cultivated in Assam.

- ▲ **Finger millet (Maruadhan):** Eleusine coracana, commonly known as finger millet or ragi (Kharif). In India, it is the sixth most produced crop after wheat, rice, maize, sorghum, and Bajra. It has various names in native languages. In Assamese, it is referred to as "Marua." It contains natural calcium, which promotes strong bones in both adults and children. It also contains iron, which aids in anaemia recovery, and is beneficial for depression, anxiety, and sleeplessness. It can also alleviate migraines.
- ▲ **Foxtail millet (Koni Dhan):** Kangani, also known as Foxtail millet (*Panicum italicum* L.), is Asia's most commonly grown millet species and the second most generally planted. Foxtail millet has been cultivated in India since antiquity. Foxtail millet, also known as Konidhan in Assam, is a popular ingredient in traditional custard and dessert recipes. It offers numerous health

benefits, including thyroid support, aiding in infant development, improving digestion, treating anaemia, and containing high levels of iron and calcium.

▲ **Proso millet/ (Cheena Bajra):** Proso millet, also known as Cheea Bajra, is grown throughout the kharif and summer seasons in India. This crop is drought-resistant and suitable for low-rainfall regions. Proso millet grains contain vitamins (niacin, B-complex vitamins, and folic acid), minerals (P, Ca, Zn, and Fe), essential amino acids (methionine and cysteine), starch, and phenolic compounds such as antioxidants and betaglucans. Seeds have therapeutic components that reduce low-density lipoprotein cholesterol and liver harm. They also contain significant levels of lecithin, which improves neurological health. Millets are currently cultivated over 6,000 hectares of land in 15 districts of Assam, including Nagaon, Bongaigaon, and Dhubri, accounting for 97% of the state's millet production.

▲ **Assam Millet Mission (AMM)**

The United Nations General Assembly approved an India-sponsored resolution designating 2023 as the International Year of Millets. The Indian government is devoted to promoting millets and their cultivation. The Government of Assam is declaring 2023 as the Year of Millets. The Assam Millets Mission (AMM) will last seven years, beginning in 2022-23. The Assam Millets Mission would focus on value chain activities, including seed production, post-harvest processing, value addition,

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and market linkages. The initiative aims to demonstrate millets on around 25,000 hectares. If adopted by a similar number of farmers, the total area under millets would be approximately 50,000 ha. The current area under millets in the state is only around 6000 ha, requiring an increase of almost 8 times. The suggested interventions will focus on 15 priority districts, including Nagaon, Bongaigaon, Dhubri, Morigaon, Barpeta, Tinsukia, Kokrajhar, Baksa, Goalpara, Karbi Anglong, Kamrup Rural, Sonitpur, Jorhat, Golaghat, and Udalguri.

Conclusion

Millets are still new in Assam. Even in places like Chirang, which has the most land under millet cultivation in the state since the campaign began, few people understand how to cook and consume millets. People in Assam typically consume rice. The majority of them are also small and marginal farmers who own 1-2 hectares of land and grow paddy in the kharif season (seeds are sown at the start of monsoon), vegetables for self-consumption in the rabi season (seeds are sown in early winter), and leave the land barren for the rest of the year. The state government has devoted resources to educate people about the health benefits of millets, but there is still a lack of market demand, linkages, and any possibility of price realisation. So far, it has not been a profitable crop.

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Shrinking Urban Open Spaces: A Comparative Study of Four Indian Cities

Shilpa Borah

Abstract

Urbanization undoubtedly offers modernization and industrialization of a region. Changing urban landscapes with high population growth and more demand for built-up areas are the major concern for the big cities of the world. The haphazard rise of urban built-up may affect the quality of life of the people and also raise the question of sustainability. It also minimizes urban open spaces which is helpful for various purposes like playing, running, yoga, meditation etc. Open spaces also serve as a short-term shelter area during disasters like earthquakes. This chapter mainly highlights the shrinking or changing of urban open spaces over time. Four cities in India are taken into consideration for the study in which two cities belong to tier I cities, i.e., Bangalore and Delhi and another two cities belong to tier II cities, i.e., Patna and Guwahati. These four cities share a strategic location in India and urbanization and population both are increasing at a higher pace there. Therefore, these cities are taken as part of the study.

Keywords: *urbanization, urban open space, sustainable development, disasters*

Introduction

Urbanization is the whole process of change and its consequences when a society gets transformed from an agrarian economy to an industrial economy and from a small homogeneous society to a large heterogeneous mass (Reissman, 1964, pp. 207-209 as cited by Chandra, R. C., 2020).

Urbanization refers to the concentration of human populations into discrete areas. This concentration leads to the transformation of land for residential, commercial, industrial and transportation purposes. It can include densely populated centers and their adjacent peri-urban or suburban fringes (*Urbanization - Overview | US EPA*, 2015). It is closely associated with modernization, industrialization and the social process of rationalization. The twentieth century is known for the rapid growth of urbanization. In recent past centuries, rapid urbanization took place, particularly in less developed countries and also causes rural-to-urban migration. However, the pattern of urbanization is unevenly distributed among developed and less developed nations. The United Nations World Urbanization Prospects shows that about 4.1 billion (2017) people were living in urban areas. Among the continents, North America and South America are registered as the most urbanized with 79% of their total population living in urban areas. However, Asia shows low performance in this respect, which stands at 39% of the urban population share. India's population stood at 1210 million in 2011, with an urbanization level of 31.1% (Census of India 2011).

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Among Indian states, 75% of the urban population of the country is in 10 States: Maharashtra, Uttar Pradesh, Tamil Nadu, West Bengal, Andhra Pradesh, Gujarat, Karnataka, Madhya Pradesh, Rajasthan, and Kerala. Assam's performance is low in this respect (Urbanisation, 2021). It is categorized as a lower level of urbanization than the national average. But urbanization in an unplanned way may have some adverse effects. It has led to unsustainable use of land causing land degradation, alteration on the one hand and unpredictability in local climates on the other which has resulted in extreme natural events including flood and drought (Emadodin, Taravat & Rajaei, 2016). Along with these issues, another burning issue caused by urbanization that most countries have been facing is the shrinking of urban open spaces.

Open spaces are mainly vacant land which is not used for residential, commercial or industrial purposes. Open spaces are not a luxury, but a necessity. Public open spaces in the form of parks, gardens, forests, playgrounds, stadiums etc. play a vital role in relieving stress, meditation, yoga, and leisure. The concept of "open space" in urban areas is not only limited to urban parks and preserves. Public spaces such as streets, schoolyards, outdoor sports complexes, cemeteries and public squares are all important open spaces (Hall and Ward, 1998). Urban open space (UOS) mainly unbuilt, often publicly accessible, area within a populated settlement, comprising vegetated 'green', water-dominated 'blue', derelict 'brown' and hard-surfaced 'grey' elements (Jansson & Randrup, 2020). Open space consists of underdeveloped lands with significant natural, cultural and visual resources that are integral to the country's quality of life (Nelson

and Whitney,2008).

In the last fifty years, the population of the world increasing at a very high rate and India also experiences high population growth i.e., from 460 million in 1961 to 1.4 billion in 2021 and the urban population also increases from time to time. This increase is seen in larger cities of India where the population is more than a million and unplanned built-up area beyond the city limits is affecting the open space availability. High population, urbanization and urban sprawl have become challenges for the cities impacting urban open spaces. Open spaces not only significantly contribute to the quality of everyday urban life but also have the capacity to facilitate recovery during a disaster. It also has some environmental benefits; it helps to preserve the better quality of air.

Urban public spaces specifically streets and boulevards and public open spaces are needed to sustain the productivity of cities, their social cohesion and inclusion, their civic identity, and their quality of life (“Adequate Open Public Space in Cities a Human Settlements Indicator for Monitoring the Post-2015 Sustainable Development Agenda,” 2015).

UN-Habitat recommends an average of 45 - 50% of urban land be allocated to streets and open public spaces, which includes 30 - 35% for streets and sidewalks and 15 - 20% for open public spaces (UN-Habitat, 2018).

In India, The Urban Regional Development Plans Formulation and Implementation (URDPFI) guidelines, 2014 recommend 10 to 12 sq. mt. of open space per person. (The Ministry of Housing

and Urban Affairs, 2022)

Therefore, the main objective of this study focuses on analyzing the decrease in open spaces across various metropolitan cities of India over time.

Materials and Methods

Four cities in India have been taken into consideration for the study in which two cities belong to Tier I cities, i.e., Bangalore and Delhi and another two cities belong to Tier II cities, i.e., Patna and Guwahati. These four cities share a strategic location in India and urbanization and population both are increasing at a higher pace there. Secondary sources of data have been used to carry out this study.

For data of Bangalore, Gandhi, 2013 and Janaagraha Centre for Citizenship & Democracy, 2017 has been referred to. For data from Delhi, Gandhi, 2013 has been used as the source of data. For Patna, Rizvi & Raj, 2022 has been used as the source of data. For obtaining the data Guwahati, Dhyani et al., 2022 and Assam State Disaster Management Authority, 2016 have been considered. Additional extrapolation on the data obtained from the above sources has been also carried out.

Discussions and Results

Bangalore is known as the city of lakes and gardens. Besides, Bangalore is also known as India's Silicon Valley which leads to urbanization causing a decrease in open space. In 1973, the city's vegetation cover was 68.27%; it had fallen to 15% by 2013. According to the development plan (CDP) of Bangalore,

the area covered by the parks, playgrounds and organised open space in the year 1983 was 2050 hectares, which was 10.1 per cent of the total area of the city. Whereas the open space in the year 1960 was 17.2 of the total area (Vagale, L.R. 1998). At present, the norm for parks and open space is 15 per cent of total land use or one hectare of open space per 1000 population (state of the environment report for Karnataka, 2003). The largest land use under the category of “parks and open space” among all the cities in Karnataka can be found in Bangalore (2132.16 hectares). But in Bangalore the area under parks and open space constitutes about 7.5 per cent of the total land use, implying the availability of 0.52 hectares per 1000 population.

Janaagraha’s survey on Open Spaces (Janaagraha Centre for Citizenship & Democracy, 2017) in Bengaluru has found that, Bengaluru has 19 sqkm of open space (parks and playgrounds), which accounts for 3% of the city area (709 sq km). But at 2.2 sq m of open space per capita, Bengaluru falls considerably short of the prescribed standard of 10-12 sq. m of open space per capita recommended by MoHUA guidelines. This would require an addition of 67 sq. km. of open space in Bengaluru.

Delhi is the capital city of India. It is known as mini-India with the largest and most diverse number of immigrant communities. Delhi has witnessed a phenomenal population growth during the past few decades which stands at 16 million. (Census 2011). In 1901, 52.7 per cent of the total population of Delhi was urban, but in recent decades, it has been increasing steadily. The urban area in Delhi territory has increased from 62.5 per cent in 2001 and in 2011 urban area is 75 per cent of the total area. Out of the

total population of Delhi, 97.50 per cent of people live in urban regions. There is a standard of 1.5 hectares of total open space per 1000 population as a minimum requirement. We shall also use the same standard for this study (Rame Gowda, 1974). Like other metropolitan cities in Delhi, the built-up area is also increasing at a higher pace. The city registered a built-up area of 24.98% in 1987 to 41.25% in 1999 and 42.58 % in 2006 which adversely lead to a decrease in open and green spaces of the city. A regional variation in urban open spaces among three different core zones of Delhi can be seen. i.e., in Chandichowk it increased from 32.5 sq. km. in 1961 to 36 sq. km. in 2011. However, in Connaught place, it is decreased from 44.5 sq. km. in 1961 to 38.7 sq. km. in 2011 and in Karol Bagh, there is a slight increase in open space between 1961 to 2011, 33.4 sq. km. to 34.5 sq. km. respectively. If we see the open spaces in the core and periphery zone of the city, there is also a negative trend followed between 1961 to 2011. In the core zone, in 1961 47.5 sq. km. of open spaces decreased to 38.4 sq. km. in 2011 and in the periphery zone, it is 77.2 sq. km. in 1961 to 68.8 sq. km in 2011.

Patna is the capital of Bihar and also known as Patliputra in ancient times, situated on the right bank of the river Ganga. Once upon a time, Patna was considered as a planned city but it is highly unplanned and chaotic in the present time. In the absence of planning interventions since 1981, the rapid growth of the city has led to haphazard development, and this resulted in the deterioration of open space and forest area (only 2.34 sq. m. per capita). Settlements or the built-up areas have expanded consistently here, i.e., changes from 35.77 km² in 1988 to 55.27

km² in 2009 and 60.37 km² in the year 2017. But there was a gradual decrease in the area of open spaces like parks, gardens and agricultural fields from 32.32 km² in 1988 to 18.90 km² in 2009 and in 2017 its area increased to 31.60 km². This increase in the area of parks, gardens and agricultural fields was related to the significant decrease in the area of fallow land from 19.58 km² in 2009 to 2.04 km² in the year 2017. This increase could also be due to the non-harvest of crops in the agricultural fields in the year 2017 due to which there is an increase in the area of the class represented by parks, gardens and agricultural fields in the year 2017.

Guwahati is the largest city in Northeast India also known as the 'gateway of the North-East' is the fastest growing cities of India, lies between the banks of the mighty river Brahmaputra and the foothills of Shillong plateau, stretching from 26° 2' N to 26° 16' N latitude and 91° 33' E to 91° 52' E longitude. It covers a geographical area of 216 km² comprising a population of 957,352 with a density of 4400/km² as per 2011 census. Favorable transport connectivity and a growing population and infrastructure have made Guwahati among the most rapidly developing cities in India. After shifting capital from Shillong to Guwahati (Dispur) in 1972, the city has been experiencing a continuous inflow of people from areas within and outside the state. High population, urbanization and urban sprawl have become challenges for the city impacting urban open spaces. Open spaces not only significantly contribute to the quality of everyday urban life but also have the capacity to facilitate recovery during a disaster. As our Northeast India belongs to seismic Zone V which is prone to high-intensity earthquakes

and Assam has experienced many high-intensity earthquakes in the past, therefore it plays a vital role in planning any rescue operations and acts as a short-term shelter area during any emergency or disaster. Urban built-up area in Guwahati city increased by 11.53% in (1990-2000), by 2000-2010 it becomes 16.31% and by 2010-2020 it becomes 13.64%. Apart from this the status of urban open space also varies from time to time. It stands at 7.7% in 1990, which later increases to 20.22% in 2000 and again it decreased to 5.5% and 2.67% in 2010 and 2020 respectively.

Conclusion

Urban densification poses a threat to urban open space. The effects of urban densification and compact city development on urban green spaces and their planning should be studied (Haaland and Bosch, 2015). Urbanization and unprecedented population growth can be seen in most countries of the world which accelerates various problems and affects the day-to-day activities of our lives. During the last some decades the world has experienced high population growth and urbanization. Our India also has been facing such issues. High population growth and haphazard urban development also lead to the loss of urban open spaces. In the above study, four cities of India are taken into consideration which show a downward curve of urban open spaces. However, Patna shows an upward trend, but this increase was related to the significant decrease in the area of fallow land. Therefore, urbanization in a planned manner is the urgent need of the hour. We should also take the initiative to create awareness among the people about the utility of urban open spaces.

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Philosophy of Mind - A Brief Introduction

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Abstract

One of the basic features that distinguishes man from rest of the nature is his possession of mind. From the time of very beginning the study of mind has occupied a significant role in philosophy. There have been various explanations regarding the question “What is Mind?” In different times, philosophers try to give the definition about the human mind. According to some thinkers mind is a thing, a substance. But according to others, mind is merely a complete states, attributes and dispositions of living bodies. On the other hand some philosophers claim that mind is a form of energy, it is a kind of force. In western philosophy, diverse points of view have been provided but they are in conflict with each other. The basic difficulty arises because of the fact that all these thinkers differentiate mind from body on the one hand, and equate mind with self on the other hand. As an important branch of Philosophy, Philosophy of mind studies the various aspects of mind and its relation to the body. Philosophy of mind has occupied a significant role in traditional as well as modern philosophy.

Keywords : *Behaviourism, Mental state, Mind body problem, Philosophy of mind, Self.*

Introduction

Mind is a complex entity which has engaged the Philosophers from the time of Thales in the sixth century B.C. Amongst all the living beings human is considered as the rational one because of the presence of mind and consciousness. In the human civilization, it is seen that human beings have been contributing to the science and technology, literature, philosophy and all other social sciences due to existence of mind. Philosophers have tried to answer the different questions regarding the concept of mind. But no philosopher could stand on a single platform reciving their doubts. It is being seen that French Philosopher, Rene Descartes had put forward a systematic study about the concept of mind. Philosophy of mind is that branch of philosophy which deals with the various problems of mind like What is 'mind'? What are mental concepts?, How one mental concept related to other mental concept or what is the realation between a mental concept and a physical concept? and so on. The problem of the philosophy of mind is to discuss the nature and structure of the mind. It is related with the different concepts of mental states and events and their relationship to one another. The most important problem of the philosophy of mind is the problem concerning the relation between mental and physical properties. It is known as mind body problem and this problem is the central point of the discussion about the nature of mind.

Objectives

1. To introduce about the philosophy of mind and its basic features.
2. To describe the basic functions of mind.
3. To briefly describe about the theories upon the relation between mind and body.

Methodology

The study is based on secondary data collected from relevant books, reputed articles of research journals, prominent sites etc.

Discussion

Nobody can deny the existence of human mind. But mind is a very complex and mysterious phenomena. The issue of mind has occupied a central place in philosophy and psychology from the beginning to till now. What is the mind? What is the relation between mind and body? etc. are the never ending problems in philosophy of mind. In different times philosophers gives their valuable comments about the nature of mind. But unfortunately nobody can give the proper answer about the problem. Apart from being itself a problem of vital interest and importance the problem is also closely connected with all the fundamental problem of philosophy.

The philosophy of mind tries to study the following mental functions –

Emotion : It is a function of mind. Every normal human being has emotion. We may mention the different kinds of emotions

like these – fear, jealousy, ever anger, grief, indignation, enjoyment etc.

Perception : Perception is a source of knowledge and it is of two kinds – external and internal. The external perceptions are seeing, hearing, tasting, smelling, touching etc. these come from five sense organs.

Quasi perceptions : It is internal perception and it is related with mind. For example, dreaming, imagining, seeing mind eye, hallucination, seeing after images etc. are known as quasi perception.

Cognition : It is the faculty of knowing perception of knowledge. Believing, knowing, understanding, conceiving, thinking and reasoning are related with cognitions.

Sensation : It is the simplest form of cognition. It is a simple impression produced in the mind by a stimulus. Pains, aches, tichles, itches, throbs, tingles etc. are the different types of sensation.

Conative state : It is an important state of mind, Acting, trying, wanting, intending, willing etc. belongs to this state.

In the Philosophy of mind we have found different theories about the concept of mind and its relation to the body. These are mainly divided into two theories viz. idealistic theory and meterialist theory of mind.

The materialists hold that only physical matter exists and therefore if mind exists then it must exist in the form of matter. Materialism has many variants, but it always holds that the matter

is fundamental and that whatever else exist depends on matter.

The idealistic theory of mind has a significant role in the philosophy of mind. The mind is not an abstract nominal principle of unity, above and beyond mental phenomenon, nor an aggregate of mental states or phenomena, but a concrete spiritual principle of unity in plurality. In other words, it is a simple abiding subject manifesting itself in a plurality of states and activities and through them realizes itself as a self-conscious and self-determining spirit. According to this theory self consciousness and self-determination are the characteristic features of the mind. It is a unity in differences.

The idealistic view of the mind gives an adequate explanation of self-consciousness and self-determination. Memory and expectation, personal identity, unity and continuity of consciousness and the interpretation of sensation by assimilation are explained by idealistic theory of mind.

Different Theories Regarding the Relation between Mind and Body

The problem of mind-body is the central issue in philosophy of mind. According to Bruce Anne “the mind body problem has been called a world knot, where all the problems of philosophy ultimately came together (Anne Bruce, 1967). It is obvious that there is a correspondence between mind and body. But there is no any certain solution about the problem of what is this correspondence? As answer of this question we get several theories like Dualism, Occasionalism, Pre-established harmony, Parallelism, Epiphenomenalism, Functionalism, Behaviorism

etc.

Dualism

In western philosophy dualism can be traced back to great philosopher Plato. But it was most precisely formulated by Rene Descartes in the 17th century. It is said that Descartes is an exponent of dualism.

Descartes regards matter and mind as two heterogeneous substances. Dualism begins with the claim that mental phenomena are, in some respects, non-physical. One of the earliest known formulations of mind body dualism was expressed in the eastern Sankhya and yoga schools of Indian philosophy (650 BC). This concept is divided the world into purusa (mind/spirit) and prakriti (material substance). Among the schools of Indian philosophy Yoga Shastra of Patanjali presents an analytical approach to the nature of the mind. According to dualism, for different reasons human intelligence (a faculty of the mind or soul) could not be identified with, or explained in terms of, their physical body. Descartes was the first philosopher to clearly identify the mind with consciousness and self-awareness and distinguish it from the brain which was the seat of intelligence. Therefore he was the first to formulate the mind body problem as the form in which it still exists today. Descartes was greatly influenced by his assumption with regards to the doctrine of 'substance' and its unchangeable attribute (Anne Bruce, 1967).

Wittgenstein, a linguistic philosopher opposes the dualism of Descartes. According to Descartes mind and body are two separate substances. In direct opposition to Descartes he

maintains that mind is a continuation of language and the world. He states that mind is a part of the world. It is the media of thinking and acting in the world and language. Wittgenstein reduces the Cartesian “cogito” or “self” into a psychological self and says that as it is a part of the world, this self cannot represent the world in any way either from within the world or from outside it. He says that instead of representing the world by the Cartesian cogito it is necessary to represent the Cartesian self itself as it a part of the world. He further criticizes the Cartesian conception of self as substance. He says that to be a substance it must be unchangeable and simple something. But Cartesian self being and psychological one cannot be called substance. Thus he says that the question of mind-body relation or distinction does not arise because both are parts of world. Wittgenstein strongly rejects the Cartesian thesis that mind belongs to inner world and its activities are thinking. Cartesian philosophers say that as thought resides in inner world of mind so it exists prior to an independent of language. They believe that mind is subjective and invisible as distinct from body. Such view is rejected by Wittgenstein. He advocates that such an idea arises because of the misunderstanding of language. According to Wittgenstein there is nothing in the mind which is call “mental states” and so it cannot be describe in the way a room can be. Hence, for him, mind stands not for mental entities but for mental activities.

Prof Gilbert Ryle, offered a well known criticism against Descartes dualistic theory of mind. His famous book “The Concept of Mind” presents a criticism of Descartes dualistic

theory. In the 1st chapter of his book named “Descartes’ Myths” he holds that Descartes theory of mind can be named as a theory of “Ghost in the Machine”. According to Ryle, Descartes present mind as if it is something inner, private and therefore unknowable. Though mind is something private yet it can be cause of some of the bodily movements. Therefore Ryle holds that it acts as a ghost on the body (Smith N.K. 1953). Though mind cannot be seen, its presence can be felt because of its effects on the body, according to Ryle, Descartes dualistic theory commits a very big mistake known as category mistake. The basis of Descartes theory is mistaken as it assumes that the body and mind are independent substances. Ryle states that his aim is to determine the logical cross bearing of the mental concept, Ryle aims to demolish the Cartesian conception of the mind as a ghostly non-physical entity existing ever and above the familiar flesh and blood of living human being, an entity whose states are supposed to be logically private. Dualism, Ryle says embodies a category mistake. Ryle argues that mistakes about the mind come from wrongly believing that mind like matter belongs in the category substances. In Ryle’s view, the Cartesian concept of the mind is essentially private. He strongly rejected the notion that there exists two kinds of realities, for example the physical and the mental. He writes ‘to talk of a person’s mind is not to talk of a repository which is permitted to house objects that, something called the physical words is forbidden to house, it is to talk of the persons abilities, liabilities and inclinations to do and undergo certain sorts of things and of the doing and undergoing of these things in the ordinary worlds (Ryle Gilbert, 1950).

Occasionalism

Occasionalism is an important theory of mind body problem. Melebrance and Geulinox, the followers of Descartes have to avoid the difficulties of the theory of interaction resorted to the hypothesis of occasional cause or occasionalism. According to this theory mind and body are opposed to each other and consequently cannot interact upon each other, but still there is a correspondence between the two, and this correspondence is brought by the God, who upon the occasion of certain changes in the one, intervenes to bring about corresponding changes in the other. Wherever changes arise in the body God invents and produces corresponding sensations in the mind, and wherever there are volitions in the mind to move the body. He produces corresponding movements in the body.

The Pre Established Harmony

This theory is produced by Leibnitz. He tried to explain the relation between mind and body by the theory of pre-established harmony. According to this theory, at the time of creation, God established such a harmony between mind and body. Body and mind thus may be regarded as two clocks which was constructed and set the same time and keeping the same time without either of them acting upon the other. According to Leibnitz, 'Each living body has a dominant entelechy, which in the case of an animal is the soul. The soul follows it own laws, and the body, by the virtue of the harmony pre-established among all substances, since they are all, representations of one and the same universe.' There is a perfect harmony between the perceptions of the monad and the motions of the bodies.

Parallelism

Parallelism is a notable theory of mind body problem To avoid the difficulties of Dualism and Interactionism, Spinoza started the hypothesis of universal parallelism or parallelistic monism according to which mind and matter are not two distinct and independent substances, but only two parallel attributes of the same substance. According to this theory mind and matter are the correlative aspects. In this context Bertrand Russell says in book “History of Philosophy” that “the metaphysics of Spinoza is a modification of Descartes” (Russell Bertrand, 1945).

Epiphenomenalism

Epiphenomenalism is a theory that has its own version of the nature of relation between body and mind. The epiphenomenalist holds that the mind is nothing but an epiphenomena of the body. There is a causal connection between the mental and the physical events, but it only goes in one direction from the physical to mental. Therefore, according to this theory, the mental event, always are the effects of physical changes and never are causes of physical changes. In this theory, mind is related to the body like the shadow is related to the person. The motion of the person in the cause of the motion of his shadow, but the motion of the shadow does not cause of the motion of the person. Similarly, the physical causes the mental, but the mental never causes the physical. It is strictly an one way causal relationship. The epiphenomenalist believes that the physical sciences will show a steady increase in the number of physical phenomena which can be explained in purely physical terms. The postulation of non-physical cause of physical phenomena has proved fruitless,

where as the postulation of physical causes has produced important results.

Phenomenalism

Phenomenalism is a theory that represents of external objects are all that exist. In brief, phenomenalism interests itself in the essential structures are found within the stream of conscious experience – the stream of phenomena – as these structure manifest themselves independently of the assumptions and presuppositions of science (Moore B.N. & Bruder K, 2004). This theory was adopted by Bertrand Russell and many of the logical positivist during the early 20th century. It accepts the existence of the basic substance which is neither physical nor mental. Then both physical and mental would be properties of this neutral substance. Such a position was adopted by Baruch Spinoza. This theory may be called as neutral and it resembles property dualism.

The phenomenologist argument of mind body problem cannot give the proper solution because they do not support either mind or body. It is controversial and vague. They have to support any one of them (mind or body) so phenomenalism also rejected.

Behaviorism

According to John R. Searle, “The earliest influential form of materialism in the twentieth century was called ‘behaviorism (Searle J. R., 2004). Behaviorism says that the mind is just the behaviour of the body. There are two types of behaviorism viz. psychological or methodological and logical or analytical or philosophical behaviorism.

In the 1st half of the 20th century, behaviorism dominated in both psychology and philosophy. Behaviorism in psychology, developed as a reaction to the inadequacies of introspectionism. It is known as stimulus response theory in psychology. The main objective of psychological behaviorism is that, there is no such an entity called mind. We realize only behavior. P.F. Skemer, J.B. Watson etc. are the pioneer of psychological behaviorism. Philosophical behaviorism was developed parallelly to the development in psychology which is differ from psychological behaviorism. This is characterized by strong verificationism, which generally considers unverifiable statements about interior mental life sensation. For this type of behaviorism, mental states are not interior states on which one can make introspective reports. They are just descriptions of bahavior or dispositions to behave in certain ways, made by third parties to explain and predict of others behavior.

Conclusion

From the above discussion it is found that the history of mind-body problem is a long one. The search for the solution of this problem was started in primitive age and it is going on till today. This problem is of concern in psychology also. In different times philosophers provide different theories about the relation between mind and body. These theories have valuable contributions to the philosophy of mind. With the help of these theories, modern philosophers can improve their views and can contribute many new ideas regarding this issue. Though some analytic philosophers criticize Descartes' concept of mind as ineonsistent, it is seen that Descartes has the great rle in modern

philosophy because for the first time he presented a systematic theory of the mind-body problem. In contemporary western philosophy Gilbert Ryle contributes his analysis regarding the concept of mind in the field of philosophy of mind. He rejects the theory of dualism of Rene Descartes. Ludwig Wittgenstien, a reknown analytical philosopher declares that mind is not a substance. He also rejects Descartes' view that mind is a substance. In the opposition of Descartes wittgenstien says that mind is not an entity, it can be realised through human behavior.

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**Exploring the Role of Religious Tourism in
Promoting Sustainable Tourism Development in
Rural Areas of Assam**

Silpi Rani Baruah

Abstract

The purpose of this research is to look into the role of religious tourism in promoting sustainable tourism development in rural Assam, India. The research will look into the potential of religious tourism to drive economic growth, preserve cultural heritage, and support environmental conservation in these rural areas, with a focus on the cultural and environmental implications. This research seeks to provide valuable insights into how religious tourism can be leveraged as a catalyst for sustainable development in Assam's rural areas through interviews with local communities, religious priests, and tourism stakeholders. The study's findings will contribute to the academic discourse on sustainable tourism and provide practical recommendations for policymakers and local stakeholders interested in harnessing the potential of religious tourism for the benefit of the community as well as the protection of Assam's cultural and natural resources.

Keywords : *Religious tourism, sustainable tourism development, rural assam, cultural and environmental implications*

Introduction

Religious tourism has become an important part of the global travel industry, attracting millions of pilgrims and tourists each year to sacred sites and religious landmarks. Religious tourism plays an important role in the socioeconomic development of rural areas in many regions, acting as a catalyst for long-term tourism growth while also preserving cultural and environmental heritage.

Assam, a state in northeastern India, is known for its diverse religious traditions and rich cultural tapestry. Temples, monasteries, and pilgrimage sites abound in the state, attracting devotees and tourists from across the country and beyond. Assam is a fascinating example for studying the intersection of religious tourism and sustainable tourism development due to the confluence of cultural, natural, and spiritual elements.

Religious tourism has had a transformative impact on rural areas in Assam, presenting unique opportunities and challenges for sustainable development. The increased pilgrim and tourist traffic in these areas has boosted economic activity, created jobs, and contributed to infrastructure improvements. The uncontrolled influx of visitors, on the other hand, has raised concerns about environmental degradation, cultural commodification, and community resilience.

In light of this, it is critical to thoroughly investigate the role of religious tourism in promoting sustainable tourism development in Assam's rural areas. Understanding the dynamics of religious tourism in this context will provide insights not only into the socioeconomic implications, but also into cultural preservation and environmental sustainability. Furthermore, such an investigation will pave the way for the development of strategic interventions and policy frameworks to capitalise on the potential of religious tourism while addressing its associated challenges..

The purpose of this research is to delve into the multifaceted dimensions of religious tourism, assess its impact on Assam's rural areas, and make actionable recommendations for sustainable tourism development. The study aims to contribute to a broader conversation about sustainable tourism and heritage preservation in the context of religious pilgrimage sites, with a particular emphasis on the unique socio-cultural and environmental landscape of rural Assam.

Objectives of the Study

- ▲ To assess the socioeconomic impact of religious tourism on rural communities in Assam
- ▲ To investigate the cultural implications of religious tourism in rural Assam, with a focus on cultural heritage preservation, indigenous art forms, traditional practices, and socio-cultural interactions between pilgrims and local communities.
- ▲ Assess the environmental dimensions of religious tourism in rural areas, identifying environmental

degradation challenges in the context of pilgrimage sites and religious festivals.

- ▲ Investigate the governance and policy framework of religious tourism in Assam.

Literature Review

WCED, (1987) Though it may be legitimate to argue that sustainable development has under-emphasised the cultural dimension or missed the culture mark entirely, it nevertheless runs through the three most cogent, powerful and politically significant expressions of the concept over several years. Not surprisingly, as global political statements they do not engage in detailed discussion of the relationships which exist between culture, cultures and the environment.

Muller (1994) describe that sustainable tourism has been promoted in policy documents, strategic plans and the academic literature related to tourism. There have been numerous attempts to define the term, yet few have explored stakeholder perceptions of sustainable tourism. Arguably, without a full understanding of how tourism is perceived by stakeholders who live in, use and use and manage the resource to which management is to be applied, there is a risk that sustainable tourism will not occur. This is because sustainable tourism, as we apply it, is able to deal with impacts in the short and long term by involving the needs and requirements of all stakeholders: it is both proactive and holistic. In addition to this, it is tourism in which stakeholders have a sense of ownership and a desire for it to be of high quality.

Cohen(1998) explains that the term religious tourism embraces

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a category of travellers between pilgrims and tourists on the one hand, and between pious and pleasure travellers with knowledge-based motivation on the other hand.

Al-Amin (2002), According to him there are two distinct types of religious tourism, as opposed to the single type of tourism that secular tourism is performed as part of a religious obligation and in tourism, where the information is documented and used as a source for wider dissemination. If religious tourism's primary goal were to win God's blessings, it would also succeed in its secondary goal of drawing tourists. The goal is to introduce tourists to a country that they may not be familiar with and that they would never learn about if there were no religious tourism. If religious tourism did not exist in a country, tourists would not be able to learn more about the people living there

Satyajit Sinha and Abdul Risha, K. T., (2016) They have discussed the importance of tourism in eradicating poverty, which is one of our nation's major issues. The paper concentrates on the framework of PPT (Pro-Poor Tourism), which is different from those other concepts of tourist industry has a lot of potentiality in places where there is limited scope for other businesses. As it is a low skilled industry requirement industry, it can be survived through the proper implementation of PPT tool. Local community participation in tourism activities will keep the generated income in the destination.

Anitha KP and Dr. B Chandrashekara (2017) describes that religious tourism is totally related with emotions of the people who visits the place. Religion motivates the traveller to migrate from one place to another. The brightside of this religious tourism

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is that it generates employment and economic growth. It should be changed into sustainable tourism so that natural resources are preserved

K.Auckland (2018) In this paper there is a description about the role of travel agencies in development of religious tourism in the india.He concentrates basically on the hindu religion. Here it is been mentioned that hindu travellers purchase varieties of tour packages to pilgrimage sites. In the tourism market,places are been favoured where there is religious and additional other attractions with good services. Religious tourism creates travel motivation for all types of tourist.

K.Shinde (2020) The paper focuses on the role of religious theme parks that can easily attract tourist to religious destination. There should be proper infrasturcture planning in a sustainable manner so that visitor can easily have all the facilities they require while travelling .Religious tourism has been increasing in India from natural sacred places to religious towns.Charitable Trust of the religious institution has a big role on it. There should be marketing of this places with authentic informations

Bipathalal Balakrishnan Nair/Sandip Solanki (2022)The paper discuss on the introduction of Yoga tourism which is also part of religious tourism that is been introduced by the great religious gurus and saints.They are the ambassadors for this form of tourism. The busy schedules and hectic life of the common people has increase the motivation towards the de-stress and leisure tourism. Yoga tourism in ashrams have able to attract and accomodate people from distant places. The market for yoga

tourism is been increasing popular than before.

Methodology

Primary data has been collected from religious sites and rural communities in Assam, using methods such as surveys, interviews, and on-site observations to capture diverse perspectives and experiences related to religious tourism. Secondary data has been collected from academic literature, government reports, and tourism statistic, providing a comprehensive understanding of the subject.

Role of Religious Tourism in Economic Development

Religious tourism is important in driving economic development, particularly in rural areas like Assam, where religious sites are frequently used as focal points for tourism activities. The investigation of the role of religious tourism in promoting sustainable tourism development in Assam's rural areas necessitates a thorough understanding of its economic implications. This section discusses religious tourism's multifaceted role in driving economic development in rural Assam.

▲ Revenue Generation

Religious tourism contributes significantly to revenue generation in rural Assam. Pilgrims and visitors frequently make offerings, make donations, and buy religious accessories, injecting capital into local economies. Visitors' spending on lodging, food, transportation, and other necessities supports local businesses, fostering income generation and job opportunities.

▲ **Infrastructure Development**

The influx of religious tourists frequently necessitates the development of infrastructure such as roads, lodging, and amenities, which not only improves the tourism experience but also benefits local communities. Infrastructure construction and maintenance generate job opportunities and spur the growth of ancillary businesses, thereby contributing to rural economic development.

▲ **Job Creation**

Religious tourism generates diverse employment opportunities, ranging from hospitality and transportation to craft production and guiding services. The demand for skilled and unskilled labor in various sectors, including hospitality, handicrafts, and cultural performances, stimulates local job creation and economic diversification, thereby contributing to the overall livelihood improvement in rural communities.

▲ **Entrepreneurial Initiatives**

The proliferation of religious tourism often spurs entrepreneurial initiatives, as local residents recognize and capitalize on the economic potential of religious sites. Small-scale businesses offering goods and services related to religious tourism, ranging from local cuisine to souvenirs and cultural experiences, contribute to the growth of the local economy, fostering self-employment and community resilience.

▲ **Cultural Preservation and Heritage Management**

Religious tourism protects cultural heritage and traditional

practices, preserving the authenticity of rural Assam. The combination of pilgrimage activities and cultural events promotes the preservation of local traditions, arts, and crafts, while also serving as an economic asset by attracting visitors seeking authentic cultural experiences and products.

▲ **Community Development Initiatives**

Religious tourism's economic impact has the potential to catalyse community development initiatives in rural Assam. Religious tourism revenue may be used to fund infrastructure improvements, educational advancements, and healthcare facilities, resulting in an overall improvement in the quality of life for local residents and the establishment of a robust social and economic ecosystem.

▲ **Sustainable Livelihoods**

Religious tourism has the potential to help rural Assam achieve sustainable livelihoods by encouraging economic diversification and resilience. Local communities can invest in sustainable livelihood practices such as agro-tourism, eco-friendly initiatives, and traditional handicraft production by leveraging the economic gains from tourism, ensuring long-term economic stability and environmental conservation.

▲ **Regional Economic Linkages**

Religious tourism has economic benefits that extend beyond the immediate vicinity of religious sites, creating regional economic linkages and amplifying the economic impact. Increased tourism activity can help to grow supply chains, market links, and trade

networks, forging economic links between rural and urban areas and fostering a more inclusive and interconnected economy.

Environmental Implications of Religious Tourism

The environmental implications of religious tourism on the sustainable development of rural areas in Assam are significant and multifaceted. As religious tourism intersects with the natural environment, it exerts a profound influence on ecological resources and sustainability efforts.

- ▲ **Natural Resource Conservation:** Religious tourism has the potential to contribute to the conservation of natural resources in rural Assam. Pilgrimage sites frequently include ecologically significant areas, and cultural reverence for these sites can lead to the preservation of forests, rivers, and biodiversity, thereby protecting the region's natural heritage.
- ▲ **Development of Sustainable Infrastructure:** Promoting sustainable infrastructure and facilities to accommodate religious tourists can have a positive environmental impact. Adopting eco-friendly construction practices, renewable energy sources, and waste management systems can help to mitigate the environmental impact of increased tourist traffic while also contributing to the long-term development of rural Assam.
- ▲ **Biodiversity Conservation:** Religious tourism can help to conserve biodiversity in rural Assam. Many pilgrimage sites are in ecologically diverse areas, and responsible

tourism practices can help protect these areas' flora and fauna. Furthermore, the preservation of sacred groves and natural habitats associated with religious sites can help to preserve biodiversity.

- ▲ **Sacred Sites and Landscapes Protection:** The cultural significance of pilgrimage sites frequently extends to the protection of sacred landscapes and natural features. Recognising these environments' spiritual value can lead to their sustainable management, reducing the risks of habitat degradation, deforestation, and pollution, and ensuring the preservation of culturally significant landscapes.
- ▲ **Environmental Education and Awareness:** In rural Assam, religious tourism provides opportunities for environmental education and awareness initiatives. Visitors and local communities can participate in programmes that promote environmental stewardship, sustainable practices, and the importance of preserving the region's natural beauty, fostering an environmental culture among all stakeholders.
- ▲ **Waste Management and Pollution Control:** If not properly managed, the influx of religious tourists can result in increased waste generation and pollution. To reduce the environmental impact of religious tourism in rural Assam, sustainable waste management practices such as recycling and proper disposal, as well as measures to reduce air and water pollution, are required.

- ▲ **Eco-Tourism and Nature-Based Experiences:** Religious tourism can help to develop ecotourism and nature-based experiences in rural Assam. Stakeholders can leverage the region's environmental appeal while raising awareness about conservation efforts by promoting activities such as nature walks, birdwatching, and sustainable wildlife tourism around pilgrimage sites.

Challenges and Opportunities

- ▲ **Environmental Degradation:** Increased pressure on fragile ecosystems, habitat destruction, pollution, and deforestation can result from the influx of tourists and pilgrims to rural religious sites, posing significant challenges to environmental sustainability.
- ▲ **Infrastructure and Resource Constraints:** Rural areas may face infrastructure development limitations such as inadequate waste management facilities, scarcity of water, and a lack of proper sanitation, limiting their ability to sustainably accommodate growing tourist numbers.
- ▲ **Balancing Conservation and Visitor Experience:** Maintaining the sanctity of religious sites and natural environments while providing an enriching visitor experience is a delicate balance that necessitates careful management to avoid over-commercialization and environmental impact.
- ▲ **Socio-Cultural Implications:** The incorporation of religious tourism into rural areas may result in socio-cultural issues such as cultural commodification, erosion

of traditions, and conflicts between commercial interests and local beliefs and customs.

▲ **Community Involvement and Empowerment:**

Engaging and empowering local communities to participate in and benefit from religious tourism development is critical, but it may be difficult due to unequal power dynamics, limited capacity, and the need for skill enhancement and entrepreneurship training.

Opportunities:

▲ **Sustainable Livelihoods:** Promoting religious tourism in rural areas provides an opportunity for local communities to generate sustainable livelihoods by creating employment in hospitality, handicrafts, ecotourism, and other related sectors, thereby mitigating rural-urban migration.

▲ **Environmental Conservation:** By embracing sustainable practices and instilling environmental awareness in visitors, religious tourism can help to conserve natural habitats, preserve ecosystems, and promote biodiversity in rural areas.

▲ **Cultural Preservation and Heritage Promotion:** Religious tourism provides a platform for the preservation and promotion of indigenous cultural heritage, traditional art forms, and local customs, fostering pride, preserving knowledge systems, and increasing awareness of Assam's diverse cultural tapestry.

- ▲ **Community-Based Tourism Enterprises:** Involving local communities in tourism activities allows for the development of community-based tourism enterprises, which encourages economic empowerment, fosters social cohesion, and ensures that tourism benefits are distributed equitably.
- ▲ **Educational and Awareness Initiatives:** Religious tourism can act as a catalyst for educational programmes, environmental awareness campaigns, and capacity-building initiatives, fostering a culture of responsible tourism and environmental stewardship among both visitors and locals.

Recommendations for Policy and Practice

- ▲ **Develop and implement sustainable tourism policies:** policies should be tailored specifically to religious tourism in rural areas, addressing environmental conservation, community participation, and cultural preservation while ensuring that economic benefits are distributed equitably.
- ▲ **Environmental Impact Assessments:** Require comprehensive environmental impact assessments for proposed religious tourism development projects in rural areas in order to assess potential environmental consequences and guide mitigation measures.
- ▲ **Conservation-Based Planning:** Incorporate conservation-based planning principles into the design and development of religious tourism infrastructure and

activities, with a focus on the preservation of natural habitats and biodiversity, as well as the reduction of negative environmental impacts.

- ▲ **Infrastructure Development and Management:** To meet the increased demand for religious tourists in rural areas, invest in sustainable infrastructure development, such as waste management, sanitation facilities, renewable energy adoption, and transportation systems that prioritise environmental stewardship.
- ▲ **Community-Led Conservation Initiatives:** Encourage community-led environmental conservation and restoration initiatives that align religious tourism development with conservation priorities and traditional ecological knowledge of local communities.
- ▲ **Ecotourism Promotion:** Promote ecotourism initiatives in rural religious sites by emphasising the intrinsic value of natural landscapes, biodiversity, and traditional ecological practices, as well as incorporating ecotourism principles into religious tourism experiences.
- ▲ **Environmental Education and Awareness:** Incorporate environmental education and awareness programmes into religious tourism activities, focusing on both visitors and local communities in order to foster an environment of stewardship and responsible tourism practices.
- ▲ **Sustainable Waste Management:** Supported by community engagement and stakeholder partnerships, implement sustainable waste management practices such

as waste segregation, recycling, and the reduction of single-use plastics in religious tourism sites and surrounding areas.

- ▲ **Biodiversity Conservation and Restoration:** Support initiatives for biodiversity conservation and restoration in rural religious tourism destinations, such as reforestation, habitat protection, and the promotion of sustainable agricultural practices.
- ▲ **Monitoring and Enforcement:** Create mechanisms for monitoring and enforcing sustainable tourism practices, such as the enforcement of environmental regulations, visitor carrying capacities, and the implementation of sustainable tourism standards in religious tourism sites.

Conclusion

Lastly, investigating the role of religious tourism in promoting sustainable tourism development in Assam's rural areas reveals both challenges and opportunities. Religious tourism's environmental implications highlight the need for comprehensive policies and practices to mitigate negative impacts on the natural environment while leveraging the potential for positive change in rural communities. Assam can harness the cultural and spiritual significance of religious sites to drive responsible and sustainable tourism development by addressing the environmental implications of religious tourism through sustainable tourism policies, conservation-based planning, community-driven initiatives, and stakeholder collaboration. This approach promotes environmental stewardship among visitors and

residents while facilitating the equitable distribution of economic benefits to local communities. Assam can position itself as a model for sustainable religious tourism by preserving the natural environment, biodiversity, and cultural authenticity while also promoting responsible tourism practices and community well-being. By incorporating these considerations into religious tourism development, Assam can realise religious tourism's transformative potential as a driver for sustainable rural development, environmental conservation, and cultural preservation, all while instilling a sense of pride and ownership in local communities.

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Women's Economic Empowerment and Inclusive Growth:

The Case of the Rural Non-Farm Sector

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Umesh Ch. Sarma

Dreamly Sarmah

Abstract

Empirical evidence strongly emphasizes gender equality's pivotal role in driving economic growth, particularly by improving women's access to education and employment. Ensuring women's entry into the workforce and empowering them through education is vital for alleviating household poverty and fostering their active participation in overall economic development. India, acknowledging this imperative, integrates inclusive growth principles into its Eleventh Five Year Plan, prioritizing equal opportunities for marginalized groups like women and youth. Specifically, empowerment in this context refers to women's economic empowerment within labor markets and livelihoods. With India's population growing, urgent attention to the nonfarm sector becomes crucial, offering significant potential for

employment generation and enhancing women's access to resources and job opportunities. This underscores the immediate need for policy-oriented research to understand the factors shaping women's economic empowerment in India's evolving economic landscape.

Keywords: *Rural non farm sector, Women Empowerment, Inclusive Growth, Sustainable Development*

Introduction

Women's economic empowerment is a pre-requisite for sustainable development, pro-poor-growth, and the achievement of all the Millennium Development Goals (MDGs). At the same time it is about rights and equitable societies (OECD, 2012). To achieve women's economic empowerment, women should not only have access to resources, but employment opportunities should be improved and due recognition should be given for women's vast unpaid work. In fact, women should be integrated in the growth process through public policies, making them active partners in all development programmes.

Within the neo liberal paradigm of economic growth, there are two broad distinctions between studies of gender equality and economic growth; studies focusing on the contribution of gender equality to economic growth and others which have explored the implications of economic growth for gender equality.

Gender equality especially in education and employment has a positive impact on economic growth. Numerous studies (Kabeer, 2003; WDR 2012) show that not only does women's access to employment and education opportunities reduce the likelihood of household poverty but resources in women's hands have a range of positive outcomes for human capital and capabilities within the household. These findings are sufficient proof for ensuring women's participation in the process of growth: it will contribute to the inclusiveness of growth, not only because

women constitute 50% of the world's population, but also because women's access to economic resources improves distributional dynamics within the household (Kabeer, 2012).

