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Contents

Articles

Accidents in Coal Mining in Colonial Assam: A Study of Makum Coalfields

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Abstract

The modern mechanized coal mining industry, which developed in Europe in the 19th century, increased the extraction of coal in the industrial age. This increased extraction witnessed numerous accidents leading to the deaths of miners in the underground mines. It developed and shaped new legislations related to mining and labour bringing significant changes to the industry. Coal mining in colonial India witnessed exploitation of the poor peasants brought to work in the mines. The mines in general were located in remote areas and the pathetic life of the miners remained hidden from the gaze of the mainstream society for a long time. Coal mining began in Assam towards the end of the 19th century when organised mining operations began in the Makum coalfields of present day Tinsukia district. The mine labours had to adopt the new way of life in the underground mines where deaths and accidents was a frequent affair. Mining regulations though introduced had limited effect especially until the first quarter of the 20th century. This paper tried to understand the history of the accidents in the coalmines of colonial Assam with especial reference to the Makum coalfields. The paper discusses the measures taken by the colonial regime to regulate, inspect and report on the workings of the underground mines vis-a-vis the high rate of mine accidents recorded.

Introduction

The Margherita and Ledo region of Tinsukia district of Upper Assam are known for the coal industry owned by the North Eastern Coalfields of Coal India Limited. Coal mining began here in the late 19th century when coal was discovered by European geologists working for the Geological Survey of India. To extract coal from the region European venture formed the Assam Railway and Trading Company Limited and were subsequently granted the lease of coal mining in the region, which they called as the Makum coalfields. Presently the industry has an important role in the economy of the region. The industry both directly and indirectly has helped in providing livelihood to the local communities. At the same time, it also has drastic impacts on the environment of the region especially after the introduction of open cast mining from the 1980s. Illegal rat hole mining has further disrupted the environment. These illegal mines have

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led to several accidents in the recent years leading to the death of poor mineworkers. In September 2022, two coal miners died in a gas explosion inside an illegal mine. Most of these accidents take place because the illegal mines undermine safety protocols, putting the miner's lives at risk with the sole intension of making profits. Accidents in coal mining in Assam in recent years have become a subject of discussion and debate due to its relation with rat hole mining banned by the National Green Tribunal in 2014. However, such mining operations have continued and are often in news due to accidents, causing deaths of the miners. Recently in January 2025, an accident which led to the death of four miners in an rat hole mine in Umrangso, Dima Hasao has again brought the debate of stopping such mining practices in the region. As one looks back into the history of coal mining in the region one finds that mining accidents were frequently in the Makum coalfields due to the unsafe mining practices by untrained miners. The colonial records show high rate of mine accidents in the Makum coalfields from the late 19th century to the end of the 1920s. Most of these accidents were because of neglecting safety mechanism in the underground mines and lack of proper training of the miners.

Coal mining is a risky and perilous industry due to the large number of deaths due to workplace accidents and occupational diseases. Scholars have noted the natural element in mining where one has to work underground against the natural geological settings that make the mining job much riskier. However, the rate of accidents was always high due to unsafe mining practices undertaken globally which increased the risk of accidents. The demand for coal and the subsequent mining practices resulted in a large number of deaths occurring in the coalmines. Catherine Mill in the context of the British coal industry stated that due to the emergence of mechanized industry in the late 18th and 19th centuries, the workers faced new challenges relating to industrial health among which the mining industry was the most oppressive.[3] The industry by its nature has to deal with the hazards of working underground in the presence of poisonous gases, unstable structures, and poor ventilation with the lack of proper lighting. These problems led to changes in the mining industry in the form of legislation, recruitment and working procedures bringing significant changes to the industry and in the life of the mine labourers. In the 18th and 19th century, Britain witnessed expansion in the mining industry with the rising demand of coal and other minerals because of rapid industrialization. In the coal sector, increased extraction of coal by deep mining fulfilled the growing demand for coal. This created new problems for the miners in matters related to safety, as they had to work in extremely hostile and dangerous situations. The labourers engaged in the mines also increased in the period thus increasing the numbers of human lives who were at risk. Mills writes that the average life expectancy of a British coal miner in the mid-19th century was only 29 years.[4] Until 1850s state regulations for labour in the coalmining sector focussed on removing women and children from hazardous workplaces. The mine labourers themselves were responsible for their own safety in the mines. First legislation relating to inspections and safety in the coalmines was enacted in under the Coal Mines Inspection Act. In 1855, a code for safe working in the mines and punishments for any violence was enacted.[5]

[3] Mills, Catherine (2010), Regulating Health and Safety in the British Mining Industries, 1800-1914 UK, Ashgate , 1.

[4] ibid

[5] ibid

Records on history of mining did not cover the history of safety and accidents in the mines with a historical perspective initially. Until the 1980s, history of mine accidents was discussed only in terms of their causes. Michael Farrenkopf stated that it was only in the 1980s that Helmuth Trischler of Germany and John Benson of Britain argued about the lack of research in the history of deaths that occurred in the process of mining. Trischler stressed the study of the impacts made by the mine accidents on the industrial economy and employment rather than just focusing on the causes of the accidents. He also emphasized exploring the consequences of those changes. Benson on the other hand argued that the British coal industry in the 18th and early 19th century worked for safety almost in relation to the number of fatal accidents only.[6] In the context of India Dhiraj Kumar Nite in the book, 'Coal Nations: Histories Ecologies and Politics of Coal in India', writes that low wages of the miners were responsible for a large number of accidents and other health problems. It was because the labourers used to extract the easily available coal, which often endangered their lives.[7]

The coalfields of Makum were the easternmost coalfields of British India situated in the province of Assam. Assam passed into the hands of the British India Company in the year 1826 and the 19th century saw the colonial penetration and the exploitation of its resources. After the discovery of tea, the Europeans felt the necessity for sourcing locally available coal at a cheaper rate, which would help sustain the fuel required for tea industry. The coal exploration was carried throughout the 19th century; in the first half of the century, the British military officials on various political engagements in eastern Assam discovered coal in various places in the downhill slopes of the Patkai range. In the second half of the century, the Geological Survey of India completed systematic surveys in the region especially in the Makum belt and considered the Makum coalfields as a site where coal could be extracted profitably. This possibility led to the formation of the Assam Railway and Trading Company, which began coal mining in the Makum coalfields from the year 1882. The coalfields of Makum in the late 19th and early 20th century found a mention in colonial documents for its infamy of high fatality rates among the mine labourers due to the working conditions in the mines. The accidents in the coalmines in India were recorded in various inspection reports, which provide the causes and circumstances of the accident.

Recruitment of Labour and the Making of a Coal Miner

After the grant of leases to the Assam Railway and Trading Company, it engaged the local Naga people to clear the surrounding forests. However, they could not engage the Nagas for digging the mines or working on the underground.[8] For this reason, they had to bring labourers from outside the province to work in the coalmines. Procurement of

[6] Berger, Stefen & Alexander, Peter (2020), Making Sense of Mining History: Themes and Agendas, Routledge, New York, 193 – 194.

[7] Nitte, Dhiraj Kumar (2014), "Slaughter Mining and the 'Yielding Collier': The Politics of Safety in the Jharia Coal Fields" in The Coal Nation: Histories Ecologies and Politics of Coal in India, Kuntala Lahiri Dutt (ed.), Ashgate Publishing Limited, Surrey England, pp. 105-128.

[8] Report on the Inspection of the Coal Mines Belonging to the Assam Railways and Trading Company Limited, Assam ,1899.

labour did not pose a problem as the tea gardens of Assam were recruiting indentured labours especially from the regions of eastern and central India. The labourers brought to work in the coalmines in the initial periods belonged to regions of Chota Nagpur, Bengal, United Provinces and Central Provinces. Few of the labourers included people from the North Western Frontier Provinces. Most of the labourers belonged to the Orang, Munda and Santhal communities.[9] From the year 1911, Nepalese were brought to work in the collieries[10] and by the end of the decade they were the major labour force operating in the mines. The Nepalese mine labourers were sourced from either Nepal through the Gorakhpur depot or from among those Nepalese settled in Assam.[11] Along with them, a small numbers of Chinese labourers were brought to work in the collieries.[12] Some of the labour force had also come on their own to work in the collieries. During and after the First World War, some prisoners of war were made to work in the collieries of Makum.[13]

The mining industry required skilled labour. The new coal industry in India recruited the peasants to work in the mines. These agricultural workers aquired the skill for extraction from underground coal reserves with all the risks involved. The labourers brought to Assam did not have prior knowledge or the skill required for working in a colliery. G.W. Gwathrop in his book *"The Story of the Assam Railway and Trading Company, 1881- 1951"* noted-

> *"As the mining required from them was unlike anything they had seen or done before, it was soon found out that to introduce the South Staffordshire method of getting thick coal in India, it would be better at once to begin at the beginning, and train up to the work young Indians who had never seen a coal mine, under selected thick coal miners. This was done, and there are now (1895) hundreds of Indians working in the mines, careful and good workmen, who were agriculturalists a few years ago."*[14]

Dhiraj Kumar Nite writes that the "the industry (coal) relied on a handicraft or artisanal form of production, i.e. employment of predominantly human labour power and archaic ways of mining. As mining practices advanced, a new generation of better-informed young colliers appeared armed with safety-related wisdom."[15] The miners in general

[9] ibid.

[10] Report of the Chief Inspector of Mines In India for the year ending 31st December 1911, Accessed from- https://dspace.gipe.ac.in/xmlui/handle/10973/22032.

[11] Gurung, Tejimala (2003), "Human Movement and the Colonial State: The Nepalis of Northeast India under the British Empire" in The Nepalis in Northeast India- A Community in Search of Indian Identity, A.C. Sinha and T.B. Subba (eds.), New Delhi, M.L. Gidwani, Indus Publishing Company, New Delhi, 172-183.

[12] Report of the Chief Inspector of Mines In India for the year ending 31st December 1911, Accessed from- https://dspace.gipe.ac.in/xmlui/handle/10973/22032.

[13] Sen, Sanjay (2014). Coal mining industry in Assam: A study of Tinsukia district 1865- 1940 (Ph.D thesis, Assam University, 42.

[14] Gawthrop, W.R. (1951), The Story of the Assam Railways and Trading Company Limited 1881-1951, Harley Pub. Co., London. 28

[15] Nitte, Dhiraj Kumar (2014), "Slaughter Mining and the 'Yielding Collier': The Politics of Safety in the Jharia Coal Fields" in The Coal Nation: Histories Ecologies and Politics of Coal in India, Kuntala Lahiri Dutt (ed.), Ashgate Publishing Limited, Surrey England, 108

learnt the new art of mining from the senior laboureres and the European supervisors. Dhiraj Kumar Nite argues that the Indian mines followed a trial-and-error method in the absence of proper training. The precautions that the miners took were limited to prevent the accidents in the mines. Most of the accidents in the Makum coalfields were because of the company's negligence and the responsibility to provide proper training and information on all the hazards, which a miner may overcome while working in the mines. This highlighted the management's unserious attitude towards the life of the miners. The Inspectors of Mines for India himself remarked in 1929 that the Makum Coal field had the worst natural condition among all the coalmines in India. [16] The early miners who came to work had to face those challenges without any proper support and help from the company.

Description of the Mines of Makum in the Late 19th Century

The higher up officials in the Makum coalfields consisted of the manager, the assistant manager, the foreman and the engine wright who were mostly Europeans. The foreman made daily underground inspections and supervised the mining work. The colliery machinery was under the charge of the engine wright. Around six to twenty nine labourers were placed under a experienced senior miner who was known as the *sirdar.* At the groundlevel, the *sirdar* had to ensure that the underground workspace had safety measures in place. The entrance to the mines was from the side of the hills. Timber used to protect the roof. The coal was brought to the surface from mines in trams pulled by ponies. Few mines also had a holding engine to pull the trams. To keep the underground mines lighted, candles, kerosene oil tin *battis* and safety lamps were used. This lighting was not enough for illumiating the underground space and often caused the underground accidents. The timber required in the underground mines and for constructing rail tracks and bridges was obtained from the nearby forests. In the collieries and forests, men folk were engaged to extract the coal and timber, women were employed to carry the coal brought to the surface and children who were more than ten years old employed in other works in the mines overground.[17]

Accidents in the Coal Mines of Makum

From the late 19th century when coal mining was started by the Assam Railway and Trading Company Limited, death rate due to diseases and accidents were high enough to gain the attention and concern of the provincial government. In December 1898, the Inspector of Mines for India, James Grundy, made an inspection to the coalfields of Makum. The inspections were carried at the request of the Chief Commissioner of Assam, Henry Cotton, who was informed by the Deputy Commissioner of Lakhimpur about the causalities in the coalmines of Ledo and Tikak. Henry Cotton received reports of mining accidents from the police stations and acknowledged the seriousness of the situation. He observed that it was, "desirable that the mines should be inspected

[16] Annual Report Of The Chief Inspector Of Mines In India For The Year Ending 31st December 1929, Retrieved from- https://dspace.gipe.ac.in/xmlui/handle/10973/22014.