However, the converse relationship that economic growth leads to gender equality is not as strong. Thus, while economic growth is not always sufficient to promote gender equality, the outcomes of growth is more positive where it is accompanied by an expansion in women's employment and education, access to finance, land, etc.

The two sets of findings thus emphasize that women's access to economic resources is important (i) for growth and (ii) for ensuring gender equity of growth outcomes.

The paper has the following objectives. First, it examines how women empowerment, *i.e.*, women's economic empowerment has been conceptualized. This highlights the importance of women's access to economic resources in the process of economic growth. Second, it studies the relation between gender equality and economic growth. How and why should women be included in the growth process will be examined. It further tries to answer the question whether the concept of 'inclusion' is important for growth. Third, the paper makes an analysis of the rural non farm sector as an agent of women's access to resources, leading to economic empowerment, is examined.

Concept of Women's Economic Empowerment

Economic empowerment is the capacity of women and men to participate in, contribute to and benefit from growth processes in ways which recognize the value of their contributions, respect

their dignity and make it possible to negotiate a fairer distribution of the benefits of growth (Eyben *et al.*, 2008). Thus, when we talk about women's economic empowerment, it means women's access to economic resources and opportunities including jobs, financial services, property and other productive assets, skills development and market information.

Studies (Sen and Grown 1988; Kabeer 1994, Rowlands 1997) have drawn attention to the unequal power relations which have blocked women's capacity to participate in the development process. These studies thus focused on the changes to be brought about which can promote women's capacity at individual and collective level. The women in these studies did not form a homogeneous group-they were marked by differences in socio-economic inequality, differences in class, caste, race, ethnicity, etc., along with the injustices associated with them. The focus of these studies were on three aspects of women empowerment-first, there was a focus on women's subjectivity and consciousness ('the power within') as a requirement of change; second, they emphasized the importance of resources (material, human, social) to women's capacity to exercise greater control over important aspects of their lives and to participate in the wider societies ('the power to'); and third, they attached a great deal of significance to the need for women to come together collectively to acquire a shared understanding of the institutionalized (rather than individual) nature of injustices they faced and to act collectively to tackle these injustices, which is a challenge beyond the capacity of uncoordinated individual action. These processes of empowerment have a strong collective

dimension ('the power with') (Kabeer, 2012).

Women's empowerment always had an economic dimension to it. However, this has become more visible in international policy discourse after the Beijing Platform for Action which spoke of the need to promote women's economic independence, including employment, and 'ensuring equal access for all women to productive resources, opportunities and public services.' The Millennium Development Goals on gender equality and women's empowerment adopted an increase in women's share of non agricultural employment as one of its indicators of women's empowerment. Although these documents did not define women's economic empowerment, their formulation shifted the focus on women's economic empowerment and their access to productive resources, including paid work. The World Bank was one of the first agencies to explicitly define women's economic empowerment: 'Economic empowerment is about making markets work for women (at the policy level) and empowering women to compete in markets (at the agency level)'. (World Bank, 2006). Following this, women's economic empowerment has been defined by different agencies and individual studies with slight modifications. In an ICRW publication (Golla, *et al.*, 2011), a woman is considered economically empowered when she has the ability to succeed and advance economically and the power to make and act on economic decisions. Similarly, Tornqvist and Schmitz (2009), on women's economic empowerment defined it as "the process which increases women's real power over economic decisions that influence their lives and priorities in society. Women's economic empowerment

can be achieved through equal access to and control over critical economic resources and opportunities, and the elimination of structural gender inequalities in the labour market including a better sharing of unpaid care work’.

The underlying emphasis in all these definitions is that access to resources is synonymous with women’s economic empowerment. Thus, women empowerment is now taken up as a challenge in all economies of the world and steps are taken to include them in the growth process. Economic empowerment of women is now considered a pre-requisite for sustainable development, pro-poor growth and the achievement of Millennium Development Goals. Gender equality and empowered women act as catalysts in development efforts. Investments in gender equality yield the highest returns of all development agents. (OECD, 2011).

Gender Equality and Economic Growth

Does gender equality and women empowerment help in stimulating economic growth? Klassen (1999) makes an analysis of how gender inequality in the use of human resources affects growth. The first effect relates to productivity of labour and the extent to which economies make optimal use of their human resources. If ability and talents are assumed to be evenly distributed by gender, then the failure to educate and make use of women’s ability and talent to the same extent as that of men represents market distortions. That is, it leads to an artificial restriction on the talent available in an economy, lowering the average productivity of its human capital. The second effect relates to family relations. Positive externalities are generated

by greater gender equality on household decisions relating to human capital determinants of growth. Women's access to education and economic opportunities leads to greater investment in human capital of their children (Dey, 1981, Kabeer, 2003, Blumberg, 2005). This improves the productivity of the next generation of workers. Higher levels of female education and labour force participation also is a major factor in bringing about fertility decline which in turn reduces the dependency burden in the economy and increases savings. These effects are brought about through increased bargaining power associated with women's education and employment resulting in their ability to exercise control over their own fertility as well as influence investment in their children. Thus, from a growth perspective, investing in gender equality in education and employment not only increases women's voice and bargaining power within the family but also maximizes the productive potential of human resources within an economy. This same argument can thus be extended to greater equality in access to other valued resources, such as productive assets, financial services and so on (Kabeer, Natali, 2013). However, priorities may change based on specific needs. The emphasis may be to promote women's access to literacy and primary education in poor countries but to offer a more diversified range of educational options, including higher education but also vocational training and skills development, once markets begin to operate more efficiently. Another instance may be to promote microfinance for women as a means of helping women to start up their own enterprises but access to broader range of financial services may become necessary if these enterprises are to become profitable.

Gender equality is not only a legitimate policy goal (as incorporated in the MDGs), gender equality is also desirable from an efficiency perspective: increases in opportunities for women lead to improvements in human development outcomes, poverty reduction and potentially accelerated rates of growth (Morrison, Raju, Sinha, 2007).

It is now universally accepted that gender equality and empowerment of women are key dimensions of human progress. However, women have not always been in the growth process. The Eleventh Five Year Plan in India envisions inclusive growth as a key objective. Inclusive growth (Hirway, 2011) has been defined as the growth process that reduces poverty faster, that is broad based and labour intensive, reduces inequalities across regions and across different socio economic groups, opens up opportunities for the excluded and marginalized not only as beneficiaries but also as partners in the growth process. It is not a goal that can be achieved in the short run though the process of inclusion should start first without waiting for a certain level of growth and redistribution to take place. This implies that everyone, including women and the marginalized sections of the society are to be encompassed in the growth process.

The Rural Non Farm Sector

India is a predominantly agricultural based economy with an overwhelming majority of rural population depending on agricultural sector both for employment and livelihood. However, the agricultural sector alone is not in a position to create productive employment or sufficient income to sustain the livelihood of its growing population. The on farm sector,

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particularly in rural areas is now recognized as a potent instrument for alleviating rural poverty and providing employment opportunities. Thus, rural sector is not just agriculture and rural non farm income and employment is a major feature in the economic empowerment process of rural men and women.

The jinx of near stagnant heavy agriculture dependent occupational structure of Indian economy seems to have changed during the last two decades. The proportion of rural workers engaged in agriculture in relation to total workforce remained stagnant at around 78% till 1993-94, and then declined to 70% in 2007-08. This structural break away from agriculture in favour of secondary and tertiary sectors reflects the importance of the rural non farm sector (RNFS). With continued sliding down of the share of agriculture in GDP, it has become difficult for agriculture sector alone to generate enough employment opportunities to sustain the vast and ever growing rural workforce. In recent years, RNFS has received considerable attention both from policy makers and researchers in propounding and implementing rural development strategies (Lanjouw, Sarif, 2004). A large number of studies made by Department for International Development (DFID) and World Bank in developing countries of Latin America, South East Asia and Africa have put forward arguments in favour of RNFS as an alternate source of employment in rural areas.

Cliché (2011) studied rural women empowerment by exploring the non agriculture, non farm components of the rural economy, their growing importance in Latin America in the livelihood

strategies of rural people and how and where non farm employment can be a significant driver of rural women's empowerment. It stresses on the fact that government should provide social protection to rural women in the informal economy where a majority is active. Governments cannot wait for women to become part of the formal economic sector to recognize their rights. And new rural development frameworks need to tackle both gender gaps and regional disparities within countries. Papola and Sahu (2012) found that with about one third contribution to employment and over 60% in GDP, the non farm sector is now an important segment of the rural economy of India. The RNFS has also registered a faster growth in employment in rural areas than in urban areas during the reference period 1972-73 to 2009-10.

In the context of Assam, the RNFS is perceived to be a potent source of employment to the growing labour force in the face of heavy demographic pressure on land, small and fragmented land holdings and iniquitous land distribution structure. The state witnessed an annual average growth rate of NSDP of only 2.84 per cent during 1993-2007 against the national average of 6.16 percent. The growth of agriculture sector has been a little over one percent during 1994-2004. With such a sluggish growth rate, the agricultural sector is unlikely to provide gainful employment opportunities to the rural labour force.

The following tables make an analysis of the growth of employment in the farm and non farm sectors of India and Assam. The tables are based on various rounds of NSS data on employment and unemployment.

Table 1 show that the long term employment growth over the period of four decades has been around two per cent per annum. It has however shown a declining trend from one decade to another: it was 2.44 percent during 1972-73/1983, 2.02 percent during the next ten years and 1.84 per cent during 1993-94/2004-05.

Table 2 shows an intriguing fact that a decline in employment is accompanied by acceleration in economic growth. Thus, when GDP grew at 4.7 per cent per annum during 1972-73 to 1983, employment was 2.4 per cent. The condition is similar in case of the other time periods.

Table 3 shows the percentage distribution of workers in two broad categories- farm and non farm. The table shows that there is a structural transformation in rural sector of Assam with a decline in the proportion of workforce engaged in farm sector in favour of non farm sector.

Conclusions

Based on literature and data available, it can be said that RNFS has received considerable attention from both policy makers and analysts. There are several arguments in favour of RNFS – (i) it provides employment for a growing labour force, (ii) it contributes to growth, (iii) it shows rural-urban migration and helps control urban congestion and pollution; and (iv) it promotes an equitable distribution of income and contributes to the alleviation of poverty.

As the rural labour force in most developing countries is growing rapidly, agriculture cannot absorb all these workers. NFS is

important in these areas because it is generally organized on a small scale and provides employment opportunities, mostly using local labour and local resource and uses labour intensive techniques. Therefore, as concern about employment expansion and poverty alleviation in rural areas has grown and since urban-based industrialization cannot provide a solution, attention has shifted towards the rural non farm sector, which, as an intermediate sector, straddles the urban economy, on the one hand, and the rural agriculture economy on the other (Islam, 1997). The types and patterns of non farm employment are different for the richer farming households than for the poorer ones. This gives an opportunity to all to engage in non farm activities. The poor engage in low-paid employment, often as wage labourers, or they are self employed at home. The rich often are engaged in industry, commerce and trade as entrepreneurs and employers. The RNFS provides an opportunity for women to combine household obligations and work, including care of children, with additional employment and income, especially if these activities can be carried out at or near the home. This is important for the poorer households. Thus, growth is inclusive by giving an opportunity to all to take part in the growth of the economy. It can also lead to women empowerment as it provides paid work.

Analysis of non farm employment opportunities and earnings finds strong evidence of the importance of education in determining access to non farm occupations (Lanjouw, Shariff, 2004). Education, including primary and secondary, improves productivity of agriculture on the one hand (through the use of technological innovations and modern inputs) and through

expansion and improvement of productivity of the non farm sector with the development of skill, managerial capacity and the capacity to perceive market possibilities and profit opportunities in the non farm sector arising from linkages with the farm sector. Investment in health is as important (Islam, 1997). The extension of health and sanitation facilities reduces morbidity, enhance the benefits of food intake, improve nutritional status, and increase labour productivity. Spread of women education reduces the fertility rate and increases their participation in income-earning activities. This strengthens their decision making power in the household and improves children's nutrition and education. This leads to a circular flow of interaction between agricultural growth, growth of the non farm sector, and the improvement of human capital.

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Measurement of Women's Empowerment: A Survey of Indicators

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Abstract

The quest for women's empowerment and gender equality is a contemporary global phenomenon that has significantly evolved. Post-World War II, international treaties primarily focused on human rights, but the recognition of distinct women's rights gained prominence in subsequent years. In the 1970s, advocates intensified efforts, addressing issues like the feminization of extreme poverty and disparities in politics, education, and wealth. The pivotal turning point occurred with the 1995 Beijing Declaration and Platform for Action, emphasizing a concerted effort to underscore women's empowerment. Acknowledged as a key objective in various development projects, women's empowerment is fundamental to fostering growth, reducing poverty, and enhancing governance. Leading government and non-government agencies champion women's empowerment initiatives, employing diverse indicators to assess women's status, evaluate interventions, and consider policy options for development.

Keywords: *Women's Empowerment, Gender Equality, Indicator.*

Introduction

Women's empowerment and the movement toward gender equality is a modern phenomenon that continues to develop around the world. After World War II, international treaties put great focus on human rights; however, as time progressed, it became clear that special attention must be given to women's rights. Therefore, beginning in the 1970s, advocates lobbied for women's rights at greater lengths. Issues such as feminization of extreme poverty and disparities in politics, education, and wealth served as the justification for explicit support and recognition of women's empowerment. The Beijing Declaration and Platform for Action in 1995 initiated a move to focus on women's empowerment.

Women's empowerment, a major goal of many development projects, formed a basis to foster growth, reduce poverty, and promote better governance (Malhotra *et al.*, 2002). Numerous government and non-government agencies, including the United Nations, World Bank, U.S. Agency for International Development (USAID), Pan-American Health Organization, Freedom House, World Health Organization, and Canadian International Development Agency are leaders in women's empowerment projects. These agencies use indicators to assess the status of women, evaluate interventions, and assess policy options for development. As indicators are often not standardized across agencies, a survey of existing indicators and an analysis of their efficiency can help streamline efforts to assess women's

empowerment. This paper attempts to make a survey of existing indicators and recommend a set of indicators to assess women's empowerment.

Review of Literature

Though a number of models exist, women's empowerment is difficult to measure (Kabeer, 2001). Sociologist Janet Z. Giele devised a six-fold framework of dimensions of women's status to assess and compare the legal status and social positions of women in different societies (Giele, 1977). Young, Fort, and Danner's (1994) framework consisted of 21 social indicators of gender inequality, divided into two general groupings to reflect gender inequality within two spheres in five key dimensions of social life. The two main spheres are the human rights sphere and the social relations sphere.

Institutional mechanisms for women constituted one critical aspect and a key objective identified was the development of gender-disaggregated data for planning, gender impact assessments, and gender budgeting. Consequently, new research programmes, policies, and instruments to measure aspects of women's lives were developed, along with new data bases and sources of statistical information. The latter included the celebrated UN report *The World's Women 1995: Trends and Statistics*; the UNDP's 1995 Human Development Report, which first introduced the Gender and Development Index (GDI) and the Gender Empowerment Measure (GEM) and United Nations Women's Statistics and Indicators (WISTAT) database. The World Bank introduced its on-line Gender Stats, which are gender profiles of countries with quantitative information.

Methodology and Objective

This study is based on library work and is based on the review of inter-disciplinary literature about women empowerment and gender issues. This study, being a conceptual input based on qualitative design, does not use any instruments of quantitative research. Rather, this study uses textual and graphical tools to report and analyze the work.

The objective of the study is to suggest a framework for measurement of women empowerment.

Discussion and Result

In order to ascertain the level of women empowerment in any region, there is a need for having precise indicators to measure the status of women empowerment. Much diverse conclusions have been drawn with respect to the indicators of women empowerment. Broadly, these indicators range from quantitative to qualitative. Quantitative indicators help standardize the measurements of change and are therefore, preferred by global agencies. Quantitative indicators, however, fail to provide an in-depth analysis particularly pertaining to social and psychological patterns, which are no less important either. Qualitative indicators help understand how gender roles evolve. Hence, qualitative indicators also need to be brought into the frame for complementing the quantitative one.

As a measure of change in conditions over time, gender-sensitive indicators capture existing differences between genders. Based on the codification of these differences, efforts to empower women can be measured (Jafer 2009). More specifically,

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indicators allow for qualitative descriptions and quantification of differences between genders, thereby providing the basis for women's empowerment interventions. By measuring progress using benchmarks, indicators can highlight areas that benefit from improved allocation of resources. Indicators also permit efficient, empirical assessment of existing policies and hold institutions and countries accountable by illustrating gaps between commitments and actual program outcomes.

As women's empowerment is a vast field with a myriad of indicators, the focus is given on its prominent dimensions. Specifically, here five dimensions of women's empowerment are analyzed: economic contribution, education, government, health, and media. Each dimension is divided into categories of indicators used by national and international agencies.

A. Economic Contribution

Gender-sensitive economic indicators reveal human capital utilization gaps and market inefficiencies. With women representing one-half of human capital, limiting the ability of women to contribute impedes economic growth. A study of sub-Saharan African and East Asian countries shows gender inequality accounts for 15 to 20 percent of differences in cross-national economic growth performance (Klasen, 1999; Randriamaro, 2006). Ensuring women have equal access to financial and development opportunities empower women, expedite progress toward gender equality, and can translate into improved national and international economic efficiency. Economic indicators in the market participation, income distribution, workforce composition, economic freedom and

access to economic opportunities reflect economic empowerment.

B. Education

Indicators of education are among the most important measures of women's status and gender equity. Education equips girls and women with knowledge to make informed decisions about their everyday lives and to gain bargaining power. A mother's education influences her children more than the fathers in terms of securing resources. With higher levels of education, women tend to have lower fertility rates, improved nutrition, and increased use of health services for themselves and their children. Additionally, education serves as a predictor of better employment opportunities because educated women participate more in the labour force and earn higher incomes. Education indicators can be literacy, educational attainment, access to education, school attendance, enrolment, retention, educational resources, etc. Among education indicators, enrolment and literacy rates are most commonly used to measure women's status and progress of women's empowerment.

C. Governance

Although women's empowerment improved with the implementation of gender sensitive policies, governance still lags behind other dimensions. With increasing awareness of the political importance of gender-sensitive economic development and policy reform, decision makers are starting to give considerable attention to the role women play in politics. Women's participation in the decision-making process is critical

when assessing women's empowerment, gender equality, and other developmental goals. The concept of women's empowerment is embedded in protection of women's rights, which has political and legal implications. Although the concept of women's empowerment is rooted in human rights treaties, the 1995 Beijing Declaration and Platform for Action began a concerted effort to strengthen women's participation in decision-making. The subsequent Millennium Development Goals also intend to promote gender equality by focusing on women's role in governance. Due to these strong initiatives toward women's involvement, agencies such as UNDP and the World Bank established indicators to measure the quality of women's development in governance, strengthen the capacity of women to access resources, and offer opportunities to counter a history of oppression and discrimination (Scott and Wilde, 2006). Governance empowerment may be indicated by representation of women in legislature, political and civic engagement, electoral systems, women's influence on high-level decision making, women's awareness of their rights and treatment of women within the justice system.

D. Health

Health is a determinant of a population's well-being, labor market participation, worker productivity, savings, and fertility. As a key component for strong human capital, research shows that health directly influences economic growth and development. Women's health affects both individual household and national economic welfare due to gender roles. A woman's ability to lead a healthy and productive life is crucial for a country's well-being.

To fulfil important duties and ensure well-being of their families, women must be physically well and knowledgeable about health. Broader changes can occur within communities and regions if societies have improved women's abilities to make decisions regarding childbearing, childrearing, sexual relations, and use of contraceptives. Maternal and infant health indicators are the most widely used health indicators because of their significance to overall health of a population and women's access to medical resources. Many other factors such as sanitation, access to potable water, etc. also important indicators of women health.

E. Media

Media plays a significant role in shaping women's importance in society. From perpetuating gender inequalities and stereotypes, media can play an important role in empowering women. Women access to communication systems, such as media, does not guarantee that their opinions will be expressed equally or that their participation in the media will be mainstreamed. Stereotyping and alienation of women by the media are still remarkably widespread phenomena. Media reflects social and cultural values of society and does have the capability to empower women through purposefully voicing their opinions and perspectives among the population. According to UNESCO, the diversification of media workers (e.g., females writing news items, presenting all types of news stories and making top-level decisions in news organizations) promotes fair gender portrayal in the media. The 1995 Beijing Declaration and Platform for Action, adopted at the UN's Fourth World Conference on Women, highlighted the key role of media to promote gender

equality. In 2010, UNESCO, as part of International Women's Day celebrations, launched a global exchange on gender sensitive indicators for media organizations. UNESCO, in 2012, published its report on gender-sensitive indicators for media, the most comprehensive listing of such indicators.

From the discussion, the following indicators are suggested to capture women empowerment under the five dimensions mentioned above.

Economic Contribution

- Adult labour force participation rate (female/male)
- Female share of paid labour force
- Unemployment rate (% female/male)
- Estimated earned income
- Female professional and technical workers (as % of total)
- Length, amount, and source of paid maternity leave

Education

- Youth literacy rates (% ages 15–24, female/male)
- Adult literacy rates (% ages 15 and over, female/male)
- School life expectancy (expected number of years of formal schooling, female/male)
- Net secondary school enrolment (% female/male)
- Tertiary enrolment rates, gross enrolment ratio (% female/male)

Governance

- Seats in parliament in Single or Lower chamber (%)

female)

Seats in government at ministerial level (% female)

Seats in government at sub ministerial level (% female)

Female legislators, senior officials and managers (as %
total)

Health

Maternal mortality rate (per 100,000 live births)

Child mortality rate (% age 0–5, female/male)

Contraceptive prevalence (% married women)

People HIV infected (% female among adults)

Sexual abuse of women (% total population)

Domestic Violence (% change over the years)

Media

Access to computers, internet (% female/male)

Print and electronic media (number of existing feminist
resources)

Number of women's NGOs

Female Workforce in Media (% female/male)

Female Media Executive (% female/male)

Conclusion

The framework presented here attempts to capture the various aspects of women empowerment. Women's empowerment is a multi-dimensional process of achieving basic capabilities, legal rights, and participation in key social, economic and political domains. It is felt that these indicators will be useful in enabling a researcher to ascertain the extent to which women's

empowerment has been achieved and gender inequalities minimized –or, conversely, the challenges that remain for the achievement of women’s equal participation and rights. At the same time, it should be noted that gender comparisons alone are not sufficient measures of social inequalities; aggregate data and statistical averages do not reveal anything about within-group inequalities. So, there is need for more detail study to determine the sets of indicators to be able to determine within group differences.

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Women and Legal Rights: A Study on the Legal Awareness of Women in Darrang District of Assam

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Abstract

The legal dimension stands as a crucial facet of women's empowerment. In societies marked by gender inequality, the realization of women's rights hinges on the recognition and protection afforded by the legal system. Despite specific provisions and laws within the Constitution of India and the judicial system aimed at safeguarding women's rights, numerous obstacles impede women's empowerment. Challenges persist within households and communities, where equal status is often denied to women. The procedural aspects of our legal system, although in place, provide limited opportunities for women to benefit fully. The enduring influence of patriarchal norms and age-old discrimination compels women into submissive roles, leading to their ignorance and reluctance to seek legal protection. This research delves into the legal and judicial procedures safeguarding women's rights and assesses women's awareness of such systems, focusing on Darrang district in Assam.

Keywords: *legal right, awareness and women empowerment.*

Introduction

The issues concerning the human rights and security of women have been a central point in current socio-political debates all over India. Gender subordination and practice of gender inequality to a great extent has devalued the concept of 'gender justice' promoted by our legal system. As such ensuring legal rights for women can bring gender justice by eliminating all types of ill practices and discrimination against women. The real picture in Indian society for women is not very satisfactory. Traditional prejudices and customs based on patriarchal norms and values are instigating to keep women subordinate to their male counterpart resulting in both physical and mental torture in their day today life. For instance practice of dowry, female infanticide, wife burning, sexual violence, domestic violence and other varied kinds of discriminatory practices: all such acts consists of physical as well as mental element.¹ To eliminate such kind of violence and discrimination our constitution of India and judicial system has given specific legal rights and legislations. But in reality, still a lot to be done in order to realize these legal protections to its contents. Illiteracy, ignorance, fear of status, poor self image among women and poverty are the factors responsible for depriving from getting such legal protections.

Objectives of the Study

The main objectives of the study are—

- ▲ To highlight on the legal rights and judicial procedures

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enacted for the protection of women in India.

- ▲ To investigate about the legal awareness among women in Darrang district of Assam.
- ▲ To provide additional measures for empowering women for addressing their problems in getting legal justice.

Study Area

The study area selected for this research work is Darrang district of Assam. Darrang district is situated in the central part of Assam and on the northern side of the river Brahmaputra.

Methodology

To investigate into the problem the researcher has adopted the descriptive survey method. The research work is based on both primary and secondary data. To collect primary data 50 women are being selected from different parts of Darrang district. The secondary data concerning to this research study have been collected from books, journals, articles, internet and so on.

Legal rights and Women

Legal rights are those rights declared by legal authorities. Those rights are recognized by the state authority and enforced by the police and the court. Mere information of just laws cannot bring legal justice until and unless the content of these laws are realized in true sense. It demands for ensuring that all sections of society particularly the weaker and disadvantaged section should get just and adequate goods, services, benefits, and opportunities for development. Hence, legal rights for women are very much

essential for their empowerment through which they can enhance their status in society. Legal empowerment which could be seen as sub-set of political empowerment, has gained increasing prominence in recent years. The first organization who uses the concept of legal empowerment was Asian Development Bank. It mainly focused on the ability of women and disadvantaged groups to use legal and administrative processes and structures to access resources, services and opportunities by providing skills and confidence to the beneficiaries (ABD, 2001)..2

Constitutional Provisions

The Constitution of India not only grants equality to women but also empowers the state to adopt measures of positive discrimination in favor of women. Fundamental Rights, among others, ensure equality before the law and equal protection of law; prohibits discrimination against any citizen on grounds of religion, race, caste, sex or place of birth, and guarantee equality of opportunity to all citizens in matters relating to employment. Articles 14, 15, 15(3), 16, 39(a), 39(c), 42 and 243 of the Constitution are of specific importance in this regard (Important Constitutional and Legal Provisions for women in India).

Legal Provisions

To uphold the constitutional mandate, the state has enacted various legislative measures intended to ensure equal rights, to counter social discrimination and various forms of violence and atrocities and to provide support services to women. Although all laws are not gender specific, the provisions of law affecting women significantly have been reviewed periodically and

amendment carried out to keep pace with the emerging requirements. Some acts which have special provisions to safeguard women and their interests are:

- ▲ The Family Courts Act, 1954;
- ▲ The Hindu Marriage Act, 1955;
- ▲ The Hindu Succession Act, 1956 with amendment in 2005;
- ▲ The Maternity Benefit Act, 1961(Amendment in 1995);
- ▲ Dowry Prohibition Act, 1961;
- ▲ The Medical Termination of Pregnancy Act,1971;
- ▲ The Equal Remuneration Act, 1976;
- ▲ Commission of Sati (Prevention) Act, 1987;
- ▲ The Prohibition of Child Marriage Act,2006;
- ▲ The Protection of Women from Domestic Violence Act, 2005 etc.

For the convenience of our research study, out of the above mentioned Acts, we have focused on mainly The Dowry Prohibition Act, 1961; The Hindu Succession Act, 1956 (Amendment in 2005) and The Protection of Women from Domestic Violence Act, 2005.

The Dowry Prohibition Act 1961 came into force on 01-07-1961 in India. According to this act 'dowry' means any property or valuable security given or agreed to be given either directly or indirectly (Section 2, Dowry Prohibition Act, 1961). The payment

of dowry has been prohibited under the dowry prohibition Act 1961 and subsequently by sections 304B and 498A of the Indian Penal Code (Provisions of Domestic violence Act 2005). This act also states that if any person, gives or takes or abets the giving or taking of dowry, he/she shall be punishable with imprisonment for a term not be less than five years, and with fine which shall not be less than fifteen thousand rupees or the amount of the value of such dowry, whichever is more (Dowry Prohibition Act, 1961).

According to the Protection of Women from Domestic Violence Act 2005, the term domestic violence includes elaborately all forms of actual abuse or threat of abuse of physical, sexual, verbal, emotional and economic nature that can harm, cause injury to, endanger the health, safety, life limb or wellbeing, either mental or physical or the aggrieved person (Section 2, Dowry Prohibition Act, 1961). According to this act the aggrieved person or any other witness of the offence on her behalf can approach a police officer, protection officer or service provider and file a complaint with a magistrate for obtaining orders or reliefs under the domestic violence act 2005 (Provisions of Domestic violence Act, 2005). Section 498A of the Indian Penal Code, which defines the offence of matrimonial cruelty and prescribes the punishment for the husband of a woman or his relatives who subjects her to cruelty (Provisions of Domestic violence Act, 2005).

Gender discrimination has been removed to a larger extent by the Hindu Succession (Amendment) Act 2005 which came into force on 09-09-2005. Now daughters can claim equal right, in

the self acquired/separate property and also coparcenary property, left by their parents (Women Property Right in India). The Muslim women are govern by Muslim Personal Law (Sariat) Application Act 1937 and Muslim Women's (Protection of Rights on Divorce) Act 1986 (Women Property Right in India).

Analysis and Discussions

Table-1: Awareness and views on legal rights of women.

Sl. No.	Statement	Response (%)	
		Yes	No
1	Women's familiarity about legal rights and procedures.	64	36
2	Views on adequacy of laws and judicial system	48	52
3	Views on successful implementation of laws.	16	84
4	Views on the need of equal property right	84	16
5	Preference for inheritance of property right by daughter	88	12

Source: Field Study, 2015.

Table-1 indicates the awareness and views on legal rights of women. Table shows that 64 percent women are familiar about legal rights and procedures; and 36 percent women are not familiar with these procedures. Again, 48 percent women have positively responded that existing laws and judicial system are adequate for the protection of women's right; and 52 percent women have responded negatively in this regard. Moreover, 16 percent women have responded that existing laws for protecting rights of women have been successfully implemented. On the other hand, 84 percent women have responded negatively in this aspect. They have argued that women are not secured till

now and physical-mental harassment, sexual abuse etc. are growing day by day. Table also shows that in view of 84 percent women equal property right is essential for women as men and women have equal rights. On the contrary, 16 percent women have responded that equal property right for women is not necessary as it is not a tradition of our society. Again, from the table it has been found that 88 percent women have preferred inheritance of property right for daughter because it assures future security and helps to improve socio-economic status of the daughter. On the other hand, 12 percent women have responded negatively in this regard. They have argued that there is no need for giving property right for daughter as they are sent to another family by our custom of marriage.

Table-2: Educational level -wise awareness among women on legal rights.

Sl. No.	Educational Qualification	Awareness (%)	
		Yes	No
1	Below Class VIII	2	18
2	Class VIII to XII	28	12
3	Above Class XII	34	6

Source: Field study, 2015

Table-2 indicates educational level-wise awareness among women on legal rights.

It shows that out of total percentage of women who are familiar with the legal processes, 2 percent women belongs to below class VIII category, 28 percent women belongs to class VIII to XII category, and 34 percent women belongs to above class XII

category. On the other hand, out of total percentage of women who are not familiar with the legal processes, 18 percent women represents below class VIII category, 12 percent women represents class VIII to XII category, and 6 percent women represents above class XII category.

Table-3: Response on domestic violence, dowry and property right.

Sl. No.	Educational Qualification	Awareness (%)	
		Yes	No
1	Experience of domestic violence	2	18
2	Support on dowry system	28	12
3	Access of equal property right	34	6

Source: Field study, 2015

Table-3 shows response of women on domestic violence dowry and property right. It shows that out of the total respondent 10 percent women positively replied that they have experience of domestic violence and they have regular experience of scolding and beating by their husbands who are alcoholic. On the contrary 90 percent women do not have such experience Table also indicates that out of the total respondent 12 percent women support dowry system and 88 percent women are against this ill practice. Those women who support dowry are in favor of following the custom of dowry and it sometimes reduces family conflicts in their opinion. Against this view those women who oppose dowry system view that it creates social disorder, increases fear among women and degrades their status and forces the women for experiencing both physical and mental harassment in the family life. Again it is seen in the table that out of total

respondent 34 percent women have accessed equal property right in their family while 66 percent women are deprived of such rights. Out of these 66 percent respondent some of them were not given their right by their family members and majority of them are not willing to access such right as it is not allowed by our traditional norms and customs.

Besides these some other findings have also been revealed by our research study. The opinion of women about protecting themselves from different types of violence or discrimination indicates that majority of them wants to avail legal assistance and justice. In this context they also seek help and guidance from some NGOs and mahila samitis to assert their rights. In this research study it is found that in view of 84 percent women, in their locality they do not have any NGO to provide legal assistance to them.

Findings

The findings of this research study are the following-

- ▲ In Darrang district most of the women are familiar with the legal rights and procedures; and more educated women are more familiar with legal rights and procedures.
- ▲ Less number of women is found to have experience of domestic violence in Darrang district.
- ▲ Large number of women in Darrang district is found to be aware of the legal rights and procedures for their protection.

- ▲ Most of the women in Darrang district do not support the dowry system. Those who support dowry are in favor of continuing this customary practice due to the fear of violation of peace and harmony in the family.
- ▲ Large number of women in Darrang district are deprived of getting property right. However most of them are not willing to demand property right as they are not free from cultural and traditional bonding.
- ▲ Most of the women want to avail legal benefit for the protection of their rights if it is violated due to discrimination and violence resulting from patriarchal domination.
- ▲ Most of the women of Darrang district have realized that existing laws and judicial system are inadequate.
- ▲ Large number of women has argued that the existing laws for protection of women are not implemented successfully.

Suggestions

After identifying and analyzing the problems the researchers suggest the following measures—

- ▲ Women's literacy skill is to be developed so that they can easily access the legal benefits. It will also be helpful in building their capacity to overcome the traditional barriers.
- ▲ Strengthening the communication system is very

important in order to provide information to women about legal rights and procedures through media, posters, and theatres with the help of local languages.

- ▲ Organizing awareness campaign for women is highly needed at the grassroots level to contribute for legal empowerment and also to develop their confidence to protest any kind of injustice to them.
- ▲ Encouraging the role of NGOs, mahila samitis and other women organizations will bring more accessibility to legal rights and procedures for women.
- ▲ Speedy and proper implementation of laws will assure justice for women in true sense.

Conclusion

In order to empower women several laws have been formulated in India and provisions have also been made to assure legal rights for women in India. But practice of some illegal customs and traditions have put obstacles in the enjoyment of such equal rights. This has proved the inadequacy of the legal procedure which remains only as policy document in actual sense. To some extent women themselves are not free from traditional norms internalized by them through the socialization process. In such a situation more and more broader outlook of human being, creating social awareness of legal rights, changing the traditional attitude and mindsets can ensure justice and equality and can enhance the status of women in the society.

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Women Empowerment in India's Social Reformation Movement

**Anupam Thakuria
Issa Ram Nath**

Abstract

Women's empowerment stands as a paramount issue in the 21st century, reflecting a historical trend of societal neglect toward women. Throughout ancient times, women faced a disregard for their fundamental rights within both society and families, a situation that persists to some extent today. The urgency for women's empowerment arises from the enduring challenges women encounter, with almost half of the population still striving for due rights and honor. Social movements play a crucial role in driving social change, and women's empowerment movements hold a significant place in Indian history. In the pre-independence era, such movements were intertwined with broader social reformation efforts. Despite being a predominantly male-dominated society, early movements for women's rights were often led by men. The Indian Constitution emphasizes gender equality, with the 73rd amendment ensuring significant representation for women in Panchayati Raj Institutions, thereby facilitating a pathway for women to claim their rights.

Keywords: *women empowerment, attitude, social movement, reformation, constitution, Reservation, victims.*

Introduction

Women's empowerment stands as a prominent issue in the 21st century, echoing a historical backdrop where women were marginalized in both societal and familial contexts. Throughout ancient times, women's fundamental rights were often overlooked, and regrettably, such attitudes persist today. This underscores the pressing need for women's empowerment. The challenges faced by women have gained increasing importance in our society, with nearly half of the population still striving for their due rights and recognition. Empowerment, whether in terms of race, social standing, education, gender, or economic strength, is pivotal. Women's empowerment entails creating an environment where women can autonomously make decisions for their comprehensive development. In the historical context of India, movements for women's empowerment have been integral to broader social reform efforts, particularly during the pre-independence era. Notably, in a male-dominated society, early movements for women's rights were often spearheaded by men themselves. In the Indian freedom movement, women, irrespective of caste, class, and religion, actively participated across regions, marking a gradual shift in the nature of women's involvement in various movements.

Objective of The Study

The main objectives of the study are-

- ▲ To understand the concept of women empowerment.

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- ▲ To analyse the role of social reform movements in pre independence period empowering women.
- ▲ To study the impact of reform movements

Methodology

The study is based on various research methodologies. Historical methods applied first to discover the basis of history, facts, and events. Secondary sources like books, journals, internet, pamphlets, newspapers and articles with published and unpublished materials are reviewed and analysed to frame the study. Library research is also applied as well.

Discussion

Women's rights encompass the freedoms and entitlements claimed by women and girls across societies, aiming for equality with men. Despite several movements for women's upliftment in both pre- and post-independence periods, patriarchal dominance remains strong in India and other regions, where women are often treated as objects within a male-dominated society. In ancient India, women enjoyed equal status with men, participating in various fields, receiving higher education, and engaging in political and philosophical discussions. Ancient texts like the Vedas, Upanishads, Mahabharata, and Puranas recognized and mentioned female scholars, philosophers, poets, and politicians. However, despite these positive aspects, women were still considered inferior in certain respects, primarily defined by their roles in serving husbands and elders.

During medieval India, women's status significantly declined,

eroding the ancient notion of equality between genders. Practices like child marriage and rigid rules for widows further marginalized women. The Mogul invasion worsened the situation, with women denied education, child marriage becoming prevalent, polygamy practiced, and the abhorrent practice of 'Sati' emerging. The status of widows deteriorated further, with restrictions on attending social functions and no provision for divorce.

In modern India, women still face cruelty and exploitation. The birth of a daughter is not universally celebrated, and daughters often lack equal rights within households, leading to a further decline in their status. The struggle for women's rights continues as society grapples with deeply ingrained norms and biases.

Social reform movements empowering women in the 19th century

The 19th-century social reform movements in India played a crucial role in empowering women and driving societal progress. The transition from medievalism to the modern age saw notable strides in religious and social spheres. Raja Ram Mohan Roy, a prominent figure, championed religious and social development, advocating for the abolition of the inhumane practice of 'sati.' His relentless efforts, including press and platform propaganda, led to Lord William Bentinck enacting Regulation No. XVII in 1829, making 'sati' illegal and punishable.

Another gruesome custom tackled was infanticide, prevalent among the Bengalis and Rajputs, rooted in considering female children as economic liabilities. Legislative measures, such as

Bengal Regulation XXI of 1795 and III of 1804, declared infanticide illegal and equivalent to murder. The Bengal Regulation of 1870 further mandated the registration of all births, with special scrutiny for female children.

Beyond suppressing harmful practices, positive actions were taken to popularize widow remarriage and raise the age limit for girls' marriage. The efforts of reformers like Ishwar Chandra Vidyasagar, Prof. D. K. Karve, Veeresalingam Pantulu, and B.M. Malabari led to the Hindu Widow's Remarriage Act (Act XV of 1856) and the Age of Consent Act (1891). The Child Marriage Restraint (amendment) Act, 1978, increased the age of marriage for girls to 18 and for boys to 21.

In the realm of education, Christian missionaries and reformers like J.E.D. Bethune and Ishwar Chandra Vidyasagar played pivotal roles. The establishment of girl's schools, initiatives by Elphinstone Institute students, and the influence of Charles Wood contributed to the inclusion of women's education in the broader campaign for societal progress.

Jyotiba Phule of Maharashtra emerged as a pioneer in women's education, founding the 'Satya Sodhak Samaj' in 1873. His dedication to educating women, despite societal norms, had a transformative impact, establishing schools for girls from diverse backgrounds

Efforts made in the early stage of 20th century

In 20th century number of social organisations came in to existence at the both all-India and provincial level. Sarojiji Naidu, Gopal Krishna Gokhle, Rabindranath Tagore C.P. Ramaswami

Iyer and Jawaharlal Nehru worked hard to awake the women of India. Sarojini Naidu brought women out of the kitchen. She travelled from state to state, city after city and asked for the rights of the women. She re-established self-esteem within the women of India. In 1903 the Bombay Social Reform Association was founded and Mrs. Anni Besant set up the Hindu Association in Madras. The All-India Anti-Untouchability League was set up in 1932 and later renamed as Harijan Sevak Sangh. Further, the social reform movement lost its upper cast basis and orientation; women themselves crushed for an equal status in society and organised the first All India Women Conference in 1926 while the lower class founded All India Depressed Classes Association in March 1918 and All India Depressed Classes Federation. Though the many social evil received the attention of the social reformers in the 20th century, improvement of the lot of women received great attention partly because of the dynamic leadership of Gandhiji. Gandhiji strongly condemned 'purdah' system among women. He appealed to women to come out of the purdha and participate in the nationalist struggle by picketing and spinning. In the Civil Disobedience Movement, 1930, women participated and courted arrest in large numbers. The All-India Women's Conference also denounced 'purdah'. The reformers were discouraging the mall practice of dowry system simultaneously.

Conclusion

The pre-independence era witnessed a pivotal role played by social reform movements led by reformers and organizations in empowering women. Noteworthy contributions came from social

organizations like The Brahmo Samaj, The Arya Samaj, The Ramakrishna Mission, The Theosophical Society, and others. Their endeavors profoundly influenced the Indian Constitution, which now reflects their ideals. Women in India actively participate in diverse activities, guided by the principles of gender equality embedded in the Constitution's Preamble, Fundamental Rights, Fundamental Duties, and Directive Principles of State Policies. Constitutional guarantees such as equality before the law, non-discrimination based on sex, equal pay for equal work, and reservation of seats in Panchayati Raj Institutions underscore the commitment to women's empowerment. Despite these constitutional provisions, women in India have faced persistent neglect and deprivation. Empowering women becomes a crucial avenue for them to assert their rights. Strengthening women's economic capacity, leveraging media for public awareness, acknowledging shared family rights, and providing proper education are essential strategies for empowering women positively.

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Quit India Movement in Assam:

A Historical Landmark on Gohpur of Sonitpur District Special Reference to Swahid Kanaklata Boruah

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Abstract

The Quit India Movement, or Bharat Chhodo Andolan, unfolded as a civil disobedience campaign in India on August 9, 1942, following Mahatma Gandhi's urgent call for immediate independence. Its momentum grew due to Gandhi's protest against Sir Stafford Cripps' return. In May 1942, Gandhi urged Britain to either "Leave India to God, and if that is too much, leave her to anarchy." On August 8, the Congress working committee modified and passed the historic "Quit India" resolution. This non-violent movement aimed to confront British rule. On August 9, top Congress leaders, including Gandhi, Abulkalam Azad, Vallabhahi Patel, and Jawaharlal Nehru, were arrested, and the Congress was declared unlawful. The "Do or Die" resolution led to widespread agitation, with the public engaging in civil disobedience. In Assam, on September 20, 1942, a tragic incident occurred when British armed police fatally shot Kanaklata Baruah, inspiring countless Indian women in their pursuit of freedom.

Keywords: *Quit India Movement, civil disobedience, Kanaklata Baruah*

Introduction

The Quit India Movement 1942 was the result of ultimate rejection of Sir Stafford Cripps proposal for a new constitution as a post-dated cheque. In 1942 British government sent Sir Stafford Cripps to India with the proposal and see with him in New Delhi and were rejected both by the Congress and Muslim league. In May 1942, Gandhi called on Britain to leave India. On July 14th, 1942 the congress committee approved the resolution which declared the immediate ending of the British rule in India on urgent necessity both for the sake of India and for the success of the cause of United Nation and it declared that free India will assure the success by throwing his great resources in the struggle for the freedom and against the aggression of Nasism Fascism and imperialism. The aim of the movement was to carrying the British government to negotiation table by holding settled war effort.

The historic session of the All-India Congress Committee began on 7th August 1942 and on 8th August 1942 congress passed “Quit India” resolution the final nationwide “Satyagraha” campaign with Gandhi as leader at Gowalia Tank Maidan, Mumbai. Gandhi in his stirring speech told the people. “There is a mantra, Short one that of give imprint it on your heart and let every breath of yours give an expression to it. The mantra is “do or die” We shall either free India or Die in the attempt. We shall not live to see the perpetuation of our slavery”. The British already alarmed by the advance of the Japanese army to the India- Burma border

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are respondent the next day by imprisoning Gandhi at the Aga Khan place in Pune. The Congress party working committee or National Leadership was arrested all together and imprisoned at the Ahmed Nagar Fort. They also banned the party altogether.

The motto of Quit India movement was non-violence and we see in the first phase of the movement was like procession and strikes and demonstrations. But Victory Lord Linlithgow adopted the policy of hart's violence and destroy the almost phase of the non-violence. The second phase of the movement saw raids in the government building and municipal houses along with this, post offices, railways stations and police station were set on fire. The third phase of Quit India movement began in September 1942. Mobs bombed police in places like Bombay, Utter Pradesh and Madhya Pradesh.

The British government has not only deprived the Indian people of their freedom but has based itself on exploitation of the masses and has ruined India economically, politically, culturally and spiritually. It has been rightly observed that though Assam was one of the latest victims of British imperialism in India her independent being lost only with the signing of the treaty of Yandabu in 1826, She was also one of the earliest to rise in revolt against the shackles of foreign rule and join the mainstream of the country's movement for freedom. David Scott laid the foundation of British administration in Assam. The provisional administration of Assam in 1824 – 25 finally led to the permanent annexation of Assam and Assam was annexed permanently by the British in 1839. Women took tremendous role in India's' struggle for freedom movement. Women from Assam took

leading part in the struggle, but participation of women in Quit India Movement immortalized in the history of Assam. In this part of the country women have shown their strength in freedom movement of the country. Landmark of Gohpur and women power of Kanaklata Baruah in front of Gohpur police station in Sonitpur district is the best example in the history of Assam.

Under the leadership of revolutionary Jyoti Prasad Agarwala in the district of Sonitpur (previously Darrang) a revolution was adopted unanimously to hoist national flag at the court and police station, as they were the marks of British Empire. Being an aware of women's participation in the national freedom struggle Kanaklata enrolled herself in the suicide squad.

Landmark of Gohpur and Kanaklata Barua

The patriotic waves of 1942 motivated 17th years old Kanaklata Baruah to join Quit India Movement. Martyr Kanaklata Baruah was born to Krishna Kanta Baruah and Karneswari Baruah on December 22, 1924 at village Barangabari of Gohpur sub division of Sonitpur districts. Her ancestors were from the Dholakharia Baruah kingdom of the erstwhile Ahom state who relinquished the Dolakharia title. Her father was a farmer. She lost her mother at the tender age of 5 years and her father later soleminised second marriage. Kanaklata Baruah received her primary education from Barangabari School. During the time of freedom struggle Kanaklata wanted to join the Azad Hind Fauz, however as she was a minor and she could not succeed. The scarified of contemporary freedom fighter like Kusal Konwar, the then president of the local congress committee who was hanged by implication him for derailing a train, led the

revolutionists of Gohpur sub division to move the British flag and unfurl the Indian National Flag at all prominent places.

The arrest of Gandhiji and members of the congress committee together with Gandhijis' called "Do or Die" soon had a galvanizing effect upon the course of the movement. There were county wide arrests of leaders, including the members of the movement. Executive committee of Assam Pradesh Congress Committee, Both Tyagavir Hem Chandra Baruah and Ameo Kr. Das were bedridden and the Assamese freedom fighter had to choose their own leader from among themselves at this stage s leader Jyoti Prasad Agarwala himself met Ameo Kr. Das at his house to decide upon the future programme. Ameo Kr. Das told Jyoti Prasad, I am bedridden, but she will remain with you will shoulder my responsibility" Here Ameo Kr. Das meant his wife Puspalata Das. The programme drafted by Jyoti Prasad Agarwala was discussed in the presence of Satradhikar of Nikamul Satra The programme was accepted and decided that the Satyagrah would be divided in to two groups –one would be called "Death Force" and other "Peace Force". The former would include only those of the age of 18th to 50th who would face death smilingly and the later would include any willing adult. The members of the peace force would work towards maintain peace and order in villages which had been subjected to military oppression. Hundreds of youth age of above 18 years, the minimum age for joining the group, joined the Mrityu Bahini. However, Kanaklata Baruah who was below 18 years of age was granted membership of the group as an exceptional case owing to her inexorable patriotic feeling. She was subsequently made the leader of the women cadres of Mrityu Bahini.

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On September 20, 1942, the revolutionary camp of Gohpur region of undivided Darrang district decided to unfurl the National Flag at the local police station which was already prepared for such action by freedom fighters under Rehati Mohan Som, officer in-charge of the police station. As the Mrityu Bahini members in large numbers under the leadership of Kanaklata Baruah approached the police station they were warned by the police not to proceed further or to face grave consequences. As the leader of the group, Kanaklata Baruah was holding the Tricolour the leading the procession. But the police force prevented the volunteer by pointing their gun towards them, ultimately Kanaklata to enter the compound by pushing aside a gun in her hand, saying that they could killed their human bodies but no their soul which is made of iron. She also said that whatever measures the Britishers might adopted to prevent them from doing their duty but they would proceed. The immortal speech of Kanaklata gave inspiration to thousands of picketers of the days in the eve of imminent danger. The police force open fire at the unarmed picketers without any prior warning and Kanaklata was gunned by the one constable Gopal chipahi by name, next round of firing caused grievous injury on the head of Mukunda Kakoti who succumbed to it on the same day at 8 pm, and also many other volunteers like Hem Kanta Bora, Tuleswar Rajkhowa, Bhola Bordoloi etc. Kanaklata died on the spot. One Rampati Rajkhowa of Kamdewal hosted the national flag on the thana building in the evening of the same day without the knowledge of British official of the thana. The body of Kanaklata brought to her home at Barangabari and cremated at her own land there.

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Conclusion:

This historic and valiant act by Mrityu Bahini at Gohpur gave an impetus to quit India Movement all across the country and made the movement successful which ultimately made the British to leave the country shortly and the country attained Independence in 1947. Kanaklata is no more with us, but the sacrifice of her life for the cause of freedom of our country has remained a great source of inspiration for thousands of Indian women. Kanaklata can be compared with Rani of Jhansi who sacrificed her life for the cause of India's freedom at the time of Sepoy Mutiny and also with Zoan Ark of France. Let us remember the great martyr after 70 years of her death.

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Empowerment Of Women Through Political Participation

Jyotismita Mishra

Abstract

Despite comprising more than half of the global population and contributing significantly to social and economic development, women's representation in formal political structures remains disproportionately low. Operating in both productive and reproductive spheres, women's involvement in decision-making processes related to societal resources is notably limited. Currently, women hold only fifteen out of every hundred seats in legislatures worldwide. Despite international commitments to gender equality through instruments like the Convention on Elimination of All Forms of Discrimination Against Women (CEDAW) and the Beijing Platform of Action, only twelve countries have achieved a parliamentary representation of 33% or more for women (UNDP Report, 2005). A nuanced understanding of women's political participation at community and national levels is vital for addressing gender inequalities. Increased participation in governance structures is seen as key to this effort, supported by a rich body of research literature offering diverse rationales and theoretical approaches advocating for women's inclusion in politics.

Keywords: *Women's political participation, gender equality, legislative representation.*

Introduction

The discrimination and exploitation of women is seen all over the world. Empowerment is an aid to help women to achieve equality with men or, at least, to reduce gender gap considerably. Women play a very strategic role in the development of society in particular and development of economy in general. Since empowerment is considered a multidimensional concept, it is determined by many socio-economic factors and cultural norms.

The term “women empowerment” has become popular in the development field since 1980s. It is vividly recognized that women empowerment is essential for sustainable economic growth and reduction in poverty in developing countries (Chaudhary I.S., 2009). Women empowerment is central to human development.

In any political system, right from the developed to the developing countries, presence of women is very low compared to men. In many countries women had to wage long battles to get right to vote. Today the percentage of women as voters has increased considerably, but their political participation is not equal to men and therefore women are unable to get an equal share in organization that require decision making. Women have not been regarded as significant part of the political arena. Politics at every level of participation is dominated by men. The omission of women from positions of power seriously affects the ability to challenge the subordination of women in all its manifestation.

Women have to be in politics and power to participate as women and to change the very nature of that power which excludes them. Women who consist of almost half of the population need to be represented significantly in decision making bodies. Otherwise, the goal of development cannot be achieved. Gender equity is very essential for the progress of any society. More women with a voice and influence in political decision-making means more public decisions with a gender and ethnic perspective, which leads to a better, more inclusive governance that recognizes women's diversity. This promotes their political, economic and social empowerment, equal access to opportunities and resources, more safety, greater prevention and efficiency of the justice system against gender violence, as well as more guarantees to achieve the realization of women's political rights. In order for women to lead and participate in political decision-making at all levels, stemming from the conviction that women's equal representation contributes to representative democracy, good governance and sustainable development.

Objective

- ▲ To know the concept of Women Empowerment in political realm.
- ▲ To know the contribution of women in politics in a quantitative way.
- ▲ To know whether the women from the poor section of the society get their due share in political ground.
- ▲ To analyse how the role of women is fruitful in giving an insight regarding the steps taken by the political body

of the country.

- ▲ To find out the status of women in decision-making bodies of the government of the country.

Methodology

Methodology is the most important part of any research activity. It is the base on which the other proceedings of research go on. For writing the research paper, the help of secondary data has been taken.

Results and Discussion

The omission of women from positions of power seriously affects the ability to challenge the subordination of women in all its manifestation. Women have to be in politics and power to participate as women and to change the very nature of that power which excludes them. Women who consist of almost half of the population need to be represented significantly in decision making bodies. Otherwise, the goal of development cannot be achieved. Gender equity is very essential for the progress of any society.

Political participation has been defined in various ways. Political participation means not only exercising the right to vote, but also power sharing, co-decision making, co-policy making at all levels of governance of the state (Singh J.P., 2000). Political participation is broadly defined as being a process through which individual plays a role in political life of his society, has the opportunity to take part in deciding what the common goals of that society are and the best way of achieving these goals.

Political participation refers to actual participation in these voluntary activities by which members of the society share in the selection of rules and directly or indirectly in the formulation of public policy (Srivastava Rashmi, 2000).

Despite undeniable gains in terms of legal and institutional progress towards more women in decision making, pervasive structural factors still hinder or limit the full exercise of women's political rights in the region. This is reflected in cultural attitudes based on patriarchal models, gender stereotypes and traditional roles of men and women, deficiencies in women's political and economic empowerment, as well as the dramatic data available on gender violence. Conversely, it is possible to change those same structural factors that exclude women precisely through the quantitative and qualitative increase in women's participation and leadership in areas of political decision-making. Their involvement in decision-making is a precondition for the public agenda to incorporate new dimensions in public policies that contribute to put an end to the vicious circle of discrimination and gender inequality. Women constitute about 46 percent of total population of the country, as per the 2011 census; they suffer many disadvantages as compared to men in terms of literacy rates, labour participation rates and earnings. In order to address issues relating to social and economic advancement of women, the Department of Women and Child Development (DWCD) under the Ministry of Human Resource Development has been implementing various schemes. The national policy of employment of women was adopted in the country in 2001 with the ultimate objective of ensuring women of their rights (Pujari M.D., 2012).

As per Census 2011, the population of India is 1210.19 million comprising 586.47 million (48.5%) females and 623.72 million (51.5%) males. Females have a share of 48.1% in the urban population and of 48.6% in the rural population (Jeyalakshmi I.S., 2012). The importance of women as an important human resource was recognized by the Constitution of India which not only accorded equality to women but also empowered the State to adopt measures of positive discrimination in their favour (India, G.O., 2006).

The Constitution of India guarantees-The right to equality (Article 14, 16); To secure all citizens men and women equally the right to means of livelihood [Article 39(a)]; Right to life (Article 21); Right to equality and equal protection before the law (Article 15); Provides for discrimination in favour of women [Article 15 (3)], To make provision for ensuring just and humane conditions of work and maternity relief (Article 42).

Much of the country's governance has been left to the hands of elected representatives and the official machinery. Notable Constitutional, legislative and policy reforms within the last decade, including the 73rd and 74th amendments and the continued administrative decentralization through programs like NRHM, have demonstrated the Government of India's commitment to increasing the political participation of marginalized groups, especially poor women (India, G.O., 2006). In 2012, women occupied only 8 out of 74 Ministerial positions in the Central Council of Ministers. There were 2 women judges out of 26 judges in the Supreme Court and there were only 54 women judges. The present membership of the women in Loksabha from

1991 to 2011 has increased comparatively from 7.17% to 11.02% respectively, but in as far as the membership of Rajyasabha is concerned the membership of the women has decreased considerably from 1991 to 2011 from 15.51 % to 10.78%.

Significance of the study

Empowering women through political participation is one of the solutions to improve their status in the society. Her potential hidden power is to be utilized for which, her status in the society must be improved and economically she should be strengthened. The poverty is the main cause for her low bargaining power hence poverty should be removed. Empowering women and removal of poverty go hand in hand. Woman if is educated and empowered, her potential power can be utilized for the economic development.

In the words of Mahatma Gandhi, *“You educate a man, you educate an individual. You educate a woman; you educate an entire family”*.

Conclusion

Women empowerment is one of the momentous issues of contemporary development policies in developing countries. A woman is different by nature yet this difference does not mean inferiority. The empowerment of women has become one of the most important concerned in the 21st century not only at the national level but also at an international level. Society must take initiative to create climate in which there is no gender discrimination and women have full opportunities of self-decision making and participating in social, political and

economic life of the country with the sense of equality. Education can play a vital role in bringing about the desirable behavioral changes among the women and make them well equipped in terms of knowledge, competence and capacity to deal with different socio-economic problems.

At the end, it is concluded that women empowerment which is declared as Millennium Development Goal by UNDP, could be achieved only when all concerned bodies will work in cooperation and understanding the factors. Empowering Women is an important end in itself not only as human right issue but also as having the potential to enhance “Human wellbeing”.

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Higher Educational Strategies Towards Women Empowerment: An Analytical Study

**Dr. Dulal Hazarika
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Abstract

Empowerment of women is the central issue that has been pervading the development debate after the 1980s of the last century. Simply empowerment means to give someone the official legal authority or freedom to do something. The Asian and Pacific Centre for Women and Development define empowerment as a process that aims at creating the conditions for the self determination of a particular people at creating the conditions for the self determination of a particular people or group. However, cannot be achieved without proper and adequate women's education especially at the higher level. So in this paper, the investigators are going to discuss the educational development of women and the role of higher education in women empowerment.

Keywords: *Women's empowerment, higher education, self-determination*

Introduction

From 1975 institutionally, attention and intellectual discussion has been steadily increased when “UN Declaration of the Decade of Women” was launched. However, the concept of women empowerment was introduced at the women conference in 1985 at Nairobi (Siddiqi Saima 2014). Simply empowerment means to give someone the official legal authority or freedom to do something (Cambridge International Dictionary). The Asian and Pacific Centre for Women and Development define empowerment as a process that aims at creating the conditions for the self determination of a particular people at creating the conditions for the self determination of a particular people or group.

Empowerment of women is the central issue that has been pervading the development debate after the 1980s of the last centuries. Women empowerment involves issues like-

- ▲ How women make out themselves in society?
- ▲ How they are treated by others?
- ▲ What ability they have to make key decisions on matters relating to themselves and their children or family?
- ▲ What role do they have in decision making in the family?

All these aspects cannot be achieved without proper and adequate women's education especially at the higher level. So here in this paper, the investigator is going to discuss the educational development of women and the role of higher education in women empowerment.

Education and Women Empowerment

Women's empowerment in India is heavily dependent on many different variables that include geographical location i.e. rural or urban, educational status, social status and age. Education at the higher level is recognized as an instrument par excellence for effecting national development as well as a dynamic instrument of change. The constitution of India also guarantees to all women equality, no discrimination, equal opportunity and dignity. Acknowledging the world-wide significance of women empowerment, the Government of India declared 2001 as the year of women's empowerment. There are numbers of programmes adopted by the government. The state has continuously given the eye to educational development of the girl child in nation-wide by implementing SSA, RTE and special education agendas.

Education is the basis of promotion and improvement of women. So, education and particularly higher education is one of the most powerful instruments for making real change in empowerment level by eradicating poverty, inequality and economic dependence. Moreover, it empowers women by improving their living standards. Higher education, in this sense, is a great asset for the women for considering own identity and

role towards the society and the nation. Higher education is directly proportional to an individual's market (capacity to earn) and non-market value (progress and human development). Various writers highlight the role of education for the empowerment of women. The national policy of education 1986 emphasized the promotion of women's education in all areas of learning to eliminate any sex based stereo typing. Since employment plays a vital role in improving the women status in a society education of women is of prime importance in any women empowerment and development programmes.

Status of Higher Education and Women Empowerment

Higher education to begin with will enable women in developing ability for critical thinking, fostering decision making, ensuring equal participation within the society in developmental processes, and enhancing self-esteem and self-confidence to do something individually and independently. Besides these higher education results in helping females develop leadership qualities needed in social development as well as corporate structures. As we all know that providing higher education refers to endowing knowledge and practical skills that help women solve theoretical and practical problems in the real life. so, status of attaining higher education for a woman is inevitable in considering their development and through these processes, women can go in to a better world of dignity and freedom.

Development of higher education since independence gives a positive influence in empowering women of the country. Higher educational institutions are expanding day by day and these are

facilitated and opportunities the women to enrol and make them highly educated to reach a better position by taking a high post of earnings. With encouragement of Co-education, women have cuts off the age-old inferiority complex and today they are marching side by side with men folk in every walk of life. With higher education and obtaining higher degrees, women capture most of the merit seats in the result of national competitive examinations and universities. So, in this circumstance, higher educational strategies must have to be oriented for the development of the women and thus it is become significant to look a critical view on the higher educational strategies and challenges in empowering women in the country.

Statement of the Problem

By observing the importance of higher education in women empowerment, the investigators have attempted to examine the higher educational strategies towards women empowerment.

Objectives

The objectives of the present paper are as-

- ▲ To study the role of higher education in empowering women and to point out the higher educational strategies for empowerment of women in our country.
- ▲ To study the challenges of higher education in empowering women and to see the measures those promote empowerment.

Methodology

For the purpose of the study a descriptive and analytical study was done and evidences are collected from the books, journals and articles etc published in the magazines. Moreover, various websites have been examined to acquire latest information on the trends of women empowerment and higher educational strategies. The study is primarily based on secondary data.

Role of higher education in women empowerment

The world history shows considerable struggle of the universities in opening their doors to the women. Cambridge permitted the women students to appear in the examination from 1872, London University in 1878 and Oxford from 1884. In our country, Calcutta University from 1877 and Bombay in 1883. It means that only to enter higher education women had to wait for years and had to overcome the social stereo. Since 1950, the movement of empowerment of women took its roots.

Before independence, European missionaries came and established many schools and promoted schooling for girls from the early part of 19th century. By the end of the 19th century, girl students were increasing because of the social movement within the Indian scholars which spread consciousness towards women's education. In the freedom struggle period, Indian national Congress played a major role in emancipating women. Within a year of its formation in 1885, ladies' association was formed. Some prominent Indian women like Rambhamai Ranade, Sarojini Naidu, Annie Besant, Sucheta Kripalini etc played an important political and social role that influences the

country for women empowerment and women participation.

After independence, women's education especially higher education had gained a new momentum. Our constitution granted equal rights to women and that included the Right to education. Jawarharlal Nehru said, "you can tell the condition of a nation by looking at the status of its women." the first prime Minister of India understood clearly that higher education for women was the need of hour. Today Indian women's participation in higher education is quite high and growing. This is now because of mass awareness, high aspiration and parental support.

As we know that human resource constitutes the basis of the wealth of the nation and so higher education has an important role in shaping the destiny of India by educating the women-the one third part of the country. Getting higher education gives women professionalism and the power to develop. The literacy of women increased from a mere 0.2 percent in 1882 to 6 percent in 1947. In 1958, the government of India appointed a national committee for the education of women. In 1964-66, Kothari Commission emphasized on equal educational opportunity for women. status of women's committee report 1974, declaration of the year 1975 as international women's year and the decade 1975-85 as women's decade, POA 1986, National policy for empowerment of women-2001-all these efforts have resulted in increase in women entering higher education to some extent. According to the data by UGC, the proportion of women in higher education stood at a base 10 percent at the time of independence and it has raised 44 percent as of 2012-13. The following table shows it in details.

Table.1: Men and women students' growth in higher education (1950-51 to 2012-13)

Year	Men	Women	Total	Women as enrolment percent of all students
1950-51	157,000	17,000	174,000	10
1955-56	252,000	43,000	295,000	14.6
1960-61	468,000	89,000	557,000	16
1965-66	849,000	218,000	1067,000	20.4
1970-71	1563,000	391,000	1954,000	20
1975-76	2131,000	595,000	2426,000	24.5
1980-81	2003,000	749,000	2752,000	27.2
1985-86	2512,000	1059,000	3571,000	29.6
1990-91	2986,000	1439,000	4425,000	32.5
1995-96	4235,000	2191,000	6426,000	34.1
2000-01	4988,000	3012,000	8001,000	37.6
2005-06	6562,000	4466,000	11028,000	40.5
2012-13	13468,000	10687,000	24180,000	44.2

Source: enrolment of women in higher education/ selected educational statistics//www.ugc.ac.in

Access to higher education for females at this junction is very

vital so as to attain a higher status that will enable, they occupy higher positions of leadership. It is unmentionable that the higher the educational background of an individual is the higher the status, earnings, participation in public activities as well as the efficiency. The higher educational institutions will provide access to female education, increase the efficiency of female and build them up as part of the national development.

Higher education has been recognized as a great equalizer and a powerful tool of upward social mobility capable of being used for reducing socio-economic disparity and building an inclusive society. Higher education gives them options to choose and turn them into the agents of social change. Higher education also important in giving high economic return to the women which result economic growth and thus their socio-economic status may be able to develop. Thus, it can be considered that higher education is one of the most important means of empowering women with the knowledge, skills and self-confidence necessary to participate fully in the development of the society and the nation.

Higher Educational Strategies in Women Empowerment

In this paper, we want to discuss some major strategies for empowering women through higher education. These are as follows.

Gender equality education: in each domain and each life stage there should be a gender awareness and reinforcement programme. Higher education has to implement the practice and appraisal of gender equality education in each educational

institution. Higher educational institutions have to be forward in implementing the gender equality education through different strategies like family education centre, women cell, special education cell etc.

Recognition of women as an essential resource: higher education must have to give the opportunity to recognize women as an essential part of the functioning of the system and the linkage between administration and academic development should be strengthened by encouraging the women participation in different programmes so that women can show their ability as a resource.

Women studies centre: the creation of women or gender study centre is definitely an excellent indicator of the higher educational institution in empowering women. Women centres should be established in the institutions particularly in home science and agriculture colleges. The centre should focus on the issues and proper communication should be established on women rights, capability building, active participation etc.

Policy changes: the higher education policy makers should be willing to reduce gender imbalances. This should reflect right from the admission policy and enrolment figures. The management has a major role in eyeing this scenario. The higher educational institutions have to make the policy that encourages the women to enrol in higher education and it may help them in their future life.

Environmental strategy: the higher educational institutions must have to make the environment conducive for women.

Policies should be made in such way that it becomes free from sexual harassment, abuse, rape and other social problems that may affect the women.

Extension education cell: the colleges and universities must have to focus on establishing the extension education cell and execute the activities of the organization. It has to expand education through campaigning and other ways that reach the unreached one of the societies.

Inclusion of professional courses: higher educational institutions should include the professional courses which help the women for independent working or entrepreneurship. Moreover, colleges should include the courses on gender awareness, women's rights, and gender violence. These courses should be interdisciplinary with law, social work, political science, education and other departments.

Scholarship, guidance and counselling and placement cell: each higher educational institution must have to establish a guidance and placement cell where female youths can be counselled on issues and problems confronting them and give information about employment opportunities on different areas. It is also mentionable that to meet the expenses of higher education, in remote and backward areas, institutions can provide scholarship besides government initiatives.

Challenges Related to Higher Education in Women Empowerment

In our discussion in this paper, we see about the strategies of higher education in empowering women, but it is a serious fact

and a reality that there are thousands of problems in this regard and so the whole atmosphere become gloom in our mind. These challenges are briefly discussed in this paper.

Dropout and its effect on GER: In India, dropout level in primary and secondary education is alarming and for this cause, the overall enrolment in higher education becomes low. In case of girl students, the situation is too disgusting as a number of girls student are left from the schooling for different socio economic and psychological factors. Between 18-23 years of age, the GER has been found to be 19 percent. In here also there is a difference in male and females. What has been seen is that the Ger of male is much higher than female. Women constitute only 44% of the 27.5 million students in Indian higher education and the only state that has a small increase in GER is Kerala which is 57%. This is very low for a country that has the third largest current student population in the world.

Patriarchal conflict: in our country patriarchal look to our family members results gender-based violence, inequality, and injustice. This is one of the great problems of higher education since denying women to take education especially in the colleges and university education as the age is alarming for the marriage life. It is still a vital issue due to the attitude of the male dominated society.

Higher cost due to privatization and commercialization: Since economic reforms, in India, higher education become expensive and entry of the private players in this area turned education as a business and they commercialized the whole

system which result the exclusion of common people from getting higher education. It is a problem to meet the demand of women empowerment.

Academic issues: there are some academic issues linking women empowerment in the higher educational institutions. Regarding curriculum of higher education there are some queries like does the curriculum provide apposite structure on women empowerment or gender research. In many times the academic environment is not well equipped as it hinders after the attitude towards women. Higher education still neglects the life skill education as a compulsory element in curricular aspect. So, in this perspective, academia should establish a strong rapport between the curriculum and other aspects to the real-life education and that helps in women empowerment and so on.

Some Measures:

Gender parity is the first issue that we must tackle and we need to make every effort for providing social justice to women and making them on par with men in the society. Higher education of women is the only solution in this case.

- ▲ Education is the key which opens the door of thousands of opportunities. So, there should be much more educational access to the people and some centres should be established which can provide literacy training even to the aged females also.
- ▲ Introduction of vocational courses in the higher educational institutions must have to encourage. In this respect UGC, AICTE, and other agencies ate continuously

trying to expand vocational courses in the colleges and universities by granting the fund in different programmes.

- ▲ Short term courses, such as capsule courses, diploma and certificate courses, skill development courses etc need to be introduced in the institutions which will help women obtain employment opportunities and score higher in the competitive environment.
- ▲ Distance education cell in the colleges and universities can make a difference in serving the household women to obtain degrees and education. Thus, distance and open education schemes will help increase the higher educational option owing to choose by the students.
- ▲ Effective implementation of Beti Bachao Beti Parhao Campaign, creating hostel facilities for girls and working women, sanitation and hygiene in institutions and establishment of legal cell in the colleges and universities are some applicable measures that may help in empowering women through higher education.

Conclusion:

In present situation and in rural societies, women empowerment is an imperative issue. Now the government has seriously started thinking about it and the strategies are likely to be adopted for the growth and development of the women. In this scenario, higher education has obviously an important role in empowering women by enlarging the chances. Higher education equips women with many of the internal and external factors that help in leading a productive life and also help the nation in its

development. We may conclude the paper by remembering the universal fact- 'educate is a human right and an essential tool for achieving the goal of equality development and peace.'

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Gandhi's View on Women Empowerment

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Abstract

Mahatma Gandhi, a key figure in India's struggle for independence, played a transformative role in advancing women's empowerment. Recognizing women as integral to societal progress, Gandhi advocated for their participation in diverse fields—social, political, economic, and educational. His vision aimed at dispelling age-old social customs like child marriage and purdah, promoting gender equality, and instilling economic independence. Gandhi emphasized the importance of education tailored to complement women's roles in both domestic and societal spheres. While he championed women's rights, critics question the extent of his tangible impact during his time. Despite the ongoing societal challenges, Gandhi's influence on women's political participation and advocacy for their rights marked a crucial departure from contemporary norms. This abstract reflects on Gandhi's multifaceted efforts to empower women and addresses debates surrounding his advocacy and its real-world impact.

Keywords: *Gandhian women empowerment, gender equality advocacy, social transformation*

Introduction

Women empowerment is one of the most relevant topics in the current society. By women empowerment we mean to make women powerful and strong in every sphere of life so that they can take part in decision making and change the society as well as the nation. Women can take their own decisions for their personal dependence. They are independent of thought, rights, decisions, and overcome the social and family limitations. It has been now considered as a core subject for every nation as to make women empowered in every field like social, political, cultural, economic and of course educational. The people are now giving more importance to strengthen the women and girls. From the ancient time women are treated as slaves and playthings by their husbands and other members of family. Some social evils in the name of customs and traditions have been prevailing in our society which actually to punish women only because they are women. Social customs like illiteracy, dowry system, sexual harassment, inequality, female infanticide, domestic violence against women, child marriage, purdah, sati etc. are nothing but social diseases which are prevailing in our society.

Decades after decades, years after years some great leaders and reformers are trying to remove these diseases from our society. They have devoted their lives to bring out women from the so called four wall household barriers to social and political matters. Among them Mahatma Gandhi, the Father of Nation, was undoubtedly the most influential name of reformers who has

sacrificed his own life as a message to the world. Mahatma Gandhi was not only a political leader who brought independence to our nation but also a social reformer.

Gandhi was one of the most versatile leaders who have change the status of women and engaged them in the different sectors of life. Mahatma Gandhi worked not only for the political emancipation of the nation but for the liberation of suppressed and oppressed sections of society. One of the noteworthy results of his lifework has been the awakening of women who made them shed their deep-rooted sense of inferiority and rise to dignity and self-esteem. For Gandhi, “when women whom we call “Abala” becomes “Sabala”, all those who are helpless becomes powerful.” For him a nation cannot develop until and unless its women are not developed from every sphere of life. Gandhi had great contribution in the uplift of women. But only the significant which he made are discussed here in this paper.

Social

In ancient period women were treated brutally and suppressed so that they cannot participate in social factors. Even women were never considered as a part of family. They were socially neglected by male people. Liberation of women for Gandhi was linked to a deep-rooted malice. In 1929 when Dr. S.M. Reddy wrote a letter to Gandhi raising some questions about women liberation, Gandhi only said that “Men are undoubtedly to blame for their neglect, nay their ill use of women, and they have to do adequate penance, but those women who have shed superstition and have become conscious of the wrong, have to do constructive work of reform. The question of liberation of women, liberation

of India, removes of untouchable, up gradation of the economic condition of the masses and the like resolves themselves by penetration into the villages, reconstruction or rather reformation of the village life.”

Gandhi respected traditions of the society but he was not adhered with the so-called tradition which he questioned whether it would take us closer to God (Truth), selfless services and love of all human beings. He proclaimed, “I do not subscribe to the superstition that everything is good because it is Indian. Any tradition however ancient, if inconsistent with morality is fit to be vanished from the land.” Again, he said that if he would have power, he would sweep out all the superstitious practices and tradition like child widowhood and child marriage from the society. Gandhi was against the ancient saying that” Her father protects her in her childhood, her husband protects her in youth and her son protects her in old age.” Gandhi felt how wrong that was, how harmful and unjust to women.

According to Gandhi the custom of child marriage is both a moral as well as physical evil, for it undermines our morals and induces physical degeneration. The purdah system according to him was” vicious, brutal and barbarous.” He called prostitution ‘moral leprosy’ and despised the fact that “the beast in man has made the detestable crime a lucrative profession”. He appealed to prostitute to give up their unworthy profession and become “sanyasis of India”.

Gandhi viewed marriage as a sacrament imposing discipline on both the partners, not a license of physical union and emphasized spiritual union. He insisted monogamous marriages and put

forward a plea for inter communal marriages. In his opinion “women are the companion of man with great mental capacity. He said, “To call women the weaker sex is libel; it is a man’s injustice to women. If by strength it is meant moral power than women are immeasurably man’s superior. Has she not more self-sacrifice, has she not more powers of endurance, has she not greatest courage. Without her man could not be. If nonviolence is the law of our being, the future is with women.” He was against the discrimination of women. He said “I fail to see any reason for jubilation over the birth of son and for mourning over the birth of a daughter. Both are God’s gift. They have equal right to live and are equally necessary to keep the world going”.

In 1940, reviewing Gandhi ‘s twenty-five years of work in India concerning women’s role in society he said, “My contribution to the great problem lies in my presenting for acceptance Truth and Ahimsa in every walk of life. Whether for individual or nations I have hugged the hope that women will be unquestioned leader and, having thus found her place in human evolution will shed her inferiority complex. Ahimsa means infinite love, which again means infinite capacity for suffering. And who but women, mother of man, shows this capacity in the largest measure”.

Political

Gandhi had tremendous faith on the capacity of women for non-violence. And his experience of participation of women in politics started from his days in South Africa till the end of his life bears. For Gandhi, empowering women socio economically through increased awareness of their rights and duties, is a decisive step towards greater security for them. Gandhi asserted,

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“Ganges of right flow from the Himalaya of duties.” Gandhi always spoke about the constitutional rights of women. While considering Gandhi’s views on women’s reservation in legislature, one has to take into consideration both the external and internal forces which shaped his approach to the problem. In 1906-07 when he was in South Africa, he wrote in *The Indian Opinion*, about the British women’s movement for gaining their voting right. The British govt. was not willing to grant voting right to women. So, one day a group of women came to the House of Commons, indulged in breaking furniture etc. for which they were sent to jail and fined five starlings each. Gandhi was very much impressed by the courage and determination of British women in face of police atrocities. In this event he saw ample possibilities of similar awakening among Indian women.

Gandhi’s next step towards women’s reservation in legislatures came out vigorously in September 1931 when he was attending the second Round Table conference in London as the sole congress representative. He spoke in the conference, “I would boycott that legislature which will not have a proper share of women members.”

Mahatma Gandhi played an important role in the participation of women in political activities in India. Women’s entry into national politics through non-violent methods brought miraculous results. Women become aware of their inner strength. In fighting for the rights, Gandhi wanted, the women of India, not to emulate the West but to apply method suitable to the Indian environment. Because he knew that India is a country where women like Sita, Draupadi, Sabitri, Damayanti exhibited their

strength and heroic conduct.

Gandhi was profoundly influenced by Annie Besant, a British militant feminist and a theosophist, Sarojini Naidu, a trusted Gandhi's co-worker, Kamala Devi Chattopadhyaya, a fiery Satyagrahi, Rajkumari Amrit Kaur and Puspaben Mehta.

Gandhi encouraged women to fight against foreign domination, thousand women rallied to Gandhi's call for civil disobedience. Women set aside their seclusion, they cast off their purdah. They entered the public domain with men, and offered Satyagraha. They remained undaunted by police beatings and extreme hardship in prison. Even illiterate tribal women from the forest joined freedom movement. That is the truth force Gandhi urged in private matters as well.

Economical

Women are an integral part of every economy. All round development and harmonious growth of a nation would be possible only when women are considered as equal partners in progress with men. Gandhi realized that although women constitute half of world's population yet they are the largest group which is excluded from the benefit social and economic development. Women constitute a strong labour force which needs to be mobilized encouraged to make effective contribution to the development process.

Gandhi was not against economic independence of women. Some people feared that economic independence of women may lead to spread of immorality among them and disrupt domestic life. To that his answer was that morality should not depend upon

the helplessness of a man or women. It should be rooted in the purity of hearts. Although he wanted women to take up some work so as to supplement the earning of the family. He recommended work like spinning, which will not disturb the home as he regarded their duties at home to be as important as men's duty to earn. He recommended equal payment to women.

The ultimate goal of empowerment of women based on Gandhi's vision is Sarvodaya, the welfare of all through co-operation and trusteeship in the economic sphere and mutual aid in the social sphere. Thus, empowerment of women cannot be imposed from above, it must grow from the bottom upwards.

Educational

Gandhi believed that education was needed to awaken in the minds of women a consciousness of their present condition. He believed that education will enable women to assert their natural right and exercise them wisely and to work for their expansion. However, he also believed that since home life is entirely the sphere of women, they ought to have knowledge regarding domestic affairs and upbringing of children. Hence courses of introduction should be based on appreciation of basic roles of man and women. Men and women are complementary to each other. Man is supreme in the outward activities. But home life is entirely the sphere of women. Therefore, women should have proper knowledge of the basic things which are unavoidable in domestic affairs. Gandhi's view on women's education is based on family ideas because he assumes that man is supreme in the extra-mural activities and that women are supreme in intra-mural activities. Hence education imparted to both men and women

should be according to their pre-ordained stations in life. The Mahatma's views on women's education are based on his belief in women being a complement to men, unlike his contemporaries of men and are therefore out of sync in the modern context.

According to Gandhi, an education which does not teach us to discriminate between good and bad, to assimilate the one and eschew the other, is a misnomer. Education should be so revolutionized as to answer the wants of the poorest villagers, instead of answering those of an imperial exploiter. Education in the understanding of citizenship is a short-term affair if we are honest and earnest. Basic education links the children, whether of cities or the villages, to all that is best and lasting in India. Literacy is not the end of education nor even the beginning. Literacy in itself is no education. Real education has to draw out the best from the boys and girls to be educated.

Conclusion

To understand in depth the role that Gandhi played in improving the position of women in society, it is essential to look at women's status prevalent at that time. When Gandhi emerged on to the political scenario, social evils like child marriage and dowry system were rampant. Indian women had an average life span of only twenty-seven years. But when Gandhi showed his faith on women that women can make a miracle by their active participation, India has been counted as one of the developed countries. The Father of the Nation, Mahatma Gandhi was the first man to encourage participation of women in politics. The constitution of India guarantees equal rights to men and women as voters

and citizens. Presently there are very few women parliamentarians in India. It shows that Gandhi 's ideas about women and their role in political life was a departure from those of 20th century reformers.

But apart from all the successes, some critics are raising the question that was he a strong advocate of women empowerment much like his views on human rights? What did he do to help women during his time? Gandhi recognized the patriarchal society in India. He acknowledges that men play a domineering role and that this is almost universally prevalent in Hindu society. When Gandhi came into political and social power, India's social evils were still lurking such as child marriage and dowry. Thus, there are vast differences between uttering words and work on those words.

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**A Witty Stratagem for Love and Marriage:
Humour and Intrigue in Oliver Goldsmith's *She
Stoops to Conquer, or the Mistakes of a Night***

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Dr. Runjun Devi
Rupa Rani Bhuyan
Neha Mahanta**

Abstract

She Stoops to Conquer is a remarkable comedy by Oliver Goldsmith, first performed in London in 1773. It is one of the few plays from the 18th century to have retained its appeal and is still regularly performed. The play has been adapted into a film several times, including in 1914 and 1923. Initially, the play was titled *Mistakes of a Night* and the events within the play take place in one long night. In 1778, John O'Keefe wrote a loose sequel, *Tony Lumpkin in Town*. The play is notable for being the origin of the common English phrase, "Ask me no questions and I'll tell you no lies." (Appearing as 'fibs' in the play). The play centres around noble Kate Hardcastle and her betrothed, Young Marlow, after Kate's father arranges for their marriage. Marlow, who tends to get nervous around women of noble stature, finds himself at the

centre of an outrageous scheme after Kate disguises herself as a servant to trick him into wooing her. It is a splendid comedy of wit, humour and intrigue. In the play, we find plots, designs, contrivances, and even conspiracies of one character or a group of characters against the others.

Keywords: *Comedy, wit, intrigue, humour, conspiracies.*

Introduction

Oliver Goldsmith is regarded as a prolific author of the 18th century who wrote works in a variety of genres. He was a playwright, a novelist and an essayist. His plays are written against the sentimentalism of Steele and Lawrence Sterne and hence he seems propagating the theory of anti-sentimentalism. His renowned play *She Stoops to Conquer* or *The Mistakes of a Night* deals well with human relationships and the goodness of humanity and humour in life. Characters inside the play belong to the restoration age of William Congreve, Vanbrugh, Etherege, and Wycherley. In the restoration age of Charles II, wit was employed mostly in the dramas to the pleasure of the king. The present play also fulfils the demands of comedy of manners whereby characters are witty and jolly and amuse the audience/readers with their witty dialogues. Though the comedy deals with various issues as disguises, identities, directions, corrections, politeness, modesty, and impudence but all result in humour and hence declares the play to be the best comic play ever. The play centres around noble Kate Hardcastle and her betrothed, Young Marlow, after Kate's father arranges for their marriage. Marlow, who tends to get nervous around women of noble stature, finds himself at the centre of an outrageous scheme after Kate disguises herself as a servant to trick him into wooing her.

Review of Literature

Oliver Goldsmith's remarkable play *She Stoops to Conquer*

mocked the simple morality of sentimental comedies. Subtitled *The Mistakes of a Night*, the play is a light-hearted farce that derives its charm from the misunderstandings which entangle the well-drawn characters. Himani Sharma (2020) in a research paper titled “Wit and Humour in Goldsmith’s *She Stoops to Conquer*” highlights wit and humour in the play. Her textual analysis of the play leads her to conclude that one major mistake and one misleading by Tony Lumpkin made the play a masterpiece. In a research paper titled “Immense Variety of Humour in Goldsmith’s *She Stoops to Conquer*”, Dr. C.N. Baby Maheswari highlights the immense variety of humour in the play that happen because of the intrigues. Rameshwar Prasad Singha (2022) in his thesis titled “The Mind and Art of Oliver Goldsmith” analyses the unique art of Goldsmith in creating literary masterpieces. He highlights Goldsmith’s art and mind by critically analysing his major plays. The present study aims to bring out wit, humour and intrigue in the play by critically examining the play using various literary tools.

Objective

The study primarily aims to bring out wit, humour and intrigue in Oliver Goldsmith’s *She Stoops to Conquer*. The paper highlights how Goldsmiths employs plots, designs, contrivances, and even conspiracies of one character or a group of characters against another to infuse wit and humour in the play.

Research Methodology

To write this paper, prime concentration was given to the textual approach. The authors use a descriptive-analytical method to

analyse the play *She Stoops to Conquer*, first performed in 1773. The data are taken from the play by Oliver Goldsmith, whose utterances, events, dialogues and paragraphs show factors that lead to wit and humour in the play.

Discussion

“Ask me no questions and I’ll tell you no fibs,” declares Tony Lumpkin as he conveys a box full of stolen jewels to his friend Hastings in the third act of *She Stoops to Conquer* (1773). The quotation indicates the central mechanisms of Oliver Goldsmith’s most popular play, in which assumptions, fibs, misunderstandings, and mistakes conspire with results that have tickled audiences through the centuries. *She Stoops to Conquer* opens with a prologue in which an actor mourns the death of the classical low comedy at the altar of sentimental, “mawkish” comedy. He hopes that Dr. Goldsmith can remedy this problem through the play about to be presented.

The subtitle *The Mistakes of a Night* refers to the several mistakes Marlow committed during the course of a single night. First, he mistakes the residence of a respectable country Squire Hardcastle to be an inn. Second, he takes Hardcastle himself to be an innkeeper though an uncommon one and thirdly, he mistakes Miss Hardcastle to be a bar maid. It is all a comedy of errors packed with hilarious fun and laughter. There is not even a single dull moment from beginning to end. The plot of the play is made up of a main plot and a subplot. The main plot consists of the Marlow- Kate Hardcastle love story. The subplot deals with Hastings – Constance Neville’s love story. The two stories are fused into a single whole by the intrigues of Tony Lumpkin, the

stepson of Mr. Hardcastle. It is he who initiates the action, as well as brings it to a successful conclusion.

Act I is full of set-up for the rest of the play. Mr And Mrs Hardcastle live in an old house that resembles an inn, and they are waiting for the arrival of Marlow, the son of Mr Hardcastle's old friend and a possible suitor to his daughter Kate. Kate is very close to her father, so much so that she dresses plainly in the evenings (to suit his conservative tastes) and fancifully in the mornings for her friends. Meanwhile, Mrs. Hardcastle's niece Constance is in the old woman's care and has her small inheritance (consisting of some valuable jewels) held until she is married, hopefully to Mrs. Hardcastle's spoiled son from an earlier marriage, Tony Lumpkin. The problem is that neither Tony nor Constance loves the other, and in fact, Constance has a beloved, who will be travelling to the house that night with Marlow. Tony's problem is also that he is a drunk and a lover of low living, which he shows when the play shifts to a pub nearby. When Marlow and Hastings (Constance's beloved) arrive at the pub, lost on the way to Hardcastle's, Tony plays a practical joke by telling the two men that there is no room at the pub and that they can find lodging at the old inn down the road (which is of course Hardcastle's home).

Act II sees the plot get complicated. When Marlow and Hastings arrive, they are impertinent and rude to Hardcastle, whom they think is a landlord and not a host (because of Tony's trick). Hardcastle expects Marlow to be a polite young man and is shocked at the behaviour. Constance finds Hastings and reveals to him that Tony must have played a trick. However, they decide

to keep the truth from Marlow, because they think revealing it will upset him and ruin the trip. They decide they will try to get her jewels and elope together. Marlow has a bizarre tendency to speak with exaggerated timidity to “modest” women while speaking in lively and hearty tones to women of low class. When he has his first meeting with Kate, she is dressed well and hence drives him into a debilitating stupor because of his inability to speak to modest women. She is nevertheless attracted to him and decides to try and draw out his true character. Tony and Hastings decide together that Tony will steal the jewels for Hastings and Constance so that he can be rid of his mother’s pressure to marry Constance, whom he doesn’t love.

Act III opens with Hardcastle and Kate each confused with the side of Marlow they saw. Where Hardcastle is shocked at his impertinence, Kate is disappointed to have seen only modesty. Kate asks her father for the chance to show him that Marlow is more than both believe. Tony has stolen the jewels, but Constance doesn’t know and continues to beg her aunt for them. Tony convinces Mrs. Hardcastle to pretend they were stolen to dissuade Constance, a plea she willingly accepts until she realizes they have actually been stolen. Meanwhile, Kate is now dressed in her plain dress and is mistaken by Marlow (who never looked her in the face in their earlier meeting) as a barmaid to whom he is attracted. She decides to play the part, and they have a lively, fun conversation that ends with him trying to embrace her, a move Mr Hardcastle observes. Kate asks for the night to prove that he can be both respectful and lively.

Act IV finds the plots almost falling apart. News has spread that

Sir Charles Marlow (Hardcastle's friend, and father to young Marlow) is on his way, which will reveal Hastings's identity as beloved of Constance and also force the question of whether Kate and Marlow are to marry. Hastings has sent the jewels in a casket to Marlow for safekeeping but Marlow, confused, has given them to Mrs. Hardcastle (whom he still believes is the landlady of the inn). When Hastings learns this, he realizes his plan to elope with wealth is over, and decides he must convince Constance to elope immediately. Meanwhile, Marlow's impertinence towards Hardcastle (whom he believes is the landlord) reaches its apex, and Hardcastle kicks him out of the house, during which altercation Marlow begins to realize what is actually happening. He finds Kate, who now pretends to be a poor relation to the Hardcastles, which would make her a proper match as far as class but not a good marriage as far as wealth. Marlow is starting to love her, but cannot pursue it because it would be unacceptable to his father because of her lack of wealth, so he leaves her. Meanwhile, a letter from Hastings arrives that Mrs Hardcastle intercepts, and she reads that he waits for Constance in the garden, ready to elope. Angry, she insists that she will bring Constance far away, and makes plans for that. Marlow, Hastings and Tony confront one another, and the anger over all the deceit leads to a severe argument, resolved temporarily when Tony promises to solve the problem for Hastings.

Act V finds the truth coming to light, and everyone is happy. Sir Charles has arrived, and he and Hastings laugh together over the confusion young Marlow is in. Marlow arrives to apologize, and in the discussion over Kate, claims he barely talked to Kate.

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Hardcastle accuses him of lying since Hardcastle saw him embrace Kate (but Marlow does not know that was indeed Kate). Kate arrives after Marlow leaves the room and convinces the older men she will reveal the full truth if they watch an interview between the two from a hidden vantage behind a screen. Meanwhile, Hastings waits in the garden, per Tony's instruction, and Tony arrives to tell him that he drove his mother and Constance all over in circles, so that they think they are lost far from home when in fact they have been left nearby. Mrs. Hardcastle, distraught, arrives and is convinced she must hide from a highwayman who is approaching. The "highwayman" proves to be Mr Hardcastle, who scares her in her confusion for a while but ultimately discovers what is happening. Hastings and Constance, nearby, decide they will not elope but rather appeal to Mr. Hardcastle for mercy. Back at the house, the interview between Kate (playing the poor relation) and Marlow reveals his truly good character, and after some discussion, everyone agrees to the match. Hastings and Constance ask permission to marry and, since Tony is actually of age and therefore can of his own volition decide not to marry Constance, the permission is granted. All are happy (except for miserly Mrs. Hardcastle), and the "mistakes of a night" have been corrected.

There are two epilogues generally printed to the play, one of which sketches in metaphor Goldsmith's attempt to bring comedy back to its traditional roots, and the other of which suggests Tony Lumpkin has adventures yet to be realized. The title refers to Kate's ruse of pretending to be a barmaid to reach her goal. It originates in the poetry of Dryden, which Goldsmith may have seen misquoted by Lord Chesterfield. In Chesterfield's

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version, the lines in question read: “The prostrate lover, when he lowest lies, But stoops to conquer, and but kneels to rise.” Goldsmith’s friend and contemporary, Samuel Johnson, greatly admired the play. James Boswell quoted him as saying, “I know of no comedy for many years that has so much exhilarated an audience that it has answered so much the great end of comedy – making an audience merry”.

Conclusion

Goldsmith sets out to make us laugh and he does so successfully. He used for his plot a reputed experience of his own as a schoolboy. When having lost his way, he asked for an inn and was directed by a practical joke to the local squire’s house. He behaved there rather as Marlow, the hero of his play, behaves but in the morning when he called for his bill, discovered that the man he had assumed to be an innkeeper was in fact an old college friend of his father. His use of the incident is farcical; but his hero Marlow and his friend Hastings are possible young men; his host innkeeper, Mr. Hardcastle and his wife are another convincing pair of characters. The play is a blend of broad and light comedy. Hardcastle has a fine sense of humour and a lively wit. It is his sense of humour which enables him to bear so much with a smile on his face. When his wife speaks of Tony’s reaching the age of discretion, he retorts that he will never do that. When she says that she is afraid of his lungs, Hardcastle wittily observes that he also is afraid of Tony’s Lungs that is of his loud shouting. His sense of humour enables him to see the ludicrous aspect of things and keeps him always in a genial and cheerful frame of mind. When his daughter tells him that Marlow is a shy and

modest youth, he laughs in his sleeve, for he knows why she has suddenly formed this good opinion of Marlow. He is shrewd enough to understand the situation at once and forgives Marlow for all his previous insolence and is well pleased that both he and his daughter like each other so well. The humour view of life separates the play from the two opposing schools of its day. It is certainly unsentimental without any parade or refined sensibilities even in its heroines. It is pure comedy throughout eschewing tears and reforms. It is also free from the sarcastic or satirical attitudes of Congreve. It offers no view of high society or stylish wit. It can be called high comedy either in the sense that it is concerned with the refinement of humour and manners as opposed to low and obvious excitement of laughter or in the sense that its plot is determined by its characters.

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Empowering Women Through Self Help Groups: A Case Study in Assam

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Abstract

Self-Help Groups (SHGs) play a pivotal role in India's rural poverty eradication efforts. Emphasizing independence, human agency, and action, the self-help paradigm aims to empower women, enhance rural areas, and alleviate poverty. Through community-building, equitable connections, and group formation, self-help endeavors to surmount obstacles to participation and empowerment. SHGs act as conduits for microcredit distribution, reducing reliance on informal credit systems. Women, empowered and aware of their potential, experience increased independence, confidence, and a stronger understanding of their rights. Liberation from outdated traditions allows women to express themselves freely, fostering personal growth and development. SHGs thus become catalysts for transformative change, amplifying women's voices and fostering economic independence in rural India..