[17] Report on the Inspection of the Coal Mines Belonging to the Assam Railways and Trading Company Limited, Assam ,1899.

by an expert with a view to ascertaining whether the fatalities have been due to any want of proper care, and of suggesting any additional precautions which may appear to be required."[18] In December 1898, inspections were arranged for the coalmines, and Inspector of Mines for India, James Grundy inspected these coalmines. The inspections were made for three consecutive years- 1896, 1897, 1898 on all the 5 working mines of Makum coalfields viz. Ledo Valley East, Ledo Valley West, Upper Ledo, Tikak and Namdang coal mine.

Grundy in his inspections found that in three years 37 miners died in the mines. Among the fatalities, 12 were women miners who worked overgrond in the coalmines. The causes of the accidents were fall of coal and timber, suffocation, explosions inside the mines and collisions by trams and tubs.[19] Grundy noted in his inspection report about the negligence of the mining company to provide safe working conditions and to frame safety regulations in the coalmines where the accidents took place. The mine labourers were mostly former peasants who were brought from eastern and central India and from the North Western Frontier Province. Grundy noted that in most of the cases the mining company did not provide training and skill to the miners and this proved to be fatal. He found the miners ignorance responsible for the accidents and most of the accidents happened due to miners burried under heaps of coal that crumbled in during mining and as many as eighteen (18) deaths out of a total of thirtyseven (37) deaths were caused by this. He found that in the coal fields of Makum very little action was taken to support and ensure the safety of the roofs and side walls of the mines when coal was extracted. In the absence of proper lighting the workers hit upon the unsupported roofs thus causing accidents. The inspections carried out by Grundy reflected the sheer negligence on the part of the coal companies and failure to ensure safety in the mines. Reflecting on an accident that occurred in the year 1896 at Upper Ledo mine, when a miner was doused by fire upon entering the mine with a burning lamp inside the fenced area, Grundy noted the callousness of the coal company for not laying down any safety rules in respect of entry of a miner inside a restricted area holding a burning lamp/candle for lighting up the area and without the knowledge of the foreman[20]. He noted:, "The rule is that all dangers should be removed, and all dangerous places made safe as soon as possible, no matter whether persons have to go to work at the place or not."[21] The miners of the Makum coalfields who had liitle or no experience of mining were left to work in the coal mines with very little training or skill. In the coal mines of Makum a new miner introduced to mining work had no other option but to learn the process of mining from the other labourers. The new miners were put to work at less dangerous places at first and once they became accustomed with the mining work underground, they were put under a experienced miner and had to work under his guidance. The workings in the Indian coalfields were mostly pre industrial in nature. Most of the coalmine labourers were primarily agriculturist. According to Dhiraj Kumar Nite, the miners of India generally followed a trial and error method, which caused the accidents and these

[18] ibid.
[19] ibid.
[20] ibid.
[21] ibid

mining approaches at best were "misadventure, ignorance, negligence or foolishness."[22] Grundy found that the coal company was not providing adequate information to the miners who had little or no idea of mining and the possible details of the risks involved in the process of mining, in other word the Company carefully withheld the information on hard and harsh conditions in which the miners had to work. Dhiraj Kumar Nite observed that the production in the Indian coal industry was artisanal in nature where the labourers worked at the collieries in an unsafe manner. He mentioned –

> *"The lack of constant, efficient expert safety supervision was an expression of both the colliers' dependence on the mining sirdar and his employees responsible for accident control, and reliance on the collier's practical skills of production and protection, which were regarded as more cost effective than any investment in training."* [23]

Due to the insufficiency and inefficiency of the supervising staffs, the mineworkers under the *sirdar* continued work in the colliery with full autonomy. Meanwhile to regulate the mining industry of India and to develop safer working conditions the absence of mining legislation was deemed necessary by the colonial government in India by the end of the 19th century. In 1890 Lord Cross, the Secretary of State for India proposed for inspections and regulation of the mining operations in India. [24] It led to the appointment of James Grundy who became the first Inspector of Mines in India in the year 1893. He began working with the Geological Survey of India (GSI) and conducted a series of inspections in most of the major mines of India. Based on his experiences from the inspection to various mines, he laid down suggestions to enact rules for the opening of mines, controlling accidents, minimum age of the miners and matters related to the safety and supervision of the mines. In 1895, Government of India constituted a committee to formulate general rules for the mining operations, which finally resulted in the enactment of the Indian Mines Regulation Act of 1901. The act defined 'mine' as a place where any excavation of minerals deeper than 20 feet below the level of the adjacent ground. The government was also empowered to establish mining boards, which would deal with mining legislations.[25] By thic act, the mines in India were divided into two inspection circles. The coalfields of Makum were placed in circle II and G.F. Adams was appointed as the Chief Inspector of Mines.[26] The coalmines under the supervision of Adams were larger compared to coalmines under Circle II. Adams was advised not to make systematic inspections of the mines of Assam, Burma and Baluchistan The reason behind this exclusion was that the mining industries in those provinces were not fully developed and occasional tours of inspection, by the Chief

[22] Nitte, Dhiraj Kumar (2014), "Slaughter Mining and the 'Yielding Collier': The Politics of Safety in the Jharia Coal Fields" in The Coal Nation: Histories Ecologies and Politics of Coal in India, Kuntala Lahiri Dutt (ed.), Ashgate Publishing Limited, Surrey England, 110

[23] ibid

[24] "Report of The Committee for Review and Restructuring of the Functions of Indian Bureau of Mines," Retrieved from- https://ibm.gov.in/?c=pages&m=index&id=366

[25] ibid.

[26] "Arrangements for the Inspection of Mines under the Indian Mines Act, 1901," Proceedings of revenue for the year July 1903, ASA Library, 1903.

Inspector of Mines or the Circle Inspector would be sufficient. The Chief Inspector of mines found that the records maintained in the mines of Assam and Baluchistan were ill maintained with frequent accidents and hence this necessiated systemic inspections. In 1902, the Chief Inspector of mines proposed the government for conducting, quarterly inspection of the mines of Assam. However, the proposal did not obtain approval from the government for conducting such frequent inspections. In lieu, governmnet approved inspections to be carried out twice a year. It also directed the Chief Inspector to check and make arrangements so that the inspections of Assam collieries did not interfere with other mines. Regular inspections of the coalfields of Makum started from 1904-05.[27]

Although legislations were made but there were no improvements in the Makum coalfields especially in the first two decades of the 20th century. The yearly inspection reports recorded that during the period 1905 and 1920 there were more than 250 serious accidents. The report noted that about 130 accidents were fatal eventually causing death of more than 150 coal miners. The death rate was high especially at the beginning of the First World War and in the year 1915 the Makum coalfields witnessed 32 mine accidents. [28] The coal company held that lack of technical improvements in the mines, especially the arrangement of good lighting, and detection of inflammable and poisonous gases were the main causes behind the accidents. Some of the accidents were so severe that it led to the deaths of several labourers in one single accident. On 26th of November 1910, four serial underground explosions occurred in the Namdang Coal Mines within ten hours. It led to the death of thirteen persons among whom twelve were mine labourers and one was a European official.[29] In the Namdang colliery, *chamber mining* was practiced. After mining was completed in a chamber, it was sealed and separated from the others by constructing a barrier, called *dam*. This was required because the old chamber had splinters to cause fire, which may spread to the rest of the mines. On the morning of that fateful day, the assistant foreman found the area filled with the smell of fire sting, on further investigation he found that smoke filled the air from the old dam causing the fire sting. The dam was repaired but an explosion occurred in the evening, which continued till midnight.The Chief Inspector of mines wrote in his report that the accident could have been prevented if prudence and caution had been exercised. He noted in his report that it was urgent on part of the Assistant Foreman to evacuate the workers to a position of safety after the first explosion. There was negligence of regular inspection of the dam and on being interrogated the Assistant Foreman submitted that the dam remained un inspected since November 23rd, as he was on leave due to illness and his seniors were uninformed about his leave of absence, however no action was recorded against him.[30] In 1914 a European Foremen opened the safety lamp without checking for any combustible gases to help a miner to light the fuses of dynamite shots.

[27] ibid.

[28] Report of the Chief Inspector of Mines in India for the year ending 1905, 1906 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1920,' Accessed from- https://dspace.gipe.ac.in/xmlui/.

[29] Report of the Chief Inspector of mines in India for the year ending 31st December 1910, Accessed from- https://dspace.gipe.ac.in/xmlui/handle/10973/22030.

[30] ibid.

This caused fire to break out which killed the miner after 6 days of hospitalization.[31] The Chief Inspector reported that, the practice of opening a safety lamp for firing was an unsafe practice inside a mine and the Assistant Foreman was reprimanded for his negligence.[32]

The death rate due to accidents from 1911 to 1920 was more than five per thousand workers. From the 1920s there was a decline in the number of accidents and associated deaths in the coal fields of Makum, between 1921 and 1925 the death rate was reduced to about three per thousand coal miners. In 1925 the death rate was 1.72 which was the lowest ever recorded. The Chief Inspector of Mines in his report accredited the reduction in death rate in kamku Coal Field largely to the efficiency of the staff and technological improvements especially introduction of electrical lights in the underground mines that greatly helped in reducing the underground accidents.[33] New lighting system helped the miners to have clearer visuals as these new facilities could focus with beams of light to a distance of upto 50 feet. Semi portable electric lamps introduced in all the mines of Makum in the year 1933 were powerful enough to lighting 48 candles for a full mining shift. The colliery superintendent was greatly impressed by the development in the lighting system, which provided safer working conditions especially while working in a mining chamber as miners could move through any hindrance with caution and proper inspection of the roofs and sidewalls could be undertaken. [34]

In 1923, the Mines Act was revised and the Indian Mines Act 1923 came into force on 1st July 1924. In exercise of the powers of section 30 of the Mines Act of 1923, the Indian Coal Mine Regulations was passed in 1926.[35] This new regulation empowered the Government of Assam to pass new rules for the coalmines for the province. These rules were intended to address the safety of the coalmine labourers and also check and maintain the health and hygiene in the mining settlements. All the mines were required to provide free drinking water to its employees. It was necessary to provide sufficient supply of water both above and below the mines. Sanitation facilities and sanitary toilets were essential, instructions were laid for provision of the same for the use of the workers, and the mines were to be freed from disposing sanitary wastes for which a sweeper was to be appointed. Adequate arrangements for training people in emergency and transfer of patients in ambulance during emergency were made. It was laid down that a logbook for workers working in the mines had to be maintained with records of their hours of work to ensure safety and security. In underground mines, it is crucial to maintain an accurate count of all people at all times for safety reasons. This involves regular headcount checks, often called *reckoning* or *muster*, to ensure that everyone is accounted especially in emergencies. The Mines Regulation 2023 introduced the

[31] Report of the Chief Inspector of mines in India for the year ending 31st December 1914, Accessed from-https://dspace.gipe.ac.in/xmlui.

[32] ibid.

[33] Report of the Chief Inspector of mines in India for the year ending 31st December 1925, Accessed from-https://dspace.gipe.ac.in/xmlui.

[34] Report of the Chief Inspector of mines in India for the year ending 31st December 1935, Accessed from-https://dspace.gipe.ac.in/xmlui.

[35] The Assam Mines Manual, 1927, ASA Library.

clause for *reckoning* and if any accident occurred due to the negligence on the part of the management the owner may have to pay all the expenses of the enquiry [36]. By the mid 1930s, helmets and safety hats were introduced in the mines and records reveal that on two occasions, it saved the lives of two miners.[37] Better safety helmets made of compressed fibre was introduced in 1939 for working in chambers and openings.[38] In 1926 the British Government awarded 'Edward Medal' to two miners' viz. Kristo Kamar and Bhikham Sirdar, for rescuing 37 miners and 3 European officials from an underground fire.[39] Arrangements were made for proper training of the *sirdars* and subordinate mining officials to reduce accidents in the mine. In the year 1924, examination for the certification of *sirdars* was held in Margherita. From 1930, classes were organised to give technical knowledge to the subordinate workers in the collieries of Makum.[40] Punishments in the form of fines were collected from the colliery labourers if any safety norm was violated. The fines were very high, e.g. in 1929, the Colliery Superintendent prosecuted a labour for unlocking a safety lamp, while working in the underground, with a fine of Rs. 50.[41] Though the inspection reports have mentioned about various such cases, no records were available on prosecution or any penalty to the European employees for negligence of work in the mines.

Conclusion

In the year 1901, the Indian Mines Act, 1901 was passed which allowed systematic yearly inspections of all the coalmines in India under its jurisdictions. These inspections brought to light the recurring and frequent accidents with a high fatality rate in the coal mines of India. The management and authority of the mines often tried to override the unsafe environment in the mines by shifting the onus of these accidents to the ignorance of the miners. The coalmine workers were an uneducated lot who had noprior experience of working in these conditions and were unaware of the hostile conditions in underground mines. While colliery owners focussed on extraction of coal which had a large global demand, investment on safety measures was of least concern and priority. In such an unbalanced power relation between the management and the workers, the fault inevidently was rested on the shoulder of the coalmine workers.

The inspection reports of the mines however pointed out the laxity in safety norms and emphasized that strict supervision, training of miners and changes in working techniques could reduce those accidents. The Chief Inspector of Mines wrote in his report for the year 1914-

[36] The Assam Mines Manual, 1927, ASA Library.

[37] Report of the Chief Inspector of mines in India for the year ending 31st December 1935, Accessed from-https://dspace.gipe.ac.in/xmlui.

[38] Report of the Chief Inspector of mines in India for the year ending 31st December 1939, Accessed from https://dspace.gipe.ac.in/xmlui/.

[39] Report of the Chief Inspector of mines in India for the year ending 31st December 1926, 22 Accessed from-https://dspace.gipe.ac.in/xmlui/.

[40] Annual Report Of The Chief Inspector Of Mines In India For The Year Ending 31st December 1930, Accessed from- https://dspace.gipe.ac.in/xmlui/handle/10973/22015.

[41] Annual Report Of The Chief Inspector Of Mines In India For The Year Ending 31st December 1929, Accesed from- https://dspace.gipe.ac.in/xmlui/handle/10973/22014, p. 37.

> *"For every case in which an accident occurs, there must be many more cases, in which wrong-doer has procured his easily got coal with impunity. That at some mines the practice is much more common than at others, an examination of the pillars, corners, and sides will show."*[42]

The report also strongly recommended that the managers must dismiss any miner found violating and engaging in mining work in unauthorized areas under Section 14(2) of the Indian Mines Act, 1901.[43] However, no observation was recorded in the report of the Chief Inspector of Mines in respect of the wages paid to the miners and it was held that the accidents occurred due to the ignorance and carelessness of the miners, which could be prevented by strict punitive actions. The high demand for coal as primary source of energy and fuel and easy availability of cheap labour for extraction who were ignorant of the mining work and its hazard and the necessary safety gears left the Company owners free to decide on the mode of extraction and safety gears of miners vis-s-vis their profit.

[42] Report of the Chief Inspector of mines in India for the year ending 31st December 1914, Accessed from- https://dspace.gipe.ac.in/xmlui/.

[43] ibid.

Formal Credit Access by Rural Households: Empirical Evidences from Four Districts of Assam

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Abstract

This study tries to find out the influence of a number of socio-economic and demographic factors on the ability of rural households to borrow from formal banking institutions. The study is based on primary data collected through primary survey in four selected districts of Assam, namely, Kamrup, Nagaon, Barpeta and Dhubri. The sample consists of 400 households from 16 Gram Panchayats of the selected districts. The analysis of primary data shows that access to formal credit significantly differs across different socio-economic and demographic attributes. For example, the study found that male has greater access to formal credit than females, higher percentage of financially literate respondents has access to credit compared to the financially illiterate households. Econometric analysis using the logistic regression model shows that variables like gender, financial literacy, number of dependent family members have positive significant effect on access to formal credit. Variables like holding of bank accounts, age group (50 and above), occupation categories (self-employed and handicraft worker), and semi-medium land holdings have no statistically significant influence and, distance to bank branch and constraints etc., have significant negative impact on access to formal credit.

Introduction

The ability of rural households to engage in diversified income-earning activities enhances financial stability and flexibility against agricultural uncertainties. Lack of capital in the hands of the rural poor is a major hurdle in their path to convert potentialities into productivity (Levine & Kunt, 2007). Several studies across different countries have shown that timely access to formal credit is an effective tool for fighting against poverty. Studies conducted by the World Bank (2009) have revealed that access to credit can reduce damaging concentrations of economic power and help the poor catch up with the rest of the economy as it grows. Due to the instability of rural income and uncertainties associated with the agricultural sector, rural households are vulnerable to various types of risks and shocks (Kapoor & Ojha, 2006). By removing capital constraints on rural

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households, access to credit increases their risk-taking and risk-bearing abilities and alters their risk-coping strategies (Birthal et al., 2021). In times of crop failure and other unforeseen events, such as price fluctuations and seasonal variations, access to credit helps rural agricultural households to stabilise income flow and reduce vulnerability (Coulibaly et al., 2015). In addition, credit helps in managing capital requirements necessary for modernisation and diversification of agriculture and thus results in increased income, reduced poverty, increased employment, and empowerment of women (Diagne & Zeller, 2001). For the rural households, there are three major sources of credit- formal credit sources like commercial banks, semi-formal sources like Micro Finance Institutions (MFIs) and informal sources like moneylender, landlords etc.

However, despite the significant expansion of the formal banking sector over the past few decades, a large section of rural households in developing countries are still unable to access formal credit. According to the World Bank (2021), only 23% of adults in developing countries had access to formal credit, compared to 56% of adults in developed countries. In India, as of 2020, approximately 44.8% of adults had access to credit from any source, but only 12.8% accessed credit from formal sources. Notably, 31% of adults in India borrowed from informal sources, primarily from friends and relatives (World Bank, 2021).

The All India Debt and Investment Survey[3] (AIDIS, 2019), conducted by the NSSO in its 77th round of survey, reveals significant differences in the extent of credit access based on occupation, gender and social cast. The survey shows that only 35% of rural households in India have access to credit from either formal or informal sources. Among the cultivator households, 40.3% have access to credit, while just 28.2% of non-cultivator households have access to any source of credit. In the case of gender, 36.2% of male-headed households have access to credit from any source, compared to only 27.6% of female-headed households. In the case of social categories, 34.7% of Scheduled Caste households have access to credit from various sources, compared to only 24.7% of the Scheduled Tribe households. The households belonging to the OBC category have 38.3% borrowers, while the "Other" or general category of households has 34.7% borrowers from any source of credit. Apart from AIDIS (2019), other studies also reported that commercial banks and cooperatives follow discriminatory policies against SC and ST households in terms of credit access (Madheswarn, 2020).

Inter-regional and inter-state inequality in formal credit access by rural households is another significant issue in the rural credit market in India. AIDIS (2019) data reveals that more than 35% of rural households in states like Andhra Pradesh, Karnataka, Punjab, and Rajasthan have access to credit from any source, while in states like Delhi, Meghalaya, and Nagaland, less than 10% of rural households have access. Contrary to this, states like Assam, West Bengal, and Uttar Pradesh have less than 30% of rural households with access to credit from any source. This indicates that the extent of access to credit is largely dependent on the level of development of the states in India.

[3] AIDIS, 2019 is the latest available data source on rural credit in India.

In the context of the rural credit market of Assam, the AIDIS (2019) data highlights that rural households of the state had limited access to credit from any source, and the extent of credit access differs considerably between males and females, between agricultural and non-agricultural households, and among SC, ST, OBC, and "Other" categories of rural households.

In Assam, AIDIS (2019) data reveals that 24.75% of all rural households' accessed credit from institutional sources, while 17.1% of them accessed credit from non-institutional sources. In the case of the occupational groups, 21.2% of cultivator households' accessed institutional credit, 10.3% borrowed from non-institutional sources, and 8.8% borrowed from both institutional and non-institutional sources. On the other hand13.5% of the non-cultivator households borrowed from institutional sources, 10.0% from non-institutional sources, and 4.7% borrowed from both institutional and non-institutional sources. Thus, compared to the cultivator households, non-cultivator households had lower access to formal credit. In rural economies, the weaker segment of the non-cultivator households mainly comprised landless agricultural labourers, daily wage earners, small businessmen, rural artisans, etc. Therefore, as revealed by AIDIS (2019) data, these households have faced larger barriers to accessing formal credit in India and Assam.

The issues of barriers to accessing formal credit and the dependence on informal credit among rural households have become increasingly significant to governments, policymakers, and researchers worldwide in recent times. Several studies have identified various constraints that hinder poor individuals from obtaining institutional credit (World Bank, 2009; Beck et al., 2006; Sing, 2021). Furthermore, empirical evidences confirmed that these credit constraints have a considerable negative impact on the income and overall welfare of low-income households (Boucher et al., 2009; Zeller, 2000). In India also, several studies have been conducted on several issues related to banking sector development, credit supply, agricultural credit, etc. (Kumar et al., 2013; Pradhan, 2013).

In case of Assam, surveys conducted by NSSO surveys (2012, 2019) shows that rural households have limited participation in the credit market and minimum access to credit from formal banking institutions. A major portion of rural households are still dependent on informal sources to meet their credit requirements. However, there have been limited efforts to explore the underlying causes of the participation of a fewer number of rural households in the credit market and limited access to formal credit. In the specific context of Assam, studies investigating whether rural households are excluded from credit access by formal financial institutions or lack demand for formal bank credit seems to be limited. This study aims to fill these gaps by identifying the factors that determine access to formal credit for rural households in Assam.

Objectives of the Study

The primary objective of this study is to identify the key barriers faced by rural households in accessing formal bank credit. The specific objectives are:

1. To analyse the extent of borrowing from formal banking institutions across different socio-demographic attributes such as age, gender, and education.
2. To empirically identify the factors influencing rural households' access to formal bank credit.

Data Sources and Methodology

This study is based on a Primary survey conducted across four districts in Assam, namely, Kamrup, Nagaon, Barpeta and Dhubri. The study area is selected using the CRISIL-Inclusix financial inclusion index which categorises the districts of Assam as highly inclusive, average inclusive and low inclusive on the basis of availability of banking infrastructure, deposit mobilization and credit disbursement.

To select the sample, multistage sampling technique is used. At the first stage, 2 Community Development Blocks from each district are selected. In the second stage, 2 Gram Panchayats from each CD Block is selected. At the last stage, 50 households from each Gram Panchayats are selected. Thus a total of 400 households across 16 Gram Panchayats in Kamrup (high inclusion), Barpeta (average), Nagaon (below average), and Dhubri (low inclusion) are selected in the sample.

To study the differences in formal credit access, descriptive statistics are used and to analyse the association between the formal credit access and socio-economic and institutional factors, Chi-Square test of independence is used.

For empirical study of the impact of the socio-economic and institutional factors on formal credit access, Logistic regression model is used. The dependent variable included in the model is access to credit which is a binary variable (Y=1, if household has access to credit and Y=0, otherwise). In the study, a household is considered as having access to formal credit if he or she successfully borrowed from the formal institution at the prevailing interest rate. A number of predictors consisting of households' socio-economic and demographic characteristics and institution related factors are included in the model. These are age, education, gender, number of dependent family members, occupation, distance to the nearest bank branch, constraints in the form of collateral and others faced in the application for formal loan, agricultural landholdings, business experiences and ownership of household assets, availability of interest free loan and financial literacy. Appropriate regression diagnostic tests are conducted for ensuring robustness of the analysis.

Review of Literatures

In different parts of the World, especially in the developing countries, several research works have been conducted to study the significance and impact of access to credit. A review of some of these literatures can provide valuable insights in finding out the relevant factors influencing access to credit. Until recently, the issue of access to credit has often been neglected due to significant data gaps and little attention has been paid to the various practical and policy barriers that hinder poor people's access to financial

services in developing countries (Beck et al., 2009). According to Diagne & Zeller (2001), a household has access to a particular source of credit if it can borrow from that source, although it may choose not to borrow for a variety of reasons. Thus, access to formal credit depends on a number of supply-side as well as demand side factors. On the supply side, literatures identified the following barriers to access to credit:

Financial Service Availability: Credit access depends on the presence of banking services, suitable financial products, affordability, and ease of transaction (Diagne & Zeller, 2001).

Institutional Challenges: Issues like rural income instability, lack of collateral, small loan sizes, and high operational costs deter financial institutions from serving rural populations (Baiyegunhi, 2008).

Distance & Cost: High transportation costs and remote locations reduce access to formal financial services (Dallimore et al., 2013).

On the demand side, the following factors are identified by literatures as major determinants of formal credit access-

Household Characteristics: Credit access is influenced by factors such as wealth, assets, debt-service capacity, borrower reputation, and business relationships (Zeller, 1994; Morduch, 1999).

Socio-Demographic Attributes: Age, gender, education, land ownership, and occupation play a role in determining loan eligibility (Kumar et al., 2017).