Keywords: *Self-Help Groups, poverty, women, independence, empowerment*

Introduction

When it comes to acute poverty and its effects, women are more sensitive than males. The ability to labour, health, knowledge, and skill endowments of women are sometimes the only sources of safety for disadvantaged homes. The encouragement of female entrepreneurs requires a supportive environment, which includes the easing of institutional restraints. Improving communication channels, granting credit access, offering skill-development programs, offering trade support services, offering technical and business support services, and marketing. The development of entrepreneurship is urgently needed since it is the most practical answer to many issues, including unemployment, the concentration of industry in cities, and rural people's lack of knowledge. Rural industries are still trailing behind, and some businesses are in danger of going extinct as a result of several issues, including infrastructure issues, a lack of supporting financial institutions, bad quality goods, the use of antiquated technology, etc. Rural industry would eventually disappear if no steps are done to upgrade them owing to rising competition from urban businesses. SHGs play a significant role in fostering rural entrepreneurship as a result. Various researches have indicated that SHGs have a mixed effect on the development of rural businesses. The districts and blocks are the significant area with a variety of castes and communities. Economically, the

various communities in the study blocks are highly underdeveloped and impoverished. The effectiveness of SHGs in relation to the development of rural entrepreneurs has not yet been the subject of any studies. The current study is the first attempt to determine if SHGs have been successful in reducing rural poverty. The study has concentrated on the degree of employment, income production, and asset building by the village's rural residents. Further, it is anticipated that the study would assist the government, NGOs, and other financial and non-financial institutions in developing strategic plans to elevate rural residents out of poverty and unemployment. For the benefit of the villagers who are affected by this issue, we may learn about the best solution for handling these kinds of socio-economic issues. Additionally, it will be beneficial for other academics who are interested in conducting further study on the same issue. The study's focus is strictly limited to the ways in which SHGs can enhance human welfare. The growth of SHGs and certain soft infrastructure, such as education, employment levels, and living standards, are the key areas of attention in the research. Three districts from the northern Region were selected for the current study in order to better understand the issues affecting their socio-economic growth.

“SHG is a trust, confidence, and conviction that the community, no matter how backward, has resources that can be mobilized for addressing individual local needs and that of the community for creating local changes bringing about social transformation,” says Oscar Pereira. According to the Indian Planning Commission, a self-help group is a small, informal, self-managed

association of the poor with an average membership size of 15 persons, mostly from socio-economically homogenous families, and is structured around savings and credit operations. The SHGs were established with the intention of resolving their mutual issues without the assistance of traditional financial institutions. The prior experiences have demonstrated that women's groups outperform SHGs in all key SHG activities. SHGs are increasingly being used to supply tiny amounts of credit to its members at little cost. It functions as a forum for all participants to gather together in times of need, during natural disasters, for social purposes, and to help one another economically. The main goals of SHGs are to help members save their money, take out loans from the group's common fund, build members' confidence and talents, assist members in making decisions collectively, and inspire members to take on social obligations. SHGs have a significant impact on the reduction of poverty in rural India today. The SHG group-based strategy is frequently used to enhance rural areas, reduce poverty, and empower women. SHG groups emphasize independence, human agency, and action as a method for social development. Both the official and informal sectors contain a relatively high number of institutions. They use several delivery mechanisms to offer a range of financial services. However, SHG is one of the organizations that provide microcredit to the rural poor, whose empowerment has emerged as a crucial component in the growth of any economy. The purpose of microcredit is to advance rural people's socioeconomic development and the position of women in families and communities. Micro entrepreneurship improves economic standing and eliminates gender disparities. The SHG's

microcredit system encourages participation in additional community development initiatives among its members. Microcredit is encouraging small-scale businesses, and one of its main goals is to reduce poverty by encouraging rural poor people to engage in income-generating activities. With the aid of SHGs, the rural poor are participating in small-scale business programs. Through it, they gained prestige in the family and community and gained economic independence. SHGs are a crucial instrument for the empowerment of rural poor people today. SHG was able to create a system of revolving credit that allowed group members to draw on their own funds. The availability of microcredit finance to the group has been further improved by the linkage of these SHGs with official banking institutions. Poor families living below the poverty line were then organized into SHGs established with a mixture of government subsidy and credit from investment banks (Saha *et al.*, 2013).

In Assam, Self Help Groups (SHGs) have played a crucial role in empowering women and promoting their socio-economic development. These groups are typically comprised of 10-20 women, who come together to address common issues and improve their livelihoods through collective efforts. Here are some key ways in which SHGs have benefited women in different districts:

Economic Empowerment

SHGs provide a platform for women to save money and pool their resources. They also facilitate access to credit through

microfinance, enabling women to start or expand their own businesses, thereby promoting self-reliance and financial independence.

Skill Development

SHGs organize regular training sessions and workshops, where women learn new skills and gain access to information related to income-generating activities, agriculture, and handicrafts. This helps them diversify their sources of income and improve their overall standard of living.

Social Empowerment

By participating in SHGs, women gain a sense of identity and self-worth. These groups also serve as a platform for women to discuss and address various social issues, such as domestic violence, health, and education, ultimately promoting gender equality and social justice.

Networking and Collective Bargaining

SHGs help women establish connections with local government bodies, non-governmental organizations (NGOs), and other stakeholders. This enables them to voice their concerns, demand their rights, and negotiate for better services and opportunities.

Improved Access to Government Schemes

SHGs act as a bridge between women and government agencies, ensuring they are aware of and can access various welfare schemes and development programs. These groups also help in monitoring the implementation of such schemes, ensuring

transparency and accountability.

Health and Nutrition

SHGs often focus on creating awareness about health, hygiene, and nutrition among their members. This includes information on family planning, immunization, and maternal and child health, ultimately improving the overall health and well-being of the community.

The socioeconomic situation in the villages as a whole is extremely bad; to be more exact, the situation was severe. There are no medical facilities in the communities. The road's connection is quite poor in the most of regions. However, kaccha in nature of mud is under village road connectivity. The village roadways are harmed by heavy water logging and semi-liquid dirt on wet days. The villagers do not have access to any drainage facilities. The majority of villagers do not have formal electrical connections. The vast majority of persons and families utilize mobile phone services for communication. The communities are behind in terms of transportation infrastructure. Although experts largely concur that microfinance has benefited the lives of the poor, critics claim that sometimes it encourages borrowers to take on excessive debt, to the point where, in extreme situations, it can result in suicide. The evaluation of microfinance programs costs money. However, a lot of these analyses focus more on organizational, financial, and governmental factors than on the effects on development. While each factor is significant, careful research into how microfinance affects communities is essential to demonstrate if giving the poor access to financial

services encourages people to invest in their livelihood. The role of NGOs in the research region is highly subpar or careless. The SHG members are not given access to any training facilities. Due to the fact that the majority of respondents are unskilled, the SHG members are suffering from a lack of training, which means that frequent training is the only thing that can help them do their economic tasks efficiently. The SHG members struggle to keep their books up to date since they lack the necessary knowledge. The DRDA Development Block does not give SHGs any information on loans, subsidies, or trainings. The majority of the SHG's members have a tendency to miss its weekly or monthly meetings. As a result, they have a lot of issues. The SHG are having issues with transportation, marketing, and some SHGs are having issues with inadequate raw materials. The majority of SHGs sell their goods in the neighbourhood, although occasionally they struggle to command a fair price. Most SHGs were found to be lacking in the component of future planning. Important details like how much they will create and where they will sell lack clarity among the members. Without giving them a second consideration, all of these judgments are made right away. Without careful consideration and analysis, actions will not provide lasting results. SHGs would be able to evaluate their own performance and growth through weekly, monthly, quarterly, biannual, annual, and other review sessions, which would eventually lead to systemic changes across the business. SHGs need to get a great deal of knowledge in the field of "Management" in a variety of areas, including time management, keeping accurate records, timeliness, documentation, scientific planning, progress monitoring, and public relations. They

actually need to unlearn a lot of things in order to develop management abilities. It is crucial that the SHGs understand their goals clearly. Too many goals are unattainable and seldom fulfilled in practice. Since SHG members typically aren't given a voice in the community due to low levels of social involvement, this component needs to be reinforced.

Self Help Groups (SHGs) have contributed to economic empowerment for women in various regions in Assam. Increase in savings: Participation in SHGs encourages women to save money regularly. This pooled savings can be used as a resource for providing small loans to members, which they can invest in their businesses or for other personal needs.

Access to credit

SHGs facilitate access to credit through microfinance institutions and banks, providing low-interest loans to members. This increased access to credit has enabled women to start or expand small-scale businesses, contributing to their economic self-sufficiency.

Diversification of income sources

SHGs promote skill development and training programs, allowing women to learn new skills and gain access to information related to various income-generating activities. This helps women diversify their sources of income, reducing their vulnerability to economic shocks.

Increased household income

As a result of their involvement in SHGs, many women have

been able to contribute significantly to their household income. This has a direct impact on the living standards of their families, with improvements in housing, nutrition, and access to education and healthcare.

Employment generation

SHGs have played a role in creating employment opportunities, both for their members and other women in the community. By starting small businesses or participating in income-generating activities, these groups have helped boost local economies and created job opportunities.

Asset creation and ownership

With increased financial independence, women in SHGs are more likely to invest in assets, such as land, livestock, or housing. This not only improves their economic stability but also strengthens their bargaining power within the household and community.

Further, for an effective functioning of this system a number of criteria need to be paid attentions which are as follows:

- ▲ Records must be in local language
- ▲ A functioning and authentic collection/ distribution system for records
- ▲ Supportive role by the promoting agency
- ▲ Understanding and awareness of the SHG members about the necessity of accounting and payment to the service providers.

Self-help organizations are very important to the rural residents of Blocks. The development blocks in all the districts, is significant because it is home to several SHGs that are active in the economy. In the research region, female SHGs predominate; there are a small number of male SHGs. Following the investigation, it was discovered that the SHGs' economic situation in the area was improving compared to past periods, which was due to their endeavours to engage in economic activities. By participating in activities like duckery, poultry, piggery, handloom, etc. in the study area, SHGs have now become economically stronger than they were previously. However, the SHGs are still having issues with marketing, transportation, credit, training facilities, the lack of government agents, and other issues. Therefore, the research region needs to improve the function of DRDA, BLOCK, and NGOs towards the elimination of poverty and rural development.

General information on the impact of Self-Help Groups (SHGs) on women's empowerment and socio-economic development, based on available data up to July,2023.

National Rural Livelihoods Mission (NRLM)

In India, the NRLM was launched in 2011, aiming to reduce poverty by mobilizing SHGs across the country. According to the Ministry of Rural Development's data, as of March 2021, over 74 million households were engaged in SHGs under NRLM, with the majority being women.

Impact of SHGs on Poverty Alleviation

According to a 2018 study by the World Bank, titled "Women's

Empowerment in Rural Community-Driven Development Projects,” SHGs were instrumental in reducing poverty in rural areas. The study found that households participating in SHGs experienced a 25% reduction in poverty compared to non-participating households.

Increase in Savings and Credit

Several studies have found that women’s participation in SHGs significantly increases savings and access to credit. For example, a 2016 study in Andhra Pradesh, India, reported that 95% of women in SHGs saved money regularly, and 87% of them had availed credit from their groups.

Impact on Women’s Empowerment

A study conducted by the International Centre for Research on Women (ICRW) in 2012 revealed that 75% of women participating in SHGs across five Indian states reported increased decision-making power within their households.

Income Generation and Livelihood Diversification: SHGs have been found to enhance income-generating opportunities and diversify livelihoods for women. A study in West Bengal, India, in 2017 found that the average monthly income of women in SHGs increased by 64% due to participation in various income-generating activities (Rajesh Timine, 2011).

The information on the impact of Self-Help Groups (SHGs) on women’s education and empowerment in Assam, based on available data up to July, 2023. It’s important to note that these findings may not be specific to these three districts but can still

offer valuable insights into the potential benefits of SHGs for women in the region.

Increased Literacy Rates

SHGs have played a role in promoting literacy among women in Assam. For instance, a study conducted by the National Bank for Agriculture and Rural Development (NABARD) in 2015 found that 71% of women who were illiterate before joining SHGs could read and write after joining these groups.

Improved School Enrolment Rates: In regions where SHGs are active, there is often an increase in school enrolment rates for girls. The financial stability and awareness generated through these groups encourage parents to send their daughters to school. This is particularly relevant in Assam, where the female literacy rate has historically lagged behind the national average.

Skill Development and Vocational Training

SHGs often organize skill development and vocational training programs for their members. These initiatives aim to equip women with relevant skills, helping them secure better employment opportunities and contribute to their family's income. In turn, this can lead to increased investment in children's education within the household.

Enhanced Awareness on Education and Health

SHGs serve as a platform for women to discuss and address various social issues, including education and health. These discussions help raise awareness about the importance of education, particularly for girls, and can lead to increased demand

for quality education within the community.

However, the researcher discusses the general scenario of women's participation in the financial sector and related areas in Assam based on available data up to July, 2023.

Financial Inclusion

According to the National Strategy for Financial Inclusion (NSFI) report released by the Reserve Bank of India (RBI) in 2019, India has made significant strides in financial inclusion. The Pradhan Mantri Jan-Dhan Yojana (PMJDY), launched in 2014, aimed to provide universal access to banking services, including in rural areas. This has led to an increase in the number of women with bank accounts in states like Assam.

Self Help Groups (SHGs)

As mentioned earlier, SHGs play a crucial role in empowering women and promoting financial literacy and inclusion in Assam. These groups have facilitated access to credit and savings opportunities for women, enabling them to participate more actively in the economy.

Microfinance Institutions (MFIs)

Microfinance Institutions in Assam have been instrumental in providing financial services to women, particularly those from low-income backgrounds. These institutions offer small loans, savings products, and financial education, promoting women's financial inclusion and empowerment.

Women Entrepreneurs

Assam has seen a growing number of women entrepreneurs,

particularly in sectors like handicrafts, textiles, and agriculture. The state government has launched various schemes and initiatives to support women entrepreneurs, such as the Assam Women Entrepreneurs' Association and the Swabalamban scheme, aimed at promoting self-employment and skill development among women.

Skill Development and Training

The Assam Skill Development Mission (ASDM) and other similar initiatives provide skill development and vocational training opportunities to women in various sectors, including finance. These programs aim to enhance women's employability and encourage their participation in the formal economy.

Conclusion

However, insofar as the exploitation of women is practiced in India, a male-dominated country where they constitute a significant hindrance to the advancement of society, it does not become a chance for personal development. In today's world, women are employed in small businesses, banks, agencies, places, medical science, engineering, and internal affairs. Earnings for women are equal to those of males. Women are no longer homeless thanks to their independence, family choices, social activity participation, and help from social groups. They thereby granted themselves power.

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Edible Packaging: Opportunities and Challenges

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Abstract

Edible packaging represents a paradigm shift in sustainable packaging. This concise abstract explores the dual facets of opportunities and challenges within this innovative domain. Edible packaging offers eco-friendly alternatives, reducing plastic usage and enhancing food preservation. Innovations in design and fortification with functional ingredients add consumer appeal. Yet, challenges encompass maintaining structural integrity, taste considerations, regulatory compliance, scalability, and consumer perceptions. Successfully navigating these challenges is critical for the widespread adoption of edible packaging, revolutionizing the environmental impact of packaging materials in the global context.

Keywords: *Edible packaging, functional ingredients, environmental impact*

Introduction

In an era marked by heightened environmental consciousness and a growing concern for sustainable practices, innovative solutions are emerging to address the environmental impact of conventional packaging materials. One such groundbreaking concept is edible food packaging, a revolutionary approach that not only aims to preserve and protect our food but also strives to minimize the ecological footprint associated with traditional packaging (Guillard *et al.*, 2018). Edible food packaging introduces a novel and sustainable alternative that holds the potential to transform the way we think about packaging materials. This innovative concept not only aligns with the principles of circular economy and waste reduction, but also presents an exciting opportunity to enhance the overall sustainability of our food supply chain. In this exploration of edible food packaging, we delve into its origins, advantages, challenges, and the promising future it holds in the quest for a more environmental-friendly and resource-efficient packaging solution (Trajkovska Petkoska *et al.*, 2021).

Concept of Edible Packaging

The concept of edible packaging involves creating packaging materials that are safe to consume along with the food or beverage they contain. The idea is to reduce waste and environmental impact associated with traditional packaging materials, such as

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plastic, by making the packaging itself edible (Chhikara & Kumar, 2022). Edible packaging can take various forms and be made from a range of edible materials. Here are some key aspects of the concept:

- ▲ **Biodegradability:** A lot of edible packaging is biodegradable, which means that it will naturally disintegrate over time without leaving any toxic residues behind. This is in contrast to conventional packaging materials, such as plastic, which can contaminate the environment and damage ecosystems over an extended period of time (Tulamandi *et al.*, 2016).
- ▲ **Reduction in single-use plastic:** Single-use plastics could be replaced by edible packaging in a number of situations, including the packaging of sauces, snacks, and other food products. Edible packaging materials can lessen the environmental effect of single-use item disposal since they can be made to decompose faster than conventional plastics (Dey *et al.*, 2021).
- ▲ **Lower Carbon footprint:** Traditional packaging materials, particularly plastics, are produced using a lot of energy and emitting a lot of greenhouse gases. Because edible packaging is constructed of renewable and biodegradable materials, it can have a smaller carbon footprint and be a more environmentally friendly and sustainable packaging option (Zheng *et al.*, 2019).
- ▲ **Reduced Landfill waste:** One of the main causes of the expanding problem of landfill trash is the disposal of

non-biodegradable packaging materials. Due to its biodegradability, edible packaging might contribute to a decrease in the amount of waste dumped in landfills, hence lessening the environmental damage caused by overflowing landfills (Dilkes-Hoffman *et al.*, 2018).

- ▲ **Encouraging sustainable practices:** A change toward more environmentally friendly packaging techniques is facilitated by the creation and use of edible packaging. Businesses who include edible packaging in their products show that they care about the environment, which may have an impact on customer behavior and inspire other companies to use eco-friendly packaging.
- ▲ **Innovation in material science:** The quest for edible packaging has encouraged material science innovation and resulted in the creation of novel, environmentally friendly materials. In an effort to replace conventional plastics derived from petroleum, researchers are looking into a variety of palatable substances, such as proteins, starches, and seaweed.
- ▲ **Consumer Preference:** Demand for sustainable goods and packaging is rising as people become more aware of environmental issues. Edible packaging satisfies this customer preference, offering businesses a competitive advantage and possibly encouraging a wider adoption of environmentally friendly procedures (Aldred Cheek & Wansink, 2017).

Significance of edible packaging in the context of reducing environmental impact and addressing packaging waste concern

In the food sector, packaging waste is a major concern because the need for attractive and accessible packaging frequently has an adverse effect on the environment. Waste management systems face difficulties as a result of the increasing usage of single-use plastics and non-recyclable materials, which add to the accumulation of packaging waste. The food sector can consume excessive amounts of resources and energy-intensive production processes as a result of its reliance on complex packaging designs and materials that prioritize product preservation. Furthermore, the situation is made worse by problems like incorrect disposal and insufficient infrastructure for recycling, which pollute the environment and keep non-biodegradable packaging in landfills (Pauer *et al.*, 2018).

As consumer awareness about sustainability grows, there is increasing pressure on the food industry to adopt eco-friendly packaging solutions. Striking a balance between preserving food quality and minimizing packaging waste requires innovation in materials, streamlined recycling processes, and a shift towards more sustainable practices throughout the food supply chain. Addressing packaging waste in the food industry is essential for reducing its environmental footprint and fostering a more sustainable and responsible approach to packaging practices (Lindh & Williams, 2015).

Evolution of Edible packaging

Technological developments, continuous research, and a growing consciousness of environmental sustainability have all contributed to the growth of edible packaging. Although the idea of edible packaging is not new, there has been a surge in interest and advancement in this area in recent years. The development of edible packaging is indicative of a larger movement in business and consumer consciousness toward ecologically friendly and sustainable solutions. Realizing the full potential of edible packaging in lowering environmental impact and addressing package waste concerns requires ongoing research and cooperation between academia, business, and policymakers. (Kaur *et al.*, 2022)

In recent times, the evolution of edible food packaging represents a noteworthy response to the escalating environmental concerns associated with traditional packaging materials. Over the past decade, there has been a remarkable transformation in the conceptualization, development, and application of edible packaging solutions. Early on, the focus was primarily on creating thin edible films using materials such as starches and proteins to extend the shelf life of certain foods. However, the field has rapidly progressed with the emergence of innovative materials, including seaweed, fruit peels, and agricultural waste, demonstrating a commitment to sustainable sources (Bizymis & Tzia, 2022).

Recent developments point to a bright future for edible food packaging, which is expected to be essential in encouraging the

food industry to adopt more ethical and sustainable packaging methods.

Types of edible packaging materials

▲ Edible Films

Edible films and coatings are materials that can be directly consumed. They provide barrier and protection, while enhancing quality and safety of food products. One of the main advantages of using edible packaging systems, as compared to synthetic packaging systems, is that they are integral part of the food product; they can be eaten, without the need to unpack and throw the package. Moreover, these films are usually derived from renewable and edible components, offering the important advantage of being biodegradable and environmentally friendly. They are not yet meant to replace conventional packaging, in fact, they are currently used with no-edible materials to protect and improve food shelf life (Nair & Kolanowski, 2022). There are important factors that need to be considered when selecting edible materials for food packaging applications: their ability to function as barriers to the environment; their capability to improve food preservation and processing techniques and as effective carriers for bioactive compounds.

Edible films are, in general, a good moisture barrier, able to inhibit moisture exchange between food products and the atmosphere, preventing therefore microbial growth, texture changes, and undesirable chemicals and enzymatic reactions. Edible materials are also good oxygen barriers, able to preserve quality and extend the shelf life of oxygen-sensitive products.

Materials such as chitosan and carrageenan, polysaccharide-based edible film, has the advantage of being an effective barrier to non-polar aroma compounds, preventing aroma loss and oxidation. Hydrocolloid-based edible coatings, such as alginate and carboxymethyl cellulose, can be used to retain moisture and reduce fat uptake in deep-fat fried food. Edible materials with high water vapor permeability can be used to minimize salt migration into food during brine-freezing processes, while materials with selective permeability can help limit flavor and aroma loss during freeze-drying operations . Another important factor to be considered, when selecting edible packaging material for food applications, is the ability to be an effective carrier for antimicrobial and/or antioxidant compounds and to be able to control the migration of molecules from the package to the product. Edible materials have shown good delivery properties; therefore, several researchers have explored this promising area for food preservation (Mohamed *et al.*, 2020).

▲ **Edible coatings**

Edible coatings have emerged as a innovative and sustainable solution in the realm of food packaging, offering a promising alternative to traditional packaging materials. Composed of natural substances such as proteins, lipids, and carbohydrates, these coatings create a protective barrier around perishable food items, extending their shelf life and preserving their quality. The importance of edible coatings in food packaging lies in their ability to reduce environmental impact by minimizing the use of non-biodegradable materials. Furthermore, these coatings can enhance the safety of food products by acting as a shield against

contaminants and pathogens. The application of edible coatings not only slows down the deterioration of fruits, vegetables, and other perishables, but also serves as an effective method to reduce food waste. Additionally, edible coatings can contribute to the overall sensory appeal of food items, providing an attractive gloss or matte finish. As consumer preferences shift towards sustainable and eco-friendly options, the adoption of edible coatings in food packaging represents a significant stride in the quest for environmentally conscious practices within the food industry (Vukić & Odzaković, 2017).

▲ **Bio-Based Polymers**

Bio-based polymers have another advantage that will be helpful to the Earth and to living organisms: that of reduce carbon footprint, because they are degraded into their constituent monomers when treated with fungi and bacteria (microorganisms) with the production of CO₂, CH₄, and water without generating any type of toxic material. As the world's population and use of technology increases, bio-based plastics are widely used in industries and daily-life. In contrast, petroleum-based plastics/materials (such as polyethylene, polystyrene, poly-butylene, poly-vinyl chloride, etc.) have very harmful effects on the environment because they are non-biodegradable. To solve this issue, bio-based polymers have emerged as a substitute to traditional (petroleum) plastics. Bio-based polymers will decompose naturally (when environmental microorganisms breakdown and metabolize the chemical bonds present in the structure of bio-based polymers). No doubt, bio-based plastic materials are very important for

modern society and life due to their applications in multiple fields. Bio-based plastics are generally degraded under anaerobic or aerobic conditions, and the end-product (residue) may be used for supporting plant growth. Chemical recycling techniques may also be used to reclaim the original material, which might be used for rebuilding the polymer or converted into another polymer product (Tang *et al.*, 2012).

Manufacturing Processes of Edible packaging

▲ *Solvent Casting / Wet Formation*

The basic idea behind this technique is to evaporate water-containing biopolymers to dry the solution. The technique in question is the most widely used method for creating edible films (**Figure 1**). Four key phases are commonly included in the process for creating edible films: dissolving biopolymers in solvents, applying heat treatment, casting, and drying. The biopolymer and solvent are combined in the first step, and then, the chemical links between them are broken through heat treatment to help the biopolymer dissolve in the solvent. The amalgam is then homogenized and cast in an appropriate matrix that can produce an edible film with the desired shape. It is common practice to measure the volume of the solution to determine the final edible film's thickness. The solvent must then be allowed to evaporate in order to desiccate the film. In order to avoid excessive desiccation and structural damage to the edible layer, the process of evaporation often takes place inside the confines of the oven, where temperatures are carefully controlled to keep them below 60 °C. The film can be delaminated and used for its intended purpose when the solution

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has evaporated and dried.



Figure 1. Wet casting techniques for edible film formation (Kumar *et al.*, 2022)

▲ *Dry Formation Casting Techniques*

The dry formation method requires the presence of minute quantities, if any, of substances other than the primary constituent because there is no liquid component. The basic idea behind this process is illustrated in [Figure 2](#), where heat energy is applied to the powdered substrate to create a polymeric film. The powder is first added to the feed hopper to begin the dry forming process. The biopolymer powder is then compressed using a revolving screw, which aids in the creation of a homogeneous solid material unit and functions similarly to stirring. Incorporating a plasticizer during this step is typical to speed up the compaction process. The heat treatment begins and lasts for the specified amount of time at temperatures between 75 and 100 °C.

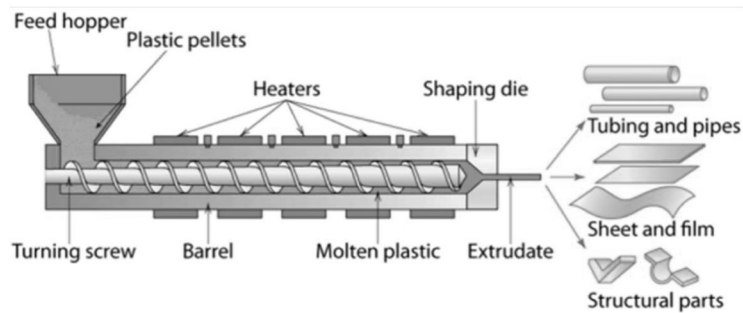


Figure 2. The mechanism of dry casting techniques for edible film formation (Irais *et al.*, 2014)

▲ *Extrusion*

An alternate method for creating polymeric films is extrusion; **Figure 3** provides a picture of the process. Because it uses less energy and takes less time to remove water for film-making, this method is chosen over casting. It is among the most advanced polymer processing methods now in use in the business world. Three zones are typically identified in the extrusion process: the feeding zone, the kneading zone, and the heating zone at the end part/machine output.

A short processing time with low energy consumption, better mechanical and optical qualities, such as elongation and transparency of edible film, are the key benefits of extrusion film formation over casting technique. It is a high-performance, inexpensive and efficient method utilised in the commercial food manufacturing industry

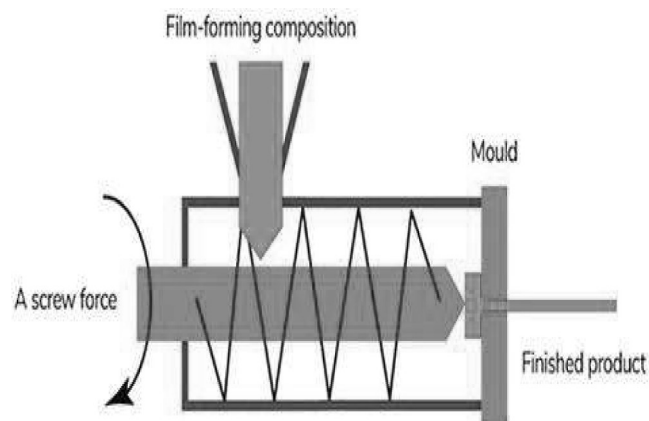


Figure 3. Extrusion machine for polymeric films. (Suhag *et al.*, 2020)

Opportunities for Edible Packaging

a. Reduced environmental impact: A potential remedy for the environmental catastrophe caused by single-use plastic trash is edible packaging. Edible packaging reduces landfill waste because it decomposes organically, in contrast to standard packaging methods. This packaging approach minimizes the environmental impact across the entire life cycle, from production to disposal. It reduces the carbon footprint caused by transportation and manufacturing in addition to being made of renewable resources. It is important to remember, though, that the methods used in edible packaging manufacture and where raw materials are sourced have an impact on the environment. Sustainable production methods are therefore essential.

b. Biodegradability and composability: Making or calling a product biodegradable has no inherent value if the product, after use by the customer, does not end up in a waste management system that uses the biodegradability features

c. Enhanced consumer experience: Meeting consumer expectations around sustainability is the primary corporate concern and the first advantage. Customers are examining brands more and more to make sure sustainability a core practice, as we've seen a global shift towards eco-friendliness. One of the finest ways to do this is using edible packaging. This kind of packaging is naturally zero-waste and biodegradable, so it may be a terrific method to demonstrate a company's commitment to the environment over the long term and help develop a devoted clientele that will support any brand.

d. Preservation of food freshness: The creation of edible packaging (coating/film) that contains natural antimicrobial and antioxidant agents has a lot of potential these days because it promotes food safety and increases the shelf life of food products by reducing oxidation while maintaining the higher-quality characteristics of the food products, such as fresh fruits and vegetables (Shit & Shah, 2014).

Challenges in Edible Packaging

Because of a number of limitations, including inadequate elongation, safety and health concerns, high cost, processing challenges, etc., edible films are still made on a laboratory scale

even with their many benefits. Enabling the production to reach industrial size and achieving commercial success for the edible films requires overcoming these challenges. (Jeya Jeevahan *et al.*, 2020)

The challenges associated with edible packaging, include:

Barrier properties and shelf-life limitations: The most important barrier properties are permeability to gases, water vapor, light, oil and aroma. The migration of oil, flavor or smell, the permeability of oxygen, carbon dioxide and other gases as well as the release of constituent materials of the packaging to the food could affect their quality. The effectiveness of the barrier properties of the packaging materials is achieved by permeability measurements. Permeability describes the rate at which gases (or vapours) are transferred through the packaging material. This process is influenced by the pressure variation between the two surfaces of the material at humidity and temperature stability conditions. The barrier properties depend on the chemical composition of the film, the process of obtaining the film and the method of applying the film to the product's surface (Wu, F., Misra, & Mohanty, 2021)

Sensory and taste considerations: Sensory and nutritional qualities of food products can be modified by exposure to light. The UV and visible barrier properties can be assessed using a spectrophotometer (exposure of films to wavelengths between 200 and 800 nm). Packaging materials must have low transmission for UV radiation (which increases the shelf life of packaged food) and high transparency in the visible region (to

give consumers visual control) (Puscaselu, Petraru & Ursachi, 2021)

Regulatory hurdles and safety concerns: There are laws that regulate the quality control of packaging in terms of the interaction with food products (packaging–product relationship). These regulations are complex due to the diversity of materials used (paper, glass and plastic), their presentation (boxes or bags) and the characteristics of the food products (moisture, fat or alcohol content, pH and freshness). Packaging must meet five basic requirements to be commercially available (Prajapati, 2022):

- a. It should not present any risk to human health,
- b. It should not change the physico-chemical composition of the food,
- c. It should not change the organoleptic characteristics of the food,
- d. It should be manufactured and treated in accordance with good manufacturing practices and
- e. It must not present misleading information about the product contained

Scalability and cost implications: The scalability and cost implications of edible food packaging present both challenges and opportunities in the pursuit of sustainable packaging solutions. Scalability, in this context, refers to the ability of edible packaging to meet the demands of a large-scale food industry while maintaining efficiency. The production of edible coatings

on a mass scale requires optimized processes and reliable sourcing of raw materials, ensuring consistent quality and performance. Challenges may arise in scaling up production without compromising the ecological benefits of edible packaging, making it crucial to strike a balance between sustainability and scalability.

Cost implications play a pivotal role in determining the feasibility and adoption of edible food packaging. Initially, the production costs of edible coatings may be higher than traditional packaging materials, primarily due to the use of natural and often specialty ingredients. However, as the technology advances and demand increases, economies of scale could lead to reduced production costs. It's essential to consider the entire life cycle of the packaging, including production, transportation, and end-of-life disposal, to assess the true cost-effectiveness of edible packaging (Werner, Koontz & Goddard, 2017).

In conclusion, while scalability and cost remain challenges for edible food packaging, ongoing research and technological advancements are likely to address these concerns, making edible packaging a viable and sustainable option for the future of food packaging.

Consumer acceptance and perceptions: Consumer acceptance and perceptions play a pivotal role in the successful adoption of edible food packaging. The idea of consuming the packaging itself is a novel concept that may elicit varied responses from consumers. One key factor influencing acceptance is the perception of safety. Consumers need reassurance that edible

packaging materials are not only safe but also meet rigorous health standards. Clear communication about the composition and processing methods of these coatings is crucial to building trust (Kaur & Sharma, 2022).

The environmental impact of edible packaging is another significant aspect. Consumers increasingly value eco-friendly options, and edible packaging aligns with sustainability goals. However, effective communication is vital to convey the positive environmental impact and dispel any misconceptions about the practicality and safety of these materials (Almenar *et al.*, 2010).

Taste, texture, and overall sensory experience also influence consumer acceptance. The edible coatings should enhance, or at the very least, not compromise the taste and quality of the packaged food. Innovations that make the edible packaging adaptable to various culinary preferences and dietary restrictions may positively influence consumer perceptions.

Education and marketing campaigns play a critical role in shaping consumer attitudes. Brands need to invest in transparent communication, highlighting the benefits of edible packaging in reducing waste and environmental impact. As consumers become more conscious of their ecological footprint, a well-informed and positive narrative can significantly contribute to the successful acceptance of edible food packaging in the market (Horská *et al.*, 2021).

Conclusion

The demand to use sustainable packaging solutions has forced all manufacturing industries to amend their ways and, thus, has

significantly changed the packaging industry as well. On the other hand of packaging sectors, edible packaging is recognized as healthy, biodegradable, low-cost and sustainable as compared to plastic packaging materials. The edible packaging (coatings, sheets, pouches and films) provides a good oxygen barrier, moisture barrier and aroma barrier properties. Different types of compounds are used to make edible packaging materials including antimicrobial, antioxidants, additives, nutraceuticals and flavouring compounds, which helps to upgrade the quality of packaging materials and handling. The edible packaging is used for different foods like fruits and vegetables, dairy products, meat, poultry, seafood, nuts, cereals and confectionery products. The advantages of edible packaging material are unique and versatile, such as providing product stability, variety, better quality, more safety along with convenience to consumers. The future research is required on reducing the cost of packaging materials, how to implement it on an industrial scale, improve its functional properties and to evaluate the compatibility between packaging, final products along with human consumption.

Waste-free food production is becoming more and more in demand due to factors including the expanding global population, shifting dietary habits and climate, and the growing need to safeguard the environment. The requirement for sustainable and long-lasting packaging materials has grown important in preventing food waste and damage of the environment. A viable way to increase food product shelf life while lowering reliance on petroleum-based resources is edible packaging. The

significance, makeup, uses, and manufacturing processes of edible packaging materials have all been covered in this review. It is crucial to take into account elements like appearance, organoleptic characteristics, and labelling information in order to guarantee the acceptability of these goods (Mkandawire & Aryee, 2018).

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**Effect of Chlorpyrifos and Cypermethrin on
Periplaneta americana (Linnaeus)**

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Pritimoni Das
Bikash Rabha
Krishna Das**

Abstract

Cockroaches due to their unappealing damages to domestic goods and for its medical significance are considered as one of the major pests amongst all urban pests. This laboratory study compared the efficacy of two commonly used insecticide formulation **Chlorpyrifos** and **Chlorpyrifos (50%) + Cypermethrin (50%)** against *Periplaneta americana* on various concentrations. The two different insecticides studied showed significant level of toxicity, where combination of **Chlorpyrifos** and **Cypermethrin** showed highest toxicity. The result found can be served as a baseline for the targeted use of insecticides in management programs for *P. americana* control. Chemical control methods are a commonly used method for controlling *P. americana* around the world but it has been limited by several factors like development of natural resistance and its toxic effect to humans and other living organisms including the surrounding environment.

Keywords: *Chlorpyrifos, Cypermethrin, Periplaneta americana, Toxicity, Pest Management*

Introduction

Pests are commonly defined as animals that harm or destroy crops, cattle, clothes, storage, buildings, etc. or cause annoyance to humans. When an insect poses a threat to people, it is typically regarded as a pest. Certain insects are helpful in certain situations and considered pests in others. Over the years, humans have tried a wide range of strategies to reduce insect pest issues. In the recent past, integrated pest control, sometimes known as pest management, has been the most common strategy. A general strategy for handling various pests, including insects, mites, and other arthropods; plants, parasitic nematodes; microbial and viral plant diseases; and vertebrates, is called pest management. For a long time, pesticides were the sole option for pest management. The formulations were developed to enhance pest control. Chemicals or biological products are used to create insecticides, which are compounds used to manage insect infestations. Typically, insecticides work by obstructing the biochemical and physiological processes that cause the insect to die. Insecticides often work by acting on the nerve system, which gives them excellent efficacy and quick action in pest management schemes. Among the most often used pesticides are those classified as organophosphate (OP), such as malathion, diazinon, and chlorpyrifos. They function by impairing an enzyme inside the acetylcholinesterase-producing body. This enzyme is essential for regulating the body's nerve signals. Other insecticides such as Pyrethroids that resemble synthetic pyrethrins and carbamate

are also being used to eradicate or manage insects mainly bugs, cockroaches, ants, fleas, and lace bugs from crops as well as within homes. There are several varieties of carbamates, and each has a unique mechanism of action and toxic impact. Carbamates are used as baits or sprays to kill insects by disrupting their nervous system and brain.

Cockroaches are among the most prevalent insect pests in homes. Cockroaches have been around for approximately 360 million years, according to a World Health Organization study (Cochran 1982). The biggest of the common peri-domestic cockroaches found in India is the American cockroach, *P. americana* (Linnaeus). Adults of *P. americana* are reddish brown and reach 2 inches in length. Both sexes have wings, and the edges of the pronotum are light coloured. The adult cockroaches are long-lived, depending on food availability. These pests are significant because they contaminate food and damage textiles and book covers. They may thus play a significant role in spreading various diseases. It is therefore imperative to eradicate this problem. This experiment was conducted to test the cockroaches' susceptibility to two chemical pesticides, namely chlorpyrifos and cypermethrin and to calculate LC50 values by using SPSS software.

Materials And Methodology

Experiment Site

The laboratory bioassays were conducted at the Department of Zoology Mangaldai College, Darrang, Assam over a period of 30 days.

Collection Of Samples

The cockroach strains that were examined in this study were collected from different areas of Orang, Udalguri, Assam. These were collected from kitchens, basements, bakeries and under sinks by trapping and hand catch methods. The collection traps for cockroaches comprised of plastic jars. Holes were made on each side of the plastic jars except the bottom region for proper ventilation and they were provided with wet bread and water till the onset of bioassay. The cockroaches were later transferred to the main collection containers placed in laboratory. The samples were collected weekly. The chemicals were obtained from the Pesticide store of Mangaldai, Darrang, Assam.

Jar Test (Bio Assay Test)

Plastic jars were used to perform the Jar Test. Five distinct concentrations of 0.5 μ L, 1.5 μ L, 2 μ L, 2.5 μ L, 3 μ L (Chlorpyrifos) and 0.5 μ L, 1 μ L 1.5 μ L, 2 μ L, 2.5 μ L (Chlorpyrifos 50% + Cypermethrin 50%) were used in this experiment. The inner surfaces of the plastic jars were covered evenly with the above given concentrations of the two chemicals, and it was allowed to dry for a short while. Ten cockroaches were placed on each jar for exposure in each trial. There were three replicas of the experiment conducted and one control group where no insecticides were applied. Following their exposure, the cockroaches were provided with ample of food. After 24 hrs of exposure the immobilized cockroaches were carefully oriented using a pair of forceps and the total number of dead cockroaches were noted for each concentration.



A

B

Fig I: Experimental setup A- Chlorpyrifos B- Chlorpyrifos (50%) + Cypermethrin (50%)

DATA ANALYSIS

Using SPSS software and probit analysis, the results of each concentration for each triplicate were examined, and the LC50 values were calculated.

Results

The mortality data following a 24-hour contact period with the chemical chlorpyrifos and 50% cypermethrin + 50% chlorpyrifos showed that at 3 μL for Chlorpyrifos and 1.5 μL for Chlorpyrifos 50% + Cypermethrin 50%, mortality ranged from 95% to 99%. The combination of chlorpyrifos and cypermethrin insecticides demonstrated 100% mortality between 2 μL to 2.5 μL . The SPSS analysis showed that the LC50 values for chlorpyrifos and chlorpyrifos (50%) + Cypermethrin (50%) were 1.41 μL and 0.508 μL respectively.

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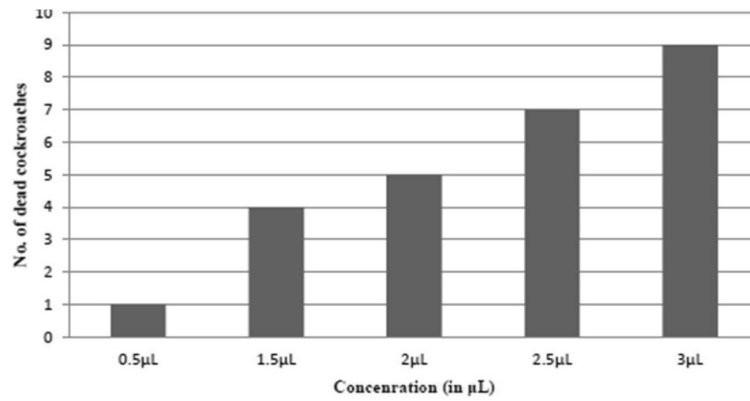


Fig II: Mortality rate of *P. americana* after 24 hours exposure with Chlorpyrifos insecticide.

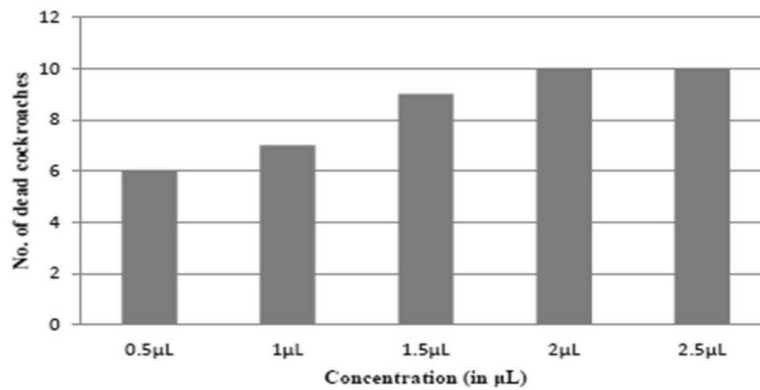


Fig III: Mortality rate of *P. americana* after 24 hours exposure with Chlorpyrifos 50% + Cypermethrin 50% insecticide.

Discussion And Conclusion

The current investigation revealed that the population of *P. americana* collected from the Orang, Udalguri, Assam area was susceptible to both the insecticides Chlorpyrifos and Chlorpyrifos (50%) + Cypermethrin (50%). The combination of Chlorpyrifos and Cypermethrin showed highest level of toxicity. Many studies have been carried out on the susceptibility of *B. germanica* against Cypermethrin and Chlorpyrifos compared to *P. americana*. Studies have shown that continuous exposure to the chemical insecticides have resulted in the development of resistance in the cockroaches against those insecticides. Study of susceptibility level of German cockroach to lambda-cyhalothrin in Tehran, the capital city of Iran, showed 4 out of 5 strains of this species are tolerant and only one is susceptible (Ladonni 1997). The irregular use of insecticides, especially pyrethroids, in the insect pests control programs, is resulted to increase their tolerance or resistance levels. The development of insecticidal resistance is thought to be primarily caused by behavioural adaptation or physiologically improved metabolic detoxification processes. Chemical control gives only temporary relief and, wherever possible, it should be accompanied by environmental sanitation and house improvement (Schal 1988). The insecticides are also known for having negative effect on non-targeted organisms and the environment. Therefore, further investigation in this area is required to find alternatives like biological control.

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A review on the impact of the COVID-19 Pandemic: Accelerating Consumer Awareness and Adoption of Ready-to-Eat Meals

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Kalyani Sharma**

Abstract

The COVID-19 pandemic has dramatically altered consumer behaviors, particularly in the food industry, leading to a profound impact on the adoption of ready-to-eat (RTE) meals. With lockdowns, social distancing, and heightened hygiene concerns, consumers sought convenient and easily accessible food options, driving a surge in the demand for RTE meals. This review explores the multifaceted implications of the pandemic on consumer awareness and preferences for RTE meals. The sudden shift towards remote work and lifestyle changes prompted individuals to prioritize time-saving solutions, amplifying the appeal of RTE meals as convenient, hygienic, and time-efficient alternatives. Additionally, the

pandemic underscored the importance of extended shelf life and minimal food preparation, positioning RTE meals as a practical choice for busy households. The heightened awareness of health and safety has also influenced the demand for transparent labeling and nutritious RTE options. As the pandemic reshapes the way consumers approach food consumption, this review highlights how the acceleration of RTE meal adoption reflects broader shifts in lifestyle and priorities, emphasizing the lasting impact of COVID-19 on the food industry and consumer choices.

Keywords: *COVID-19, ready-to-eat (RTE), consumer awareness, lifestyle*

Introduction

The COVID-19 pandemic has ushered in significant and lasting impacts on the food environment across the globe as shown in Figure 1 (Turner *et al.*, 2018). Disruptions in supply chains, lockdowns, and heightened safety measures have led to shifts in consumer behaviors and preferences. Localized food systems have gained prominence as people seek more resilient and sustainable sources. The pandemic has accelerated the adoption of digital platforms for food delivery and e-commerce, transforming the way consumers access and purchase food. Restaurants and food-service industries have faced unprecedented challenges, leading to innovations such as contactless dining and takeout-centric models. Health concerns have also influenced consumer choices, emphasizing a growing demand for functional and immune-boosting foods. Moreover, there has been increased awareness of food security and a renewed focus on community-supported agriculture. As the world adapts to the new normal, the enduring impacts of the COVID-19 pandemic on the food environment encompass not only changes in consumption patterns but also a fundamental reevaluation of the entire food supply chain and a greater emphasis on resilience, sustainability, and health (Gu *et al.*, 2021).

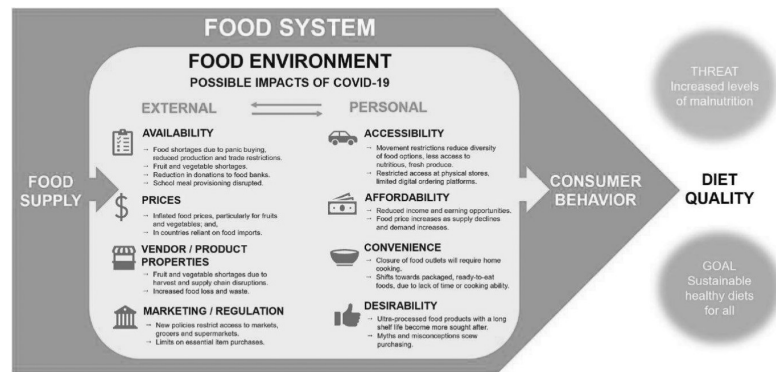


Figure-1: An illustration provided by the United Nations System Standing Committee on Nutrition (UNSCN) illustrating the effects of the Covid-19 pandemic on food surroundings (adapted from Turner *et al.*, 2018).

The COVID-19 pandemic has significantly influenced consumer acceptance of ready-to-eat (RTE) food, shaping new perspectives on convenience, safety, and hygiene. With lockdowns and social distancing measures in place, consumers turned to RTE options as practical solutions for their changed lifestyles. The pandemic has heightened awareness about the importance of easily accessible, non-perishable, and hygienically packaged food items. As individuals grappled with uncertainties and time constraints, RTE meals emerged as a reliable choice, offering quick, hassle-free, and often portion-controlled options. Moreover, the perceived safety of packaged RTE foods gained prominence, as consumers sought products with minimal handling and reduced exposure risks. The pandemic has,

therefore, accelerated the adoption of RTE foods, not only as a matter of convenience but also as a response to the evolving concerns related to health, safety, and the need for reliable and efficient food choices in times of crisis. This shift in consumer acceptance towards RTE food is likely to have lasting implications, influencing future food preferences and consumption habits (Abid & Jie, 2021).