Loan Terms & Interest Rates: Higher wealth increases access to larger loans with better terms (Binswanger & Khandekar, 1993), while low demand for formal sector credit due to high transaction costs and other reasons, push rural borrowers towards informal credit sources (Kochar, 1997).

Differences in the Proportion of Households having Access to Formal Credit Based on Socio-Demographic Attributes

The analysis of data collected through primary surveys revealed that the proportion of households having access to formal credit differs widely across different socio-economic and demographic attributes. The detailed components of each attribute along with the proportion of households having access to formal credit and the association between the dependent variable, access to credit, and the predictors socio-economic characteristics included in the model are summarised in Table: 1. The association between the dependent variable and various predictors has been examined by using the chi-square test of independence.

Table 1: Relationship between Credit Accessibility and Socio-Economic and Demographic Factors

Variable	Category	No. of HH	Proportion of HH with Access to formal Credit	Proportion of HH without Access to formal Credit	Calculated $\chi 2$	p-Value
Gender	Male	227	61.14	38.86	59.2040 (d.f.=1)	0.000
	Female	173	33.92	66.08		
Financial Literacy	Fin. Literate	263	66.02	37.07	62.3398 (d.f.=1)	0.000
	Fin. illiterate	137	19.15	75.18		
Bank account	holder	301	56.19	43.81	28.0389 (d.f.=1)	0.000
	Non-holder	99	29.70	70.30		
Possession of Agricultural Land	no holder	136	23.53	76.47	57.0718 (d.f.=3)	0.000
	Marginal holder	202	64.85	35.15		
	Small holder	54	55.56	44.44		
	Semi –Medium holder	8	62.50	37.50		
Distance from home to the nearest bank branch	Less than equal to 5 km	221	60.25	39.75	12.8674 (d.f.=1)	0.000
	More than 5 km	179	33.54	66.46		
No. of dependent family members	Less than / equal to 3	146	39.29	60.71	48.7664 (d.f.=1)	0.003
	More than 3	254	55.00	45.00		
Age	1(20-29) years	151	23.17	76.97	131.26 (d.f.=2)	0.000
	2(30-49) years	172	79.06	42.94		
	3(50 & above)	77	18.18	32.05		
Occupation	1(Farm)	136	41.18	58.82	122.1019 (d.f.=5)	0.000
	2(Wage)	105	6.67	91.43		
	3(Service)	41	85.37	14.63		
	4(Business)	62	80.65	19.35		
	5(Self Employed)	33	63.64	36.36		
	6. Handicraft	23	60.87	39.13		
Education Years of Schooling)	Primary(less than 4 years)	163	24.00	76.00	51.4850 (d.f=2)	0.000
	2(Class 5 to 12)	182	63.08	36.92		
	3(graduate and above)	55	70.91	29.09		
Business Experience	O to less than 5 years	192	36.87	63.13	11.4630	0.000
	More than 5 years	208	53.84	46.16		

Possession of Other Household Assets	Yes	277	60.28	39.72	71.4176	0.000
	No	123	14.63	85.36		
Constraints	No	253	76.67	23.32	33.2640	0.000
	Yes	147	2.72	97.27		
Availability of Interest Free Loan	No	253	74.60	25.40	18.6786	0.001
	yes	147	25.40	74.60		

Source: Own calculation.

The analysis of primary data collected through survey in Kamrup, Nagaon, Dhubri and Barpeta districts of Assam have shown the following key findings-

In the case of the attribute Gender, Male-headed households have higher access to credit (61.14%) than female-headed households (33.92%). With regard to the possession of Bank Account, it has been found that households with bank accounts have higher access to credit (56.19%) than those without (29.70%).

The analysis shows that, access to formal credit is positively correlated with Landholding Size: Larger landholdings are associated with higher access to credit. While only 23.53% of Households with no land have access to formal credit, 64.85% of the households with marginal size of land holdings and 55.56% with small size of land holdings have access to formal credit. Highest 62.50% of the semi-medium land holders have access to formal credit.

In the case of the geographical distance from home to the nearest bank branches, it has been found that, Closer proximity to banks increases access to credit. Similarly, it has been found that Households with more dependent members have higher access to credit. Data shows that, Middle-aged respondents (30-49 years) have higher access to credit compared to the younger age group and older age group respondents. In respect of the influence of the occupation of access to formal credit, analysis of data reveals that service and business owners have higher access to credit compared to the wage earners, farmers and handicraft workers. It has been found that, respondents having education level of graduation or above have greater access to formal credit compared to the primary education holders. Similarly, it has been found that more experienced business owners have higher access to formal credit in the study area. It has been found households owning other assets have higher access to credit (60.28%). Data reveals that, households who faced constraints like lack of collateral, difficult paper works etc., have lower access to formal credit (2.72%). Moreover, it is also found that, households without access to interest-free loans have higher access to formal credit. Thus, analysis of primary data reveals that access to formal credit differs significantly across different socio-economic and demographic characteristics of the households in the study area.

The association between access to formal credit and various socio-economic factors has been tested by using the Chi-square test of independence. The findings of the test, summarised in Table 1, reveals that a significantly high value of χ^2 (1, N=400) = 59.2040

indicates that there is a strong association between access to credit and the gender of the households.

In the case of possession of a bank account, it has been found it has significantly high value of χ^2 (1, N=400) = 28 and hence has a strong association with access to formal credit. Landholding size as a predictor has a close association with the dependent variable, access to credit. The Chi-square test of independence shows that landholding size has a significant value of Chi^2 of χ^2 (3, N=400) = 57.0718.

Distance from home to the nearest bank branch is another important predictor included in the study. The Chi-squared test of independence shows that access to credit and distance to a bank branch from home are closely associated. A significant value χ^2 (1, N=400) = 12.5674 is an indication of an association between access to credit and distance to a bank branch.

In the case of dependency ratios, the chi-square value is χ^2 (1, N=400) = 48.7664, which indicates a significant association with access to credit. It has also been found that there is a significant association between the age of the respondents and access to credit, as indicated by the calculated value of χ^2 (2, N=400) = 131.26 with a p-value of 0.000.

Similarly, the occupations of the respondents have a strong association with access to formal credit. Likewise, for educational attainments of the respondents, the Chi-square value χ^2 (2, N=400) = 51.4850 with a P-value of 0.000 indicates that there is a close association between the level of education and access to credit in this model. Moreover, as indicated by the Chi-square test of association, business experience and access to credit are strongly related. The significant χ^2 (1, N=400) = 11.4630 is the indication of a close association between the two. An important predictor included in the study is the ownership of other household assets, "like inhabitable lands, two-wheelers, four-wheelers, etc. Ownership of other assets and access to credit are closely related, as the calculated Chi-square value is 71.41.

It has been found that, different types of constraints, like lack of collateral, difficulties in documentation, rejection of previous loan applications, etc., are closely associated with access to formal credit.

The availability of interest-free loans from friends and relatives or other sources is another predictor included in the study. The test of independence shows that the interest-free loan has a significant chi-square value of 18.6786, which indicates that it has a close association with the dependent variable, access to credit. Thus, from the analysis of primary data, it has been found that all the variables used as predictors in this study have a strong association with the dependent variable access to credit. The extent and dimension of the impact of the predictor on the dependent variables can be made clear from the result of the logistic regression model used in this study. The subsequent sections present the outcome of the regression analysis of the data collected through the primary survey.

Determinants of access to Formal Credit by Rural Households-Results of the Logistic Regression

To empirically verify the potential influence of the selected household-level socio-economic and demographic factors on access to credit, a logistic regression model is used in this study. The dependent variable is the access to formal credit and is a binary variable such that Y=1 if the household has access to formal credit and Y=0 otherwise. Households that had successfully been able to borrow from formal financial institutions are considered as having access to formal credit, and households whose loan applications were rejected or not applied for formal credit are considered as not having access to credit. A total of 12 variables are included in the model. Out of these, gender, age, education, occupation, number of dependent family members and financial literacy are exclusively demand-side factors. On the other hand, possession of agricultural land, distance to a bank branch, possession of a bank account, and possession of other assets are the factors that influence both the borrower and the lender. However, complete separation of the demand side factors and supply side factors is very difficult. Hence, all the variables are combined in the same model without classifying them as demand-side and supply-side factors. All the explanatory variables are categorical, and the first category of each variable is taken as the reference category. The model is tested for goodness of fit by using the log-likelihood ratio test and Pearson's chi-square goodness of fit test. The LR test involves comparing a model with all the predictors (full model) to a model with only the intercept (null model). The LR test for this model shows a Chi2 value of 351.72 with a p-value of 0.000. A substantially high value of Chi2 with a significant p-value suggests that the model is well-fitted to the data. The LR test indicates that the inclusion of additional predictors enhances the explanatory power of the model. Again, Pearson's Chi2 test for goodness of fit also suggests that the logistic regression model used in this study fits the data well. The result of the Person's Chi2 test for the model of this study shows that for a total of 400 observations, the number of covariate patterns is 387, and the degrees of freedom are 365. The Chi2 value is 297.20, and p = 0.9961. Since the p-value of 0.9961 is reasonably higher than the prescribed threshold of 0.05, we have failed to reject the null hypothesis that there is no significant difference between the observed and the expected frequencies. Thus there is strong evidence that the model's predictions are consistent with the observed data and the model is a good fit for the data. Further, the pseudo-R^2value of the model is 0.6431. It indicates that 64.31 percent of variations in the dependent variable access to formal credit are explained by the predictor. The result of the logistic regression is presented in Table 2. Table 2 reflects the influence of the various demand related and supply related factors on the dependent variable access to formal credit. The Table 2 contains odds ratios which reflect the likelihood of accessing formal credit, coefficients which indicates the extent and direction of the influence of the predictor and the significance level. Values of odds ratios greater than one indicate positive association and values less than one indicates negative association. Positive coefficients suggest an increase in the log-odds of accessing credit, while negative coefficients suggest a decrease in the log-odds of accessing credit. Again, p-values which are below 0.05 indicate statistical significance at 5% level of significance.

Table 2: Results of Logistic Regression on Determinants of Access to Formal Credit by Households

Variables Access to formal Credit(Y-Dependent Variable)		Odds ratios	Coefficients.	Significance
Gender		2.384143	.8688397**	0.032
Financial Literacy		5.83084	1.763161***	0.000
Bank Account		2.07633	.7306021	0.140
Distance to bank branch		.4329707	-.8370853**	0.043
No. of dependent (More than 3)		5.084907	1.626277***	0.000
Age	Age group (30-50)	12.20406	2.501769***	0.000
	Age group (50 and above)	2.372683	0.8640214	0.154
Education	Secondary (6 to Class 12)	2.07813	.7314683*	0.100
	Graduate and above	16.12565	2.780411***	0.000
Occupation	Wage labour	.1797506	-1.716185***	0.007
	Service	19.34006	2.962178***	0.000
	Business	5.541454	1.712257***	0.004
	Self-employed	2.605058	.9574548	0.169
	Handicraft	2.354357	.8562678	0.228
Household Assets (Consumer durables)		9.211793	2.220484***	0.000
Constraint in loan application		.4424582	-.8154092**	0.038
Interest free loan		.4121562	-.8863529**	0.042
Agricultural land	Marginal	2.336988	.8488631*	0.063
	Small	5.837124	1.764238***	0.003
	Semi-medium	.9047234	-.1001261	0.904
Business Experience		2.535193	.9302699***	0.018

Dependent variable: Access to formal credit (1 = Access to credit; 0 = otherwise).
Note: first category is the reference category. Categories are mentioned in Table 3.6 Pseudo R2=0.6431
*, **, *** indicates 10%, 5% and 1% level of significance
Pseudo R2=, LR Chi2 (21) = 355.18and p=0.000, N=400

Source: own calculation based on Primary data.

From the logistic regression analysis presented in Table 2, it has been found that, gender (male), financial literacy, number of dependent family member (more than 3), age group (30-49), higher education (Graduate and above), service and business occupations, possession of household assets, small agricultural land holdings, and business experience have positive significant impact on access to formal credit.

From Table 2 it has been found that, the impact of gender on access to credit is statistically significant at 5% level of significance. And hence the null hypothesis that

males and females have equal likelihood for access to formal credit is rejected and we accept the alternative hypothesis that male have greater likelihood, compared to female of having access to formal credit.

As expected, it has been found that the odds of having access to formal credit are 2.38 times higher for males compared to females. It indicates that being male have 2.38 times more likely to have access to formal credit than females.

Financial literacy has been found statistically significant at 1% indicating that financially literate households have a greater likelihood of having access to formal credit, compared to the illiterate households. The positive coefficient reflects that log odds of financially literate respondents increase by 1.76 times compared to financially illiterate individuals, keeping all other effects constant.

It has been found from Table 2 that, the variable number of dependent family members in a household has strong statistical significance in influencing access to formal credit at 1% level of significance. The Table 2 shows that, having more than three dependents increases the odds of having access to formal credit by 5.08 times.

Middle-aged respondents have significantly greater probabilities of access to formal credit than the younger population or the old aged populations. Age group (30-49) is found to have a strong positive significant impact on access to formal credit with a coefficient value of 2.50 and odds ratio 12.20.

Concerning education as a predictor, Table 2 reveals that attainment of the level of education up to graduation or above has strong statistical significance in determining access to formal credit compared to primary and secondary education levels. The influence of higher education (graduate and above) is significant at the 1% level. Hence we reject the null hypothesis that education does not have a significant effect on access to formal credit. A similar finding is also reported by other studies (Lazaro & Alexis, 2021).

Among the occupational categories, it has been found that being in service as an occupation has 19.34 times higher odds of having access to formal credit compared to those in farming. Similarly, it is also found that the odds of having access to formal credit are 5.54 times higher for those in business occupations (p-value = 0.000). Thus, occupation is statistically significant in influencing access to credit at the 1% level.

Possession of "other household's assets," like inhabitable lands, two-wheelers, and four-wheelers, has been found to have a strong positive significant impact on access to formal credit.

Among the size of landholding categories, marginal landholding has a positive significant impact on formal credit access at the 10% level of significance. The small landholding categories have a much higher odds ratio of 5.84, indicating a much higher

likelihood of accessing formal credit. However, semi-medium landholdings have a negative coefficient of -0.1001261, indicating a reduced likelihood of accessing formal credit.

Respondents with more than 5 years of business experience have a 2.53 times greater likelihood of access to formal credit compared to the respondents with less than 5 years of business experience.

Additionally, from Table 2, several predictors are found to have a significant negative influence on access to formal credit. The variables distance to the bank branch (more than 5 km), constraints in the loan application, and availability of interest-free loans have statistically significant negative influences on access to formal credit. Distance to the bank branch is significant at the 5% level of significance with a negative coefficient value of (-0.84). It indicates that individuals living farther away from bank branches are less likely to have access to formal credit. The value of the odds ratio reflects that for every unit increase in distance to the bank branch, the odds of having access to formal credit decrease by 0.43 times.

Occupational category wage labour has a significant negative impact on formal credit access. Wage labour has a p-value of 0.007 and a negative coefficient of -1.72. An odds ratio of 0.18, which is less than 1, indicates that wage labour has reduced odds of access to formal credit compared to the reference category of occupation farmer.

The impact of the predictor constraints has been found significant at the 5% level. A negative coefficient value (-0.82) and an odds ratio of 0.44 indicate that the odds of having access to formal credit are 0.44 times lower for those who face constraints in loan applications compared to those without constraints, and the log odds of having access to formal credit decrease by 0.82 units for individuals who face constraints in loan applications. Similarly, the influence of the variable availability of interest-free loans has been found significant at the 5% level. A negative coefficient and odd ratio of less than 1 indicate that the odds of having access to formal credit are 0.41 times lower for those who receive interest-free loans.

From Table 2, it has been found that variables like holding a bank account, age group (50 and above), occupation category (Self-Employed and Handicraft Worker), and semi-medium land holdings have no statistically significant influence on access to formal credit.

The constant value in logistic regression is the predicted log-odds of the dependent variable when all the predictors are equal to zero. In this model, the constant has an extremely low odds ratio of .0002396. It indicates that in the absence of all the attributes reflected by the predictors, the chance of getting formal credit is extremely low. In other words, without financial literacy, education, agricultural land, other assets, etc., the chance of an individual getting formal credit is very low. A large and negative value of the coefficient of the constant (-8.34) means an individual has reduced chances of access

to formal credit in the absence of all the predictors. A p-value of 0.000 of the constant is highly significant and indicates that the constant term is significantly different from zero and plays an important role in predicting the likelihood of accessing formal credit in the absence of the predictors.

Conclusion

From the above analysis, it has been found that the extent of access differs significantly based on different attributes of the households. In the case of gender, male respondents have greater access to formal credit compared to females. Similarly, financially literate respondents have greater access compared to financially illiterate households, and households residing at a closer distance from a bank branch have relatively higher access than those living more in a distant place from banks. Similarly, families having more dependent members, service and business categories of education, small-size landholdings, and respondents with more business experience have greater access to formal credit compared to the other categories of the respective variables. The regression analysis has shown that several variables have a significant and positive influence on access to formal credit. These include gender (male), financial literacy, number of dependent family members (more than 3), age group (30-49), higher education (graduate and above), service and business occupations, possession of household assets, small agricultural land holdings, and business experience. Additionally, variables like distance to bank branches, wage-earning category of occupation, and constraints in loan applications have a significant negative impact on formal credit access. On the other hand, holding bank accounts, age group (50 and above), occupation categories (self-employed and handicraft worker), and semi-medium land holdings have no statistically significant influence on access to formal credit.

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Financial Performance of Food Processing Industry: A Study in Assam

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Abstract

Food Processing industry is one of the major agro-based industries. It processes raw food crops with the objective of profit motive. In Assam, varieties of horticulture crops are produced at its different parts. The state's food processing units process only a part of them. The present study aims to analyse the financial performance of the food processing industry of the state. Primary data for the study are collected from a sample of 63 food processing units of the state. Liquidity, solvency, activity and profitability ratio are applied to examine the financial performance of the industry. The study finds that liquidity performance of the food processing units is lower than the benchmark level. The solvency position of the units is also found lower than the benchmark level. The grains and cereals units are observed as the most efficient assets utilizing units. Itis observed that the grains and cereal units earn the highest returns from investment. The food processing units should minimise their liabilities and reduce their dependence on external source of finance. Grains and cereals units should be encouraged because their maximum returns earning capacity from investment fund.

Introduction

Food processing industry is a popular agro based industry satisfying community needs with respect to availability, distribution and quality of food (Zouand Prasain, 2019). Government of India has undertaken a critical responsibility for the development of food processing sector after the economic reforms (Jadhav, 2019). As a result of this, from 2015-16 to 2019-20, Indian food processing sector grew up at an annual average growth rate of 11.8 percent (Ministry of Food Processing, Government of India, 2022). But still only 10 percent of the total agricultural output of the country is processed through the food processing industrial sector (Rani and Mittal, 2021).

Assam is the most industrially advanced state of the North Eastern Region (NER) of India. At per constant price (2011-12), the annual growth rate of the industry sector

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of Assam was 11.36 percent, while at current price, it was 4.75 percent for the year 2022-23(Economic Survey, Assam, 2023-24). In terms of number of registered industrial units, the state holds the rank of 16th position in the country (Annual Survey of Industries, 2019-20).

Food processing industry is an important industry within the state. The state produces varieties of horticultural crops with its favourable agro- climatic condition. In the year 2021-22, the state produced 23.04 lakh metric ton fruits crops, 7.92 lakh metric ton tuber crops, 4.13 lakh metric ton spice crops, 57.58 lakh metric ton vegetables and 0.49 lakh metric ton plantation crop (Economic Survey Assam, 2023-24). On the other hand, the state's net sown area of 25.55 lakh hectors was used for food grains production in 2021-22 (Directorate of Economics and Statistics, Assam, 2023-24).

The state's food processing industry has been growing at an compound growth rate of 5.13 per cent within a time period of 10 years between 2009-10 to 2018-19, as per the records of Ministry of Food Processing (MOFPI), Government of India. As against this, India's food processing industry grew at compound growth rate of only 1.61 within this time period. Surprisingly, with a favourable growth of the food processing industry in Assam, the food processing industry has been still processing only a marginal portion of the state's horticulture crops. Thus, there is a opportunity and potential in food processing activities in Assam.

Review of Literature

Several studies had been undertaken on different aspects of the food processing industry. For example, Kiminami, et al. (2000) examined the food industry of East-Asian Countries from the view points of international specialization. It was found that international specialization of food industry among East Asian Countries (EACs) changes after the 1980s because of the increasing food processing industries in these countries. It is found changes at the distribution channels as well as food processing activities as a result of Foreign Direct Investment (FDI). Salimonu, et al. (2006) investigate the installed capacities of the food and beverages industries in Nigeria. The study observes declining average capacity utilization and an overall instability in the raw material utilization. It recommended imposing import restrictions of those items, which could be produced within the country, and the government could provide necessary supports to the entrepreneurs that desire to produce it. Wen-Ge Fu et al. (2011) examined the technical efficiency of wheat and paddy rice processing in China by applying stochastic frontier model. It shows that rice processing firms enjoy higher technical efficiency compared to flour processing firms. Again, it also revealed a negative growth of technical efficiency in a major portion of the firms. The technical efficiency in case of both rice and flour processing industry is observed only about 50 per cent.

Roy (1997) evaluated the growth and prospects of food processing industry in India and low level of the food processing in the country. It is identified that inadequate post-harvest technology, transport and marketing problems, weak linkages between growers and

processors and inadequate domestic demand for processed food items are the factors for low level of processing in the food processing sector. Sukla, et al. (2008) examined the problems and prospects of the fruits and vegetable processing industry in India. The study revealed that it commercially processes only 1.78 percent of its total production inspite of remarkable production of fruits and vegetables. The low level of processing in India is mainly due to the inadequate post-harvest technology, lack of transport and marketing provisions, absence of linkage between processing units and the ultimate buyers. Gopalan (1987) examined financial health of the Dharmapuri District Co-operative Sugar mill in the state of Tamil Nadu with the help of various financial ratios normally used in financial analysis. The analysis finds a good performance of the Sugar mill. The study suggests ways for achieving operational efficiency of the unit. Singha, et al. (2012) study the trend, status and find out the constraints of Indian food processing industrial units. The investigators mention that India's processing industry is largely under the control of unorganized sector. Absence of adequate infrastructure, inadequacy of information and marketing linkages, lack of electricity supply, and the absence of cold chain systems are the burning problems of the food processing industry. The study suggests popularisation of nutritious processed food among consumers, set up of distribution network, development of marketing channels, improvement of food quality standards and better provision of institutional framework to develop manpower for improving research and development.

Bhattacharyya (2013) studies the growth of food processing units and the nature of employment generated in them in Kamrup district of Assam. The study finds that availability of raw materials is the most important factor for the growth of fruits and vegetables processing industry in the district. Lack of working finance is observed as the top most serious problem of the processing industry in the district. The study suggests that the govt. officials should undertake and initiate awareness raising programmes for the better performance of food processing sector. Gogoi (2017) studies the financial health of food processing industry in Tinsukia District of Assam. The study identifies infrastructural problem, existence of large number of unskilled workers, absence of wider market, improper banking provisions, and absence of the Government supports as the major problems of the district food processing units. Mehdi (2017) tries to study on the skill gap and its requirement in the field of food processing industry of Assam. The investigator finds that majority of the states food processing units involve in processing activities such as flour mills, food and fruit processing. Shortage of adequate manpower in the food processing activities is identified as a serious problem. Sarma (2018) studies a sample of 90 industrial units with five different categories in the district of Kokrajhar, Assam. It is found that rice mill is the highest profit earning units as compared to investment. The investigator suggests giving focus on the development of fruits and vegetable processing units in the district. It also suggests distribution and provision of advanced tools and machinery to the hand of young entrepreneurs of the district.

Objectives

The study was carried out with the following objectives:

1. Analyse the financial performance of the food processing units in Assam

2. To access the financial problems, if any.

Hypotheses

The following hypotheses have been tested:

1. There is no significant difference between the liquidity ratios of different categories of food processing units.
2. There is no significant difference between the solvency ratios of different categories of food processing units.
3. There is no significant difference between the net profit ratio of different categories of food processing units

Research Methodology

The relevant primary data are collected through interview schedule from a sample of 63 entrepreneurs of food processing units out of 384 entrepreneurs from three districts of Assam, namely, Tinsukia (representing upper Assam), Nagaon (reprenting middle Assam) and Dhubri (representing lower Assam). In selecting the sample entrepreneurs, focus is given to include all the four categories of food processing units as defined by MOFPI, Government of India. As per the official website of Director of Horticulture and Food Processing, Government of Assam, two categories food processing activities (included in MOFPI, Government of India), namely, processing of fisheries and that of meat and poultry are not observed on commercial basis. The primary data from the respondent entrepreneurs are collected for the financial year 2023, covering from 1st April, 2022 to 31st March 2023. The relevant secondary data for the study are collected from various issues of Statistical Hand Book of Assam and DICs of Tinsukia, Nagaon and Dhubri District.

The financial performance of the food processing industry of Assam is analysed in the present study from the view points of liquidity, solvency, efficiency and profitability. The following financial ratios are applied in the present study:

1. Liquidity measurement:-Current Ratio and Quick Ratio

    i) Current Ratio= (Current Assets)/(Current Liabilities)

Current Assets= cash in hand, cash in bank, sundry debt, stock, loan and advance to others, small scale investment like fixed deposits, etc.