Due to urbanization, cultural shifts, and societal alteration, India's eating habits and culinary techniques have drastically changed in the last several years. Owing to the demands of a busy lifestyle, consumers favored rapid cooking and simple, low-time cooking techniques. In India, the market for prepared food items was valued at 261 million in 2017; by 2023, it is expected to expand to 647 million, with a compound annual growth rate of more than 16% (Temgire *et al.*, 2021). Because there are so many fast-food options on the market and because people are drawn to fresh, simple-to-prepare items, modern people have altered their lifestyles and behaviors towards ready-to-eat and ready-to-cook goods. Ready-to-eat food goods are packaged and may be consumed without cooking, whereas ready-to-cook food products require preparation such as heating or boiling before consumption.

In the past five years, consumers have been drawn to ready-to-eat snacks for their convenience, making them the fastest expanding food market. Consumer interest in these food products has increased owing to their attractiveness, fair price, flavor, look, texture, and so on. RTE snacks are produced using various technologies for easy operation and appealing packaging,

eliminating the need for further cooking or preparation (Chaurasiya *et al.*,2020) RTE items include a variety of food kinds, including sweet, salty, fried, canned, fast, baked, dried, preserved, and extruded foods. A variety of items, including bakery goods, extruded meals, quick snacks, fast food, morning cereals, biscuits, and bars, etc., predominate in the traditional cereal intake. Because these food formulations are shelf-stable, lightweight, nutritionally enriched, and simple to shop for and store, they are easy for humans to consume and are highly accepted by customers (Banerjee & Zhao, 2023).

Opportunities offered by Covid-19 pandemic on consumer preference towards RTE foods

The COVID-19 pandemic has presented several opportunities for the ready-to-eat (RTE) food industry, reshaping consumer behaviors and preferences. One significant opportunity arises from the increased demand for convenient and time-saving food options. With lockdowns, work-from-home arrangements, and lifestyle changes, consumers have sought quick and easy meal solutions, propelling RTE foods into the spotlight. The surge in online shopping and food delivery services during the pandemic has provided an avenue for RTE food manufacturers to expand their distribution channels and reach a broader audience (Rowan & Galanakis, 2020). Additionally, the growing emphasis on health and safety has created opportunities for RTE foods positioned as not only convenient but also hygienic and individually packaged, meeting consumer expectations for minimal handling and reduced exposure risks. As consumers continue to prioritize practicality and efficiency in their food

choices, the RTE food sector has a unique chance to innovate, diversify product offerings, and establish a lasting presence in the evolving landscape of post-pandemic consumer preferences. The adaptability and convenience offered by RTE foods position the industry for sustained growth and increased market share in the foreseeable future (Hamid & Mir, 2021). The opportunities offered by Covid-19 pandemic on consumer preference towards RTE foods are described as follows:

Increased Demand for Convenience: The pandemic accelerated the demand for convenient food solutions, as lockdowns and restrictions prompted consumers to prioritize time-saving options. RTE foods, requiring minimal preparation, met this need, contributing to a surge in their acceptance (Eftimov *et al.*, 2020).

E-commerce and Food Delivery Boom: With the rise of remote work and social distancing measures, there was a notable increase in online shopping and food delivery services. RTE foods, being well-suited for delivery and takeout, benefited from this trend, expanding their accessibility and reaching a wider consumer base (Mishra & Rampal, 2020).

Emphasis on Safety and Hygiene: Consumer concerns about safety and hygiene heightened during the pandemic. Individually packaged RTE foods gained acceptance as they addressed these concerns by reducing handling and potential exposure points, aligning with the evolving priorities of health-conscious consumers (Ray, 2020).

Adaptability and Innovation: The RTE food industry seized

the opportunity to innovate and diversify product offerings. Manufacturers introduced new flavors, healthier options, and premium choices to cater to changing consumer preferences, enhancing the overall appeal of RTE foods (Djekic *et al.*, 2021).

Shift in Perceived Value: The pandemic prompted a reassessment of the perceived value of RTE foods. Previously seen as primarily convenient, these foods gained recognition for their role in ensuring food security, reducing grocery shopping frequency, and offering a reliable food source during uncertain times (Dannenberg *et al.*, 2020).

Health and Wellness Focus: As health became a top priority, RTE foods that aligned with health and wellness trends experienced increased acceptance. Products emphasizing nutritional content, organic ingredients, and immune-boosting properties garnered attention in the market.

Market Expansion and Global Reach: The disruptions in traditional food consumption patterns created opportunities for RTE food companies to expand their market presence. The global nature of the pandemic encouraged international brands to explore new markets and capitalize on the increased acceptance of RTE foods worldwide (Faour-Klingbei *et al.*, 2021).

Challenges faced by the RTE food industry before the Covid-19 pandemic

Before the COVID-19 pandemic, the RTE food industry faced several challenges that impacted its operations, growth, and consumer acceptance. Some of the key challenges include:

Perception of Processed Foods: RTE foods often face skepticism due to the perception that they were heavily processed and might contain preservatives, additives, or high levels of sodium and sugars and chances of microbial contamination. Overcoming negative perceptions about the nutritional value and healthiness of these products was a significant challenge (Ricci *et al.*, 2017).

Competition with Fresh Foods: The preference for fresh, homemade, or restaurant-prepared meals poses a challenge for the RTE food industry. Consumers often perceive fresh alternatives as healthier and more wholesome, making it challenging for packaged RTE foods to compete on these fronts (Thienhirun & Chung, 2018).

Quality and Taste Concerns: Maintaining the quality and taste of RTE foods throughout their shelf life is a consistent challenge. Consumers were hesitant to compromise on flavor and texture, and any perception of a decline in quality could impact on repeat purchases (Choi, 2022).

Packaging and Environmental Concerns: Packaging was a concern both in terms of sustainability and convenience. The environmental impact of excessive packaging and the challenge of creating eco-friendly packaging solutions without compromising product quality were significant hurdles (Silberbauer & Schmid, 2017).

Supply Chain and Distribution Challenges: Ensuring a consistent and reliable supply chain for ingredients and maintaining the quality of products during distribution were

challenges. Transportation and logistics issues could lead to disruptions and impact on the availability of RTE foods in the market (Castro-Ibáñez, Gil & Allende, 2017).

Regulatory Compliance: Meeting strict regulatory standards for food safety and labeling was a constant challenge. Navigating the complex regulatory landscape requires significant resources and diligence to ensure compliance with various health and safety regulations (Álvarez-Ordóñez *et al.*, 2015).

Consumer Education: There was a need for increased consumer education about the benefits and convenience of RTE foods. Communicating nutritional information, preparation methods, and addressing misconceptions was crucial to building trust and acceptance among consumers (Chambers *et al.*, 2020).

These challenges underscored the need for the RTE food industry to address quality, innovation, and communication to enhance consumer confidence and overcome barriers to widespread adoption.

Conclusion

In conclusion, the COVID-19 pandemic has undeniably acted as a catalyst in reshaping consumer attitudes and behaviors towards RTE meals. This review has delved into the multifaceted impacts of the global health crisis on the RTE food industry, revealing a seismic shift in consumer awareness and adoption patterns. The pandemic, with its disruptive force, has propelled RTE meals into the forefront of consumer choices, highlighting their convenience, safety, and versatility.

The surge in demand for RTE meals during the pandemic was not merely a fleeting trend but rather an enduring transformation in the way individuals approach food consumption. As the world grappled with unprecedented challenges, the inherent characteristics of RTE meals – requiring minimal preparation, having extended shelf life, and offering a quick and reliable source of sustenance – became paramount. The need for convenient and time-efficient options was exacerbated by lockdowns, remote work scenarios, and a collective desire for contactless solutions.

Moreover, the heightened awareness of health and safety played a pivotal role in shaping consumer preferences. RTE meals, with their individually packaged servings and reduced exposure risks, emerged as a reassuring choice in an environment where hygiene concerns were paramount. The packaging industry responded by innovating to meet both safety standards and environmental sustainability goals, aligning with the evolving expectations of conscious consumers.

The pandemic-driven acceleration in the adoption of RTE meals is not only a testament to their immediate practicality but also indicative of a broader shift towards a new normal. The changes observed during this period are likely to have a lasting impact on the RTE food industry, influencing product innovation, market dynamics, and consumer expectations in the post-pandemic era.

As we reflect on the dynamic landscape sculpted by the pandemic, it becomes evident that the RTE food industry is positioned for continued growth and adaptation. However, it is crucial for stakeholders in the industry to remain vigilant and

responsive to evolving consumer needs. Sustainability, nutritional value, and continued innovation will be key factors in maintaining and expanding the newfound acceptance of RTE meals. This chapter serves not only as a retrospective analysis of the pandemic's impact on the RTE food sector but also as a compass guiding future endeavor in the realm of convenient and consumer-friendly food solutions. The pandemic has indeed been a transformative force, and the RTE food industry, having weathered its challenges, emerges poised for a future where convenience and adaptability are paramount.

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Sustainable Wisdom: The Banana Tree's Cultural Heritage among the Bodo Society

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Abstract

This study explores the deep cultural significance and sustainable wisdom that are inherent in the Bodo society's use of the banana tree. The banana tree is ingrained in numerous aspects of the cultural heritage of the Bodo people, who are renowned for their close relationship with the natural world and their adoption of sustainable techniques. The banana tree appears as a symbol of ingenuity and cultural identity in a variety of circumstances, including religious events, culinary customs, agricultural operations, and traditional medicine. This abstract explores the many functions of the banana tree, highlighting its essential role in upholding Bodo customs and illustrating a peaceful coexistence between the local people and the environment. This abstract seeks to illuminate the lasting cultural heritage and ecological awareness contained in their relationship with the banana tree via an analysis of particular usage instances.

Keywords: *Bodo, banana tree, cultural significance, sustainable development.*

Introduction

The Bodo people have traditionally adhered to the religion of Bathouism, which is a religion that is based on nature and includes the worship of a supreme god known as Bathou Bwrai. The philosophy of the religion is based on the concept of respect for nature and the components that make up nature. In this religion, Bathou Bwrai is revered as the one who conceived of and guarded the whole universe. The act of worship consists of rites, prayers, and ceremonies that are carried out in natural settings, such as groves, hills, or open areas. The concept of Bathouism emphasizes the holiness of the natural world and the connections that exist between all living things and the natural world. The intimate connection that the Bodo people have with the natural world goes through every aspect of their existence, influencing not just their means of livelihood but also their whole way of life. According to them, nature is more than just a source of resources; it is also a guiding force that has a significant impact on the cultural practices, traditions, and activities that they engage in daily. Their peaceful relationship with the environment is reflected in the sustainable living techniques that they use. To demonstrate a thorough awareness of ecological balance and a dedication to protecting natural resources for future generations, they gain the essential materials from the natural environment. There is an abundance of traditional knowledge about the natural world that is intricately woven into their cultural identity. The knowledge that involves this includes information on medicinal

herbs, agricultural skills, and ceremonies that emphasize their harmonious connection with the natural world. It is this knowledge that has been handed down from generation to generation that adds to the distinctiveness of their traditions. The natural world serves as a major source of inspiration for their cultural festivities. Festivals take place in time for harvests, farming seasons, and other natural events. During these festivals, they show their gratitude and strong connection to the ever-changing natural environment via traditional dances, music, and rituals.

Summary

This study is going to explore the importance of banana trees in Bodo society. The importance of the banana tree extends beyond its use for just practical reasons. The immeasurable significance of the banana tree in Bodo society is intricately intertwined into the structure of everyday existence, as well as the cultural and spiritual aspects of the community. In terms of culture, the banana tree is seen as a respected symbol, and it is often presented in the context of ceremonial rites and celebrations. Bathouism, the ancient religion of the Bodo people, and other rituals are embodied by the holy traditions that are worshiped by its leaves, which constitute a vital part of religious prayers and rites. Through its symbolic representation of a link to spiritual worlds and the knowledge of ancestors, the tree transforms into a living embodiment of cultural identity. Not only does the banana tree play an important cultural significance, but it also has a prominent position in the gastronomic view of Bodo culture. As a result of the eating of the fruit, steam flowers as well as the creative use

of banana leaves in the preservation and wrapping of food, it becomes an essential component in the culinary traditions of the community. It is a testament to the inventiveness of the Bodo people that they can meet their nutritional requirements via the adaptability of the banana in the kitchen. Within the sphere of folk beliefs and practices, the banana tree has a special and distinct position. Traditional knowledge is encapsulated inside it, and it is linked with traditions that have been handed down from generation to generation. Furthermore, the tree is not only a biological organism; rather, it becomes a reservoir of cultural information, encapsulating the stories and beliefs that create the worldview of the Bodo people. From birth until death, the banana tree plays a key part in a variety of activities and traditions, demonstrating the community's creativity and approach to living sustainably.

It is common practice among the Bodo society to employ different parts of bananas in their farming practices. There is a major ritual that is related to the agricultural activities of the Bodo people, notably in the context of rice plantation, which is the foundation of the way of life of Bodo families. There is a significant custom that includes the planting of a small size banana tree in the paddy field on the first day of rice planting. This ceremony is called Gosha Lanai in Bodo. This ceremony is significant not just from a traditional and symbolic standpoint, but also symbolizes a connection between the natural world, spirituality, and the sustainability that agriculture provides.

They also use the outer bark of the banana to protect freshly planted crops such as brinjal, tomatoes, and chili. They also

employ a unique agricultural technique where they pull a banana tree with a rope tied to it in the paddy field. This method is utilized to help the paddy plants regain an upright position. However, the grasses intertwined with the paddy often end up being broken during this process. In addition, banana leaves are used in the production of vegetables as a natural ground cover. this controls weeds, keeps moisture, and gives nutrients to the soil and they degrade.

The Bodo people use different parts of the banana plant in their food, which shows how adaptable this plant is in their traditional ways of culinary. As part of the Bodo cooking practice, bananas are used to make a wide range of meals. The fruit is also eaten, and other parts like stem and flowers are also eaten. They have a method that is both distinctive and traditional including the combination of banana leaves with other herbal components to make Emao. Emao is the yeast that is used in the fermentation process to produce rice beer. Rice beer is a culturally significant beverage in many groups, and the Bodo people showcase their cultural diversity and traditional customs by making it. The Bodo people have an innovative method of making rice beer using bananas with the addition of Emao.

One of the most important sources of alkalinity in the Bodo community is the banana tree. The process starts with the chopping of different components of the banana tree into smaller pieces. These sections include the leaves, stems, and outer bark. After that, the pieces are dried with great care, which is an essential process that eliminates any moisture that may be present in the plant material. A regulated burning process is performed

on the little parts of banana trees after they have been completely dried out. This process results in the generation of ashes. Alkaline qualities are shown by the ashes that are produced as a result of this burning process.

Within the Bodo society, the outer bark of the banana tree can be utilized as a significant resource for the production of rope. It is through this traditional practice that the community shows its creativity and its belief in a sustainable approach to the use of natural resources. The outer bark, which is rich in fibers, is picked and then processed with great care to produce threads that are suitable for the making of rope.

In Bodo society, the banana tree takes on a multifaceted role, extending beyond its agricultural and utilitarian functions. Notably, Bodo parents showcase creativity and resourcefulness by using the banana tree to craft toys for their children. This traditional practice reflects a harmonious blend of practicality, sustainability, and cultural expression within the community.

In religious rituals, the use of banana leaves carries with it a great meaning since it helps to build a link between the worshippers and the natural world, as well as to symbolize purity and reverence in their connections to the divine.

The Bodo people have a rich tradition of utilizing various parts of the banana plant for medicinal purposes. Bhim Thalir is used to cure stomach-related problems, while Kharwi (Traditional Alkaline of the Bodos) extracted from the banana tree is applied to treat dandruff problems and is given to mothers during childbirth. The consumption of curry made from banana flowers

and Magur fish (*Clarias batrachus*) is believed to be effective in treating white spots on the body, and pregnant women are encouraged to include banana flowers in their diet. They employ a unique approach in their traditional medicinal practices for the treatment of nyctalopia or night blindness. Fireflies (*Lampyridae*) are mixed with Malbhog Thalir (*Musa paradisiaca*) to treat this ailment. This conventional method involves the careful insertion of fireflies into ripe Malbhog Thalalir. After this, the patient is given this for consumption. For patients suffering from tuberculosis, a combination of banana flowers and pigeon meat is recommended. In the case of chicken fox, the Bodo people provide a remedy consisting of banana flowers with Magur fish. The flower of Bhim Thalir is given to individuals experiencing urination-related problems. Furthermore, the Bhim Thalir is utilized to treat burns. They also utilize the tubers of Aathiya Thalir (*Musa bulbisiana*) to cure toothaches. Additionally, they make Bidi, a traditional cigarette from Aathiya Banana's dried leaves, and smoke it to treat cough and cold. These diverse applications of the banana plant in Bodo traditional medicine highlight its integral role in their healthcare practices.

Banana leaves play a crucial role in food preservation among the Bodo people, particularly in the preparation of Napham (Fermented Fish). In this process, dried banana leaves are utilized to cover the bamboo poles that hold the Napham. This serves a purpose: the leaves act as a protective layer, shielding the fermented fish from external elements. When it comes to preserving fresh green vegetables for a long length of time, one

way includes making use of the outer bark and leaves of the banana tree.

Banana trees were used to create boats by the Bodo people in earlier times, demonstrating their innovation and resourcefulness. According to this traditional technique, a temporary boat was constructed by attaching three or four banana trees. The community's capacity to reuse native materials for practical reasons, including transportation on water bodies, was shown by this unique solution, which served as a tribute to the local community's adaptability and creativity.

Utilizing banana trees in a variety of ways in their cultural and ceremonial activities is one way in which they demonstrate their inventiveness. The construction of roofs and posts for use in festivals and celebrations is a significant application. The use of banana trees in the construction of traditional pandal is a significant contributor to the one-of-a-kind and vibrant environment that is present during these cultural events. Not only this, they also used the leaves and outer bark of bananas as a plate and Batha (Bota) on many festivals. They have a profound connection to the natural elements that surround them, which is reflected in this practice, which not only shows the practical use of local resources but also illustrates the deep connection between the Bodo people and the natural elements.

They have a unique ritual associated with the burial of individuals who pass away without getting married. According to this tradition, when someone dies without entering into marriage, a symbolic act is performed during the burial ceremony. In such cases, a banana tree is planted in front of the burial site or grave

as part of the funeral ritual.

Conclusion

Furthermore, the banana tree is not only a biological entity in Bodo culture; rather, it is a symbol of subsistence, cultural identity, and a conduit for the practical, spiritual, and holistic components of their life. The use of the banana tree by the Bodo people exemplifies a strong relationship with the natural world and reflects a way of life that is in harmony with tradition, sustainability, and the vitality of cultural expression. Bananas are essential to our lives and have several uses that are often forgotten in the modern day. But our forefathers were quite skilled at making use of the resources available to them, especially the adaptable banana plant. Their inventiveness was evidence of their sustainable development methods rather than only being useful in real-world situations. Bananas used to be more than just a fruit; it was a versatile resource. Our forefathers were well aware of the many uses of the banana plant, including its use as a main food source to its role for constructing boats, ropes, roofing, and even traditional medicine. Their inventive use of local resources demonstrated an extensive dedication to sustainable living.

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সংস্কৃত ভাষাৰ উত্পত্তি আৰু বিকাশ –

এক সমীক্ষা

শ্ৰী গগেন কাকতি
সহযোগী অধ্যাপক
মঙলদৈ মহাবিদ্যালয়

মানৱ সভ্যতাৰ ক্ৰমবিকাশে পৃথিৱীত জাতি-উপজাতিৰ সৃষ্টি কৰিলে, সমাজ সংগঠন হ'ল, সংস্কৃতিৰ বাতাবৰণৰ পৰিসীমা বিস্তৃত হ'ল। বিশেষ বিশেষ ভৌগোলিক পৰিবেষ্টনীত একো একোটা নিৰ্দিষ্ট ভাষাৰ প্ৰচলন হব ধৰিলে। পৃথিৱীৰ সকলোবিলাক ভাষা অধ্যয়ন কৰি কেইটামান বিশেষ ভাগত বিভক্ত কৰা হৈছে। ভাষাৰ বৰ্গীকৰণ বা শ্ৰেণীকৰণে কিছুমান বৰ্গীকৃত ভাষা (Classified Language) আৰু কিছুমান অবৰ্গীকৃত ভাষা (Unclassified Language) নিৰ্ণয় কৰিছে। পৃথিৱীৰ ভাষা পৰিয়ালসমূহৰ ভিতৰত ইন্দো-ইউৰোপীয়, ছেমীয়-হামীয়, অষ্ট্ৰিক, তিব্বত-চীনিয়, ড্ৰাবিড়, ইউৰাল-আলটাই, ককেচীয়, এণ্ডিমো, আমেৰিকা, আফ্ৰিকা, অষ্ট্ৰেলিয়া আদি ভাষাই প্ৰধান। এই সকলোবিলাক ভাষা পৰিয়ালৰ ভিতৰত ইন্দো-ইউৰোপীয় ভাষা পৰিয়ালটোৱেই সৰ্ববৃহৎ ভাষা-পৰিয়াল বুলি স্বীকৃত হৈছে। পৃথিৱীৰ বিপুল জনসংখ্যাৰ মাজৰপৰা সুকীয়া সুকীয়া ভাষাৰ বৈশিষ্ট্য আদি বাছি উলিয়াই ভাষাৰ শ্ৰেণীবিভাগ কৰা হৈছে। কিছুমান ভাষাৰ মাজত ধ্বনিগত, উপগত, শব্দগত, বাক্যগত বৈশিষ্ট্যৰ সাদৃশ্যৰ প্ৰতি লক্ষ্য ৰাখি একে গোষ্ঠীৰ অন্তৰ্গত বুলি ঠাৱৰ কৰা হৈছে। লেটিন,

গ্ৰীক, সংস্কৃত, পাৰ্চী, জাৰ্মান, আৰ্মেনীয় আদি ভাষাসমূহৰ অধ্যয়ন কৰি সেইবোৰ একে মূলৰ পৰা অহা বুলি অনুমান কৰা হৈছে। পৃথিৱীৰ বৃহত্ ভাষাগোষ্ঠী ইন্দো-ইউৰোপীয় পৃথিৱীৰ বৃহত্ ভূ-খণ্ড জুৰি ব্যাপ্ত হৈ আছে আৰু এই ইন্দো-ইউৰোপীয় ভাষা-পৰিয়ালৰ অন্তৰ্গত ভাষাসমূহ হ'ল- কেল্টীয়, ইটালীয়, জাৰ্মানীয়, গ্ৰীক, টোখাৰীয়, বাল্টোল্লাবীয়, আলবেনীয়, আৰ্মেনীয় আৰু ইন্দো-ইৰাণীয়। ইন্দো-ইৰাণীয় বা ভাৰত-ইৰাণীয় ভাষাৰ অন্যতম এক শাখা হল ভাৰতীয় আৰ্যভাষা। মূল ইন্দো-ইৰাণীয়ৰ এটা দল আনুমানিক খৃঃপূঃ পঞ্চদশ শতিকামানতে ইৰাণ,ইৰাক আদি অতিক্ৰমি আফগানিস্তান, বেৰুছিস্তান, পাকিস্তানৰ মাজেৰে আহি ভাৰতবৰ্ষৰ উত্তৰ-পশ্চিম কোণত অৱতীৰ্ণ হয়হি। ক্ৰমান্বয়ে পঞ্জাব, মধ্যপ্ৰদেশ, উত্তৰপ্ৰদেশ, বিহাৰ, উৰিষ্যা, পশ্চিমবঙ্গ, অসম আদি ৰাজ্যত ই প্ৰসাৰতা লাভ কৰে। ভাষা-সাহিত্যৰ ক্ষেত্ৰত তেওঁলোক বৰ উন্নত আছিল। তেওঁলোকৰ সাহিত্যিক কৰ্মৰাজি বৈদিক আৰু সংস্কৃত ভাষাত ৰচিত। প্ৰাচীনতম সাহিত্যিক ৰূপ বৈদিক ভাষাতে পৰিস্ফুট হয় যদিও সংস্কৃত নামটো ভাষা অৰ্থত পৃথিৱীব্যাপী পৰিচিত, ভাষাতাত্ত্বিকসকলে কিন্তু সংস্কৃত ভাষাতত্ত্বৰ গ্ৰন্থত সংস্কৃত নামৰ পৰিবৰ্তে আৰ্য ভাষা নামটোহে প্ৰয়োগ কৰা দেখা যায়। আৰ্য শব্দটো ভাষা অৰ্থত আৰণ্যকাৰি (৭০০ খ্ৰী.পূৰ্ব) গ্ৰন্থত পোৱা যায়। ঐতৰেয় আৰণ্যকত (৩.২.৫) আৰু সাংখ্যায়ন আৰণ্যকত (৮.৯) আৰ্য্য বাক্ বুলি আৰ্য্যভাষাৰ প্ৰয়োগ আছে। ভাষা অৰ্থত সংস্কৃত শব্দটো বহুত প্ৰাচীন নহয়। ভাষা অৰ্থত ইয়াৰ প্ৰয়োগ কেতিয়াও হোৱা নাছিল। বৈদিক সাহিত্যত সংস্কৃত শব্দ ভাষা অৰ্থত প্ৰয়োগ হোৱা দেখা পোৱা নাযায়। ঋগ্বেদ (১.১৬৪.৪৫), তৈত্তিৰীয় সংহিতা

(৬.৮.৩), মৈত্ৰায়ণী সংহিতা (১.১১.৫) আৰু অন্যান্য বৈদিক সাহিত্যত চাৰি প্ৰকাৰ ভাষাৰ উল্লেখ আছে, কিন্তু তাৰ মাজত সংস্কৃতৰ উল্লেখ নাই। শতপথ ব্ৰাহ্মণতো (৪.১.৩.১৬) নানা ধৰণৰ ভাষাৰ উল্লেখ আছে, কিন্তু তাতেও সংস্কৃত নামৰ উল্লেখ নাই। গতিকে ঋগ্বেদৰ (১৫০০ খ্ৰী.পূৰ্ব) যুগৰপৰা আৰম্ভ কৰি পাণিনি (৪০০ খ্ৰী.পূৰ্ব) পৰ্যন্ত সংস্কৃত শব্দৰ ভাষা অৰ্থত প্ৰয়োগ পোৱা নাযায়।

ভাষাতাত্ত্বিকসকলে এই আৰ্য নামৰ পৰাই ভাৰতবৰ্ষৰ প্ৰাচীন ভাষাৰ নাম আৰ্যভাষা (Aryan language) দিছিল আৰু এই ভাষাৰপৰা উত্পন্ন বা তাৰ সৈতে সংশ্লিষ্ট পৰবৰ্তী কালত অন্য যিবোৰ ভাষাৰ উদ্ভৱ হৈছিল সেইবিলাকৰ নামৰ সৈতে সঙ্গতি ৰাখি এই ভাষাৰ নাম আৰ্যভাষা দিয়া হৈছিল আৰু এই আৰ্যভাষাকে তিনিটা স্তৰত ভাগ কৰা হৈছিল। সকলোতকৈ প্ৰাচীন স্তৰৰ নাম প্ৰাচীন ভাৰতীয় আৰ্যভাষা (Old Indo Aryan = OIA) (খ্ৰীষ্টপূৰ্ব ১৫০০-৫০০), মধ্য ভাৰতীয় আৰ্যভাষা (Middle Indo Aryan = MIA) (খ্ৰীষ্টপূৰ্ব ৫০০-১০০০) আৰু আধুনিক ভাৰতীয় আৰ্যভাষা (Modern Indo Aryan = MIA) (খ্ৰীষ্টাব্দ ১০০০ পৰা)। যদিও এই তিনিটা স্তৰৰ তিনিটা পৃথক পৃথক ভাৰতীয় নাম আছে ,তথাপি একেটা ভাষাৰ সৈতে সংযুক্ত অপৰাপৰ ভাষাসমূহক বুজোৱাৰ কাৰণে এই নামটোৱেই ভাষাতত্ত্ববিদসকলৰ ওচৰত সৰ্বাধিক সমাদৃত। সংস্কৃত অথবা ভাষাতত্ত্বগতভাৱে প্ৰাচীন ভাৰতীয় আৰ্যভাষা ইন্দো-ইৰাণীয় উপশাখাৰ অন্তৰ্গত। গতিকে এই সংস্কৃত ভাষা এফালে ইন্দো-ইৰাণীয় উপশাখাৰ সৈতে আৰু আনফালে ইন্দো-ইউৰোপীয় ভাষাগোষ্ঠীৰ সৈতে নিকট সম্পৰ্কযুক্ত। সাধাৰণতে এটা

কথা কব পৰা যায় যে কোনোও ভাষা পৃথকভাৱে অৱস্থিত নহয়, সেই ভাষা হয় পূৰ্ববৰ্তী কোনো ভাষাৰ বংশধৰ, নহয় কোনো ভাষাৰ পৰা উদ্ভূত। আকৌ কেতিয়াবা কেতিয়াবা একেই ভাষাৰ প্ৰাচীন ৰূপৰপৰা উদ্ভূত হয় আৰু সেইবোৰ অন্যান্য ভাষাৰ সৈতে মিলি গৈ ব্যৱহৃত হয় অথবা একেই ভাষাৰ ভিন্নৰূপ হিচাবে ব্যৱহৃত হয়। গতিকে সংস্কৃত কোনো পৃথক ভাষা নহয়, এই ভাষাৰ পূৰ্বপুৰুষ আছে আৰু তাৰ বংশধৰো আছে। সংস্কৃতৰ পূৰ্বপুৰুষ হল বৈদিক ভাষা পৰোক্ষভাবে ইন্দো-ইৰাণীয় আৰু ততোধিক পৰোক্ষভাবে ইন্দো-ইউৰোপীয়। বিভিন্ন খণ্ড আৰু ভাষাৰ প্ৰভাৱত ইয়াক সংক্ৰমণৰ পৰা ৰক্ষা কৰিবলৈ আচাৰ্য পানিনিয়ে অষ্টাধ্যায়ী ৰচনা কৰি এই নতুন সাহিত্যিক ভাষাক লৌকিক ভাষা বুলি নামকৰণ কৰিছিল, যিটো ভাষা সংস্কৃত নামেৰে পৰিচিত হ'ল আৰু ইয়াৰ সাৰ্বজনীন মহত্বৰ বাবে ইন্দোচাইনাত জনপ্ৰিয় হৈ উঠিছিল আৰু... ভাৰত দ্বীপ, মধ্য এছিয়া, তিব্বত, চীন, কোৰিয়া, জাপান আদি দেশত প্ৰৱেশ কৰি বিখ্যাত হয়।

ঐতিহাসিক অধ্যয়নে দেখুৱাইছে যে ভাৰতত আৰ্য ভাষাৰ বিকাশ দুটা ৰূপত হৈছিল। ইয়াৰ প্ৰথম ৰূপ সাধাৰণ মানুহৰ কথিত ভাষাত আৰু দ্বিতীয়টো সাহিত্য ভাষাৰ ৰূপত পোৱা যায়। ইয়াৰ ভিতৰত কথিত ভাষাসমূহ আছিল আঞ্চলিক ভাষা (লোকভাষা) আৰু সাহিত্যিক ভাষা আছিল সংস্কৃত। আঞ্চলিক ভাষাৰ প্ৰবল সমৰ্থক জৈন আৰু বৌদ্ধসকলে সংস্কৃতৰ প্ৰভাৱ নিজৰ ভিতৰতে গ্ৰহণ কৰিব বিচাৰিছিল যদিও ঠিক বিপৰীতে ঘটিল। সংস্কৃতৰ বিকাশ অব্যাহত আছিল যদিও পানিনি ব্যাকৰণৰ সৃষ্টিৰ পাছত সংস্কৃতৰ মূল্যবোধ আৰু ফলাফল সীমিত কৰাৰ বাবে বিপুল প্ৰচেষ্টা চলোৱা

হৈছিল, কিন্তু পাণিনী ব্যাকৰণেও সংস্কৃতৰ অবিৰত বিকাশমুখী প্ৰৱণতাক ৰোধ কৰিব পৰা নাছিল। সংস্কৃত সাহিত্যৰ প্ৰথমৰ পৰা শেষলৈ যি ভাষা, চিন্তা আৰু ৰচনা শৈলীৰ বৈচিত্ৰ্য দেখা যায় তাৰ কাৰণ হ'ল ইয়াৰ নিৰন্তৰ বিকাশমুখী স্বভাৱ।

প্ৰাচীন ভাৰত-আৰ্য ভাষাৰ পৰিশোধিত আৰু পৰিশোধিত ৰূপৰ বাবে আৰ্যসকলে সংস্কৃত শব্দটো ব্যৱহাৰ কৰিছিল, যাৰ অৰ্থ হৈছে পৰিশোধিত বা (ব্যাকৰণৰ নিয়ম অনুসৰি) বিশুদ্ধ আৰু সংস্কৃতবান। সম্ সূট ক্ + ক্ত = সংস্কৃত। এই প্ৰাচীন ভাষাৰ ইতিহাস চালে আমি দেখিবলৈ পাবোঁ যে ভাৰতত স্বতন্ত্ৰ ভাষা হিচাপে গঢ় লৈ উঠা এই ভাষাই ভাৰতৰ বাহিৰত- ইউৰোপীয় আৰু ভাৰত-ইৰাণী একেৰাহে পৰিস্থিতিৰ মাজেৰে পাৰ হৈ নিজৰ পৰিশোধিত ৰূপ লাভ কৰিছিল। তুলনামূলক ভাষাবিজ্ঞানৰ অধ্যয়নৰ পৰা এই তথ্য নিশ্চিতভাৱে অনুমান কৰিব পাৰি, কিন্তু ভাষাৰ এই সকলোবোৰ পৰিস্থিতিৰ কোনো প্ৰকৃত সাহিত্য নিৰাপদ নহয়। এই ভাষাৰ ঐতিহাসিক যুগ আৰম্ভ হয় ঋগ্বেদিক মন্ত্ৰৰ উপলব্ধি বা ৰচনাৰ সময়ৰ পৰা। পশ্চিমীয়া পণ্ডিতসকলে এই সময়ছোৱা খ্ৰীষ্টপূৰ্ব ১২০০ চনৰ আশে-পাশে নিৰ্ধাৰণ কৰিছে যদিও ভাৰতীয় পণ্ডিত জ্যোতিষী বাল গংগাধৰ তিলকৰ মতে এই তাৰিখ প্ৰায় ৬০০০ খ্ৰীষ্টপূৰ্ব হ'ব লাগে। যি হওক, ইমানেই নিৰ্বিবাদ সত্য ভাৰতীয়ৰ আটাইতকৈ পুৰণি ৰূপ আৰ্য ভাষা আমি পাবোঁ ঋগ্বেদত। ঋগ্বেদিক মন্ত্ৰৰ অধ্যয়নৰ পৰা স্পষ্ট যে এই মন্ত্ৰবোৰ এটা সময়ত বা এটা ঠাইতো ৰচিত হোৱা নাছিল। ই বহু শতিকাৰ আৰু বহু ঠাইৰ সৃষ্টি, যিটো ইয়াত উপস্থিত বৈচিত্ৰ্যৰ পৰা স্পষ্ট হৈ পৰে। সাহিত্য পৰম্পৰাৰ এই প্ৰক্ৰিয়া নিৰন্তৰভাৱে চলি থাকিল

সংহিতা,ব্ৰাহ্মণ,আৰণ্যক,উপনিষদ আদিৰ ৰূপত। পণ্ডিতসকলৰ মতে যি ভাষাত ঋগ্বেদ ৰচনা হৈছিল সেয়া কথিত ভাষা নহয় বৰঞ্চ সেই সময়ৰ এক সুপ্ৰতিষ্ঠিত সাহিত্যিক ভাষা আছিল। ইয়াৰ সমান্তৰাল লোকভাষা নিশ্চয় আছিল যদিও লিখিত সাহিত্যৰ অভাৱ আছিল বাবে তাক জনাৰ কোনো উপায় নাছিল যদিও এইটো সচা যে বৈদিক ভাষাৰ পৰা সংস্কৃত ভাষাৰ বিকাশ হৈছে। কিন্তু একাংশ লোকে বিশ্বাস কৰে যে সংস্কৃত ভাষা বৈদিক ভাষাৰ পৰিবৰ্তে সমসাময়িক উপভাষাৰ পৰাই গঢ় লৈ উঠিছিল,যিটো বহু কাৰণত গুৰুত্বপূৰ্ণ হৈ উঠিছিল। যেতিয়া বৈদিক ভাষা সংক্ৰমিত হৈছিল, তেতিয়া ইয়াৰ ক্ৰমান্বয়ে বৃদ্ধি পোৱা পাৰ্থক্যৰ বাবে বিচলিত হৈ আচাৰ্য পাণিনিয়ে বৈদিক ভাষাক চূড়ান্ত কৰিছিল। ইয়াক কঠোৰ নীতি-নিয়ম আৰু অনুশাসনেৰে অনুশাসিত কৰা হৈছিল, তাৰ পিছত সেই পৰিশোধিত (সংস্কাৰযুক্ত) ভাষা সংস্কৃত নামেৰে জনাজাত হল। এই ধৰণে ভাষাৰ স্বভাৱৰ ভিত্তিত সংস্কৃত সাহিত্যক দুটা ভাগত বিভক্ত কৰা হল- ১. বৈদিক সাহিত্য ২. লৌকিক সাহিত্য। বৈদিক ভাষাৰ সাহিত্যৰাজিৰ ভিতৰত বেদ বা সংহিতা, ব্ৰাহ্মণ, আৰণ্যক, উপনিষদ উল্লেখযোগ্য। চাৰিবেদৰ ভিতৰত ঋগ্বেদেই বৈদিক সাহিত্যৰ ভিতৰত পুৰাতন। বাকী সাম, যজুঃ, অথৰ্ব বেদ ইয়াৰ পৰবৰ্তী ৰচনা। ব্ৰাহ্মণ গ্ৰন্থৰাজিত আছে বিভিন্ন যাগ-যজ্ঞ কাৰ্যৰ বিৱৰণী আৰু ব্যাখ্যা। উপনিষদ হল ভাৰতীয় মণিশীৰ আধ্যাত্মিক চিন্তা-অনুভূতিৰ অপূৰ্ব কবিস্বয় ৰূপ। মূখ্য উপনিষদ কেইখন হল- ঈশ, কেন, কঠ, প্ৰশ্ন, মুণ্ডক, মাণ্ডুক্য, তৈত্তিৰীয়া, ছান্দোগ্য, ঐতৰেয় তথা বৃহদাৰণ্যক -

“ঈশকেনকঠপ্রলমুণ্ডমাণুক্যতিতিৰঃ ।

ছান্দোগ্য-ঐতৰেয়ং চ বৃহদাৰণ্যকং তথা “।।

প্ৰাচীন-ভাৰতীয় আৰ্যভাষাৰ সময়-সীমা (১৫০০-৫০০ খ্ৰীষ্টাব্দ) বুলি বিবেচনা কৰিলে ৰামায়ণ, মহাভাৰত, পুৰাণ আৰু বেদাংগ গ্ৰন্থও ইয়াৰ ভিতৰতে সমাহাৰ হৈ যায়।

খ্ৰীষ্টীয় প্ৰথম শতিকাৰ আশে-পাশে ৰচিত সংস্কৃত নাটবোৰ অধ্যয়ন কৰি আমি গম পাওঁ যে ভাষাটো সংস্কৃত আছিল আৰু নিম্নবৰ্গৰ যেনে মহিলা, চাকৰ আদিৰ মুখৰ পৰাই প্ৰাকৃত ব্যৱহাৰ কৰা হৈছিল। ভাৰতৰ বিভিন্ন প্ৰান্তত (উত্তৰ ভাৰত) এফালে অনাৰ্য পৰম্পৰা সম্পূৰ্ণৰূপে আৰ্যকৰণ হৈ এক ঐক্যবদ্ধ সংস্কৃতি প্ৰতিষ্ঠিত হৈছিল, আনহাতে আনফালে ধৰ্ম, দৰ্শন আৰু কাহিনী সৃষ্টিৰ বাবে সংস্কৃতক সৰ্বসন্মতিক্ৰমে গ্ৰহণ কৰা হৈছিল। খ্ৰীষ্টপূৰ্ব প্ৰায় প্ৰথম শতিকালৈকে এই প্ৰক্ৰিয়া চলি থাকিল আৰু এই সময়ছোৱাৰ শেষৰ ফালে ই সম্পূৰ্ণৰূপে সমাপ্ত হয়। ইফালে সমগ্ৰ ভাৰততে আৰ্য-অনাৰ্যসকলৰ মাজত ঐক্য প্ৰতিষ্ঠা কৰি আৰ্য ভাষা জনসাধাৰণৰ সৰ্বসন্মতিক্ৰমে সংস্কৃতিত পৰিণত হৈ বৃহত্তৰ ভাৰতৰ নিৰ্মাণত নিয়োজিত আছিল। ইটোৱেই আছিল আৰ্য ভাষাৰ আটাইতকৈ ডাঙৰ বিজয়, যে ভাৰতৰ সমগ্ৰ বৈদিক আৰু অবৈদিক জনসংখ্যাক ইয়াৰ ক্ষেত্ৰখনৰ অন্তৰ্গত আছিল। পশ্চিমে গান্ধাৰৰ পৰা মধ্য ভাৰতলৈকে আৰু পশ্চিমত গুজৰাটৰ সাগৰৰ পাৰৰ পৰা আৰ্য ভাষাৰ সমৃদ্ধি আছিল দক্ষিণলৈকে। খ্ৰীষ্টপূৰ্ব ৬০০ চনৰ আশে-পাশে এই পৰিস্থিতি সম্পূৰ্ণৰূপে প্ৰতিষ্ঠিত হৈছিল। এইটো সঁচা যে প্ৰথমতে দ্ৰাবিড়

জনসাধাৰণে সংস্কৃত গ্ৰহণ কৰাত দ্বিধাবোধ কৰিছিল যদিও ক্ৰমান্বয়ে সংস্কৃতিবান দ্ৰাবিড়সকলে সংস্কৃত গ্ৰহণ কৰিছিল, ফলত তেলেগু, কানাড়া আৰু মালয়ালম তিনিওটা ভাষাৰ সাহিত্য সংস্কৃতৰ অনুৰূপ আৰু অনুৰূপ ৰূপেৰে ভৰি পৰিছিল।

খ্ৰীষ্টীয় তৃতীয় শতাব্দীত ভৰতৰ নাট্যশাস্ত্ৰত সংস্কৃতৰ ভাষা অৰ্থত প্ৰয়োগ আছে অৰ্থাত্ ভৰতে তেওঁৰ নাট্যশাস্ত্ৰত প্ৰাকৃত সহ সাতটা ভাষাৰ উল্লেখ কৰিছিল, তাৰ মাজত সংস্কৃতো এটা। তাৰ পিছৰপৰাই অৱশ্যে সংস্কৃতৰ ভাষা অৰ্থত বহু প্ৰয়োগ পোৱা যায়। সংস্কৃত আলংকাৰিক গ্ৰন্থত প্ৰাকৃত সহ সংস্কৃত শব্দৰ ভাষা অৰ্থত প্ৰয়োগ আছে।

সংস্কৃত সাহিত্যৰ বুৰঞ্জী পঢ়িলে আমি বৈদিক সাহিত্য, ৰামায়ণ, মহাভাৰত, পুৰাণ, উপপুৰাণ আদিৰ পিছতে খ্ৰীষ্টীয় ১ম শতিকাৰ কবি অশ্বঘোষৰ ৰচনাৰাজিৰ বিষয়ে জানিব পাৰো। চীনা পৰিব্ৰাজক ইটিসঙৰ মতে অশ্বঘোষে বৌদ্ধদৰ্শনৰ ওপৰত চাৰিখন গ্ৰন্থ ৰচনা কৰিছিল। সেয়া হ'ল—(১)মহাযানশ্ৰদ্ধোত্পাদন সংগ্ৰহ (২) বজ্ৰসূচী (৩) গণ্ডীস্ৰোত্ৰব্যখ্যা আৰু (৪) সূত্ৰালংকাৰ। ইয়াৰোপৰি তেওঁ সৌন্দৰ্যানন্দ আৰু বুদ্ধচৰিত নামে দুখন মহাকাব্য আৰু শাৰিপুত্ৰপ্ৰকৰণ, ৰাষ্ট্ৰপাল আৰু উৰ্বশীবিয়োগ নামে তিনিখন নাটকো ৰচনা কৰিছিল। অশ্বঘোষৰ পিছতে মহাকবি কালিদাসৰ ৰচনাৰাজিৰ বিষয়ে উল্লেখ আছে— ঋতুসংহাৰম্ আৰু মেঘদূতম্ (খণ্ডকাব্যম্), অভিজ্ঞানশকুন্তলম্, মালবিকাগ্নিমিত্ৰম্ আৰু বিক্ৰমোৰ্বশীয়ম্ (নাটক), ৰঘুবংশম্ আৰু কুমাৰসম্ভৱম্ (মহাকাব্য)। ৪২০-৪৫০ খ্ৰীষ্টাব্দৰ কবি প্ৰৱৰসেনে পোন্ধৰটা সৰ্গত বিভক্ত সেতুবন্ধ নামৰ মহাকাব্য, ৯ম শতিকাৰ

পূৰ্বাৰ্দ্ধৰ কৰি কুমাৰদাসে জানকীহৰণ নামৰ মহাকাব্য, ৫৭৫-৬৩৫ খৃষ্টাব্দৰ কৰি ভাৰৱিয়ে কিৰাতাৰ্জুনীয়ম্ মহাকাব্য, খৃষ্টীয় ৭ম শতিকাৰ কৰি ভদ্ৰিয়ে ৰাৱণবধ কাব্য, মাঘে শিশুপালবধ মহাকাব্য, শ্ৰীহৰ্ষই নৈষধচৰিত মহাকাব্য ৰচনা কৰিছিল। ঠিক এইদৰে ব্ৰাহ্মণ চাৰুদত্ত আৰু গণিকা বসন্তসেনাৰ প্ৰণয় কাহিনীক লৈ শূদ্ৰকে ষষ্ঠ শতিকাত মূচ্ছকটিক প্ৰকৰণ, বিশাখদত্তই মূদ্ৰাৰাক্ষস, হৰ্ষবৰ্দ্ধনে ৰত্নাৱলী আৰু নাগানন্দ নামৰ দুখন নাটক, ৮ম শতিকাত ভৱভূতিয়ে মালতীমাধৱ, মহাবীৰ চৰিত আৰু উত্তৰৰামচৰিত নামৰ তিনিখন নাটক, ভট্টনাৰায়ণে বেনীসংহাৰ, আৰু ১০ ম শতিকাৰ কৰি ৰাজশেখৰে বালৰামায়ণ, বালভাৰত, বিদ্বশালভঞ্জিকা আৰু কপূৰমঞ্জৰী নামে চাৰিখন নাটক লিখিছিল।

ইয়াৰ বাহিৰেও ন্যায়, বৈশেষিক, সাংখ্য, যোগ, মীমাংসা (পূৰ্ব মীমাংসা), বেদান্ত (উত্তৰ মীমাংসা) আদি আন্তিক দৰ্শন আৰু জৈন, বৌদ্ধ, চাৰ্বাক দৰ্শন আদি নাস্তিক দৰ্শন ৰচনা কৰা হৈছিল। ঠিক সেইদৰে শ্ৰুতবোধ, ১৬ শ শতিকাৰ বেঙ্কটেশ্বৰৰ বৃত্তৰত্নাৱলী, ১৫ শতিকাৰ গঙ্গাদাসৰ ছন্দামঞ্জৰী, ১৯ শ শতিকাৰ শেষভাগৰ অসমৰ বিখ্যাত পণ্ডিত মহামহোপাধ্যায় ধীৰেশ্বৰাচাৰ্যৰ বৃত্তমঞ্জৰী আদি ছন্দ শাস্ত্ৰৰ গ্ৰন্থ, গৌতম-ধৰ্মসূত্ৰ, হাৰিত ধৰ্মসূত্ৰ, বশিষ্ঠ ধৰ্মসূত্ৰ, বোধায়ন ধৰ্মসূত্ৰ, আপস্তম্ব ধৰ্মসূত্ৰ, মনুসংহিতা আদি ধৰ্মসূত্ৰসমূহ, ৫৮৭ খৃষ্টাব্দত বৰাহমিহিৰে পঞ্চসিদ্ধান্তিকা আৰু বৃহত্সংহিতা, আৰ্যভট্টই গণিত বিয়ৰ (৪৭৬ খৃঃ) আৰ্যসিদ্ধান্ত, ৭ম শতিকাৰ ব্ৰহ্মগুপ্তই ব্ৰহ্মস্ফুটসিদ্ধান্ত আৰু খণ্ড খাদ্যক নামে গণিত জ্যোতিষৰ দুখন বিখ্যাত গ্ৰন্থ আৰু ১২শ শতিকাত ভাস্কৰাচাৰ্যই সিদ্ধান্ত শিৰোমণি