Current liabilities= creditors, short term loans taken for one year time period, bank overdraft, cash credit, advance tax and insurance premiums and all others payable. Bench mark for current ratio is 2:1.

    ii) Quick Ratio= (Quick Assets)/(Current Liabilities)

Quick Assets=Current Assets- inventories- prepaid expenses and *Current liabilities* =

already shown at Current Ratio. Bench mark for Quick Ratio is 1:1.

2. Solvency Measurement- Equity Ratio and Debt Ratio

i) Equity Ratio= (Shareholder^' s Equity)/(Capital Employed)

Shareholder's Equity= Own capital and *Capital Employed*= Own capital +Borrowed capital. 0.5 or more is considered as good ratio.

ii) Debt Ratio = (Total outside liabilities)/(Total Assets)

= Total short term liabilities (short term loan, bank over draft and cash credits)+Long term liabilities (borrowed capital). *Total assets*=Current Assets + Non-current Assets ,i.e. fixed asset. Normally 0.4 or less is considered as good ratio.

3. Efficiency measurement -Total Asset Turnover Ratio and Fixed Asset Turnover Ratio

i) Total Asset Turnover Ratio= (Net Sales)/(Total Assets)

Net Sales= Gross sale-allowance- discounts-returns. *Total assets* = Current Assets + Non current Assets, i.e. fixed asset. There is no bench mark ratio for total asset turnover ratio, but higher ratio is preferable.

ii) Fixed Asset Turnover Ratio= (Net sale)/(Fixed Assets)

Net Sales= Already shown at Total Assets Turnover Ratio. *Fixed Assets*= value of land property+ factory building +Machine +fixtures and furniture. There is no bench mark ratio for fixed asset turnover ratio, but higher ratio is preferable.

4. Profitability measurement-Return on Investment(ROI) and Net Profit Ratio (NPR)

i) Return on Investment (ROI)= (Returns or Profits or Earnings)/(Investment or Sales) ×100

Profits stands for net profits= Gross sale- Cost of Goods sold - Operating expenses Investment = Shareholders' Fund (or) Investments. There is no bench mark ratio for ROI, but higher ratio is preferable.

ii) Net Profit Ratio (NPR)= (Net Profit)/(Net Sale) ×100

Net Profit= Gross profit- Operating expenses. *Net sales*= Gross sales - Returns, Allowances, and Discounts. There is no bench mark ratio for NPR, but higher ratio is preferable.

Findings and Discussion

Liquidity Measurement: Liquidity shows how well a business firm can manage its

short term liability with short term assets. For measuring liquidity, the present study uses two liquidity ratios: Current Ratio and Quick Ratio.

Current Ratio: Current ratio is the ratio between current assets to current liabilities. Current ratio shows the extent to which the current liabilities (to be paid back within 12 months' duration) are covered by its current assets (assets to be realised within 12 months' duration). A generally acceptable current ratio is 2:1 (The institute of Chartered Accountants of India, 2021).Table 1 displays the category wise current ratio of the food processing units of the study area.

Table 1: Categorywise Current Ratios of Food Processing Units for the Year 2022-23

Category	Current Assets (Rs.) (Col.-I)	Current Liabilities (Rs.) (Col.-II)	Current Ratio Col.-III [(Col.(I))/(Col.II)]	
	Mean	Mean	Mean	SD
Dairy	2706485	2372685	1.1406	0.1110
Fruits & Vegetables	1050430	982318	1.0693	0.2756
Grains and cereals	1912065	1367198	1.3985	0.6230
Consumer food	1310713	999518	1.3113	0.3992
All Units	1744923	1430430	1.2198	0.5594

Source: Field Survey, 2023

It is observed from Table 1 that the current ratio of all the individual categories of food processing units as well as the all units, in general, is less than the bench mark ratio of 2:1. It implies that the current liabilities of the units are much more comparing to their current assets. Standard deviation (SD) of all the categories is found to be 0.5594 (i.e. lower than 1), implying that the current ratios are more or less are following same pattern in the food processing units of the study area.

Quick Ratio: Quick ratio, also called as acid-test ratio, measures the performance of a business firm to pay-off its instant obligation without relying on its inventories. It is the ratio between quick assets (current assets excluding inventories) to current liabilities. The bench mark quick ratio is 1:1 (The institute of Chartered Accountants of India, 2021). Table 2 displays the category wise quick ratio of the food processing units.

Table 2:Category wise Quick Ratio of Food Processing Units for the Year 2022-23

Category	Current Assets (Rs.) (Col.-I)	Current Liabilities (Rs.) (Col.-II)	Current Ratio Col.-III [(Col.(I))/(Col.II)]	
	Mean	Mean	Mean	SD
Dairy	2223885	2372685	0.9372	0.1155
Fruits & Vegetables	866230	982318	0.8818	0.1629
Grains and cereals	1439477.7	1367198.4	1.0528	0.5517
Consumer food	1112092.5	999518.9	1.1126	0.4006
All Units	1410421	1430430	0.9860	0.4932

Source: Field Survey, 2023

Table 2 indicates that the quick ratios of dairy as well as fruits and vegetable category units are less, while those of grains and cereals as well as consumer food category units are more than bench mark ratio. Quick ratio of a food processing unit, in general is found to be lower than the benchmark ratio which implies that the food processing units maintain some amount of inventory and rely on selling of inventory for clearing their current liabilities. The SD of quick ratios of all units is found to be less than 0.5 which indicates almost similar pattern of quick ratios throughout the industry.

Solvency Measurement: Analysis of solvency measurement provides the information about financial capacity of industrial units to repay long-term liabilities. Solvency position in the study is analysed by using two ratios, namely, equity ratio and debt to equity ratio.

Equity Ratio: Equity ratio is the proportion of the owner's funds to the total funds employed in a business entity. Normally, higher the equity ratio the lower is the degree of risk, as higher ratio indicates higher size of owner's fund comparing to borrowed fund. The ideal equity ratio is 1:2 or 50 per cent. Table 3 shows the equity ratio of the food processing units of the study area.

Table 3: Category wise Equity Ratios of the Food Processing Units for the Year 2022-23

Category	Equity Capital (Rs.) (Col.-I)	Capital Employed (Rs.) (Col.-II)	Capital Employed Col.-III (Col.–I)/(Col.(I+II))]	
	Mean	Mean	Mean	SD
Dairy	1985000	2596000	0.4333	0.0213
Fruits & Vegetables	1022000	1219200	0.4560	0.0614
Grains and cereals	1583523	1786762	0.4698	0.0990
Consumer food	1131158	1157857	0.4941	0.0980
All Units	1430420	1689954.8	0.4584	0.0960

Source: Field Survey, 2023

From table 3, it is clear that on an average, equity ratios of all the food processing units are less than0.5. It means that out of the total capital invested, the owners' capitals are less than their borrowed capital. It indicates an unhealthy long-term solvency position of the units. SD of equity ratios of all the units are also found to be 0.096 implying approximately similar pattern of equity ratios in all the units.

Debt Ratio: The debt ratio is a financial ratio that shows leverage of a business firm. It is the ratio of total outside liabilities to total assets. It can be interpreted as the proportion of a firm's assets that are financed by debt. From a pure risk perspective, debt ratios of 0.4 or lower are considered better, while a debt ratio of 0.6 or higher makes it more difficult to borrow money (Ross,2022). The category wise debt ratios of the units are shown at Table 4.

Table 4: Category wise Debt Ratio of Food Processing Units for the Year 2022-23

Category	Total outside liabilities (Rs.) (Col.-I)	Total Asset(Rs) (Col.-II)	Debt Ratio(Col.-III) (Col.–I)/(Col.-II)	
	Mean	Mean	Mean	SD
Dairy	2596000	6343185	0.4092	0.0197
Fruits & Vegetables	1219200	3429458	0.3555	0.0329
Grains and cereals	1786762	4963579	0.3599	0.0614
Consumer food	1157857	4076249	0.3821	0.0510
All Units	1689955	4703117	0.3593	0.0605

Source: Field Survey, 2023

Table 4 shows that the debt ratio of all the units is 0.3593 which is lower than the ideal debt ratio of 0.4 indicating good solvency position. It is observed that among the categories only dairy units experiences solvency issue, as its debt ratio is found to be 0.4092 or more than 0.4. SD of debt ratios of all the units is only 0.0605 which means that all the units have almost similar pattern of debt ratios.

Efficiency Measurement: Efficiency measurement indicates efficiency of business firms in the application of their various assets. Here, efficiency of the food processing units is checked through two prominent efficiency ratios, namely, total assets turnover ratio and fixed assets turnover ratio.

Total Asset Turnover Ratio: Total asset turnover ratio is used to examine the efficiency of a business firm from the view point of uses of its total assets. It is the ratio of net sale to total assets of a business firm. There is no ideal total assets turnover ratio. But, generally, a higher ratio is favored, because it implies that a firm is efficient in generating sales or revenues from its asset base (Hayes, 2024). Table 5 shows the category wise total assets turnover ratio of the food processing units.

Table 5:Total Assets Turnover Ratios of Food Processing Units for the Year 2022-23

Category	Net Sale (Rs.) (Col.-I)	Total Assets (Rs) (Col.-II)	Total Assets Turnover Ratio (Col.-III)(Col.–I)/ (Col.-II)]	
	Mean	Mean	Mean	SD
Dairy	6624877	6343185	1.0444	0.0434
Fruits & Vegetables	2865142	3429458	0.8354	0.1657
Grains and cereals	15842149	4963579	3.1916	2.4685
Consumer food	4454298	4076249	1.0927	0.5369
All Units	7446616.5	4703117.75	1.5833	2.3110

Source: Field Survey, 2023

It is clear from table 5 that the total assets turnover ratio is the highest (3.1916) in case of grains and cereals category. In other words, all the categories, grains and cereals

processing units are utilizing their assets in the most efficient manner. SD of total assets turnover ratios of all the units is observed to be 2.3110 indicating some sort of dissimilarity in the pattern of total assets turnover ratio among the various units.

Fixed Assets Turnover Ratio: Fixed assets turnover ratio shows how well a firm uses its fixed assets for generating its sales. It is the ratio of net sale to a firm's fixed assets. A high fixed assets turnover ratio indicates efficient utilization of fixed assets in generating sales (The institute of Chartered Accountants of India, 2021). Table 6 displays the fixed assets turnover ratios of the food processing units in the study area.

Table 6: Fixed Assets Turnover Ratios of Food Processing Units for the Year 2022-23

Category	Net Sale (Rs.) (Col.-I)	Fixed Assets (Rs) (Col.-II)	Fixed Assets Turnover Ratio(Col.-III)[(Col.–I)/ (Col.-II)]	
	Mean	Mean	Mean	SD
Dairy	6624877	3636700	1.8216	0.0889
Fruits & Vegetables	2865142	2379028	1.2043	0.2576
Grains and cereals	15842149	3051514	5.1915	3.7181
Consumer food	4454298	2765535	1.6106	0.7811
All Units	7446616.5	2958194.25	2.5172	3.5601

Source: Field Survey, 2023

It is seen from the table 6 that the fixed assets turnover ratio of grains and cereals category is the highest in the food processing industry. Thus, fixed assets are utilized in the most efficient manner comparing to other categories. SD of fixed assets turnover ratios of all the units is observed to be 3.5601 indicating some sort of dissimilarity in the pattern of fixed assets turnover ratios among the various units.

Profitability Measurement: The ability of an industry to earn its profits is well explained by judging its profitability measurement. The present study analyses profitability of food processing units based on two ratios: return on investment (ROI) and net profit ratio (NPR).

Return on Investment (ROI): Return on investment is used to examine how much return an investor will receive from his invested fund. ROI is calculated by the ratio of net profit to invested fund. ROI of various categories are shown at table 7.

Table 7 shows that ROI of grains and cereals is the highest (123.65 percent) among all the categories. It implies that the investment in grains and cereals category can generate maximum returns comparing to those invested in other categories. SD of ROIs of all the categories is observed to be 51.5289 which indicate dissimilarity in the ROI among various units of the food processing units.

Table 7: ROI of the Food Processing Units for the Year 2022-23

Category	Net Profits (Rs.) (Col.-I)	Investment (Rs) (Col.-II)	ROI (%)(Col.-III) [(Col.–I)/(Col.-II)×100]	
	Mean	Mean	Mean	SD
Dairy	1502000	3060000	49.08	2.9335
Fruits & Vegetables	1362080	1762000	77.3	11.1692
Grains and cereals	3402862	2751933	123.65	52.5321
Consumer food	1765394	2311000	76.39	20.6500
All Units	2008084	2471233	81.6	51.5289

Source: Field Survey, 2023

Net Profit Ratio (NPR): The ratio between net profit and net sales is known as Net Profit Ratio (NPR). Net profit refers to the proportion of sales that is left over after adjustment of all relevant expenses. This ratio expresses overall efficiency of a firm in operating its business. The NPRs of various categories of units is shown at table 8.