নামে গ্ৰন্থ ৰচনা কৰিছিল। ইয়াৰোপৰি আয়ুৰ্বেদ, ধনুৰ্বেদ, গান্ধৰ্ববেদ আৰু অৰ্থশাস্ত্ৰও সংস্কৃত ভাষাত ৰচিত হৈছিল ।

সাধাৰণতে সংস্কৃত ভাষাৰ ভৌগোলিক সীমা আছিল কেৱলমাত্ৰ ভাৰতৰ উত্তৰাংশ অৰ্থাত্ পশ্চিমাংশৰ পৰা পূৰ্বাংশ পৰ্যন্ত। বৰ্তমান ভাৰতৰ প্ৰায় পঞ্চাশখনৰো অধিক বিশ্ববিদ্যালয়ত সংস্কৃত ভাষাৰ অধ্যয়ন আৰু অধ্যাপনা হৈ আছে। কিন্তু ক্ৰমে ক্ৰমে সপ্তদশ শতাব্দীৰ আগভাগৰ পৰাই এই সংস্কৃত ভাষাই ভাৰতৰ সীমা অতিক্ৰম কৰি বিদেশত অথবা পাশ্চাত্যত কেইবাখনো দেশত নানা বিশ্ববিদ্যালয়ত বা শিক্ষানুষ্ঠানত প্ৰচাৰ আৰু প্ৰসাৰ আৰম্ভ হোৱা দেখা যায়। পাশ্চাত্য দেশসমূহৰ ভিতৰত সংস্কৃত চৰ্চাৰ ক্ষেত্ৰত ভূমিকা লোৱা দেশসমূহ হল— জাৰ্মানী, ইংলেণ্ড, আমেৰিকা, ৰাছিয়া, কানাডা, ফ্ৰান্স, ইটালী, নৰৱে, ছুইডেন, নেদাৰলেণ্ড, অষ্ট্ৰেলিয়া আৰু দক্ষিণ আফ্ৰিকা। জাৰ্মানীৰ প্ৰায় পোক্ৰাৰখন, অষ্ট্ৰিয়াৰ দুখন, বেলজিয়ামৰ তিনিখন, ডেনমাৰ্কৰ এখন, ফিনলেণ্ডৰ ছয়খন, গ্ৰেটব্ৰিটেইনৰ চাৰিখন, ইটালীৰ আঠখন, নেদাৰলেণ্ডৰ দুখন, ছুইডেনৰ দুখন, ছুইজাৰলেণ্ডৰ দুখন, চীনৰ এখন, থাইলেণ্ডৰ দুখন, আমেৰিকা মহাদেশৰ প্ৰায় বিৰাশীখন আৰু অষ্ট্ৰেলিয়াৰ চাৰিখন বিশ্ববিদ্যালয়ত সংস্কৃত ভাষাৰ অধ্যয়ন আৰু অধ্যাপনা হৈ আছে। ইয়াৰোপৰি আমাৰ চুবুৰীয়া ৰাষ্ট্ৰ শ্ৰীলংকাৰ তিনিখন আৰু নেপালৰ আঠখনমান বিশ্ববিদ্যালয়ত সংস্কৃত ভাষাৰ অধ্যয়ন আৰু অধ্যাপনা চলি আছে।

গতিকে কব পৰা যায় যে প্ৰায় পাঁচ হাজাৰ বছৰ আগতেই উদ্ভৱ হোৱা সংস্কৃত ভাষা বিভিন্ন প্ৰক্ৰিয়াৰ মাজেৰে পাৰ হৈ আহি বৰ্তমানৰ ৰূপ পাইছে আৰু সভ্যতা, সংস্কৃতি, ধৰ্ম, দৰ্শন তথা ভাষা-

সাহিত্যৰ ওপৰত প্ৰভাৱ পেলাইছে। সংস্কৃত ভাৰতীয়ৰ এক
সমৃদ্ধিশালী ভাষা। এই ভাষা নিজ মহিমাৰে মহিমামণ্ডিত। জাৰ্মান
পণ্ডিত উইলছনৰ ভাষাৰে –

যাবদ্ ভাৰতবৰ্ষং স্যাদ্ যাবদ্ বিক্ষ্যাহিমাচলৌ ।
যাবদ্ গংগা চ গোদা চ তাৱদেৱ হি সংস্কৃতম্ ॥

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সহায়ক গ্ৰন্থসমূহ :

- (১) ভাষাতত্ত্ব - ডঃ দীপ্তি ফুকন পাটগিৰি ।
- (২) সংস্কৃত ভাষাতত্ত্ব - সত্যৰঞ্জন বন্দ্যোপাধ্যায় ।
- (৩) History of Sanskrit Philology And The Indian
Archaeosophy by G.U.Thite

অসমীয়া চুটিগল্পৰ ইতিহাস

চুটিগল্প আধুনিক সাহিত্যৰ এটা জনপ্ৰিয় অংগ। চুটিগল্পত মানৱ জীৱনৰ কোনো এক মুহূৰ্তৰ অবিস্মৰণীয় ঘটনা ৰূপায়িত হয়। সাহিত্যৰ সকলোবোৰ বিশিষ্ট শিল্প প্ৰকৰণৰ ভিতৰত চুটিগল্পই নতুনতম সৃষ্টি। চুটিগল্প ঊনবিংশ শতিকাৰ ফৰাচী প্ৰতিভাৰ দান।^১ ঊনবিংশ শতিকাত পাশ্চাত্যৰ সাহিত্য জগতত এক নৱজাগৰণৰ সৃষ্টি হৈছিল। তাৰ ফলস্বৰূপে সাহিত্যৰ আন আন অংগৰ লগতে চুটিগল্পই জন্ম লাভ কৰিছিল।

চুটিগল্প আধুনিক যুগৰ সৃষ্টি হ'লেও মানৱ সমাজত কিন্তু গল্প কোৱা ৰীতি অতি প্ৰাচীন। হাবিয়ে-বননিয়ে, পৰ্বতে-পাহাৰে বসবাস কৰা আদিম মানৱে যেতিয়া, প্ৰথমবাৰলৈ কথা ক'বলৈ শিকিছিল, সম্ভৱতঃ তেতিয়াই গল্প কোৱাৰ হাবিয়াস জন্মিছিল। হাবিতলীয়া মানুহে তেওঁলোকৰ খাদ্য সংগ্ৰহ বা চিকাৰৰ অভিজ্ঞতা আনৰ আগত ব্যক্ত কৰিবলৈ যোৱাৰ ফলতে একো একোটা গল্পৰ সৃষ্টি হৈছিল। আদিম সমাজৰ গল্পৰ লগত বৰ্তমানৰ চুটিগল্পৰ সাদৃশ্য নাই যদিও গল্প কোৱা আৰু শুনাৰ ধৰ্মটো সেই সময়ৰ সৃষ্টি। দিন বাগৰাৰ লগে লগে মানৱসমাজ ক্ৰমাৎ উন্নতিৰ পথত আগবাঢ়ে আৰু জীৱন ধাৰণৰ মানদণ্ডৰো পৰিৱৰ্তন ঘটে। সমাজ পৰিৱৰ্তনৰ লগে লগে সাহিত্যৰ পৰিৱৰ্তনো আৱশ্যসম্ভাৱী। সেয়েহে সেই হাবিতলীয়া গল্পবোৰ প্ৰাচীনৰূপতে আৱদ্ধ নাথাকি ঊনবিংশ শতিকাত সাহিত্যৰ অন্য এক বিশিষ্ট অংগৰূপে প্ৰকাশ লাভ কৰে। অৰ্থাৎ আদিম মৌখিক কাহিনীয়েই মানৱ সভ্যতাৰ বিবিধ স্তৰ অতিক্ৰম কৰি আহোঁতে ঊনবিংশ শতিকাত চুটিগল্পৰ স্তৰত উপনীত হ'লহি।^২

ফৰাচী সাহিত্যত চুটিগল্পই জন্মলাভ কৰাৰ সমসাময়িকভাৱে ৰুচিয়া আৰু আমেৰিকাতো চুটিগল্পৰ উদ্ভৱ আৰু বিকাশ হয়। ইটালী, জাৰ্মানী, নৰৱে, ছুইডেনতো একে সময়তে চুটিগল্পৰ বিকাশ হ'বলৈ ধৰে। পৃথিৱীৰ ভিন ভিন

দেশৰ ভিন ভিন লেখকৰ হাতত চুটিগল্পই ভিন ভিন বৈশিষ্ট্যৰে দেখা দিলে। এইবোৰৰ ভিতৰত প্ৰধান হ'ল লক্ষ্য আৰু ফলশ্ৰুতিৰ একময়তা, নাটকীয় আৰম্ভণি আৰু আকস্মিক পৰিণতি, ইঙ্গিতময়তা আৰু প্ৰতীকৰ ব্যৱহাৰ ইত্যাদি। বিষয়বস্তু, চৰিত্ৰ, কলাকৌশল, সামাজিক চিত্ৰ আদি চুটিগল্প নিৰ্মাণৰ উপাদান হিচাপে নিৰ্ণিত হ'ল। মানুহৰ বাস্তৱ জীৱনৰ সৰু-বৰ ঘটনা চুটিগল্পৰ বিষয়বস্তু হৈ পৰিল।

বিশ্বৰ আন আন দেশৰ দৰে ভাৰতবৰ্ষতো পলমকৈ হ'লেও চুটিগল্পৰ জন্ম আৰু বিকাশ হৈছিল। অৱশ্যে গল্প সাহিত্যৰ ক্ষেত্ৰত ভাৰতবৰ্ষ অতি প্ৰাচীনকালৰে পৰা চহকী। ৰামায়ণ, মহাভাৰত, পুৰাণ আদিৰ উপৰিও কথাসৰিৎসাগৰ, পঞ্চতন্ত্ৰ আৰু বৌদ্ধ জাতকমালাবোৰে গল্প সাহিত্যৰ ক্ষেত্ৰত ভাৰতবৰ্ষৰ প্ৰাচীনত্বৰ প্ৰমাণ দিয়ে। এইবোৰৰ মাজতে চুটিগল্পৰ উৎস লুকাই আছে বুলি ভাবিবৰ থল থাকিলেও দৰাচলতে আধুনিক ভাৰতীয় চুটিগল্পই পাশ্চাত্য সাহিত্যৰ অনুপ্ৰেৰণাৰ ফলস্বৰূপেহে বিকাশ লাভ কৰিছে।^৩

ভাৰতবৰ্ষত ঊনবিংশ শতিকাৰ শেষৰফালে সাময়িক পত্ৰিকা আৰু আলোচনীৰ পাতত চুটিগল্পৰ জন্ম হয়। উৰিয়া সাহিত্যত ফকিৰ মোহন সেনাপতিৰ হাতত, বঙলা সাহিত্যত ৰবীন্দ্ৰনাথ ঠাকুৰৰ হাতত, হিন্দী সাহিত্যত প্ৰেমচন্দৰ হাতত চুটিগল্পই জন্ম লাভ কৰে। বিভিন্ন আলোচনীৰ পাতত এই লেখকসকলৰ গল্প প্ৰকাশ পায়।^৪

বঙলা সাহিত্যত বংগ দৰ্শনৰ প্ৰথম বছৰতে বংকিম চন্দ্ৰৰ ইন্দিৰা আৰু মধুমতী প্ৰকাশ পায়। কিন্তু ভাৰতী আলোচনীত প্ৰকাশ পোৱা ৰবীন্দ্ৰনাথ ঠাকুৰৰ 'ভিখাৰিণী' নামৰ গল্পটোকহে বঙলা সাহিত্যৰ প্ৰথম সাৰ্থক চুটিগল্প বুলি ক'ব পাৰি।^৫ উৰিয়াত ফকিৰ মোহন সেনাপতিয়ে ৰবীন্দ্ৰনাথ ঠাকুৰতকৈ আগতে চুটিগল্প ৰচনাত আত্ম নিয়োগ কৰিছিল। তেওঁৰ প্ৰথম প্ৰকাশিত গল্প 'লছমনিয়া'। ১৯০০ চনত হিন্দী সাহিত্যত বিখ্যাত সৰস্বতী আলোচনী প্ৰকাশ পায়।^৬ এই আলোচনীৰ পাততে কিশোৰী লাল গোস্বামীৰ ইন্দ্ৰমতী নামৰ গল্পটো প্ৰকাশ হয়। এই গল্পটোকে হিন্দী গল্প সাহিত্যৰ প্ৰথম গল্প বুলি অভিহিত কৰা হয়। কিন্তু হিন্দী গল্প সাহিত্যৰ প্ৰকৃত বিকাশ হয় প্ৰেমচন্দৰ

জৰিয়তে (১৮৮০-১৯৩৬) ৭। প্ৰেমচন্দেও *সৰস্বতী* আলোচনীৰ পাততে আত্মপ্ৰকাশ কৰে। *সৰস্বতী* আলোচনীতে প্ৰেমচন্দৰ প্ৰথম হিন্দী ভাষাৰ গল্প *সৌত* প্ৰকাশ পায়। অসমীয়া ভাষাত ঊনবিংশ শতিকাৰ শেষ দশকত লক্ষ্মীনাথ বেজবৰুৱাৰ হাতত চুটিগল্পৰ জন্ম হয়।

অসমীয়া সাহিত্যত চুটিগল্পৰ উদ্ভৱ আৰু বিকাশ :

অসমীয়া সাহিত্যত চুটিগল্পৰ জন্ম হয় *জোনাকী* কাকতৰ পাতত। অসমীয়া গল্পৰ জন্ম আৰু বিকাশত বাতৰি কাকত আৰু আলোচনীৰ ভূমিকা উল্লেখযোগ্য। ১৮৪৬ চনত আমেৰিকান বেপ্তিষ্ট মিছনেৰীসকলে শিৱসাগৰৰ *মিছন প্ৰেছ* পৰা *অৰুনোদই* প্ৰকাশ কৰিছিল। *অৰুনোদই* আলোচনীয়ে অসমীয়া সমাজ আৰু সাহিত্য জগতলৈ নতুন জ্ঞানৰ বতৰা কঢ়িয়াই আনিলে। অসমীয়া পৌৰাণিক সাহিত্যৰ সীমাৱদ্ধতা আঁতৰাই জাতীয় বুৰঞ্জী, আধুনিক বিজ্ঞান, নৃত্য আৰু নতুন চিন্তা ধাৰাৰ সৈতে অসমীয়া মানুহক চিনাকি কৰাই দিলে। *অৰুনোদই* আলোচনীতেই প্ৰথম চুটি কাহিনী *এলোকেশী বৈশ্য*ৰ বিষয়, *কানি বেহেৰুৱাৰ কথা*, *যোছেফৰ কাহিনী*, *ফুলমাণি আৰু কৰুণা*, *মাউৰী ছোৱালী*, *আফ্ৰিকাৰ কোঁৱৰ* আদি প্ৰকাশ পায়। এই আখ্যান আৰু সাধুকথাবোৰে অসমীয়া চুটিগল্পৰ প্ৰাক্‌মুহূৰ্তত উকমুকনিকে সূচাইছিল। *অৰুনোদই* আলোচনীৰ পিছতে গুণাভিৰাম বৰুৱা সম্পাদিত *আসাম বন্ধু* আলোচনীৰ পাতত প্ৰকাশিত *বিবেক*, *প্ৰমিলা* আৰু *প্ৰকৃত লাজ কি* আদি ৰচনাৰ মাজেৰে অসমীয়া সাহিত্যত গল্প কোৱাৰ ৰীতি সূচনা হৈছিল। এনেদৰে এই দুখন আলোচনীৰ বুকুত অসমীয়া চুটিগল্পৰ বুনীয়াদ ৰচনা হৈছিল যদিও প্ৰকৃত চুটিগল্প '*জোনাকী যুগত*'হে আবিৰ্ভাৱ হয়। *লক্ষ্মীনাথ বেজবৰুৱা অসমীয়া চুটিগল্পৰ জনক*।^৮

লক্ষ্মীনাথ বেজবৰুৱাৰ প্ৰথম গল্প *সেউতী জোনাকী*ৰ চতুৰ্থ বছৰৰ চতুৰ্থ সংখ্যাত (১৮৯২) প্ৰকাশ পায়। ইয়াৰ পাছত *বেজবৰুৱাই* ১৮৯৪ চনত '*জোনাকী*'ত '*ভদৰী*', '*অনিদ্ৰা*' বা '*স্বৰ্গাৰোহণ*', '*ভেমপুৰীয়া মৌজাদাৰ*', '*মিলাবামৰ আত্মজীৱনী* আৰু ১৮৯৭ ত '*চোৰ*' গল্প লিখি ঊনবিংশ শতিকাৰ শেষ দশকত অসমীয়া চুটিগল্পক এক বিশিষ্ট ৰূপ দিয়ে। ১৯০১ চনত *সত্যনাথ*

বৰাৰ সম্পাদনাত গুৱাহাটীৰ পৰা প্ৰকাশিত 'জোনাকী'তো বেজবৰুৱাই 'আৰ্জি', 'চেনিচম্পা', 'কেহৌঁককা', 'জয়ন্তী', 'পুত্ৰবান পিতা' আদি গল্প লিখি চুটিগল্পৰ জগতখন সমৃদ্ধ কৰে।*

অসমীয়া চুটিগল্পৰ যুগ বিভাগ :

আধুনিক অসমীয়া চুটিগল্পৰ ইতিহাসক বেজবৰুৱাৰ সময়ৰ পৰা আৰম্ভ কৰি বৰ্তমানলৈ চাৰিটা যুগত ভাগ কৰা হৈছে :^{১০}

আদিযুগ বা জোনাকী যুগ : জোনাকী কাকতৰ জন্মৰ সময়ৰ পৰা আৱাহন কাকতৰ জন্মৰ সময়লৈ (১৮৮৯-১৯২৯) জোনাকী যুগ বা আদিযুগ।

আৱাহন যুগ : আৱাহন কাকতৰ জন্মৰ সময়ৰ পৰা দ্বিতীয় বিশ্বযুদ্ধৰ সময়লৈ (১৯২৯-১৯৪০) আৱাহন যুগ।

যুদ্ধোত্তৰ যুগ বা ৰামধেনু যুগ : দ্বিতীয় বিশ্বযুদ্ধৰ পাছৰ পৰা ১৯৭০ চনলৈ (১৯৪০-১৯৭০) এই সময়ছোৱা যুদ্ধোত্তৰ যুগ বা ৰামধেনু যুগ।

সাম্প্ৰতিক যুগ : ১৯৭০ চনৰ পৰা বৰ্তমানলৈ সাম্প্ৰতিক যুগ।

আদিযুগ বা জোনাকী যুগ :

উনবিংশ শতিকাৰ মাজভাগত কলিকতাত উচ্চ শিক্ষা গ্ৰহণ কৰি থকা কেইজনমান অসমীয়া ছাত্ৰৰ আন্তৰিক আৰু আশাসুধীয়া প্ৰচেষ্টাৰ ফলস্বৰূপে কলিকতাত অসমীয়া ছাত্ৰৰ সাহিত্য সভা (১৮৭২) গঠিত হৈছিল। ১৮৮৮ চনত এই সভাখনেই অসমীয়া ভাষা উন্নতি সাধিনী সভা ৰূপে আত্ম প্ৰকাশ কৰে। ১৮৮৯ চনত এই সভাৰ মুখপত্ৰ ৰূপে জোনাকী কাকতৰ জন্ম হয়। জোনাকী কাকতৰ বুকুতেই আধুনিক অসমীয়া সাহিত্যৰ প্ৰায়বোৰ ঠালৰে জন্ম হয়। অসমীয়া চুটিগল্পৰো জন্ম হয় জোনাকী কাকতৰ পাতত। জোনাকী যুগৰ চুটিগল্পৰ পৰিপুষ্টিত জোনাকী কাকতৰ উপৰিও আৰু অসংখ্য অসমীয়া কাকত-আলোচনীয়ে অবিহণা যোগাইছিল। উনবিংশ শতিকাৰ শেষ ভাগত ১৮৮৯ খ্ৰীষ্টাব্দত কলিকতাৰ পৰা জোনাকী কাকত প্ৰকাশ হয়। 'জোনাকী'

প্ৰকাশৰ মাত্ৰ এবছৰ পিছতে কৃষ্ণপ্ৰসাদ দুৱৰা, পদ্মনাথ গোহাঞি বৰুৱা আৰু বেনুধৰ ৰাজখোৱাৰ দ্বাৰা সম্পাদিত 'বিজুলী' (১৮৯০-৯২), পদ্মনাথ গোহাঞি বৰুৱাৰ 'উষা' (১৯০৭-১৬), লক্ষ্মীনাথ বেজবৰুৱাৰ 'বাঁহী' (১৯০৯-৩০), প্ৰসন্ন কুমাৰ বৰুৱা আৰু নীলমণি ফুকনৰ সম্পাদিত 'আলোচনী' (১৯১০-১৭), অম্বিকাগিৰী ৰায়চৌধুৰী সম্পাদিত 'চেতনা' (১৯১৫-২৬), গৰ্গৰাম চৌধুৰী, ডিম্বেশ্বৰ নেওগ আৰু বিনন্দ চন্দ্ৰ বৰুৱা সম্পাদিত অসম ছাত্ৰ সন্মিলনৰ মুখপত্ৰ 'মিলন' (১৯২৩), অসম মুছলমান ছাত্ৰ সন্মিলনৰ মুখপত্ৰ 'সাধনা' (১৯২৪), মহৰ্ষি কমলাকান্ত ভট্টাচাৰ্যৰ 'অসম হিতৈষী' (১৯২৫) আদি আলোচনীয়ে অসমীয়া সাহিত্যত ৰোমাণ্টিক ঢল শক্তিশালী কৰি তোলাত অভূতপূৰ্ব অৰিহণা আগবঢ়াইছিল।^{১১} উল্লিখিত আলোচনীসমূহৰ যোগেদিয়ে অসমীয়া চুটিগল্পৰ আদি যুগটোৰ ভেটি ৰচনা হয়। প্ৰায় তিনিটা দশক জোৰা এই যুগটোৰ গুৰি ধৰোঁতা গৰাকী হ'ল লক্ষ্মীনাথ বেজবৰুৱা। বেজবৰুৱাই পোন প্ৰথমে অসমীয়া সাধুকথাবোৰৰ পুনৰ মূল্যায়ন কৰে আৰু এই সাধুকথাবোৰত আউজি লৈ আধুনিক চুটিগল্পৰ জন্ম দিয়ে। বেজবৰুৱাৰ প্ৰথম গল্পপুথি সুৰভি প্ৰকাশ পায় ১৯০৯ চনত। তাৰ পাছত ক্ৰমাৎ সাধুকথাৰ কুঁকি (১৯১০), জোনবিবি (১৯১৩) আৰু কেহোঁকলি' (১৯৬৮) প্ৰকাশ পায়।^{১২}

বেজবৰুৱাৰ সকলোবোৰ গল্প একে পৰ্যায়ৰ নহয়। তেওঁৰ অধিকাংশ গল্প সমসাময়িক অসমীয়া সমাজৰ আধাৰত ৰচিত। অৱশ্যে উৰিষ্যাৰ সম্বলপুৰ আৰু কলিকতাৰ সমাজক লৈয়ো তেওঁ গল্প ৰচনা কৰিছে। বেজবৰুৱাৰ এই গল্পসমূহক প্ৰধানকৈ দুটা ভাগত ভগাব পাৰি। প্ৰথম ভাগৰ গল্পসমূহত প্ৰকাশ পাইছে তেওঁৰ সমাজ সংস্কাৰক মনটো। এই গল্পসমূহৰ মাজেৰে তেওঁ অসমীয়া সমাজৰ কিছুমান লোকৰ নীচতা, হীনতা, অহংকাৰ, ভণ্ডামী আদিক ব্যঙ্গ কৰিছে। বেজবৰুৱাৰ আনটো ভাগৰ গল্পত প্ৰকাশ পাইছে গভীৰ মানৱতাবোধ। এই গল্পবোৰত তেওঁ মানুহৰ সুখ-দুখ, আনন্দ-অশ্ৰু আদি আবেগ অনুভূতিবোৰক সহানুভূতিশীল অন্তৰেৰে অতি সংবেদনশীলতাৰে অংকণ কৰিছে।

জোনাকী যুগৰ চুটিগল্প ৰচনাৰ ক্ষেত্ৰখনত বেজবৰুৱাৰ পিছতে নাম ল'ব লাগিব শৰৎ চন্দ্ৰ গোস্বামীৰ। বেজবৰুৱা আৰু শৰৎ চন্দ্ৰ গোস্বামীৰ হাততে অসমীয়া চুটিগল্পৰ বিকাশ সাধন হয়। শৰৎ চন্দ্ৰ গোস্বামীৰ গল্পপুথি সমূহ হ'ল ময়না (১৯২০), বাজীকৰ (১৯৩০), গল্পাঞ্জলী (১৯৪৪) আৰু পৰিদৰ্শন (১৯৫৬)।

শৰৎ চন্দ্ৰ গোস্বামীৰ গল্পত হাস্যৰস নাইবা ব্যঙ্গ ভাৱৰ প্ৰাধান্য নাই যদিও সুখ-দুখ, আশা-নিৰাশাৰে মিহলি গাঁৱলীয়া সমাজৰ বিভিন্ন চিত্ৰ ফুটি ওলাইছে। বেজবৰুৱাৰ দৰে গোস্বামীৰ গল্পটো পৰ্যবেক্ষণশীলতা, ৰচনা-ৰীতিৰ সৌষ্ঠৱ আৰু সৌন্দৰ্যবোধ মন কৰিবলগীয়া।^{১০}

অসমীয়া চুটিগল্পৰ জোনাকী যুগৰ আন তিনিগৰাকী গল্পলেখক হ'ল নকুল চন্দ্ৰ ভূঞা, দণ্ডিনাথ কলিতা আৰু সূৰ্যকুমাৰ ভূঞা। এই তিনিগৰাকী গল্পকাৰে সেই সময়তে আত্মপ্ৰকাশ কৰিলেও প্ৰতিষ্ঠা লাভ কৰিব পৰা নাছিল, কিন্তু এওঁলোকৰ গল্পই সেই সময়ৰ অসমীয়া চুটিগল্পৰ প্ৰবাহক গতি প্ৰদান কৰাত অৰিহণা যোগাইছিল। লক্ষ্মীনাথ ফুকন, মিত্ৰদেৱ মহন্ত আৰু মহিচন্দ্ৰ ভূঞায়ো জোনাকী যুগতে গল্পকাৰ ৰূপে আত্মপ্ৰকাশ কৰিলেও পৰৱৰ্তী আৱাহন যুগতহে বিশিষ্ট গল্পকাৰ ৰূপে প্ৰতিষ্ঠা লাভ কৰিছিল। নকুল চন্দ্ৰ ভূঞাই বাঁহী, চেতনা আদি আলোচনীত গল্প লিখিছিল। ভূঞাৰ গল্পপুথি চোৰাংচোৱা আৰু গল্পৰ শৰাই। ভূঞাই ৰামধেনু যুগৰ আৰম্ভণিতো গল্প লিখিছিল। অসমীয়া চুটিগল্পৰ ইতিহাসৰ গতি প্ৰখৰ কৰা অথবা অসমীয়া চুটিগল্পক মহিমোজ্জ্বল কৰি তোলাত ভূঞাৰ বৰঙণি বিশেষ নাই। কিন্তু জোনাকী যুগৰ পৰা আৱাহন যুগৰ শেষলৈকে নিৰৱচ্ছিন্নভাৱে গল্প ৰচনা কৰি যি ত্যাগ আৰু নিষ্ঠা প্ৰদৰ্শন কৰিলে, তাৰ স্বীকৃতি স্বৰূপেই নকুলচন্দ্ৰ ভূঞা অসমীয়া সাহিত্যৰ ইতিহাসত স্মৰণীয় হৈ থাকিব।^{১১}

দণ্ডিনাথ কলিতা শৰৎ চন্দ্ৰ গোস্বামীৰ সমসাময়িক লেখক। তেওঁৰ ৰচিত গল্পপুথি সাতসৰী। দণ্ডিনাথ কলিতাৰ গল্পৰ বিষয়বস্তু আৰু বক্তব্য সৰল, গতানুগতিক আৰু পোনপটীয়া। সমাজত প্ৰচলিত কু-সংস্কাৰ, অৰ্থনৈতিক বৈষম্য, বিধৱা বিবাহ আদি সমস্যাবোৰক লৈ তেওঁ গল্প ৰচনা কৰিছিল।

কলিতাৰ চুটিগল্পত প্ৰয়োজনীয় কলা-কৌশলৰ অভাৱ পৰিলক্ষিত হয়। সেয়ে তেওঁৰ গল্পবোৰ বসাল নহৈ প্ৰচাৰধৰ্মী ৰচনা যেনহে হৈ পৰিল। এনেবোৰ দোষ-ত্রুটি থাকিলেও *জোনাকী* যুগৰ চুটিগল্পৰ ধাৰাটোক প্ৰবাহিত কৰি ৰখাত দণ্ডিনাথ কলিতাৰ ভূমিকা স্মৰণীয় হৈ থাকিব।

জোনাকী যুগৰ গল্প লেখকসকলৰ ভিতৰত সূৰ্যকুমাৰ ভূঞাৰ নামো উল্লেখযোগ্য। তেওঁৰ একমাত্ৰ গল্পপুথি *পঞ্চমী*। সংখ্যাত কম যদিও সূৰ্য কুমাৰ ভূঞাৰ গল্পত নৰ-নাৰীৰ প্ৰেমানুভূতিৰ প্ৰকাশ আকৰ্ষণীয় হৈ ধৰা দিছে।

আৱাহন যুগ (১৯২৯-১৯৪০) :

অসমীয়া চুটিগল্পৰ বিকাশৰ দ্বিতীয় স্তৰটোক *আৱাহন* যুগ বুলি নামকৰণ কৰা হৈছে। আধুনিক অসমীয়া সাহিত্যৰ তিনিওটা যুগৰ ভিতৰত *আৱাহন* যুগতেই অসমীয়া চুটিগল্প অধিক উন্নত আৰু সমৃদ্ধ হৈ উঠিছিল। এই যুগৰ চুটিগল্পই বিস্তাৰ লাভ কৰিবলৈ এটা শক্তিশালী পটভূমি পাইছিল। ১৯২৬ চনত কলিকতাৰ পৰা নগেন্দ্ৰ নাৰায়ণ চৌধুৰীৰ পৃষ্ঠপোষকতাত আৰু দীননাথ শৰ্মাৰ সম্পাদনাত *আৱাহন* কাকত প্ৰকাশ হয়। এই কাকতখনৰ যোগেদি চুটিগল্পৰ যি অনুশীলন আৰু চৰ্চা হয়, সেয়েই এই যুগৰ চুটিগল্পক এটা নিটোল ৰূপ দিয়ে। এই সময়তে মাধৱ বেজবৰুৱা সম্পাদিত *বাঁহী* আৰু *জয়ন্তী* আলোচনীতো ভালেমান গল্প প্ৰকাশ পাইছিল। ইতিমধ্যে অসমৰ সমাজ জীৱনলৈ বহুতো পৰিৱৰ্তন আহি পৰে। ১৯০১ চনত কটন কলেজ স্থাপন হোৱাৰে পৰা ইংৰাজী শিক্ষাৰ ভালেখিনি বিস্তাৰ হয়। অসমৰ ন-শিক্ষিত শ্ৰেণীটোৱে বিশ্ববৰ্ণ্য গল্পকাৰসকলৰ গল্পৰ প্ৰতি আকৃষ্ট হৈ সেই সকলৰ অনুকৰণত চুটিগল্প ৰচনা কৰিবলৈ ল'লে। মোপাছাঁ, চেকভ আৰু ফ্ৰয়েদৰ প্ৰভাৱত *আৱাহন* যুগৰ চুটিগল্প শক্তিশালী হৈ আহিল। *গল্পবোৰত নতুন শব্দ, নতুন ৰচনা-ৰীতি প্ৰয়োগ* কৰাত ভাষাও আগতকৈ বেছি সমৃদ্ধিশালী হৈ পৰিছে। এই সময়ৰ লেখকসকলৰ ভিতৰত নগেন্দ্ৰ নাৰায়ণ চৌধুৰী, মহিচন্দ্ৰ বৰা, হলিৰাম ডেকা, বাধিকা মোহন গোস্বামী, লক্ষ্মীধৰ শৰ্মা, বৰ্মা দাশ, বীণা বৰুৱা, ত্ৰৈলোক্যনাথ গোস্বামী, ইন্দীবৰ গগৈ, দীননাথ শৰ্মা, কৃষ্ণ ভূঞা, গোবিন্দচন্দ্ৰ পৈৰা আদিৰ নাম উল্লেখযোগ্য।^{২৫}

নগেন্দ্ৰ নাৰায়ণ চৌধুৰী আৰু মহিচন্দ্ৰ বৰা আৱাহন যুগৰ দুগৰাকী বিশিষ্ট গল্পকাৰ। এওঁলোকৰ গল্পত সামাজিক দায়বদ্ধতাৰ অনুভৱ লক্ষ্য কৰিব পাৰি। চৌধুৰীৰ গল্পত প্ৰকাশ পাইছে সমাজৰ পৰম্পৰাগত নৈতিক মূল্যবোধৰ ওপৰত গুৰুত্ব আৰু বৰাৰ গল্পত প্ৰকাশ পাইছে সমাজৰ অন্যায়ে-অবিচাৰৰ প্ৰতি সচেতনতা। মানুহৰ সুখ-দুখৰ চিত্ৰ চৌধুৰীয়ে অতি উদাৰ মনেৰে দাঙি ধৰিছে। আনহাতে, বৰাই সমাজৰ অশুভ শক্তিবোৰক তীব্ৰ ব্যঙ্গবাণেৰে আঘাত কৰিছে।

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হলিৰাম ডেকা আৱাহনৰ আন এগৰাকী বিশিষ্ট গল্পকাৰ। তেওঁৰ গল্পৰ কাৰিকৰী কৌশল অগ্ৰজ সকলোতকৈ উন্নত। বুদ্ধিদীপ্ত হাস্যৰস আৰু মৃদুব্যঙ্গ তেওঁৰ গল্পৰ বৈশিষ্ট্য। তেওঁৰ গল্পত মোপাছাঁ আৰু চেকভৰ প্ৰভাৱ লক্ষ্য কৰিব পাৰি। তেওঁৰ গল্পতে প্ৰথমবাৰৰ বাবে এক ব্যক্তিগত জীৱনৰ উত্তাপ অনুভৱ কৰা যায়। ৰাধিকামোহন গোস্বামী আৱাহন যুগৰ এগৰাকী ব্যতিক্ৰমী গল্প লেখক আছিল। তেওঁৰ গল্পৰ সংখ্যা কম। নিজৰ বক্তব্যক তেওঁ পৰোক্ষ প্ৰকাশভঙ্গীৰ কৌশলেৰে ব্যক্ত কৰিছিল। তেওঁৰ গল্পই পাঠকক জীৱনৰ সত্যানুসন্ধান আৰু আত্মজীৱন দৰ্শন কৰাৰ সুযোগ দিছিল।

আৱাহন যুগৰ আন দুগৰাকী বিশিষ্ট গল্পকাৰ লক্ষ্মীধৰ শৰ্মা আৰু ৰমা দাশ। এওঁলোকে ভিন্ন স্বাদৰ গল্প ৰচনাৰে অসমীয়া চুটিগল্পক এক নতুন আয়তন দান কৰে। যি সময়ত যৌন প্ৰবৃত্তিৰ মুকলিমূৰীয়া আলাপ-আলোচনাই সাহিত্যৰ সুচিন্তা নষ্ট কৰিব বুলি এচাম লেখকে এই সমস্যাৰ পৰা আঁতৰে আঁতৰে ফুৰিছিল; সেই সময়ত এই দুয়োগৰাকী লেখকে এই সমস্যাৰ ওপৰত সাহসেৰে পোহৰ পেলাবলৈ সক্ষম হৈছিল।

আৱাহন যুগৰ গল্পকাৰসকলৰ ভিতৰত বীণা বৰুৱাৰ গল্পৰ এখন সুকীয়া আসন আছে। তেওঁৰ দুখন গল্প সংকলন হ'ল পট পৰিৱৰ্তন আৰু আঘোণী বাই। গল্পকাৰে সমকালীন সমাজৰ সাংস্কৃতিক, শৈক্ষিক আৰু বৌদ্ধিক পটভূমিত ভিন্ ভিন্ শ্ৰেণীৰ মানুহৰ জীৱনধাৰাই কেনে ৰূপ লয় অথবা ল'ব পাৰে, তাৰ ব্যাখ্যা কৰি দেখুৱাই চৰিত্ৰৰ চিন্তা-ভাবনা আৰু হৃদয়ৰ মাজেদি। এনে বিশ্লেষণৰ মাজেদিয়ে বীণা বৰুৱাই লেখক হিচাপে তেওঁৰ বক্তব্য প্ৰকাশ

কৰে। এইখিনিতে সৃষ্টিশীল লেখক হিচাপে বীণা বৰুৱাৰ সৃষ্টিশীল কৃতিত্ব
স্মৰণীয় আৰু অনস্বীকাৰ্য।^{১৭}

ত্ৰৈলোক্যনাথ গোস্বামীয়ে এই স্তৰৰ লেখক সকলৰ ভিতৰত
বাস্তৱবাদী গল্প লেখি এটা পৃথক ধাৰাৰ সৃষ্টি কৰিছিল। দুখীয়া নিচলা,
শাৰীৰিক পৰিশ্ৰম কৰি খাটি খোৱা মানুহ আৰু সমাজে যাক মিছাই অন্যায
কৰে তেনে লোকৰ প্ৰতি এইগৰাকী সমাজবাদী লেখকৰ সহানুভূতি প্ৰকাশ
পাইছে।

আৱাহন যুগৰ আন এজন জনপ্ৰিয় গল্পকাৰ হ'ল দীননাথ শৰ্মা। জীৱনৰ
কিছুমান মৌলিক সমস্যাক লৈ তেওঁ গল্প লিখিছিল। এই সময়ৰ ভিন্ন স্বাদৰ
গল্প লিখকসকলৰ ভিতৰত কৃষ্ণ ভূঞা অন্যতম। নৰ-নাৰীৰ বিচিত্ৰ সম্পৰ্কৰ
কথা তেওঁ সুকীয়াকৈ চিত্ৰ কৰিছিল। গল্পৰ কথাবস্তু আৰু কলা-কৌশলৰ প্ৰতি
তেওঁ সমান সচেতন আছিল।

আৱাহন যুগত নতুন আৰু ব্যতিক্ৰমী বিষয়বস্তুৰে গল্প ৰচনা কৰা
সকলৰ ভিতৰত উমাকান্ত শৰ্মাও এজন। তেওঁৰ *পাখী*, *মানুহ জন্মৰ পিছত*,
মেঘে বৰষিলে জুই আদি গল্প অসমীয়া গল্প সাহিত্যত একক আৰু অনন্য।

আৱাহন যুগত পুৰুষ লেখকসকলৰ তুলনাত মহিলা লেখকসকল
পিছপৰি আছিল। অৱশ্যে এইক্ষেত্ৰত সুপ্ৰভা গোস্বামী (১৯১৭) ব্যতিক্ৰম
আছিল। সৰল আৰু পোনপটীয়া বাকভঙ্গীৰে তেওঁৰ গল্পবোৰ পৰিপুষ্ট
*'অৰিহণা'ৰ গল্পবোৰৰ প্ৰকাশ বীতি সহজ-সৰল। ঠায়ে ঠায়ে আবেগিক মুহূৰ্তৰ
চিত্ৰও পোৱা যায়।*^{১৮} আৱাহন যুগৰ আন এগৰাকী মহিলা গল্পকাৰ দ্বিপাষ্ণিতা
চৌধুৰী। অগতানুগতিক বিষয়বস্তু, ভাৱবস্তু আৰু কলা-কৌশলেৰে তেওঁ
কেইবাটাও উন্নত মানৰ গল্প ৰচনা কৰি গৈছে। তেওঁৰ কেইটামান উল্লেখযোগ্য
গল্প হ'ল *চিৰকুমাৰী*, *ৰোমাঞ্চৰ মৃত্যু*, *উদাসীন*, *যৌৱনৰ অপৰাধ* আৰু *মৰণ
আৰু মৰম*।

আৱাহন যুগৰ উল্লিখিত লেখক সকলৰ উপৰিও আন কেইবাজনো
লেখকে মাত্ৰ কেইটামান গল্প ৰচনা কৰিয়েই জনপ্ৰিয়তা লাভ কৰিছিল।

সেইসকলৰ ভিতৰত এগৰাকী হ'ল মুনীৰ বৰকটকী। বৰকটকীৰ গল্পৰ কলা-কৌশল উন্নতমানৰ। তেওঁৰ গল্পত, পাশ্চাত্যৰ আধুনিক সাহিত্যদৰ্শ আৰু জীৱন সম্পৰ্কে থকা দৃষ্টিভঙ্গীৰ গভীৰতাৰ উমান পোৱা যায়। তেওঁৰ কেইটামান বিশিষ্ট গল্প হ'ল—পাপ নে ভুল, জয়নে পৰাজয়, ছবি, সপোন সুখা, বিদ্রোহী, অপ্ৰকাশৰ বেদনা, বীণা আৰু অভিশাপ।

আৱাহন যুগৰ গল্প ৰচনাৰ প্ৰবাহক গতি প্ৰদান কৰোতা সকলৰ আৰু কেইগৰাকীমান হ'ল সদানন্দ দাস, চাহ চৈয়দ হাচান আলি, হৰেন কলিতা, সুৰেন্দ্ৰ নাথ ভূঞা, নলিনীকান্ত বৰুৱা, হৰিপ্ৰসাদ ৰায় গোৰ্খা, মোহনলাল চৌধুৰী, প্ৰেম নাৰায়ণ দত্ত, প্ৰবোধ গোস্বামী, জমিৰুদ্দিন আহমেদ আৰু তাৰকচন্দ্ৰ গোস্বামী। এইসকল গল্পকাৰৰ গল্প কলা-কৌশলৰ ফালৰ পৰা উন্নতমানৰ নাছিল যদিও এওঁলোকৰ দুই এটা গল্পই এই যুগৰ গল্পক সমৃদ্ধি প্ৰদান কৰিছিল।

যুদ্ধোত্তৰ যুগ বা ৰামধেনু যুগ (১৯৪০-১৯৭০) :

অসমীয়া গল্প সাহিত্যৰ তৃতীয় স্তৰটো আৰম্ভ হয় দ্বিতীয় মহাযুদ্ধ আৰম্ভ হোৱাৰ লগে লগে। আৱাহন যুগত বিস্কৃতি লাভ কৰা অসমীয়া চুটিগল্প আৰু অধিক সমৃদ্ধিশালী হৈ উঠে স্বৰাজোত্তৰ কালত। এই সময়ত অসমীয়া চুটিগল্পই ভাৰতৰ যিকোনো প্ৰান্তীয় ভাষাৰ চুটিগল্পৰ লগত ফেৰ মাৰিব পৰা হ'ল। চুটিগল্পৰ সমৃদ্ধি আৰু জনপ্ৰিয়তাত বিশেষভাৱে সহায় কৰিলে 'ৰামধেনু' (১৯৫১) আলোচনীয়ে। ইয়াৰ আগতে 'জয়ন্তী' (১৯৪৩) আলোচনীয়ে অসমীয়া সাহিত্যৰ প্ৰকৃতি সলনি কৰি দিছিল। 'ৰামধেনু'ৰে নতুন ধাৰাৰ সাহিত্যৰ বিস্তাৰ আৰু জনপ্ৰিয়তাত অতি গুৰুত্বপূৰ্ণ ভূমিকা গ্ৰহণ কৰিলে। আচলতে 'ৰামধেনু'ক কেন্দ্ৰ কৰিয়েই পঞ্চাছৰ দশকৰ সাহিত্য গঢ় লৈ উঠিল। সেইফালৰ পৰা পঞ্চাছৰ দশকটোক ৰামধেনু যুগ বুলি ক'ব পাৰি।^{১৯}

ৰামধেনু যুগত চুটিগল্পৰ ভাৱবস্তু আৰু ৰূপবস্তু নিৰ্মাণত ভালেখিনি পৰিৱৰ্তন আহিল। পাশ্চাত্যৰ সমাজবাদ, বাস্তৱবাদ, মনস্তাত্ত্বিক অৱস্থিতিবাদ, অভিব্যক্তিবাদ, অধিবাস্তৱবাদ, চেতনাস্ৰোত আদি ভাৱধাৰাই এই কালৰ

চুটিগল্পক বৈচিত্ৰপূৰ্ণ কৰি তুলিলে। এই পৰিৱৰ্তিত ৰূপত গল্প ৰচনা কৰিবলৈ শতাধিক নতুন গল্পকাৰৰ আবিৰ্ভাৱ হ'ল। ইয়াৰে দুই এগৰাকী গল্পকাৰে *আৱাহন* আৰু *জয়ন্তী*তে গল্প লিখিবলৈ লৈছিল। যুদ্ধোত্তৰ যুগত প্ৰথমতে *পছোৱা* তাৰ পিছত *ৰামধেনু* আৰু সমসাময়িক আলোচনী কেইখনৰ জৰিয়তে বেছিভাগ গল্পলেখকেই প্ৰসিদ্ধি লাভ কৰিছে। এই গল্পকাৰসকলৰ ভিতৰত বিশেষভাৱে উল্লেখ কৰিব পাৰি চৈয়দ আব্দুল মালিক, বীৰেন্দ্ৰ কুমাৰ ভট্টাচাৰ্য, যোগেশ দাস, মহিম বৰা, ভৱেন্দ্ৰনাথ শইকীয়া, সৌৰভ কুমাৰ চলিহা, হোমেন বৰগোহাঞি, চন্দ্ৰপ্ৰসাদ শইকীয়া, স্নেহ দেৱী, লক্ষ্মীনন্দন বৰা, নিৰুপমা বৰগোহাঞি, নিৰোদ চৌধুৰী, অতুলানন্দ গোস্বামী, শীলভদ্ৰ, মামনি ৰয়চম গোস্বামী, নগেন শইকীয়া, নীলিমা শৰ্মা, অনিমা দত্ত (ভৰালী), প্ৰবীনা শইকীয়া, গোবিন্দ প্ৰসাদ শৰ্মা, কুমুদ গোস্বামী, অপূৰ্ব শৰ্মা, ভদ্ৰেশ্বৰ ৰাজখোৱা, ৰিজু হাজৰিকা, যতীন বৰা আদিৰ নাম।

আৱাহন আৰু *জয়ন্তী*তে গল্প লিখি জনপ্ৰিয়তা লাভ কৰা চৈয়দ আব্দুল মালিকৰ গল্পই পূৰ্ণ বিকশিত ৰূপ লাভ কৰে *ৰামধেনু* যুগত। অসমীয়া সাহিত্যত আটাইতকৈ সৰহসংখ্যক চুটিগল্প ৰচনা কৰা মালিকৰ গল্পৰ বিষয়বস্তু বিচিত্ৰ। *ৰোমাণ্টিক স্বপ্ন* আৰু *নৰ-নাৰীৰ যৌন সম্পৰ্কৰ বিশ্লেষণৰ পৰা আৰম্ভ কৰি সামাজিক বাস্তৱতালৈকে বিভিন্ন বিষয় তেওঁৰ গল্পই সামৰি লৈছে। কুৰি শতিকাৰ আদি ভাগত জাৰ্মান সাহিত্যত যি ৰোমাণ্টিক বাস্তৱবাদৰ ধাৰা গঢ় লৈ উঠিছিল, মালিকৰ বিভিন্ন গল্পৰ মাজেৰে সাহিত্যৰ সেই ধাৰাটো শক্তিশালী হৈ উঠে। 'বিভৎস বেদনা', 'হৰিমাষ্টৰৰ দোকান', 'দুখন ভৰি' আদি তেওঁৰ শ্ৰেষ্ঠ গল্প।^{২০}*