Table 8: Category wise NPR of the Food Processing Units for the Year 2022-23

Category	Net Profits (Rs) (Col.-I)	Net Sale (Rs.) (Col.-II)	Net Profit Ratio (%) (Col.-III) [(Col.–I)/ (Col.-II)×100]	
	Mean	Mean	Mean	SD
Dairy	1502000	6624877	22.67	1.1359
Fruits & Vegetables	1362080	2865142	47.53	3.1573
Grains and cereals	3402862	15842149	21.47	10.1986
Consumer food	1765394	4454298	39.63	10.4923
All Units	2008084	7446617	26.96	12.8153

Source: Field Survey, 2023

From Table 8, it is observed that NPR of fruits and vegetable category is the highest (47.53 percent) followed by that of consumer food category (39.63 per cent). The SD of NPRs of all the units is found to be 12.8153 implying some sort of dissimilarity in the NPRs of the units of the industry.

Hypotheses Testing

First Hypothesis: There is no significant difference between the liquidity ratios of different categories of food processing units.

The descriptive statistics of the liquidity ratios of four categories of food processing units are given in the Table 9.

Table 9: Descriptive Statistics of Liquidity Ratios of Different Category of Food Processing Units

Liquidity Ratios	Category	N	Mean	SD	Std. Error	Minimum	Maximum
Current Ratio	Dairy	2	1.149	0.111	0.079	1.070	1.227
	Fruits and vegetables	5	1.099	0.276	0.123	0.783	1.481
	Grains and cereals	42	1.527	0.623	0.096	0.596	2.901
	Consumer food	14	1.390	0.399	0.107	0.975	2.523
	Total	63	1.451	0.559	0.070	0.596	2.901
Quick Ratio	Dairy	2	0.946	0.116	0.082	0.864	1.028
	Fruits and Vegetables	5	0.900	0.163	0.073	0.692	1.092
	Grains and cereals	42	1.156	0.552	0.085	0.389	2.548
	Consumer food	14	1.182	0.401	0.107	0.819	2.318
	Total	63	1.135	0.493	0.062	0.389	2.548

Table 10: Result of One-Way ANOVA Test for Difference Between the Liquidity Ratios of Different Category of Food Processing Units

Liquidity Ratios	Particulars	Sum of Squares	df	Mean Square	F	p-value
Current Ratio	Between Groups	1.096	3	0.365	1.177	0.326
Quick Ratio	Between Groups	0.396	3	0.132	0.53	0.663

The result of the One-Way ANOVA test for difference between the liquidity ratios of different categories of food processing units showed that the difference is not significant. All the measures of liquidity performance, such as, current ratio and quick ratio show that there is no significant difference in these ratios of different categories of food processing units. This implies that all the categories of units have similar liquidity performance. Hence, the first hypothesis could not be rejected at any level of significance. This implies that all the four categories of food processing units have similar financial performance in terms of liquidity ratios.

Second Hypothesis: There is no significant difference between the solvency ratios of different categories of food processing units.

The descriptive statistics of the solvency ratios of four categories of food processing units are given in the Table 11.

Table 11:Descriptive Statistics of the Solvency Ratios of Four Categories of Food Processing Units

Solvency Ratios	Category	N	Mean	SD	Std. Error	Minimum	Maximum
Equity ratio	Dairy	2	0.648	0.021	0.015	0.633	0.664
	Fruits and Vegetables	5	0.577	0.061	0.027	0.514	0.662
	Grains and cereals	42	0.634	0.099	0.015	0.397	0.810
	Consumer food	14	0.664	0.098	0.026	0.539	0.916
	Total	63	0.637	0.096	0.012	0.397	0.916

Debt ratio	Dairy	2	0.251	0.020	0.014	0.237	0.265
	Fruits and Vegetables	5	0.355	0.033	0.015	0.312	0.392
	Grains and cereals	42	0.326	0.061	0.009	0.211	0.460
	Consumer food	14	0.285	0.051	0.014	0.155	0.356
	Total	63	0.317	0.061	0.008	0.155	0.460

Table 12: Result of One-Way ANOVA Test for Difference Between Solvency Ratios of Different Category of Food Processing Units

Solvency ratios	Particulars	Sum of Squares	df	Mean Square	F	p-value
Equity ratio	Between Groups	0.029	3	0.01	1.063	0.37
Debt ratio	Between Groups	0.033	3	0.011	3.39***	0.02

*Note: *** indicate significant at 0.05 level of significance.*

The result of the One-Way ANOVA test for difference between the solvency ratios of different categories of food processing units showed that in case of equity ratio the difference is not significant. However, the result showed that there is a significant difference between debt ratio of difference categories of food processing units. Since there is a significant difference in one solvency ratio out of the two ratios, it can be inferred that there is a significant difference in the solvency performance of different categories of food processing units. *Hence, the second hypothesis* can be rejected. This implies that all the four categories of food processing units have different solvency performance.

Third Hypothesis: There is no significant difference between the net profit ratio of different categories of food processing units.

The descriptive statistics of the Net Profit Ratios of four categories of food processing units are given in the Table 13.

Table 13:Descriptive Statistics of the Net Profit Ratios of Four Categories of Food Processing Units

Category of units	N	Mean	SD	Std. Error	Minimum	Maximum
Dairy	2	0.2166	0.0108	0.0076	0.210	0.220
Fruits and vegetables	5	0.4642	0.0317	0.0142	0.430	0.510
Grains and cereals	42	0.2649	0.1002	0.0155	0.090	0.360
Consumer food	14	0.426	0.1010	0.0270	0.270	0.570
Total	63	0.315	0.1243	0.0157	0.090	0.570

Table 14: Result of One-Way ANOVA Test for Difference Between Net Profit Ratios of Different Category of Food Processing Units

Particulars	Sum of Squares	df	Mean Square	F-Statistic	p-value
Between Groups	0.409	3	0.136	14.648***	0.00
Within Groups	0.549	59	0.009		
Total	0.957	62			

*Note:***indicates significant at 0.01 level of significance*

The result of the One-Way ANOVA test showed that the difference between the net profit ratios of different categories of food processing units was significant at 0.01 level of significance. Hence, the third hypothesis could not be accepted. This implies that all the four categories of food processing units have different net profit ratios.

Financial Problems Observed

- Liabilities are found to be more than their assets as indicated by lower current ratio of all units comparing to the bench mark ratio.
- Food processing units are holding inventories and waiting for the sales proceeds for clearing liabilities as their general quick ratio is found to be less than the bench mark quick ratio.
- Equity ratios of the food processing units are less than 0.5 indicating less amounts of owners' capitals (or more amount of borrowed capital) to the total capital invested.
- Dairy category are depending more on external debt as its debt ratio is found to be more than the ideal level.

Conclusion

From the study, it can be concluded that the financial performance of the food processing industry of Assam is not satisfactory. The liquidity measurement analysis shows that current ratio and quick ratio of a food processing industrial units in general are lower than their bench mark level. The solvency performance displays that equity ratio and debt ratio of a unit, in general, are also found to be lower than the respective bench mark level. In case of efficiency measurement, grains and cereals category is the most efficient category as its total assets and fixed assets turnover ratios are found to be highest among all categories. ROI is found to be highest in case of grains and cereals, while NPR is observed to be the highest in case of fruits and vegetable.

Findings of the study may lead to the following policy implications: The food processing units should reduce their liabilities and steps should be taken for increasing their assets. The units should increase the share of own capital in the total capital invested and reduce their dependency on borrowed capital so far as it is possible. Encouragement should be given for establishing more grains and cereals as well as fruits and vegetables processing units because of their good returns from investment and higher net profit ratio.

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A Brief Inquiry of Intergenerational Mobility among the White-Collar Workforce in Mizoram

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Abstract

This paper examines the relationship between socioeconomic background, educational credentials, and occupational trajectories across generations among white-collar workers in Mizoram. Focusing on directly appointed Group A (Gazetted) officers with less than twenty years of service, the study employs a mixed-methods approach, primarily using original, first-hand data. It investigates whether educational achievement drives social stratification in environments with limited upward mobility prospects. The paper explores intergenerational dynamics between parental socioeconomic position, academic achievement, and offspring's educational attainment and adult social standing. Additionally, it examines disparities in social mobility opportunities between individuals of urban and rural origins. Findings indicate that educational attainment significantly influences social status transformation, but parental educational level has no discernible impact on offspring's academic outcomes. Occupational mobility is lower than educational mobility, with many individuals entering the same occupation as their parents. Urban origins have better opportunities than rural origins, highlighting persistent disparities in social mobility. The paper provides insights into the complex relationships between socioeconomic background, education, and occupation in Mizoram, with implications for policy and practice aimed at promoting social mobility and reducing inequality.

Introduction

Throughout the ages, a pronounced socioeconomic dichotomy has persisted, demarcating a stark contrast between affluent and impoverished segments of society. People are grouped into different hierarchical social categories depending on their socioeconomic status and those who possess the same status are placed in a group called social class (Britannica, 2024). The 19th century saw the development of diverse social class theories, courtesy of a cohort of influential thinkers comprising Hobbes, Locke, Rousseau, Saint-Simon, and Marx, whose works spanned political philosophy, social theory, and economic analysis. According to these theories, social

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class is comprised of the wealthy upper class which possesses significant wealth and property and better access to opportunities, and the lower class, which lacks access to opportunities, possesses fewer properties, and is dependent on wages. Despite the ongoing conflict between social classes for a classless society theorized by Karl Marx, society still exhibits a clear divide between the haves and the have-nots. To this day, the upper class maintains a profound impact on economic policy formulation, concurrently securing exclusive educational opportunities and advantageous economic positions that facilitate the intergenerational transmission of their wealth and social standing. By contrast, the lower class is distinguished by persistent socioeconomic deprivation, characterized by inadequate living standards, limited educational attainment, and constrained economic prospects, resulting in a cycle of entrenched disadvantage that spans multiple generations.

However, the development of society and the establishment of a welfare state have created many opportunities for individuals, particularly for those who are less privileged. This has facilitated the upward trajectory of individuals from disadvantaged socioeconomic positions to more privileged ones, a process termed social stratification mobility, whereby persons transition from lower to higher rungs of the social hierarchy. Consequently, social mobility can be succinctly defined as a transformation in an individual's socioeconomic position, entailing a shift in their relative standing within the social hierarchy. An individual or a group may move up or down across the social strata in terms of property, income, or status. If an individual from a family who belongs to a particular income group pursues an occupation in the same skill and income group, this indicates that there is a lower rate of social mobility. However, if an individual can pursue an occupation independent of his or her existent socioeconomic background, it brings inclusivity to society and promotes equality of opportunity. Thus, this element can play a significant role in enhancing the overall propensity for social mobility, a trend corroborated by the research of Kalsi and Kapoor (2021).

Conceptual Framework

Pritirim Sorokin, a prominent sociologist and political activist of Russian-American origin, pioneered the concept of social mobility in his groundbreaking work "Social and Cultural Mobility." He posits that societal structures exist on a spectrum, wherein no society exhibits absolute fluidity, as exemplified by the class system, nor absolute rigidity, as typified by the Indian caste system.

Social mobility refers to the temporal trajectory of social entities, encompassing individuals, families, or kinship groups, as they transition between disparate positions within a society's stratification framework (Muller & Pollak, 2015). Mobility experienced at different stages of life can be of various types. The diverse forms of social mobility operate autonomously, yet may exhibit intersections or concomitance. Horizontal mobility means the movement between classes at the hierarchical level. In this type of movement, an individual may change his occupation by changing geographical area or organizational level without changing his social standing. In contrast, vertical mobility

denotes an individual's transition between distinct social strata, characterized by either ascending (upward) or descending (downward) movements. This type of movement involves a change in one's social standing with respect to occupation, politics or religion.

The analysis of social mobility can be bifurcated into two temporal dimensions: intragenerational and intergenerational. Intragenerational mobility encompasses the changes in an individual's social position that occur within their lifetime, resulting from the accretion of experiences and events. In contrast, intergenerational mobility pertains to the variation in socioeconomic standing between an individual and their family of origin, characterized by an ascending or descending trajectory. For example, a progeny from a farming background may experience upward mobility by securing employment in the government or corporate sector, thereby achieving enhanced economic prospects.