ৰামধেনু যুগৰ এগৰাকী জনপ্ৰিয় গল্প লেখক বীৰেন্দ্ৰ কুমাৰ ভট্টাচাৰ্য। *কলং আজিও বয়, এজনী জাপানী ছোৱালী, মাকনৰ গোসাই, মিঞা মনচুৰ, ঈদৰ জোন* তেওঁৰ উল্লেখযোগ্য গল্প। ভট্টাচাৰ্যৰ গল্পত সামাজিক বাস্তৱবাদ, সমাজবাদ, মানৱতাবাদ আৰু জীৱনবোধৰ গভীৰতা আকৰ্ষণীয় ৰূপত প্ৰকাশ পাইছে। তেওঁৰ গল্প বিষয় আৰু আংগিক উভয় দিশৰ পৰা বৈশিষ্ট্যপূৰ্ণ।

ৰামধেনু যুগৰ আৰু এগৰাকী বিশিষ্ট গল্পকাৰ যোগেশ দাস। যোগেশ দাসৰ গল্পৰ বিষয়বস্তু, ভাৱবস্তু আৰু আঙ্গিকৰ বৈশিষ্ট্য বহু পৰিমাণে *আৱাহন*

যুগৰ গল্পৰ সমধৰ্মী। নিৰলংকাৰ সৰল বাক্যভঙ্গী, বাস্তৱ বৰ্ণনাভঙ্গী আৰু নাট্যগুণ ধৰ্মীতা যোগেশ দাসৰ গল্পৰ বৈশিষ্ট্য। *ৰামধেনু* যুগৰ আন এগৰাকী জনপ্ৰিয় গল্পকাৰ মহিম বৰা। *কাঠনিবাৰী ঘাট*, *টোপ*, *এখন নদীৰ মৃত্যু*, *চক্ৰবৰ্ত্ত*, *তিনিৰ তিনি গ'ল* আদি তেওঁৰ উৎকৃষ্ট গল্প। বাস্তৱ পৰিৱেশ সৃষ্টি, কাব্যিক ব্যঞ্জনা, গভীৰ জীৱনবোধ বৰাৰ গল্পৰ মন কৰিবলগীয়া বৈশিষ্ট্য।

ৰামধেনু যুগৰ এগৰাকী ব্যতিক্ৰমী, জনপ্ৰিয় আৰু শক্তিশালী গল্প লেখক সৌৰভ কুমাৰ চলিহা। তেওঁৰ প্ৰায়বোৰ গল্প নগৰীয়া জীৱনৰ পটভূমিত আৰু নগৰীয়া মধ্যবিত্ত জীৱনৰ বিভিন্ন সমস্যাক লৈ ৰচিত। *অশান্ত ইলেকট্ৰন*, *এহাত ডবা*, *গোলাম*, *বীণাকুটাৰ*, *ভ্ৰমণ বিৰতি* আদি তেওঁৰ শ্ৰেষ্ঠ গল্প।

ৰামধেনু যুগৰ বিশিষ্ট গল্পকাৰ সকলৰ ভিতৰত ভবেন্দ্ৰনাথ শইকীয়া অন্যতম। *চৰিত্ৰৰ নাট্যধৰ্মী ভংগী* আৰু *খুটি-নাতি বৰ্ণনাৰ চমকপ্ৰদ উপস্থাপন ভবেন্দ্ৰ নাথ শইকীয়াৰ চুটিগল্পৰ প্ৰধান বৈশিষ্ট্য*। তেওঁৰ *কথনভঙ্গী মনোৰম*। *গল্পবোৰ সুখপাঠ্য আৰু চমৎকাৰ*। *শইকীয়াৰ চৰিত্ৰায়ন বাস্তৱানুগ*। *চৰিত্ৰবোৰ ঘাইকৈ মধ্যবিত্ত জীৱনৰ পৰা অহা*। *জীৱনৰ সৰু সৰু সংঘাতে চৰিত্ৰ সমূহক বিপৰ্যস্ত কৰা দেখা যায়*। *সংস্কাৰাচ্ছন্ন নিৰাপত্তাহীন জীৱনত সংকুচিত নাৰীমন তেওঁ সংবেদনশীলতাৰে অংকন কৰে*।^{২১} তেওঁৰ গল্প কাহিনী প্ৰধান। *প্ৰহৰী*, *বানপ্ৰস্থ*, *এন্দুৰ*, *অসুৰ*, *গহুৰ* আদি তেওঁৰ শ্ৰেষ্ঠ গল্প বুলি কোৱা হয় যদিও *শইকীয়াৰ প্ৰায়বোৰ গল্পই কম-বেছি পৰিমাণে ৰসোত্তীৰ্ণ*।

ৰামধেনু যুগৰ আন এগৰাকী বিশিষ্ট গল্পলেখক হোমেন বৰগোহাঞি। বৰগোহাঞিৰ গল্পত মনস্তাত্ত্বিক বিশ্লেষণ আৰু সামাজিক অন্যায, অবিচাৰ, দুৰ্নীতি আদিৰ সমালোচনা মূলক দৃষ্টিভঙ্গী দেখা যায়। তেওঁৰ গল্পত চেতনাস্ৰোত আৰু অৱস্থিতিবাদৰ প্ৰভাৱ অনুভূত হয়। *ইস্মাইল শেখৰ সন্ধানত*, *ভয়*, *হাতী*, *শিল্প*, *ধুমুহা* আদি বৰগোহাঞিৰ উল্লেখযোগ্য গল্প।

চন্দ্ৰপ্ৰসাদ শইকীয়া, লক্ষ্মীনন্দন বৰা আৰু শীলভদ্ৰ *ৰামধেনু* যুগৰ তিনিগৰাকী প্ৰতিনিধি স্থানীয় গল্পকাৰ। তিনিগৰাকী গল্পকাৰে ভালেমান উৎকৃষ্টমানৰ গল্প লিখি অসমীয়া গল্পৰ ভঁৰাল টনকিয়াল কৰিছে। চন্দ্ৰ প্ৰসাদ

শইকীয়াৰ গল্পৰ বক্তব্য অতি স্পষ্ট আৰু পোনপটীয়া। লক্ষ্মীনন্দন বৰা গ্ৰাম্য জীৱনৰ বাস্তৱ চিত্ৰ অংকনত সিদ্ধহস্ত। স্থান বিশেষে আধুনিক সভ্যতাৰ হেঁচাই গ্ৰাম্য সমাজ আৰু জীৱনত কেনে প্ৰতিক্ৰিয়াৰ সৃষ্টি কৰিছে তাৰ যথার্থ চিত্ৰণ তেওঁৰ গল্পত পোৱা যায়। শব্দৰ মোহে বৰাৰ গল্প কেতিয়াবা দীপ্তিশীল কৰিছে, কেতিয়াবা আকৌ গল্পৰ গতি মথুৰ কৰিছে।^{২২}

শীলভদ্ৰ ষাঠিৰ দশকৰ পৰা মৃত্যুৰ সময়লৈকে নিৰৱচ্ছিন্নভাৱে গল্প লিখি থকা এগৰাকী জনপ্ৰিয় লেখক। শীলভদ্ৰৰ গল্পৰ কথনশৈলী সহজ-সৰল আৰু গল্পসমূহ অতি বাস্তৱধৰ্মী। আঙ্গিক আৰু কলা-কৌশলৰ দিশতো তেওঁ সচেতন আছিল। সংখ্যাৰ ফালৰ পৰা শীলভদ্ৰৰ গল্পৰ সংখ্যাও সৰহ। *সংগ্ৰাম*, *সমলয়*, *বৃত্ত*, *মধুপুৰ বহুদূৰ*, *ৰামবাবুৰ দোকান*, *অপৰাজেয়* আদি তেওঁৰ উল্লেখযোগ্য গল্প।

এই যুগৰ ষাঠি আৰু সত্তৰৰ দশকৰ ভিতৰতে আত্মপ্ৰকাশ কৰা আৰু প্ৰতিষ্ঠা লাভ কৰা গল্পকাৰসকলৰ ভিতৰত নাম ল'ব লাগিব নগেন শইকীয়া, অতুলানন্দ গোস্বামী, ইমৰান শ্বাহ, অৰুণ গোস্বামী, নিৰোদ চৌধুৰী আৰু অপূৰ্ব শৰ্মাৰ।

নগেন শইকীয়া এগৰাকী সমাজ সমালোচক গল্পকাৰ। তেওঁৰ গল্পৰ আঙ্গিক অথবা ফৰ্ম অগতানুগতিক। নগেন শইকীয়াৰ গল্পত জীৱনৰ কৰুণ-মধুৰ দিশটো অনুভূত হয়। কাব্যিকতা তেওঁৰ গল্পৰ এটা বিশিষ্ট লক্ষণ। *মজিদ চাৰ ঢুকাল*, *অস্তিম অপেক্ষা*, *ছবি আৰু ফ্ৰেম*, *আত্মহত্যা*, *বন্ধ কোঠাৰ ধুমুহা*, *এন্দুৰ আৰু এন্দুৰ* আদি তেওঁৰ উল্লেখযোগ্য গল্প।

অতুলানন্দ গোস্বামীয়ে ৰামধেনু যুগৰ পৰা সাম্প্ৰতিক যুগলৈ গল্প ৰচনা কৰি আহিছে। গোস্বামীৰ গল্পত গভীৰ মানৱতাবোধ লক্ষ্য কৰা যায়। তেওঁৰ গল্পত জীৱনৰ প্ৰতি সূক্ষ্ম দৃষ্টিভঙ্গী আকৰ্ষণীয় ৰূপত প্ৰকাশ পাইছে। গোস্বামীৰ ভাষা সহজ-সৰল, বৰ্ণনাও সংযত। তেওঁৰ গল্প কাৰিকৰী কৌশলৰ দিশতো উন্নত। তেওঁৰ কেইটামান উল্লেখযোগ্য গল্প—*বলীয়া হাতী*, *টেঁকীশালৰ বিচনা*, *শেৱালি ফুলৰ খাৰ*, *মোৰ দেশ* : *মোৰ দেশ মানুহ*, *টোপোলাৰ মৰম*,

পমী খুৰী, চেনেহজৰী আৰু অসহায়।

ইমৰান শ্বাহৰ প্ৰকাশিত গল্পৰ সংখ্যা পাঁচশতকৈ অধিক। প্ৰথম পৰ্বৰ তেওঁৰ গল্পসমূহত যি ভাষাৰ বিলাস আৰু নব-নাৰীৰ প্ৰেমানুভূতিৰ কল্লোল ঘাইকৈ দেখা গৈছিল, সেই ধাৰাৰ পৰা সোনকালেই আঁতৰি আহিল। ভাৱ আৰু বিষয়বস্তুত সামাজিক চেতনা, চিত্ৰায়ণৰ বৈচিত্ৰ্য, ভাষাত পৰিমিতিবোধ আৰু আৱেগিক ক্ষেত্ৰত সচেতনতা আদিয়ে তেওঁৰ শিল্প ভাৱনাৰ স্বাদি ঘোষণা কৰিলে। ব্যক্তি আৰু সমষ্টি-জীৱন বিকল কৰা সামাজিক অবিচাৰ, অৰ্থনৈতিক পীড়ণ, দুৰ্নীতি, ক্ষমতা-লিপ্সা, শোষণ, বুভুক্ষা আদি বিবিধ সমস্যা শ্বাহৰ গল্পত স্বকীয় ভাৱনাৰে সমুজ্বল হৈ প্ৰকাশ পালে।^{২০}

নিৰ্বোধ চৌধুৰীৰ গল্পৰ সংখ্যা যথেষ্ট। নিৰ্বোধ চৌধুৰীৰ গল্পত আৱাহন যুগৰ বৈশিষ্ট্য দেখা যায়। অৱশ্যে আৱাহনৰ বৰ্ণনা বহুলতা তেওঁৰ গল্পত দেখা নাযায়। তেওঁৰ গল্পৰ বৰ্ণনাৰীতি সাৱলীল আৰু সংযত। ভাৱবস্তুৰ ঐক্য, পৰিণতিমুখী উৎকণ্ঠা আৰু কাব্যময় পৰিৱেশ সৃষ্টি চৌধুৰীৰ গল্পৰ বৈশিষ্ট্য। চামেলি মেমচাব, বন নহৰুৰ ফুল, চেঁচা জোন, পোহৰৰ অন্য ৰূপ, মন প্ৰজাপতি, তেজপিয়া, একাৰৰ দলিচা গছকি আদি তেওঁৰ উল্লেখযোগ্য গল্প।

ৰামধেনু যুগৰ গল্প সাহিত্যলৈ অৱদান আগবঢ়োৱা গল্পকাৰ সকলৰ ভিতৰত আৰু তিনিগৰাকী গল্পকাৰ হ'ল—ৰোহিনী কাকতি, মেদিনী চৌধুৰী আৰু পদ্ম বৰকটকী। ৰোহিনী কাকতিয়ে ৰামধেনু কাকতৰ সময়ৰ পৰা সাম্প্ৰতিক যুগলৈ গল্প লিখি আহিছে। তেওঁৰ গল্পত সমাজৰ অশুভ শ্ৰেণীৰ প্ৰতি ব্যঙ্গ, মধ্যবিত্ত শ্ৰেণীৰ ক্ষয়িষ্ণু মানসিকতা আৰু নব-নাৰীৰ প্ৰেমৰ চিত্ৰ দেখিবলৈ পোৱা যায়। পদ্ম বৰকটকী এগৰাকী সমাজ সমালোচক গল্পকাৰ। তেওঁৰ গল্পত অসাধু আৰু ভণ্ড ৰাজনৈতিক নেতা-পালিনেতা সকলৰ প্ৰতি ব্যঙ্গ দেখিবলৈ পাওঁ। মেদিনী চৌধুৰী এগৰাকী সমাজ সচেতন গল্প লেখক। তেওঁৰ গল্পত সমাজৰ নিপীড়িতজনৰ দুৰ্দশা আৰু মৰ্মবেদনা, চহৰমুখী মানুহৰ যন্ত্ৰণা আৰু ভণ্ড ৰাজনৈতিক চৰিত্ৰৰ প্ৰতি সমালোচনা দেখা যায়। কলম, চহৰমুখী সভ্যতা আৰু ইন্দ্ৰিচ, মই আৰু বাবুলাল, মণিৰাম পাটৰ কেনি গ'ল, অন্তিম তপস্যা, কোনেও নুশুনা সাধু আদি মেদিনী চৌধুৰীৰ উল্লেখযোগ্য গল্প।

বামধেনু যুগত চাইদুল ইছলামে মাত্ৰ কেইটামান গল্প লিখিয়েই প্ৰতিষ্ঠা লাভ কৰিছিল। অসমীয়া সমকালীন পংগু সমাজ ব্যৱস্থাৰ প্ৰতি ব্যঙ্গ তেওঁৰ গল্পত লক্ষ্য কৰা যায়। গল্পৰ কলা-কৌশলৰ দিশত তেওঁৰ গল্পই সফলতা দাবী কৰিব পাৰে।

পঞ্চাশৰ পৰা সত্তৰৰ দশকৰ ভিতৰত কেইবাগৰাকীও লেখিকাই ভিন্নধৰ্মী গল্পৰে বামধেনু যুগৰ গল্প সাহিত্য সমৃদ্ধ কৰিছিল। সেইসকলৰ ভিতৰত অন্যতম হৈছে স্নেহ দেৱী, নিৰুপমা বৰগোহাঞি, মামণি বয়চম গোস্বামী, প্ৰবীনা শইকীয়া, অনিমা দত্ত, নীলিমা শৰ্মা আদি। এই কেইগৰাকী লেখিকাৰ গল্পত শিক্ষিতা-অশিক্ষিতা বিভিন্ন নাৰী চৰিত্ৰৰ মাজেৰে নাৰীৰ মনোজগতৰ বিভিন্ন দিশ উন্মোচিত হৈছে।^{২৪} স্নেহ দেৱীৰ গল্পৰ ভাৱবস্তু আৰু গঠনৰীতি আৱাহন যুগৰ গল্পৰ সমধৰ্মী। তেওঁৰ গল্প সাধাৰণতে সংস্কাৰধৰ্মী মনোভাৱৰ। তেওঁৰ গল্পত তুচ্ছজনৰ অন্তৰৰ উচ্চতা আৰু মহানতা দেখুৱাবলৈ যত্ন কৰা দেখা যায়।

জীৱনৰ কিছুমান সাধাৰণ ঘটনাৰ মাজতে বিশিষ্টতা বিচৰাৰ প্ৰয়াস নিৰুপমা বৰগোহাঞিৰ কেইটামান গল্পত চকুত পৰে। সহজ বাক্য-ৰীতিৰ যোগেদি পোনপটীয়াকৈ কিছুমান অভিজ্ঞতা তেওঁ বৰ্মণীয় ৰূপত প্ৰকাশ কৰিছে।^{২৫} তেওঁৰ গল্পত মধ্যবিত্ত শ্ৰেণীৰ জীৱন যন্ত্ৰণাও প্ৰকাশ পাইছে।

মামণি বয়চম গোস্বামীৰ প্ৰায়বোৰ গল্পতে নাৰীমনৰ অতি ভিতৰৰ গোপন বাৰ্তা কিছুমান নিভীকভাৱে উদঙাই দেখুৱাইছে। তেওঁৰ গল্পত এলাক্ষুকলীয়া কু-সংস্কাৰে মানুহৰ বিশেষকৈ নাৰীৰ জীৱনলৈ কিদৰে দুৰ্বহ যন্ত্ৰণা কঢ়িয়াই আনে সেই চিত্ৰ অংকন কৰিছে। *বিণিকি বিণিকি দেখিছো যমুনা*, *কুমাৰী মন*, *পৰশমণি*, *সহযাত্ৰী*, *সন্ধ্যা-ললিতা-কান্তা*, *যমুনাৰ সিপাৰে*, *সেই আন্ধাৰ পোহৰৰো অধিক*, *ভুল ঠিকনা* আদি তেওঁৰ বিশিষ্ট গল্প।

প্ৰবীনা শইকীয়াৰ গল্প ঘাইকৈ কাহিনীমূলক। সমাজ সংস্কাৰৰ মনোভাৱ আৰু পৰিস্থিতিৰ সূক্ষ্ম বিশ্লেষণ তেওঁৰ গল্পত দেখিবলৈ পোৱা যায়। যাঠিৰ দশকৰ পৰা গল্প লিখি জনপ্ৰিয়তা লাভ কৰা অনিমা দত্তই পিছলৈ গল্প লিখিবলৈ এৰি দিয়ে। দত্তৰ গল্প বাস্তৱ জীৱনৰ আধাৰত ৰচিত। *বিষম্ব বিষম্ব*, *উত্তৰণ*,

অৱগাহন, আৱশ্যসম্ভাবী আদি তেওঁৰ উল্লেখযোগ্য গল্প।

ৰামধেনু যুগৰ মহিলা গল্প লেখকসকলৰ ভিতৰত নীলিমা শৰ্মাৰ এখন সুকীয়া আসন আছে। নীলিমা শৰ্মাই তেওঁৰ গল্পত নাৰী মনস্তত্ত্ব আৰু নাৰীৰ সমঅধিকাৰ স্বত্ব অতি সাহসেৰে প্ৰতিষ্ঠা কৰিবলৈ যত্ন কৰিছে। কাৰিকাৰী কলা-কৌশলৰ সু-প্ৰয়োগে তেওঁৰ গল্পক অধিক জনপ্ৰিয় কৰি তোলে।

উল্লিখিত মহিলা লেখক সকলৰ উপৰিও এই যুগত আন বহু মহিলা লেখকে চুটিগল্প ৰচনাত হাত দিছিল আৰু পাৰদৰ্শিতাও প্ৰদৰ্শন কৰিছিল। অসমীয়া চুটিগল্পলৈ অৱদান আগবঢ়োৱা এইসকল মহিলাৰ ভিতৰত অন্যতম আছিল দিপালী দত্ত, আলিমুন্নিছা পীয়াৰ, চিত্ৰলতা ফুকন, মিনতি হাজৰিকা, ডলী তালুকদাৰ, সাধনা মজিন্দাৰ বৰুৱা, বাসন্তী বৰুৱা, বেণু বৰুৱা, আৰতি দাস বৈৰাগী, অনিমা গুহ, উষা দাস, মেৰিণা বেগম, নিজৰা হাজৰিকা, লক্ষ্মেশ্বৰী দেৱী, বেণু দেৱী, নীলিমা বৰকাকতি, সত্যৰেখা বৰুৱা, প্ৰীতি ভট্টাচাৰ্য, বীণা দেৱী, চন্দ্ৰপ্ৰভা দাস, লাৰণ্য প্ৰভা দেৱী, নিৰুপমা বৰুৱা, স্বপ্না দেৱী, মনু বৰুৱা আদি।

সীমিত সংখ্যক গল্প ৰচনাৰে ৰামধেনু যুগত প্ৰতিষ্ঠা লাভ কৰা আৰু দুই চাৰিটা গল্প লিখি নিজৰ প্ৰতিভাৰ পৰিচয় দি পিছলৈ গল্প লিখিবলৈ এৰি দিয়া ভালে কেইগৰাকী লেখকে অসমীয়া গল্প সাহিত্যলৈ অৱদান আগবঢ়াই থৈ গৈছে। এনে লেখকসকলৰ ভিতৰত উল্লেখযোগ্য হ'ল—মহেন্দ্ৰ বৰঠাকুৰ, ঈশ্বৰ মহন্ত, ভূৱনমোহন মহন্ত, হৰেন্দ্ৰ কুমাৰ ভূঞা, কেশৱ শইকীয়া, ৰুদ্ৰ প্ৰসাদ কাকতি, কুমুদ গোস্বামী, প্ৰণৱজ্যোতি ডেকা আৰু অপূৰ্ব শৰ্মা।

১.২.১.৪. সাম্প্ৰতিক যুগ (১৯৭০ৰ পৰা বৰ্তমানলৈ) :

অসমীয়া চুটিগল্পৰ আৰম্ভণিৰ পৰা অৰ্থাৎ জোনাকী যুগৰ পৰা সাম্প্ৰতিকলৈকে এই এশ বছৰীয়া ইতিহাসৰ শেষৰ সময়ছোৱাকে সাম্প্ৰতিক যুগ আখ্যা দিয়া হৈছে।^{২৬} ১৯৬৭ চনত ৰামধেনুৰ অৱলুপ্তিৰ লগে লগে অসমীয়া গল্প সাহিত্যৰ এটা যুগৰ অন্ত পৰে আৰু আন এটা নতুন যুগৰ সূচনা হয়। আৱাহন আৰু ৰামধেনু যুগৰ দৰে এই যুগটোৰ গতি পৰিৱৰ্তনত বিশেষ

অৰিহণা যোগাইছিল সমসাময়িক ৰাজনৈতিক, অৰ্থনৈতিক আৰু বৌদ্ধিক পৰিস্থিতিয়ে। ১৯৭০ চনৰ পিছত অসম তথা ভাৰতৰ ৰাজনীতি, অৰ্থনীতি, শিক্ষা আৰু সামাজিক-সাংস্কৃতিক জগতখনত অভূতপূৰ্ব পৰিৱৰ্তন ঘটিল। বাংলাদেশৰ স্বাধীনতা আন্দোলনত ভাৰতবৰ্ষৰ পোনপটীয়া সহযোগৰ ফলত উদ্ভৱ হোৱা ৰাজনৈতিক সমস্যা, ১৯৭৯ চনৰ পৰা আৰম্ভ হোৱা অসমৰ অস্তিত্ব ৰক্ষাৰ আন্দোলন, দেশৰ অৰ্থনৈতিক দুৰ্যোগ আদিয়ে অসমীয়া জাতীয় জীৱনত বাৰুকৈয়ে প্ৰভাৱ পেলালে। দেশত বিদ্যালয়, মহাবিদ্যালয় বৃদ্ধি পোৱাত শিক্ষিতৰ হাৰ বাঢ়িল, কিন্তু সেই অনুপাতে বৌদ্ধিক বিকাশ সন্তোষজনক নাছিল। দেশৰ অস্থিৰ ৰাজনৈতিক, অৰ্থনৈতিক আৰু শৈক্ষিক ব্যৱস্থাই সামাজিক-সাংস্কৃতিক ক্ষেত্ৰটো অস্থিৰতাৰ সৃষ্টি কৰিলে। দেশৰ এনে অস্থিৰ অৱস্থাতো অসমীয়া চুটিগল্পৰ প্ৰবাহটো কিন্তু থমকি নৰ'ল। অসমৰ *জোনাকী*, *আৱাহন* আৰু *ৰামধেনু* যুগৰ আঠটা দশক জোৰা ইতিহাসৰ অনুপ্ৰেৰণাত এচাম নতুন গল্পকাৰৰ সৃষ্টি হ'ল। এই নতুন লেখকসকলৰ আদৰ্শ হিচাপে আগত আছিল *ৰামধেনু* যুগতে প্ৰতিষ্ঠা লাভ কৰা এদল সফল প্ৰবীণ গল্পকাৰ।

সাম্প্ৰতিক যুগৰ চুটিগল্পত মাক্সবাদী চিন্তা-চৰ্চাই প্ৰসাৰ লাভ কৰিলে। অধিবাস্তৱবাদ, অৱস্থিতিবাদ আৰু চেতনাস্ৰোতৰো প্ৰভাৱ গল্পকাৰসকলৰ ওপৰত পৰিল। সমাজৰ আৰ্থসামাজিক কেৰোনবোৰে সৃষ্টি কৰা ক্ষোভ, দুৰ্নীতি আৰু ব্যভিচাৰে সৃষ্টি কৰা ত্ৰেণ্ড নতুন লেখকসকলৰ গল্পৰ মাজেদি পোনপটীয়াকৈ প্ৰকাশ পাবলৈ ধৰিলে। চাৰিওফালৰ অস্থিৰতাৰ মাজতো তৰুণ লেখকসকলৰ মাজত এটা সু-স্পষ্ট দৃষ্টিভঙ্গী গঢ় লৈ উঠিল। সেয়ে বিংশ শতিকাৰ শেষৰ তিনিটা দশকত ভালেমান উন্নতমানৰ চুটিগল্পৰ সৃষ্টি হ'ল।

সাম্প্ৰতিক যুগৰ চুটিগল্পত পূৰ্বৰ ধাৰণা, দৃষ্টিভঙ্গী আৰু মূল্যবোধৰ পৰিৱৰ্তন ঘটিছে। পূৰ্বতে গল্পৰ বিষয়বস্তু হিচাপে অধিক গুৰুত্ব পোৱা কিছুমান বিষয় উপেক্ষিত হৈছে আৰু কিছুমান বিষয়ৰ প্ৰতি লেখকসকলৰ দৃষ্টিভঙ্গী সলনি হৈছে। নৰ-নাৰীৰ প্ৰেম, প্ৰতাৰণা আৰু ফ্ৰয়েদৰ যৌন মনস্তত্ত্বই এই যুগত গুৰুত্ব হেৰুৱাইছে।

পূৰ্বৰ যুগকেইটাৰ চুটিগল্পত টাইপিষ্ট, কেৰাণী আৰু মাষ্টৰ শ্ৰেণীৰ চৰিত্ৰই লেখকৰ গভীৰ অনুকম্পা লাভ কৰিছিল, কিন্তু সাম্প্ৰতিক যুগৰ চুটিগল্পত কেৰাণী আৰু মাষ্টৰৰ জীৱনৰ সমস্যাৰ পৰিৱৰ্তে কৃষক আৰু শ্ৰমিকৰ অসহনীয় জীৱন যন্ত্ৰণাকহে গুৰুত্ব দিয়া হ'ল। সাম্প্ৰতিক যুগৰ লেখকসকলে সমকালীন সমাজ বীক্ষা সঠিকভাৱে কৰিব পাৰিছে বাবেই ই সম্ভৱ হৈ উঠিছে। পূৰ্বৰ যুগকেইটাৰ চুটিগল্পত সমাজৰ নশিক্ষিত মধ্যবিত্তৰ ভণ্ডামীৰ প্ৰতি লেখকসকলে তীব্ৰ ব্যংগ কৰিছিল। কিন্তু সাম্প্ৰতিক কালৰ গল্পকাৰসকলৰ দৃষ্টিত মধ্যবিত্ত ভণ্ড চৰিত্ৰতকৈ গুৰুত্ব পালে সমকালীন ৰাজনৈতিক নেতাসকলেহে।^{২৭}

সাম্প্ৰতিক যুগৰ চুটিগল্পলৈ ৰামধেনু যুগতে প্ৰতিষ্ঠা লাভ কৰা গল্পকাৰসকলে উল্লেখযোগ্য বৰঙণি আগবঢ়ায়। এই লেখকসকলৰ ভিতৰত চৈয়দ আব্দুল মালিক, মহিম বৰা, লক্ষ্মীনন্দন বৰা, ত্ৰৈলোক্য নাথ গোস্বামী, ভদ্ৰেশ্বৰ ৰাজখোৱা, ৰিজু হাজৰিকা, হৰেন্দ্ৰ কুমাৰ ভূঞা, হেমন্ত কুমাৰ শৰ্মা, উদয়াদিত্য ভৰালী, নগেন শইকীয়া, দুৰ্লভ বুঢ়াগোহাঞি আদিৰ নাম উল্লেখযোগ্য। এই যুগৰ আৰম্ভণিতে অৰুণ গোস্বামী আৰু পোলেণ বৰকটকীয়ে আত্মপ্ৰকাশ কৰে। গোস্বামীৰ *মাছমৰীয়া ছোৱালীৰ লাজ* সেই সময়ৰ এটা উন্নত মানৰ গল্প। কুমুদ গোস্বামীও সেই সময়ৰে পৰা গল্প লিখা আন এজন সমাজ সচেতন লেখক।

আশীৰ দশকত বহুসংখ্যক অসমীয়া গল্পকাৰৰ আবিৰ্ভাৱ হয়। এইসকলৰ ভিতৰত কমলা বৰগোহাঞি, ভগৱান শৰ্মা, বিৰিঞ্চি কুমাৰ মেধি, ভূৱন চন্দ্ৰ কলিতা, ভূপেন্দ্ৰ নাৰায়ণ ভট্টাচাৰ্য, বিপুল খাটনিয়াৰ, নয়ন কুমাৰ মেধি, যতীন্দ্ৰ কুমাৰ বৰগোহাঞি, দেৱব্ৰত দাস, মদন শৰ্মা, মনোজ গোস্বামী, পৰাগ কুমাৰ ভট্টাচাৰ্য, অভিঞ্জিৎ শৰ্মা, ইন্দ্ৰকান্ত কাৰ্কী, গুণীন্দ্ৰ গায়ন, পৰমানন্দ ৰাজবংশী আৰু প্ৰশান্ত ৰাজগুৰু আদি উল্লেখযোগ্য। এই গল্পকাৰসকলে নিজস্ব ৰচনাৰীতিৰে এই দশকৰ অসমীয়া গল্প সাহিত্যক চহকী কৰে। এই সময়তে আত্মপ্ৰকাশ কৰা কেইগৰাকীমান মহিলা লেখক হৈছে—অৰুপা পটঙ্গীয়া কলিতা, দিপালী ডেকা আৰু যমুনা শৰ্মা চৌধুৰী।

বিংশ শতিকাৰ শেষৰ দুটা দশকত ভালেমান নবীন গল্পকাৰে আত্মপ্ৰকাশ কৰে। এইসকলৰ ভিতৰত কুল শইকীয়া, শিবানন্দ কাকতি, অতনু ভট্টাচাৰ্য, অপূৰ্ব শইকীয়া, বিতোপন বৰবৰা, জয়ন্ত বৰুৱা চেতিয়া, জেহিৰুল হুছেইন বিশেষভাৱে উল্লেখযোগ্য। এইসকল গল্পকাৰৰ গল্পত মানুহৰ মনোজগতৰ সূক্ষ্ম ক্ৰিয়া-কলাপ বিশ্লেষণৰ প্ৰচেষ্টা পৰিলক্ষিত হয়। এওঁলোকৰ পৰৱৰ্তী সময়ত লিখিবলৈ লোৱা মৌচুমী কন্দলী, অনামিকা বৰা, বন্তি শেনচোৱা, মণিকুন্তলা ভট্টাচাৰ্য, গীতালী বৰা, মনিকা দেৱী, বশ্মিৰেখা বৰা, পূৰ্বী তামুলী, জুৰি দত্ত আদি মহিলা লেখকসকলৰ গল্পত কিছু অভিনৱ চিন্তাৰ বেঙণি দেখিবলৈ পোৱা যায়। তেওঁলোকৰ গল্পত পৰম্পৰা ভাঙি ওলাই অহাৰ মানসিকতা প্ৰৱল।

বৰ্তমান একবিংশ শতিকাৰ দ্বিতীয় দশকতো অসমীয়া চুটিগল্পত উত্তৰ আধুনিকতাবাদী প্ৰৱণতা কিছুমান দিশত ফুটি উঠিছে। তৰুণ গল্পকাৰসকলে বিষয়বস্তু আৰু প্ৰকাশৰ ফালৰ পৰা অসমীয়া গল্পৰ জগতখনৰ সম্প্ৰসাৰণ ঘটাইছে। তেওঁলোকৰ গল্পত চিৰাচৰিত কাহিনী কথনৰ পুৰণি শৈলী পৰিহাৰ কৰি মানুহৰ মনোজগতত প্ৰৱেশ কৰিছে। সেয়ে অসমীয়া সাম্প্ৰতিক সকলো চুটিগল্পতে এটা নিটোল কাহিনী বিচাৰি পোৱা নাযায়। সামাজিক-ৰাজনৈতিক অথবা ব্যক্তি জীৱনৰ বিভিন্ন ক্ষেত্ৰৰ পৰা গল্পকাৰে কিছুমান খণ্ডিত ঘটনা জোৰা দি গল্পৰ শৰীৰ নিৰ্মাণ কৰি তাক কবিতা আৰু গীতৰ কাষ চপাইছে। কথনৰীতি আৰু আঙ্গিকৰ ক্ষেত্ৰতো নতুন নতুন পৰীক্ষা-নিৰীক্ষা চলি আছে যদিও পুৰণি পৰম্পৰাৰে ৰচিত গল্পয়ো বৰ্তমান সমাদৰ নোপোৱাকৈ থকা নাই। মুঠতে অসমীয়া সাম্প্ৰতিক চুটিগল্পই বৰ্তমান কোনো স্পষ্ট আদৰ্শ বা তত্ত্বকে খামোচ মাৰি ধৰি নাথাকি সামাগ্ৰিকভাৱে কিছু নতুনত্ব কঢ়িয়াই আনিছে।

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সাহিত্য-সংস্কৃতিত দৰঙী ৰাজ-পৃষ্ঠপোষকতা

ড° বৰ্ণালী কলিতা

অসম ৰাজ্যৰ এক ঐতিহ্যমণ্ডিত অঞ্চল দৰং। বৰ্তমান অসম ৰাজ্যৰ আয়তনত সৰু এখন জিলাৰূপে দৰং প্ৰশাসনিকভাৱে পৰিচিত। বিভিন্ন ৰাজনৈতিক আৰু সামাজিক ঘটনা পৰিঘটনাই দৰং জিলাৰ সীমা সংকুচিত কৰিছে। সময়ৰ পৰিৱৰ্তনে দৰং জিলাৰ আকাৰত প্ৰভাৱ পেলালেও, সামাজিক, ৰাজনৈতিক আৰু সাংস্কৃতিক দিশত দৰঙৰ গুৰুত্ব হ্রাস পোৱা নাই। দৰঙৰ এক গৌৰৱময় ইতিহাস আছে। এই ইতিহাস কামৰূপৰ কমতাৰ ইতিহাসৰ লগত সংস্পৃক্ত। মধ্যযুগৰ পৰা এই অঞ্চলটোক দৰং দেশ নামে জনা যায়। কবি সুচন্দাই কবিৰাজ মিশ্ৰই লিখিছে—

“কামৰূপ মধ্য গৃহ দৰং দেশৰ।

আছিলেক বাৰ ভূঞা বিপ্ৰৰ বংশৰ।।

(শিয়াল গোসাঁইৰ বংশাৱলী)

ঊনবিংশ শতিকাৰ তৃতীয় দশকত ইয়াণ্ডাবু সন্ধি অনুসৰি ইংৰাজে অসম দেশ অধিকাৰ কৰাৰ পিছত প্ৰশাসনীয় নথি পত্ৰত এই অঞ্চলটোক বুজাবৰ বাবে দৰং দেশ নামটোৱেই ব্যৱহাৰ কৰিছিল। পুৰণি কামৰূপৰ চাৰিপীঠ ক্ৰমে কামপীঠ, ৰত্নপীঠ, সুবৰ্ণপীঠ আৰু সৌমাৰপীঠ। ইয়াৰ সুবৰ্ণপীঠ হ'ল ৰূপসী নদী আৰু ডৰলী নদীৰ অন্তৰ্ৱৰ্তী ভূ-ভাগ। এই ভূ-ভাগতেই দৰং দেশৰ অৱস্থিতি বুলি পণ্ডিতসকলে মতপোষণ কৰে। বৰ্তমান দৰং জিলাত থকা ঐতিহাসিক নিদৰ্শন আৰু ভৌগোলিক অৱস্থিতিয়ে উক্ত কথাৰ সত্যতা

প্ৰতিপন্ন কৰে (পৰমানন্দ ৰাজবংশী : ৰাজ-পৃষ্ঠপোষকতাত অসমীয়া সাহিত্য পৃষ্ঠাঃ ৪০)। প্ৰাক্ ঐতিহাসিক যুগৰ পৰা খ্ৰীষ্টপূৰ্ব চতুৰ্দশ শতিকালৈ দৰং দেশৰ ভূ-খণ্ডত কোনো সুকীয়া ৰাজ্যৰূপে পৰিচিত নাছিল (দৰং জিলা সাহিত্য সভা : দৰঙৰ ইতিহাস, পৃষ্ঠাঃ ১৯৪)। বৃহৎ কামৰূপ ৰাজ্যৰ অবিচ্ছেদ্য অংগ এই ভূ-ভাগত ভূঞাসকলে সৰু সৰু অঞ্চলত ভূমিৰ অধিকাৰী হৈ শাসন কাৰ্য চলাইছিল। কিছু অংশ কোচ ৰাজ্যৰ অধীন আছিল। এই দৰং দেশ নিৰ্দিষ্ট চাৰিসীমাৰে সুকীয়া ৰাজ্যৰূপে পৰিচিত হয় ১৬১৪ খ্ৰীষ্টাব্দত। কোচৰজা ৰঘুদেৱ নাৰায়ণৰ পুত্ৰ বলিনাৰায়ণে ধৰ্মনাৰায়ণ নাম লৈ খেৰখেৰীয়াত ৰাজধানী পাতি ৰাজ্য শাসন কৰাৰে পৰা বলিনাৰায়ণ আছিল চিলাৰায়ৰ নাতি আৰু কোচ হাজোৰ ৰজা পৰীক্ষিত নাৰায়ণৰ ভাতৃ। কোচ ৰজা নৰনাৰায়ণ আৰু ভাতৃ চিলাৰায়ে মহা পৰাক্ৰমেৰে পূবে শদিয়াৰ পৰা পশ্চিমে কৰতোৱালৈ বিস্তাৰ কৰা বিশাল কোচ ৰাজ্য নৰনাৰায়ণৰ ৰাজত্বকালতে দ্বি-খণ্ডিত হয়। ৰাজ পৰিয়ালকেন্দ্ৰিক অস্থিৰতাৰ হেতু নৰনাৰায়ণে বিশাল কোচ ৰাজ্যক সোণকোষ নদীক মধ্যসীমা কৰি দ্বি-খণ্ডিত কৰে আৰু পশ্চিম অঞ্চল নিজ পুত্ৰ লক্ষ্মীনাৰায়ণ আৰু পূব অঞ্চল চিলাৰায়ৰ পুত্ৰ ৰঘুদেৱ নাৰায়ণক প্ৰদান কৰে। কিন্তু ৰাজ্যৰ সীমা চুক্তি সম্পৰ্কত লক্ষ্মীনাৰায়ণ আৰু ৰঘুদেৱ নাৰায়ণৰ মাজত মত বিৰোধ অব্যাহত থাকে, ৰঘুদেৱ নাৰায়ণৰ মৃত্যুৰ পিছত তেওঁৰ পুত্ৰ পৰীক্ষিত নাৰায়ণ ৰজা হয়। লক্ষ্মীনাৰায়ণ আৰু পৰীক্ষিত নাৰায়ণৰ মাজত ৰাজ্যৰ সীমা চুক্তি সম্পৰ্কত হোৱা মনোমালিন্য আৰু তাৰ বাবে ৰাজ্যত সৃষ্টি হোৱা অস্থিৰতাৰ সুযোগ মোগলসকলে গ্ৰহণ কৰে। লক্ষ্মীনাৰায়ণৰ ৰাজ্যত প্ৰৱেশ কৰা মোগল সৈন্যৰ সহায়ত লক্ষ্মীনাৰায়ণে পৰীক্ষিত নাৰায়ণক দমন কৰাৰ চেষ্টা চলায়। মোগল সম্ৰাটৰ নিৰ্দেশত মোগল সৈন্যই পৰীক্ষিত নাৰায়ণক বন্দী কৰি দিল্লীলৈ লৈ যায়। এই ঘটনাৰ পিছত পৰীক্ষিত নাৰায়ণৰ ভাতৃ ক্ৰমে বলিনাৰায়ণ আৰু হৰ নাৰায়ণে ৰাজ্য ত্যাগ কৰি সপৰিয়ালে, মন্ত্ৰী আৰু পাইকসহ এবছৰ দৰঙৰ বৰ ভূঞাৰ ঘৰত আশ্ৰয় লয়—

“জেহি দিনা ৰাজাক বদনে নিলে ধৰি।

ৰৈল বলি নাৰায়ণ মনে দুখ কৰি।।

মন্ত্ৰীসমে আলোচিয়া হয় এক ঠাই।

বোলে ই দেশত থাকিবৰ যোগ্য নাই।।

দৰং দেশত বৈলা মনিয়ৰি গ্ৰাম

বড় ভূঞা গৃহে পাছে কৰিলা বিশ্ৰাম।।

সূৰ্যখড়ি দৈবভড় ঃ দৰঙৰ ৰাজবংশাৰলী।

এবছৰ পিছত বলি নাৰায়ণে আহোম স্বৰ্গদেউ প্ৰতাপ সিংহৰ শৰণাপন্ন হয়। ইতিপূৰ্বে পৰীক্ষিত নাৰায়ণে আহোম স্বৰ্গদেউ প্ৰতাপ সিংহলৈ নিজৰ ভগ্নী 'মঙলদৈ কুঁৱৰী'ক বিয়া দিছিল। ভিনিহিয়েক প্ৰতাপ সিংহই বলিনাৰায়ণৰ গাত ৰাজ লক্ষণ দেখি, এগৰাকী সোণাৰী ছোৱালী বিয়া দি যৌতুকৰূপে বলি নাৰায়ণক দৰঙী ৰাজ্য প্ৰদান কৰে। প্ৰতাপ সিংহ স্বৰ্গদেৱে দৰঙৰ চাৰিসীমা নিৰ্ধাৰণ কৰি, বলি নাৰায়ণক ধৰ্মনাৰায়ণ নাম দি দৰং ৰাজ্যৰ ৰাজপাটত বহুৱায়।

ৰাজ্য দিলো আজি ধৰি চতুৰ্দ্দিশে সীমা কৰি

সজে সজে কৈলোহো নিশ্চয়।

পূৰ্বতে ভৈৰৱী নদী পশ্চিমে কৰ্ভিয়া নদী

যাক সেবি নৰ মুক্ত হয়।।

উত্তৰে সামৰি গিৰি দক্ষিণত পৰ্বত চিৰি

এহি চতুৰ্হদে দিলো ভূমি।

উৎসৰ্গিলো তিলে কুশে ভূঞ্জিবাহা মহাসুখে

সত্যে সত্যে ভূঞ্জিবাহা তুমি।।

দৰং ৰাজবংশাৰলী

এনেদৰে আহোম স্বৰ্গদেউ প্ৰতাপ সিংহৰ মধ্যস্থতাত ১৬১৪ খ্ৰীষ্টাব্দৰ পৰা দৰঙত কোচ ৰাজবংশৰ পৰা ফালি অহা ফৈদৰ শাসন আৰম্ভ হয়। কোচ ৰাজবংশৰ এই ফৈদক দৰঙী ফৈদ নামে জনা যায়। দৰঙী ফৈদে শাসন কৰা ৰাজ্যই দৰঙী ৰাজ্য নামেৰে প্ৰখ্যাত। সপ্তদশ শতিকাৰ আগভাগৰ পৰা অষ্টাদশ শতিকাৰ আগভাগলৈ দৰঙী ৰাজবংশই ৰাজত্ব কৰিছিল।

কোনো এখন দেশৰ ভাষা, সাহিত্য আৰু সংস্কৃতিৰ বিকাশত সেই দেশৰ শাসক অথবা ৰাজন্যবৰ্গৰ অৰিহণাই এক বিশেষ ভূমিকা পালন কৰে।

শাসকৰ পৃষ্ঠপোষকতাই একোটা জাতিয়ে একোটা যুগৰ সৃষ্টি কৰিবলৈ সক্ষম হয়। উদাহৰণস্বৰূপে ভাৰতবৰ্ষত গুপ্তযুগত দ্বিতীয় চন্দ্ৰগুপ্তৰ (৩৭৫-৪১৫ খ্ৰীষ্টাব্দত) শাসন কালত গণিত, জ্যোতিৰ্বিদ্যা, বিজ্ঞান, ধৰ্ম, দৰ্শন আদিৰ অভূতপূৰ্ব বিকাশ সাধন হয়। এনে উল্লেখযোগ্য সাফল্যৰ বাবে এই কালছোৱাক স্বৰ্ণযুগ আখ্যা দিয়া হয়। তেনেদৰে ইংলেণ্ডৰ বাণী প্ৰথম এলিজাবেথৰ (১৫৫৮-১৬০৩ খ্ৰীষ্টাব্দত) ৰাজত্বকালত ইংলেণ্ডৰ ইতিহাসৰ স্বৰ্ণ যুগ। অসমীয়া ভাষা সাহিত্যৰ প্ৰাচীন ইতিহাসলৈ লক্ষ্য কৰিলে দেখা যায় যে খ্ৰীষ্টপূৰ্ব চতুৰ্দশ শতিকাত বৰাহী ৰজা মহামাণিক্য, কমতেশ্বৰ দুৰ্লভ নাৰায়ণ, ইন্দ্ৰ নাৰায়ণ, তাম্ৰধনু আদি ৰজাৰ অনুপ্ৰেৰণাত অসমীয়া কাব্য সাহিত্যৰ এক শক্তিশালী ধাৰাই ঠন ধৰি উঠে। পৰৱৰ্তী সময়ত কোচ ৰজাজন নৰনাৰায়ণ আৰু তেওঁৰ ভাতৃ চিলাৰায়ৰ পৃষ্ঠপোষকতাত শংকৰ-মাধৱ, ৰামসৰস্বতী, পীতাম্বৰ সিদ্ধান্ত বাগীশ আদি বিদ্বানসকলে সাহিত্য কৰ্মৰ জৰিয়তে অসমীয়া ভাষা-সাহিত্যক টনকিয়াল কৰি তোলে। বিজয় নগৰত ৰাজধানী পাতি ৰাজ্য শাসন কৰা কোচ হাজোৰ ৰজা ৰঘুদেৱ নাৰায়ণৰ ৰাজ্যতো ৰাজ-পৃষ্ঠপোষকতাত সাহিত্য-সংস্কৃতিৰ চৰ্চা অব্যাহত আছিল।

আহোমৰ ৰাজত্বকালত স্বৰ্গদেউসকলৰ পৃষ্ঠপোষকতাত ৰংপুৰক কেন্দ্ৰ কৰি অসমীয়া সাহিত্য-সংস্কৃতিৰ উল্লেখযোগ্য বিকাশ ঘটে। বিশেষকৈ স্বৰ্গদেউ জয়ধ্বজ সিংহৰ ৰাজত্বকালৰ পৰা ৰুদ্ৰ সিংহ, শিৱ সিংহ, বৰ ৰজা ফুলেশ্বৰী, ৰাজেশ্বৰ সিংহ, কমলেশ্বৰ সিংহ স্বৰ্গদেউৰ পৃষ্ঠপোষকতাত অসমীয়া সাহিত্যই বৈচিত্ৰ্যময় ৰূপত বিকাশ লাভ কৰে। স্বৰ্গদেউসকলৰ লগতে ৰাজ বিষয়াসকলেও সাহিত্যিকসকলক অনুপ্ৰেৰণা আৰু অৰ্থসাহায্য আগবঢ়াইছিল (সত্যেন্দ্ৰনাথ শৰ্মা : অসমীয়া সাহিত্যৰ ইতিবৃত্তঃ ১৮৬)। তেওঁলোকে নিজেও সাহিত্য সৃষ্টি কৰিছিল। প্ৰাচীন অসম মুলুকৰ বৰাহী, কমতা, কোচ আৰু আহোম ৰাজ্যৰ ৰজাসকলৰ দৰেই দৰঙী ৰাজ্যৰ প্ৰথম ৰজা ধৰ্ম নাৰায়ণে আছিল। এগৰাকী বিদ্যুৎসাহী বিদ্যানুৰাগী লোক। মহাপৰাক্ৰমী, প্ৰজাৰ হকে সাহিত্যানুৰাগী কোচ ৰজা নৰনাৰায়ণ আৰু ভাতৃ চিলাৰায়ৰ লগতে কোচ হাজোৰ ৰজা ৰঘুদেৱ নাৰায়ণৰ উত্তৰসূৰি হিচাপে দৰঙী ৰজা ধৰ্মনাৰায়ণে তেওঁৰ ৰাজ্যত সাহিত্য-সংস্কৃতি চৰ্চাৰ এক বাতাবৰণ গঢ়ি তোলে।

ধৰ্ম নাৰায়ণৰ ৰাজ্যৰ ৰাজধানী পোনতে খেৰখেৰীয়াত আছিল যদিও ১৬১৬ খ্ৰীষ্টাব্দত তেওঁ ৰাজধানী স্থানান্তৰিত কৰে হাউলী মোহনপুৰলৈ। নতুন ৰাজধানীলৈ কেইবাগৰাকী কবি-সাহিত্যিকৰ আগমন ঘটে। কোচ বংশৰ পূৰ্বৰ পৰম্পৰা অটুট ৰাখি ধৰ্ম নাৰায়ণে এইসকল বিদ্বানক সাহিত্য সৃষ্টিৰ বাবে অনুপ্ৰেৰণা যোগায়। ধৰ্ম নাৰায়ণৰ পিছত ক্ৰমে মহীন্দ্ৰ নাৰায়ণ বা সুন্দৰ নাৰায়ণ, চন্দ্ৰ নাৰায়ণ, ইন্দ্ৰ নাৰায়ণকে আদি কৰি কেইবাজনো ৰজাই দৰঙী ৰাজ্য শাসন কৰাৰ লগতে সাহিত্য সৃষ্টিৰ ক্ষেত্ৰত বিশেষ অৰিহণা আগবঢ়ায়। সপ্তদশ শতিকাৰ আগভাগৰ পৰা ঊনবিংশ শতিকাৰ আগভাগলৈ এই বংশৰ ৰজাসকলে ৰাজত্ব কৰে। হেমচন্দ্ৰ গোস্বামীৰ সম্পাদিত দৰং ৰাজবংশাৱলীৰ পাতনিত দীনেশ্বৰ শৰ্মাৰ মঙ্গলদৈৰ বুৰঞ্জীত এই ৰজাসকলৰ বংশলতা সন্নিবিষ্ট হৈছে। দৰঙী ৰজাৰ ৰাজগুৰু স্বৰ্গীয় জগন্নাথ ভট্টাচাৰ্য্যই প্ৰণয়ন কৰা অপ্ৰকাশিত গ্ৰন্থ ‘কোচ ৰজাৰ ৰাজত্ব আৰু স্বৰ্গীয় পীতাম্বৰ সিদ্ধান্ত বাগীশৰ বুৰঞ্জীত’ দৰঙী ফৈদৰ বংশলতা পোৱা যায়। এই সম্পৰ্কত পৰমানন্দ ৰাজবংশীয়ে ৰাজ-পৃষ্ঠপোষকতাত অসমীয়া সাহিত্য শীৰ্ষক গ্ৰন্থত আলোচনা আগবঢ়াইছে। সপ্তদশ শতিকাৰ আদি ভাগৰ পৰা সুদীৰ্ঘকাল ৰাজত্ব কৰা দৰঙী ৰজাসকলে কেইবাগৰাকীও কবি-সাহিত্যিকৰ পৃষ্ঠপোষকতাৰে অনুপ্ৰাণিত কৰি অসমীয়া ভাষা-সাহিত্যৰ উন্নতি সাধন কৰে। কৃষ্টি সংস্কৃতিৰ বিকাশতো কেইবাগৰাকীমান দৰঙী ৰজাই বিশেষ উদ্যোগ লোৱা দেখা যায়। সাহিত্য-সংস্কৃতিৰ বিকাশত অৰিহণা যোগোৱা দৰঙী ৰজাসকলৰ ভিতৰত ধৰ্ম নাৰায়ণ, মহীন্দ্ৰ নাৰায়ণ বা সুন্দৰ নাৰায়ণ, চন্দ্ৰ নাৰায়ণ, হয়নাৰায়ণ, সমুদ্ৰ নাৰায়ণ, জগত নাৰায়ণ আৰু গন্ধৰ্ব নাৰায়ণৰ নাম বিশেষভাৱে উল্লেখযোগ্য। এই ৰজাসকলৰ পৃষ্ঠপোষকতাত ৰচিত সাহিত্যসমূহক পৰমানন্দ ৰাজবংশীয়ে তেওঁৰ গৱেষণামূলক গ্ৰন্থত সাতভাগত ভাগ কৰি আলোচনা কৰিছে। এই বিভাগসমূহে দৰঙী ৰাজ-পৃষ্ঠপোষকতাত ৰচিত সাহিত্যৰ বহুখা বিভক্ত ৰূপৰ্বিক যথার্থ ৰূপত দাঙি ধৰিছে-

- (ক) মহাভাৰতীয় সাহিত্য
- (খ) পুৰাণ সাহিত্য
- (গ) পাঁচালী সাহিত্য

- (ঘ) বংশাবলী সাহিত্য
- (ঙ) ব্যৱহাৰিক সাহিত্য
- (চ) লোক ৰঞ্জক সাহিত্য আৰু
- (ছ) চৰিত সাহিত্য

(ক) মহাভাৰতীয় সাহিত্য : ধৰ্ম নাৰায়ণে দৰঙী ৰাজ্যৰ ৰাজ সিংহাসন লাভ কৰাৰ পিছত নানা গুণী-জ্ঞানী পণ্ডিতে তেওঁৰ ৰাজসভা শুৱনি কৰিছিল। নৰনাৰায়ণ-চিলাৰায়ৰ আদৰ্শৰ দ্বাৰা অনুপ্রাণিত ধৰ্মনাৰায়ণে বধুনাৰায়ণৰ ৰাজগুৰু পীতাম্বৰ সিদ্ধান্ত বাগীশক তেওঁৰ ৰাজসভাত ৰাজ পুৰোহিত হিচাপে প্ৰতিষ্ঠা কৰিছিল। ধৰ্ম নাৰায়ণৰ ৰাজসভাত স্থান লাভ কৰা আন এগৰাকী পণ্ডিত আছিল ৰামসৰস্বতী, কোচৰজা নৰনাৰায়ণৰ সভা কবি আৰু মহাভাৰতীয় সাহিত্যৰ ৰচকৰূপে অসমীয়া ব্যাস নামেৰে পৰিচিত ৰাম সৰস্বতীয়ে দৰঙী ৰজাৰ পৃষ্ঠপোষকতাত সাহিত্য ৰচনা কৰি সাহিত্যৰ ভঁৰাল চহকী কৰে।

“শুনিয়েক আজ্ঞা মোৰ ৰাম সৰস্বতী
ভাৰতৰ পদ তুমি কৰিয়ো সম্প্ৰতি”

নৰনাৰায়ণৰ এই আদেশ শিৰে তুলি ৰাম সৰস্বতীয়ে প্ৰবাহিত কৰা মহাভাৰতীয় সাহিত্যৰ ধাৰাটো অব্যাহত ৰখাৰ বাবে দৰঙী ৰজা ধৰ্ম নাৰায়ণে উদ্যোগ লয়। ফলস্বৰূপে দৰঙী ৰাজ্যত বিভিন্ন সময়ত কেইবাগৰাকী কবি-সাহিত্যিকে মহাভাৰতীয় সাহিত্য ৰচনাৰে বৰঙনি আগবঢ়ায়।

ৰাম সৰস্বতীয়ে ধৰ্ম নাৰায়ণৰ পৃষ্ঠপোষকতাত সিন্ধুযাত্ৰা, উদ্যোগ পৰ্ব, ভীষ্ম পৰ্ব আৰু দ্ৰোণ পৰ্ব ৰচনা কৰে। সিন্ধু যাত্ৰা তেওঁ ৰজা ধৰ্ম নাৰায়ণৰ আজ্ঞাত ৰচনা কৰিছিলঃ শ্ৰীধৰ্ম নাৰায়ণ, আজ্ঞা পায় বঙ্গমন ৰচিলো পয়াৰ ইটো মনত পৰিল যিটো।

উদ্যোগ পৰ্বতো তেওঁ ধৰ্ম নাৰায়ণৰ নামোল্লেখ কৰিছে। ভীষ্ম পৰ্বত ৰাম সৰস্বতীয়ে ৰজাজনৰ যশ কীৰ্তন কৰিছে—

নৃপতি জে ধৰ্ম নাৰায়ণ যাৰ যশ সবে গায়
স্বদেশী বিদেশী সবে প্ৰজা।
ধৰ্মত প্ৰশান্ত কাম ধৰ্ম নাৰায়ণ নাময
থৈলা স্বৰ্গ নাৰায়ণ ৰাজা।।

ধৰ্ম নাৰায়ণৰ ৰাজসভাতে তেওঁ পুত্ৰ গোপীনাথৰ সহযোগত দ্ৰোণ পৰ্ব ৰচনা কৰে। ধৰ্ম নাৰায়ণৰ মৃত্যুৰ পিছত পুত্ৰ মহিন্দ্ৰ নাৰায়ণ দৰঙী ৰাজ্যৰ ৰজা হয়। মহিন্দ্ৰ নাৰায়ণক সুন্দৰ নাৰায়ণ আৰু মকৰধ্বজ নামেৰেও জনা যায়। ৰজা মকৰধ্বজৰ পৃষ্ঠপোষকতাত ৰাম সৰস্বতীয়ে 'সাবিত্ৰী উপাখ্যান' ৰচনা কৰে। সাবিত্ৰী উপাখ্যানত তেওঁ মকৰধ্বজ ৰজাৰ গুণানুকীৰ্তন কৰিছে—

সৰ্ব গুণে গুণাকৰ নৃপতি মকৰধ্বজ

ৰঘুদেস্ত নৃপতিৰ নাতি।

যাৰ গুণে ধৰণীত প্ৰজাৰ আনন্দ চিত

সৰ্বদায় মহন্তৰ ৰতি।।

মূল মহাভাৰতৰ 'পতিব্ৰতা মহাত্ম্য পাবৰ্ণ' অধ্যায়ৰ আলমত ৰচনা কৰ সাবিত্ৰী উপাখ্যানত ১৫৩ স্তৰক আছে। কাব্যখনত কৃষ্ণৰ মুখে সতী সাবিত্ৰীৰ আখ্যান ব্যক্ত কৰা হৈছে। বিষ্ণুৰ মহাত্ম্য ধ্বনিত কাব্যখনত কাহিনীৰ উপস্থাপনত কাব্যখন ৰাম সৰস্বতীৰ শেষ ৰচনা কবিৰ মৌলিকতা প্ৰকাশ পাইছে।

ৰাম-সৰস্বতীৰ সুযোগ্য পুত্ৰ গোপীনাথ পাঠকে ৰজা ধৰ্ম নাৰায়ণৰ পৃষ্ঠপোষকতাত মহাভাৰতীয় সাহিত্য ৰচনা কৰে। তেওঁৰ 'স্বৰ্গাৰোহণ পৰ্ব' নামৰ কাব্যখন ধৰ্ম নাৰায়ণৰ ৰাজসভাত ৰচিত। তেওঁ পিতৃ ৰাম সৰস্বতীৰ সহযোগত যুটীয়াভাৱে সভা পৰ্ব ৰচনা কৰে। ১০৭৩ স্তৰকযুক্ত এই কাব্যখনৰ প্ৰায় ২৬০টা স্তৰক গোপীনাথ পাঠকৰ দ্বাৰা ৰচিত। এই কাব্যখনত দৰঙী ৰজাৰ উল্লেখ নথকালৈ চাইহে দৰঙী ৰাজ পৃষ্ঠপোষকতাত ৰচিত কাব্য নহয় বুলি পণ্ডিতসকলে স্থাৱৰ কৰিছে। কিন্তু দ্ৰোণ পৰ্ব দৰঙী ৰজা ধৰ্ম নাৰায়ণৰ পৃষ্ঠপোষকতাত ৰচিত। পিতৃ ৰাম সৰস্বতী আৰু দামোদৰৰ সহযোগত গোপীনাথ পাঠকে কাব্যখন ৰচনা কৰে।

দৰঙী ৰজা মকৰধ্বজৰ পৃষ্ঠপোষকতাত মহাভাৰতীয় সাহিত্য ৰচনা কৰি বিশেষ অৱদান আগবঢ়োৱা আন এগৰাকী কবি দামোদৰ দ্বিজ। তেওঁ 'শল্য পৰ্ব'ৰ পদ ভাঙনি কৰিছিল। কাব্যখনত কবিজনাই আত্ম পৰিচয় দিয়া নাই। কিন্তু তেওঁ ৰজা মকৰধ্বজৰ আনুগত্য স্বীকাৰ কৰিছে। তিনিটা অধ্যায়ত বিভক্ত দামোদৰ দ্বিজৰ শল্য পৰ্বত কুৰুক্ষেত্ৰ যুদ্ধত সেনাপতিৰূপে পৰাক্ৰমেৰে

যুদ্ধ কৰি মৃত্যুবৰণ কৰা শল্যৰ বিৱৰণ দাঙি ধৰিছে। পৰম্পৰাগত প্ৰবাদ পটন্তৰ আৰু ছন্দ অলংকাৰৰ প্ৰয়োগেৰে দামোদৰ দ্বিজৰ শল্য পৰ্ব এক উল্লেখযোগ্য কবি কৰ্ম।

কবি গোবিন্দ মিশ্ৰ কৃত 'শ্ৰীকৃষ্ণ গীতা' এখনি অতি জনপ্ৰিয় গ্ৰন্থ। গোবিন্দ মিশ্ৰৰ আন এখন উল্লেখযোগ্য গ্ৰন্থ হ'ল ভট্টদেৱ ৰচিত সংস্কৃত ভক্তি বিবেকৰ পদানুবাদ। এইগৰাকী জনপ্ৰিয় কবিৰ পৰিচয় সম্পৰ্কত বিশেষ তথ্য পোৱা নাযায়। পণ্ডিতসকলৰ মত অনুসৰি গোবিন্দ মিশ্ৰ দৰঙী ৰাজ্যৰ অন্তৰ্গত ডলাৰ লোক আৰু দৰঙী ৰজা বলিনাৰায়ণৰ (ধৰ্ম নাৰায়ণ)ৰ ৰাজ পৃষ্ঠপোষকতাত তেওঁ সাহিত্য ৰচনা কৰিছিল (দীনেশ্বৰ শৰ্মা : মঙ্গলদৈৰ বুৰঞ্জী : পৃষ্ঠা ৮৪)। এইগৰাকী দৰঙী কবিয়ে শ্ৰীমদ্ভগৱদ্গীতাৰ দৰে দাৰ্শনিক তত্ত্বসমূহ অতি সহজ-সৰলকৈ পদত দাঙি ধৰিব পৰাতেই গোবিন্দ মিশ্ৰৰ বিশেষ কৃতিত্ব প্ৰকাশ পাইছে। দৰঙী ৰাজসভাত ৰচিত মহাভাৰতীয় সাহিত্যসমূহৰ মাজত গোবিন্দ মিশ্ৰৰ 'শ্ৰীকৃষ্ণ গীতা' এক অনন্য সৃষ্টি।

সাগৰ খড়ি দৈৱজ্ঞ দৰঙী ৰজাৰ ৰাজসভাৰ এগৰাকী বিশিষ্ট পণ্ডিত। প্ৰকৃত নাম চন্দ্ৰ শেখৰ। গণনাৰ দ্বাৰা তেওঁ নদীৰ পানীত কেতিয়া কি উটি আহিব বা কিমান দকৈ খান্দিলে পুখুৰীৰ পানী ওলাব ইত্যাদি কথা কৈ দিব পাৰিছিল। ৰজা ধৰ্ম নাৰায়ণে চন্দ্ৰশেখৰৰ গণনাৰ দ্বাৰা একাধিকবাৰ উপকৃত হৈ তেওঁক সাগৰখড়ি উপাধি প্ৰদান কৰে আৰু ভূমি দান কৰে। (দীনেশ্বৰ শৰ্মা : মঙ্গলদৈৰ বুৰঞ্জী, পৃষ্ঠা ৮৫) ৰজা ধৰ্ম নাৰায়ণৰ ৰাজ পৃষ্ঠপোষকতাত তেওঁ মহাভাৰতৰ আধাৰত 'কুৰ্মৱলী বধ' কাব্য ৰচনা কৰে। কাব্যখনত কবিয়ে আত্ম পৰিচয় বা পৃষ্ঠপোষক ৰজাৰ নাম উল্লেখ কৰা নাই। কৌৰৱৰ অশ্বমেধ যজ্ঞৰ ঘোঁৰা কুৰ্মৱলীৰ দ্বাৰা আটক, কৌৰৱৰ লগত কুৰ্মৱলীৰ মহা পৰাক্ৰমেৰে কৰা যুদ্ধ, কুৰ্মৱলীৰ মৃত্যু আৰু গান্ধাৰীৰ নিৰ্দেশত কৌৰৱৰ অশ্বমেধ যজ্ঞৰ স্থগিতকৰণ এয়েই কাব্যখনৰ মূল বিষয়বস্তু। কাব্যখনত ৰাম সৰস্বতীৰ বধ কাব্যৰ প্ৰভাৱ অনুভূত হয়। যুদ্ধ কাব্যখনত কবিয়ে সম-সাময়িক সমাজ জীৱনৰ ছবি পুংখানুপুংখভাৱে দাঙি ধৰিছে। ছন্দ অলংকাৰৰ যথার্থ প্ৰয়োগ দেখা যায়। নাম ধৰ্মৰ শ্ৰেষ্ঠত্ব প্ৰতিপাদনৰ চেষ্টা, কাব্যখনৰ অন্যতম লক্ষণীয় দিশ--

“কলিৰ যুগত জানা নামেহে প্ৰধান।

সত্য কৰি কহো নাম বিনে নাই আন।।”

দৰঙী ৰাজ-পৃষ্ঠপোষকতাত মহাভাৰতীয় সাহিত্য ৰচনা কৰা আন এগৰাকী কবি শুভনাথ দ্বিজ। তেওঁ হয় নাৰায়ণৰ ৰাজসভাৰ কবি বুলি পণ্ডিতসকলে অনুমান কৰে ‘ধৰ্ম সংবাদ’ পুথিত কবিয়ে লিখিছে—

“শিৱ সিংহ ধৰ্ম ৰাজা হয় নাৰায়ণ।

কৰন্তু ভকতি সদা কৃষ্ণৰ চৰণ।।”

ধৰ্ম সংবাদ

শুভ নাম দ্বিজৰ নামত দুখন পুথি পোৱা যায়— ধৰ্ম সংবাদ আৰু স্বপ্নাধ্যায়।

স্বপ্নাধ্যায় : পুথিৰ এটি ভনিতাত কবিয়ে লিখিছে—

“ভনে দ্বিজে শুভ নাথে বৈৰত পুৰাণ।

সুণা সৰ্বজন আৰু হুয়া সাৱধান।।

ধৰ্ম ৰাজা হয় নাৰায়ণ নৃপবৰ।

কলি যুগে নৃপতি মহন্ত বীৰবৰ।।

‘ধৰ্ম সংবাদ’ কাব্যখনি মহাভাৰতৰ অশ্বমেধ পৰ্বৰ আধাৰত ৰচিত। কাব্যখনৰ ভাষা সাবলীল। কাব্যখনৰ মূল বিষয় নীতিমূলক যদিও ভাষা সুললিত। যুধিষ্ঠিৰৰ পিতৃ ধৰ্ম ৰাজৰ চণ্ডালৰ বেষত যুধিষ্ঠিৰক সাক্ষাৎ আৰু যুধিষ্ঠিৰৰ লগত ধৰ্মৰাজৰ বাৰ্তালাপ। পিছত প্ৰকৃত পৰিচয়েৰে ধৰ্মৰাজৰ লগত পাণ্ডৱৰ মিলন আৰু উপদেশ প্ৰদান কাব্যখনৰ মূল বিষয়।

(খ) পুৰাণ সাহিত্য : অসমীয়া সাহিত্যৰ বুৰঞ্জী অধ্যয়ন কৰিলে দেখা যায় যে প্ৰাক্‌শংকৰী আৰু শংকৰী যুগত ভাগৱত পুৰাণ ব্যতিৰেক আন পুৰাণ সাহিত্যৰ চৰ্চা প্ৰায় হোৱা নাছিল। বৈষ্ণৱ ভাবাদৰ্শৰ সৰ্বতোক প্ৰভাৱৰ বাবেই, বৈষ্ণৱসকলৰ প্ৰধান ধৰ্ম শাস্ত্ৰ ভাগৱত পুৰাণে বিশেষ গুৰুত্ব লাভ কৰিছিল। বৈষ্ণৱ ভাবাদৰ্শৰ তীব্ৰতা হুঁস আৰু ৰসজ্ঞজনৰ ৰুচিৰ পৰিৱৰ্তনে পৰৱৰ্তী সময়ত আন আন পুৰাণৰ প্ৰতিও সাহিত্যিকসকলক আগ্ৰহী কৰি তোলে। সপ্তদশ শতিকাত দৰঙী ৰজা ধৰ্ম নাৰায়ণৰ ৰাজ্যতো পুৰাণৰ চৰ্চা আৰম্ভ হয়।

ভাগৱত পুৰাণৰ আধাৰত ৰচিত গ্ৰন্থৰেই ইয়াৰ শুভাৰম্ভ কৰে ৰাম সৰস্বতীয়ে। ৰজা ধৰ্মনাৰায়ণৰ পৃষ্ঠপোষকতাত তেওঁ জয়দেৱৰ ‘গীত গোবিন্দৰ’ পদ ভাঙনি কৰে যাক ‘জয়দেৱ কাব্য’ নামেৰে জনা যায়। (সতেন্দ্ৰ নাথ শৰ্মা : অসমীয়া সাহিত্যৰ সমীক্ষাত্মক ইতিবৃত্ত, পৃষ্ঠা : ১৪৮)

“জয়দেৱ কাব্য নামে বিৰচিলো সাৰ।

শুৰুধৰজ ৰাজটীকা কৰিলন্ত জাৰ।।

ৰাধা কৃষ্ণৰ পূৰ্ব-ৰাগ, বিৰহ, উৎকণ্ঠা আদিৰে মূল কাব্যত প্ৰেমৰ প্ৰাধান্য থাকিলেও ৰাম-সৰস্বতীৰ কাব্যত ভক্তি ৰসৰ প্ৰাধান্য পৰিলক্ষিত হয়।

‘ব্ৰহ্ম বৈৰত’ পুৰাণৰ পদ ভাঙনি দৰঙী ৰাজ-পৃষ্ঠপোষকতাত সৃষ্ট পুৰাণ ভিত্তিত অন্যতম সাহিত্য কৰ্ম। ৰজা হয় নাৰায়ণৰ আজ্ঞানুসৰি ৰতিকান্ত দ্বিজৰ নেতৃত্বত চাৰিগৰাকী কবিয়ে মূল সংস্কৃত ‘ব্ৰহ্ম বৈৰত’ পুৰাণৰ পদ ভাঙনিত তেওঁলোকৰ সৃষ্টিশীল প্ৰতিভাৰ স্বাক্ষৰ দেখুৱাবলৈ সক্ষম হৈছে। হয় নাৰায়ণ (১৭৮৭-১৮০৬) দৰঙী ৰাজ্যৰ শেষ সময়ৰ ৰজা। সাহিত্য ৰসিক ৰজাগৰাকীয়ে উক্ত পুৰাণৰ অসমীয়া পদৰ সন্ধান কৰি ব্যৰ্থ হয় আৰু নিজৰ ৰাজ্যৰ ব্ৰাহ্মণ কবিসকলক পুৰাণখনৰ পদানুবাদ কৰিবলৈ আজ্ঞা দিয়ে। সেই আজ্ঞানুসৰি ৰতিকান্ত দ্বিজৰ নেতৃত্বত মহাকাব্যখনৰ পদানুবাদৰ কাম আৰম্ভ হয় আৰু ১৭১৭ শকত (১৭৯৫ খ্ৰীষ্টাব্দত) শেষ হয় (সতেন্দ্ৰ নাথ শৰ্মা : অসমীয়া সাহিত্যৰ সমীক্ষাত্মক ইতিবৃত্ত, পৃষ্ঠা: ১৯৯)।

(গ) পাঁচালী সাহিত্য : পাঁচালী সাহিত্যৰ উদ্ভৱ হৈছিল পঞ্চদশ শতিকাৰ শেষ আৰু ষোড়শ শতিকাৰ আদি ভাগত। বৈষ্ণৱ ভাবাদৰ্শৰ পৰা মুক্ত এই পাঁচালী সাহিত্য বিশেষভাৱে ওজাপালি অনুষ্ঠানৰ বাবে ৰচিত হৈছিল। সেয়ে ইয়াক ওজাপালি সাহিত্য বুলিব পাৰি (সতেন্দ্ৰ নাথ শৰ্মা : অসমীয়া সাহিত্যৰ সমীক্ষাত্মক ইতিবৃত্ত, পৃষ্ঠা: ৯৩)। ওজাপালি দুই প্ৰকাৰৰ— বিয়াহৰ ওজাপালি আৰু সুকনান্নি ওজাপালি। ৰামায়ণ, মহাভাৰত, ভাগৱত পুৰাণ আদিৰ কাহিনী সম্বলিত ওজাপালিক বিয়াহৰ ওজাপালি আৰু মনসাৰ মাহাত্ম্যসূচক ওজাপালিক সুকনান্নি ওজাপালি বুলি জনা যায়। এই দুই শ্ৰেণীৰ ওজাপালিৰ বিকাশত দৰঙী ৰাজবংশৰ ভূমিকা উল্লেখযোগ্য। প্ৰথম দৰঙী ৰজা ধৰ্মনাৰায়ণে প্ৰজাসকলৰ বহুমুখী প্ৰতিভাৰ বিকাশৰ ক্ষেত্ৰত বিশেষ উদ্যোগ

লৈছিল। ওজাপালি অনুষ্ঠানৰ লগত জড়িত কলা-কুশলীসকলক মাটি-বাৰী দি উৎসাহিত কৰিছিল। ধৰ্ম নাৰায়ণৰ ৰাজত্বকালতে সুকবি নাৰায়ণদেৱে পদ্মপুৰাণ ৰচনা কৰে। পাঁচালি কবিসকলৰ ভিতৰত সুকবি নাৰায়ণ দেৱৰ জনপ্ৰিয়তা শীৰ্ষত। ৰজা ধৰ্মনাৰায়ণৰ পৃষ্ঠপোষকতাত ৰচিত সুকবি নাৰায়ণ দেৱৰ পদ্মপুৰাণ এখনি বৃহৎ গ্ৰন্থ। গীতপ্ৰধান এই কাব্যখনে দৰঙৰ লগতে কামৰূপ, গোৱালপাৰা, আদি অঞ্চলতো প্ৰভূত জনপ্ৰিয়তা লাভ কৰিছিল। ধৰ্মনাৰায়ণ ৰজাই পদ্মপুৰাণৰ গীতৰ ৰসত আপ্লুত হৈ তেওঁক 'সুকবি' উপাধিৰে ভূষিত কৰে (দীনেশ্বৰ শৰ্মা : মঙ্গলদৈৰ বুৰঞ্জী পৃষ্ঠাঃ ৯১)। পদ্মপুৰাণ অসমীয়া বাংলা উভয় ভাষাতে অতি জনপ্ৰিয় (অজিত কুমাৰ বন্দোপাধ্যায় : বাংলা সাহিত্যৰ সম্পূৰ্ণ ইতিহাস পৃষ্ঠা : ৫৯)। যাৰ বাবে বহু সময়ত পদ্ম পুৰাণৰ হাতে লিখা সাঁচিপতীয়া পাঠত সুকবি নাৰায়ণৰ জন্মভূমি মৈমনসিং জিলা বুলি প্ৰক্ষিপ্ত সোমাই পৰাও দেখা যায়।

দৰঙী ৰাজ্যৰ শেষ কালছোৱাত জয়ৰাম নামৰ এগৰাকী অজ্ঞাত কবিৰ 'শীতলা' বা 'শীতলা দেৱীৰ স্তব' নামৰ এখনি পুথি ৰচিত হয়। দৰং অঞ্চলত শীতলা পূজা অতীতৰে পৰা বহুলভাৱে প্ৰচলিত। দীনেশ্বৰ শৰ্মাই 'মঙ্গলদৈৰ বুৰঞ্জী'ত জয়ৰামক দৰঙী ৰজাৰ আমোলৰ কবি বুলি কৈছে (পৃষ্ঠাঃ ৮৪)। মহেশ্বৰ নেওগে অসমীয়া সাহিত্যৰ ৰূপৰেখাত কবিগৰাকীৰ সম্পূৰ্ণ নাম জয়ৰাম দাস বুলি কৈছে (পৃষ্ঠা : ২১১)। যি কি নহওক, জয়ৰাম ৰচিত 'শীতলা' এখনি সৰু কাব্য হ'লেও কাব্যখনে অসমীয়া পাঁচালি কাব্যৰ ভঁৰাল চহকী কৰিছে।

(ঘ) **বংশাৱলী সাহিত্য** : 'বংশাৱলী সাহিত্য'সমূহ অসমীয়া ভাষা সাহিত্যৰ ইতিহাসত এক অমূল্য সম্পদ। দৰঙী ৰজাৰ ৰাজ-পৃষ্ঠপোষকতাত তিনিখন বংশাৱলী ৰচিত হৈছিল, য'ত কোচ ৰাজবংশৰ উৎপত্তি আৰু অভ্যুত্থান বিবৃত হৈছে। লগতে আহোম স্বৰ্গদেউ, বিষয়াসকল, মোগল আৰু দাঁতি কাষৰীয়া ৰাজনৈতিক শক্তিসমূহৰো বিভিন্ন কাৰ্যাৱলীৰ বৰ্ণনা সন্নিৱিষ্ট হৈছে। তদানীন্তন সময়ৰ সামাজিক, ৰাজনৈতিক, সাংস্কৃতিক আদি দিশৰ উল্লেখৰে বংশাৱলীসমূহ মেটমৰা আৰু সেয়ে ইয়াৰ ঐতিহাসিক গুৰুত্ব অৱশ্যে স্বীকাৰ্য। দৰঙী ৰজাসকলৰ ৰাজত্বকালত ৰচিত বংশাৱলী, দৰং ৰাজ

বংশাৱলী আৰু গন্ধৰ্ব নাৰায়ণৰ বংশাৱলী।

দৰঙী কোচৰজা হয় নাৰায়ণৰ ৰাজত্বকালত ৰতিকান্ত দ্বিজে এখন বংশাৱলী ৰচনা কৰি খড়গ নাৰায়ণ কোঁৱৰক উপহাৰ দিয়ে। এই বংশাৱলীখনকেই ‘খড়গ নাৰায়ণৰ বংশাৱলী’ নামেৰে জনা যায়। বংশাৱলীখন ৰচনাৰে সময় ১৭২২ শক বুলি ‘কোচ বিহাৰেৰ ইতিহাস-প্ৰথমখণ্ডত’ পোৱা যায় (পৃষ্ঠা ৪১৪)। খাঁ চৌধুৰী আমানত উল্লা আছামদে এই প্ৰসাদত কৈছে—

“১৭২২ শকে (১৮০০ খ্ৰীষ্টাব্দ) দৰঙতে ৰাজকুমাৰ খড়গনাৰায়ণেৰ আদেশে ৰতিকান্ত কৰ্তৃক অসমীয়া ভাষাই পদে বিৰচিত”

বংশাৱলীখনত কোচ ৰাজ বংশৰ উৎপত্তিৰ পৰা মাধৱ নাৰায়ণ কোঁৱৰলৈকে কোচ ৰাজবংশৰ বিস্তৃত বৰ্ণনা পোৱা যায়। ইয়াত কোচ ৰাজবংশৰ দৰঙী ফৈদৰ পুংখানুপুংখ বিৱৰণ পোৱা যায় যদিও লক্ষ্মীনাৰায়ণৰ পিছৰ কোচ বিহাৰৰ ৰজাসকলৰ কোনো বিশেষ উল্লেখ পোৱা নাযায়।

ৰজা সমুদ্ৰ নাৰায়ণৰ আঞ্জানুসৰি বলদেৱ সূৰ্যখড়ি দৈৱজুই ১৮০৬ খ্ৰীষ্টাব্দত ‘দৰং ৰাজবংশাৱলী’ ৰচনা কৰে—

“সমুদ্ৰ নাৰায়ণ বোলে মোৰ বাক্য সুন।

মোৰ উৰ্দ্ধ পুৰুষে কৰিছে যত গুণ।।

কেনমতে বিশ্ব সিংহ নৰপতি ভৈলা।

কাহাৰ বংশত আহি উৎপত্তি হৈলা।।

কোচ ৰাজবংশৰ ৰজাসকলৰ অনুক্রমিক বৰ্ণনাৰে ‘দৰং ৰাজ বংশাৱলী’ এখন গুৰুত্বপূৰ্ণ ঐতিহাসিক কাব্য। ৰজা সমুদ্ৰ নাৰায়ণৰ আদেশত ৰচনা কৰা বাবে ইয়াক ‘সমুদ্ৰ নাৰায়ণৰ বংশাৱলী’ নামেৰে জনা যায়। কাব্যখন তিনিটা খণ্ডত বিভক্ত। তৃতীয় খণ্ডত চিলাৰায়ৰ নাতি বলি নাৰায়ণে আহোম স্বৰ্গদেউৰ সহযোগত দৰং ৰাজ্য লাভ কৰাৰ লগে লগে হঠাতে গ্ৰন্থখন আধৰুৱাভাৱে পৰিসমাপ্তি হৈছে।

সূৰ্যকান্ত সিদ্ধান্ত বাগীশে দৰঙী কোঁৱৰ গন্ধৰ্ব নাৰায়ণৰ অনুৰোধ মৰ্মে এখন ৰাজবংশাৱলী ৰচনা কৰে। যাক ‘গন্ধৰ্ব নাৰায়ণৰ বংশাৱলী’ নামেৰে জনা যায়। বংশাৱলীখনৰ ৰচনাৰ সময় ১৮৪০ খ্ৰীষ্টাব্দ। খাঁ চৌধুৰী আমানত উল্লা আহমেদে ‘কোচ বিহাৰেৰ ইতিহাস’ গ্ৰন্থত লিখিছে— “পুথিৰ ৰচনাকাল

কোথায়ও লিখিত নাই। গন্ধৰ্ব নাৰায়ণ ১৮৪০ খৃষ্টাব্দে বিদ্যমান ছিলেন, সুতৰাং পুথি খানা প্ৰায় ঐ সময়েই ৰচিত হৈছিল” (পৃষ্ঠা : ১৬)। ‘অসমীয়া সাহিত্যৰ ৰূপৰেখা’ গ্ৰন্থত মহেশ্বৰ নেওগে ১৮৪০ খৃষ্টাব্দতে এই বংশাৱলীখন ৰচনা কৰা হৈছিল বুলি মত পোষণ কৰিছে (পৃষ্ঠা : ২০০)। আন দুখন বংশাৱলীৰ দৰেই গন্ধৰ্ব নাৰায়ণৰ বংশাৱলীতো কোচ ৰাজবংশৰ উৎপত্তিৰ বিৱৰণ পোৱা যায়। ৰাজগুৰু জগন্নাথ ভট্টাচাৰ্যৰ মতে বংশাৱলীখনত অনেক বাহুল্য বৰ্ণনা সংযোজিত হৈছে (কোচ ৰজাৰ ৰাজত্ব আৰু পীতাম্বৰ সিদ্ধান্ত বাগীশৰ বুৰঞ্জী, অপ্ৰকাশিত)। অতিৰঞ্জিতখিনি বাদ দিলে বংশাৱলীখনক কোচ ৰাজবংশৰ উত্থান-পতনৰ এখন প্ৰামাণ্য দলিল আখ্যা দিব পাৰি।

(ঙ) ব্যৱহাৰিক সাহিত্য : সংখ্যাত তাকৰ হ’লেও দৰঙী ৰাজ আমোলত কেইখনমান ব্যৱহাৰিক জ্ঞানৰ পুথি ৰচিত হৈছিল। প্ৰতিষ্ঠাপক ৰজা ধৰ্ম নাৰায়ণৰ ৰাজত্বকালত সাগৰখড়ি দৈৱজ্ঞই ‘অশ্ব নিদান’ নামৰ ঘোঁৰাৰ চিকিৎসা শাস্ত্ৰ এখন ৰচনা কৰে (দীনেশ্বৰ শৰ্মা : মঙ্গলদৈৰ বুৰঞ্জী, পৃষ্ঠা : ৮৫)। ‘দৰং ৰাজবংশাৱলী’ৰ প্ৰণেতা সূৰ্যখড়ি দৈৱজ্ঞই জ্যোতিষ শাস্ত্ৰ ‘ৰাজমাৰ্ত্তণ্ড’ টীকা ৰচনা কৰে। দৰঙী ৰাজপৰিয়ালৰ সদস্যসকলেও যে সাহিত্য ৰচনাত প্ৰবৃত্ত হৈছিল তাৰেই অন্যতম নিদৰ্শন ‘ৰাজনীতিৰ লক্ষণ’ গ্ৰন্থখন। ধৰ্ম নাৰায়ণ ৰজাৰ কনিষ্ঠ পুত্ৰ ভোগ নাৰায়ণে ৰচনা কৰা এই গ্ৰন্থখন মিতাক্ষৰ আৰু অমিতাক্ষৰ উভয় ছন্দতে ৰচিত। ৰাজনীতিৰ তাড়িক দিশবোৰৰ সৰল ব্যাখ্যা থকা গ্ৰন্থখনক ব্যৱহাৰিক সাহিত্যৰ অন্তৰ্ভুক্ত কৰিব পাৰি। নৈতিকতা সম্পন্ন ৰাজনীতিৰ ওপৰত ৰচয়িতাই বিশেষ গুৰুত্ব আৰোপ কৰাটো এক লক্ষণীয় দিশ।

শুভ নাথ দ্বিজৰ ‘স্বপ্নাধ্যায়’ নামৰ সৰু পুথিখন ব্যৱহাৰিক সাহিত্যৰ অন্তৰ্গত। পুথিখনত স্বপ্নফল আৰু স্বপ্নৰ গুণাগুণ দাঙি ধৰা হৈছে। হয় নাৰায়ণৰ নামোল্লেখ থকালৈ চাই এইগৰাকী দৰঙী ৰজাৰ দিনতে পুথিখন ৰচনা কৰা হৈছিল বুলি ভাবিব পাৰি।

(চ) লোক ৰঞ্জক সাহিত্য : ভ্ৰাম্যমাণ কবি সুচন্দাই কবিৰাজ মিশ্ৰই দৰঙী ৰাজ্যত অষ্টাদশ শতিকাত ৰচনা কৰে ‘শিয়লা গোসাঁই বংশাৱলী’। ‘মঙ্গলদৈৰ বুৰঞ্জী’ অনুসৰি দৰঙী ৰজাই কবি সুচন্দাইক কবিৰাজ উপাধি দিছিল (পৃষ্ঠা : ১০৩)। কিন্তু কবিগৰাকীয়ে কোনো ৰাজপৃষ্ঠপোষকতা লাভ কৰা

নাছিল (মহেশ্বৰ নেওগ : অসমীয়া সাহিত্যৰ ৰূপৰেখা, পৃষ্ঠাঃ ২০০)। ‘শিয়াল
গোসাঁইৰ বংশাৱলী’ এখন মৌলিক কাহিনীৰ আধাৰত কবিয়ে কাব্যখন ৰচনা
কৰিছে। দৰঙত ‘শিয়াল বৈষ্ণৱ চৰিত’ নামেৰে খ্যাত এই কাব্যখনত শিয়াল
গোসাঁইৰ জন্ম বৃত্তান্ত অলৌকিক বৰ্ণনাৰ মাজেৰে দাঙি ধৰা হৈছে। ইয়াত
শিয়াল গোসাঁইৰ বংশধৰসকলৰো কিছু বৰ্ণনা পোৱা যায়। কবিয়ে কাব্যখন
লোক কাহিনীৰ আধাৰত ৰচিত এখন লৌকিক কাব্য (সতেন্দ্ৰ নাথ শৰ্মা :
অসমীয়া সাহিত্যৰ সমীক্ষাত্মক ইতিবৃত্ত, পৃষ্ঠাঃ ২০২)।

ইতিপূৰ্বে কোৱা হৈছে যে দৰঙী ৰাজবংশৰ সদস্যসকলে সাহিত্য
সৃষ্টিৰ বাবে অনুপ্ৰেৰণা যোগোৱাৰ লগতে সাহিত্য চৰ্চাও কৰিছিল। তেনে
এগৰাকী ৰাজকোঁৱৰ মধু নাৰায়ণ। মধু নাৰায়ণ কোঁৱৰ ৰজা জগতানন্দৰ পুত্ৰ
আৰু গন্ধৰ্ব নাৰায়ণৰ ভাতৃ (মহেশ্বৰ নেওগ : অসমীয়া সাহিত্যৰ ৰূপৰেখা
পৃষ্ঠা : ২০০)। মধু নাৰায়ণ কোঁৱৰে ‘যমৰ ঘৰত জীৱন্ত মনুষ্য’ নামৰ এখন সৰু
কাব্য ৰচনা কৰে। মহেশ্বৰ নেওগে কাব্যখনৰ আন এটি নাম ‘অগ্নি পুৰাণ’ বুলি
কৈছে (অসমীয়া সাহিত্যৰ ৰূপৰেখা, পৃষ্ঠা : ২০০)। জনহিতাৰ্থক আকৰ্ষণ
কৰিব পৰা কাব্যখনৰ মূল বিষয়বস্তু কিছু ব্যতিক্ৰমী। যমৰ নগৰত উপস্থিত
এজন জীয়া মানুহৰ প্ৰতিপত্তি আৰু ফলস্বৰূপে যম ৰজাকে আদি কৰি যম
নগৰীৰ অন্যান্য সকলোৰে বিলাই-বিপত্তিৰ ছবি গ্ৰন্থখনত বিবৃত হৈছে। কাব্যখনৰ
বিষয়বস্তু কিছু তৰল যদিও এখন কৌতূহল উদ্দীপক লৌকিক লোকৰঞ্জক
কাব্য হিচাপে অসমীয়া সাহিত্যত মধু নাৰায়ণ কোঁৱৰৰ ৰাজ্যখনৰ বিশেষ মূল্য
আছে।

(ছ) চৰিত সাহিত্য : ভবানন্দ দ্বিজি ৰচনা কৰা ‘গোবিন্দ চৰিত’ দৰঙী
ৰাজ্যত ৰচিত একমাত্ৰ চৰিত পুথি। ৰজা ধৰ্ম নাৰায়ণৰ নাতি চন্দ্ৰ নাৰায়ণৰ
দিনত চৰিতখন ৰচিত হয়—

“শুনা সভাসদ লোক লীলা গোবিন্দৰ

চন্দ্ৰ নাৰায়ণ নৃপ আছিল নগৰ।।

খটৰা সত্ৰৰ প্ৰতিষ্ঠাপক গোবিন্দ আতৈৰ জীৱন আৰু কৰ্ম চৰিত
পুথিখনত বিবৃত পোৱা হৈছে। ২০২টা পদত ৰচিত চৰিতখনত খটৰা সত্ৰ
প্ৰতিষ্ঠাৰ ইতিহাস, সমসাময়িক, সমাজ, সত্ৰলৈ ৰজাঘৰীয়া বৰঙণি আদি

ঐতিহাসিক তথ্যসমূহ সন্নিবিষ্ট হৈছে।

অসমীয়া ভাষা সাহিত্য আৰু সংস্কৃতিৰ বিকাশত দৰঙী বজাসকলৰ অনুপ্ৰেৰণা আৰু অৱদান অনস্বীকাৰ্য। বিবিধ বিষয়ক সাহিত্য কৰ্মৰ লগতে দৰঙী ৰাজ-পৃষ্ঠপোষকতাত সংগীত, নৃত্য কলাৰ বিকাশ সাধন হৈছিল। ৰজা ধৰ্ম নাৰায়ণৰ ৰাজত্বকালত সৰ্বানন্দ ব্যাস কলাই ৰাজসভাৰ সংগীতজ্ঞ, কলা সাধক আৰু নৃত্য বিশাৰদ আছিল। তেওঁৰ ৰাজত্বকালতে দুৰ্গা পূজা ৰজাঘৰীয়া উৎসৱ আছিল। আনে দুৰ্গা পূজা কৰিব নোৱাৰিছিল। দুৰ্গা পূজাৰ লগতে মনসা পূজাত শাক্ত দৰঙী বজাসকলৰ ৰাজত্বকালত বিকাশ আৰু প্ৰসাৰ লাভ কৰে। সেয়ে মনসা শাখাৰ ওজাপালিৰো বিকাশ সাধন হয়। ধৰ্ম নাৰায়ণ ৰজাই ওজাপালিৰ কলা-কুশলীসকলক ধন, মাটি-বাৰী দি প্ৰেৰণা যোগাইছিল। শাক্ত ধৰ্মাৱলম্বী হ'লৈও দৰঙী বজাসকলে বৈষ্ণৱ আদৰ্শক উদাৰ দৃষ্টিভংগীৰে গ্ৰহণ কৰিছিল। ফলস্বৰূপে বিবাহৰ ওজাপালিৰো প্ৰসাৰ হৈছিল। বজাসকলে নতুনকৈ সত্ৰ প্ৰতিষ্ঠা কৰাৰ লগতে পুৰণি সত্ৰসমূহলৈও ভূমি দান কৰি সত্ৰ সংস্কৃতিৰ বিকাশত অৰিহণা যোগাইছিল। অসমৰ সামাজিক আৰু সাহিত্যিক ক্ষেত্ৰখনত দৰঙী ৰাজবংশ আৰু তেওঁলোকৰ পৃষ্ঠপোষকতাত সৃষ্ট কলা-সংস্কৃতি আৰু সাহিত্যৰ বিশেষ মূল্য আছে। সেয়ে এই দিশত অধিক অধ্যয়ন আৰু গৱেষণাৰ অৱকাশ আছে।

গ্ৰন্থপঞ্জী

অসমীয়া

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বুৰঞ্জী (অপ্ৰকাশিত)

ৰাজবংশী পৰমানন্দ : ৰাজ-পৃষ্ঠপোষকতা অসমীয়া সাহিত্য

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অসম প্ৰকাশন পৰিষদ, দ্বিতীয় প্ৰকাশ। ১৯৭৪

শৰ্মা, সতেন্দ্ৰ নাথ : অসমীয়া সাহিত্যৰ সমীক্ষাত্মক ইতিবৃত্ত অৰুণোদয় প্ৰেম,
নৱম সংস্কৰণ, ২০০০

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আহমদ, বাঁ চৌধুৰী আমানত উল্লা : কোঁচ বিহাৰেৰ ইতিহাস প্ৰথম খণ্ড, মডাৰ্ণ
বুক এজেণ্চি, ১৯৯০

"Expanding Horizons: A Multidisciplinary Approach to Research" showcases a diverse range of academic works, encouraging collaboration across disciplines of research. The chapters explore a variety of topics, including agro-waste, women's empowerment, and celiac disease trends, so broadening awareness. Seasoned specialists provide distinct insights on themes including religious tourism and waste management, demonstrating the breadth of contemporary research.



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