The notion of social mobility is inextricably linked to the principle of egalitarian opportunity, predicated on the idea that although individuals may not attain identical outcomes, they should nonetheless possess equivalent access to opportunities for advancement. In societies characterized by limited social mobility, an individual's life chances and outcomes are heavily influenced by their familial background and socioeconomic heritage. In contrast, societies exhibiting high social mobility are characterized by a decoupling of individual outcomes from familial antecedents, wherein one's life chances are independent of his family of origin. As a result, the promotion of equal opportunities is vital for enhancing social mobility and economic productivity, enabling the effective allocation and utilization of human capital.

Research on social mobility has encompassed its intersections with various socio-economic indicators, including economic resources, health outcomes, and educational attainment. A plethora of research has demonstrated an inverse correlation between social mobility and economic disparity, while the relationship with health status appears to be more nuanced, yielding inconsistent findings across various investigations. Among the various dimensions, education is frequently identified as a paramount determinant of social mobility, exerting a more profound impact than parental occupational status on offspring's socio-economic outcomes. In their seminal work, "The American Occupational Structure" (1967), Blau and Duncan posited that educational attainment serves as the primary predictor of individuals' occupational trajectories and constitutes the crucial mediating factor between socio-economic origins and ultimately attained positions. Thus, education can be viewed as a pure investment where individuals continue to invest until the additional personal benefit equals the extra cost (Behrman et al., 1998).

Social Mobility across Generations in OECD Nations

The Organisation for Economic Co-operation and Development (OECD) is a multilateral entity comprising 38 member countries, established in 1961 to foster economic growth and global commerce. As a premier international forum, its member nations profess a shared dedication to democratic principles and market-oriented economies. A seminal

study published in 2010 by Orsetta Causa and Åsa Johansson examined the prevailing dynamics of intergenerational social mobility within the OECD countries, shedding light on recent patterns and trajectories. Causa and Johansson's research endeavors to furnish standardized estimates of intergenerational wage and educational mobility across OECD nations by examining two pivotal concepts:

a. The impact of familial antecedents on the remuneration and educational attainment of diverse adult cohorts in 14 European OECD countries, operationalized through the educational credentials of parents.

b. The effect of parental background on the cognitive accomplishments of 15-year-old students in 30 OECD countries, gauged by a composite indicator of socio-economic standing.

This paper drew upon two primary sources of individual-level data: firstly, the 2005 Eurostat Survey of Income and Living Conditions (SILC) poverty module, which provided insights into wage and educational mobility; and secondly, the 2006 OECD Programme for International Student Assessment (PISA) survey, which examined the impact of parental background on adolescent cognitive performance. From this, it is evident that the availability of comprehensive data enables in-depth research in more advanced countries. To capture the nuances of intergenerational social mobility, a suite of indicators is utilized, encompassing wage rigidity, educational attainment persistence across secondary and post-secondary levels, and additional pertinent metrics, thereby providing a more holistic understanding of social mobility dynamics. Further, wage mobility or stability is captured by a summary index of wage persistence, while educational trajectory or persistence is assessed through consolidated indicators of persistence in upper-secondary and tertiary educational levels.

The findings reveal a robust and statistically significant association between parental socio-economic status and the educational attainment and labor market outcomes of their offspring, a pattern consistently observed virtually across all countries under examination. The key results on intergenerational mobility trajectories suggest that a pronounced rigidity in social mobility is evident in countries like the United Kingdom, Italy, the United States, and France, whereas Australia, Canada, and the Nordic countries display a more fluid mobility landscape. This mobility is quantified by examining the intergenerational earnings correlation, which assesses the relationship between parental income and their offspring's subsequent earnings. In the majority of OECD nations, the cognitive abilities of students are significantly affected by the collective socio-economic background of their peers' parents within the same educational institution. Additionally, individuals from families with higher levels of educational attainment are more likely to pursue and attain tertiary education. Meanwhile, individuals from less educated families face a disproportionate probability of academic underachievement.

Thus, the indicators reveal a nuanced pattern, wherein certain countries exhibit greater rigidity in wage mobility compared to educational mobility, while in contrast, others display a converse trajectory characterized by relatively higher fluidity in wage mobility

and more substantial persistence in educational attainment. In certain instances, a substantial premium is associated with attaining tertiary education for individuals from highly educated families, concurrently with a relatively modest penalty for those from less advantaged backgrounds. In the meantime, the opposite holds in other countries, with a negligible premium for the former and a pronounced penalty for the latter. Lastly, this paper underscores the pivotal influence of policy interventions in education and early childhood care on the variance in intergenerational social mobility across nations, suggesting that targeted public policies can significantly impact social mobility trajectories.

Intergenerational Social Mobility in India

Since studying intergenerational social mobility requires detailed data on parents and children's outcomes, measuring mobility is quite challenging, especially on a national scale. Notably, the extant literature, particularly in the Indian context, exhibits a significant gender bias, as it predominantly focuses on the intergenerational mobility outcomes of paternal-son dyads, neglecting the experiences and trajectories of women and daughters.

In the scholarly article "Social Mobility in India: Determinants and Recommendations for Change" (Chapman, 2020), the author presents empirical evidence on the dynamics of intergenerational income and occupational mobility in India, shedding light on the relative movements of individuals across socio-economic strata. Additionally, the study proposes a set of policy interventions and strategic recommendations aimed at enhancing social mobility in the Indian context, thereby informing evidence-based initiatives for promoting greater socio-economic fluidity.

The key factors influencing social mobility in India include the caste system, migration trends, education, religion, gender, and location. A study published in the Journal of Human Resources in 2013 by Chapman reveals that offspring from the lowest quintile of household income confront substantial barriers to upward mobility, with limited prospects of ascending to the highest quintile. Conversely, the research finds that a majority – exceeding 50% – of children born to parents in the top income quintile tend to perpetuate their advantageous socio-economic position, remaining in the highest quintile. Furthermore, using intergenerational wage elasticities to measure mobility, the study observed that the mean income elasticity in the country is 0.49, higher than the international mean of 0.35 for high-income countries. This result suggests a stronger link between parents' and children's incomes, indicating lower mobility.

The Indian scenario presents a unique backdrop for examining occupational mobility, given the persistent intersections between caste identity and professional engagement, with certain occupations remaining deeply entrenched in the country's caste-based social stratification. Azam (2015) compared the occupational mobility between the 1945-54 cohort and the 1975-84 cohort. He noted a pronounced tendency for offspring to replicate their fathers' occupational choices, indicative of a pervasive pattern of

intergenerational occupational persistence, which reveals the prevalence of low social mobility. As such, only a few children could move from lower occupations (farming, unskilled) to higher occupations (white-collar, skilled/semi-skilled). Additionally, an inter-cohort comparison indicates that the 1975-1984 birth cohort exhibits enhanced mobility outcomes compared to the 1945-1954 cohort, signifying a generational improvement in socio-economic mobility trajectories.

In light of the entrenched correlations between caste identity and occupational engagement in India, Majumdar (2010) investigated to assess the degree of intergenerational mobility in educational and occupational attainments among various social groups, aiming to uncover the underlying factors contributing to the perpetuation of socio-economic inequalities. Notwithstanding the upward socio-economic trajectory of contemporary generations relative to their predecessors, Majumder's research reveals that the educational and occupational stratification system continues to exhibit a pronounced bias towards the privileged castes, perpetuating entrenched social inequalities. The phenomenon of upward mobility exhibits a notable caste-based dichotomy, wherein the upper castes experience more pronounced advancements, while the socio-economic prospects of individuals from excluded castes remain disproportionately shaped by parental factors, highlighting the persistence of caste-based disparities in social mobility. Furthermore, his research reveals that a significant proportion of occupational transitions occur within expansive occupational categories rather than involving upward shifts from lower to higher-status professions. This phenomenon suggests that occupational mobility lags behind educational mobility, potentially indicative of discriminatory practices within the labor market.

Azam & Bhatt (2015) conducted an in-depth examination of the intergenerational dynamics of educational attainment in India, focusing on the father-son relationship, and charted the trajectory of educational persistence across diverse castes and states for birth cohorts spanning 1940 to 1985. They observed a discernible downward trajectory in the strength of association between paternal and filial educational attainment, indicating a weakening of intergenerational educational persistence. Further, a study concentrated on women was conducted by Akanksha & Singh (2018). The researchers observed a positive correlation between upward intergenerational mobility and overall health outcomes among women, with those mirroring their mothers' educational trajectories exhibiting enhanced health prospects. Additionally, the study revealed significant disparities in health outcomes across geographic and religious dimensions, with rural women and Muslim women facing reduced likelihoods of optimal health relative to their urban and non-Muslim counterparts.

Therefore, to increase social mobility in India, Chapman (2020) suggests various recommendations to improve equality of opportunity. There has to be an increase in labour migration for efficient allocation of talent across regions, states, and industries. Given the pivotal role of education in mediating the intergenerational transmission of socioeconomic status, the nation must augment its allocations toward ensuring high-quality, affordable, and accessible early childhood educational opportunities.

Review of Literature

The multidimensional nature of social mobility lends itself to various subfields of inquiry, encompassing investigations into the intricate relationships between income inequality and bidirectional social mobility (Amaral et al., 2019; Heckman & Landersø, 2021), examinations of the causal links between enhanced social mobility and health inequality (Boyle et al., 2009; Präg & Gugushvili, 2021), and analyzing how education may strengthen social inequalities and reduce social mobility (Plewis & Bartley, 2014, Magnani & Zhu, 2015, Xie et al., 2022).

Amaral et al. (2019) examined the temporal dynamics between income inequality and intergenerational mobility across countries, including the United States, Canada, and eight European nations. Their findings revealed a pronounced inverse correlation between income inequality and mobility, wherein countries exhibiting elevated levels of inequality tended to exhibit diminished mobility prospects. Furthermore, the study discerned a more robust association between intergenerational income elasticities and the Gini coefficient, which underscored the notion that inequality's detrimental effects on mobility are more pronounced than variations across the income distribution. Heckman and Landersø's (2021) comparative study juxtaposed the United States and Denmark, elucidating the intricate relationship between social mobility and income inequality. Their findings revealed that Denmark's more equitable income distribution and enhanced intergenerational income mobility relative to the United States can be attributed to comprehensive social policies. The study found that, among recent cohorts, intergenerational educational mobility demonstrates equivalent levels in both the United States and Denmark. Furthermore, the estimated intergenerational elasticities of lifetime well-being, derived from income measures spanning an individual's entire lifespan, surpass those obtained from income assessments limited to a narrow age range, underscoring the importance of considering long-term economic outcomes.

Utilizing data from the 1971 and 1991 Censuses in England and Wales, Boyle et al. (2009) examined the relationship between health and social mobility. Their findings indicated a significant expansion of the health gap associated with deprivation between 1971 and 1991, as reflected in the differential health outcomes observed across various socio-economic classes over the two decades. Präg and Gugushvili (2021) undertook a distinctive study, employing a cross-sectional analysis of representative German survey data to investigate the effects of both subjective and objective social mobility on various health and wellbeing outcomes. The researchers found that the impact of both subjective and objective social mobility on health outcomes is relatively modest, with effect sizes ranging from approximately one-sixth to one-fifth of a standard deviation. In a follow-up investigation, Gugushvili and Präg (2021) examined the nexus between social mobility and health in a unique Russian cohort, navigating the transition to a market-oriented society. Utilizing Priv Mort survey data, their research demonstrated a robust link between subjective intergenerational mobility perceptions and health outcomes, supporting earlier research. The analysis revealed a nuanced pattern, wherein perceived downward mobility exhibited a stronger association with physical health, while upward mobility to mental well-being.

Numerous studies have investigated the intricate relationship between education and social mobility. Plewis and Bartley (2014) conducted a seminal study in the United Kingdom, examining the intergenerational dynamics of social class mobility and its implications for educational stratification. Specifically, their research probed the association between parents' intra-generational social class mobility and their offspring's subsequent educational attainment, utilizing advanced statistical models in STATA. The study drew upon robust datasets, including the UK Office for National Statistics Longitudinal Study and the British Cohort Study 1970. The researchers observed a distinctive pattern wherein children of upwardly mobile parents tend to achieve higher educational qualifications in their origin social class and relatively lower qualifications in their destination social class than their peers. In contrast, children of downwardly mobile parents display a reversed pattern. Magnani and Zhu (2015) undertook a comprehensive study examining the impact of parental education on children's educational outcomes in urban China, utilizing data from the 1990 and 2000 Chinese Population Censuses. Employing Ordinary Least Square (OLS) estimation, the researchers quantified the marginal effects of parental education on offspring's educational attainment. The study's findings suggest that the pronounced persistence of educational attainment across generations hinders equal opportunities in children's academic outcomes and future labor market prospects.

Furthermore, Xie et al. (2021) conducted a comprehensive study examining long-term trends in social mobility in the Republic of China, operationalized through two distinct metrics: intergenerational occupational mobility and intergenerational educational mobility. Despite relative stability compared to trends in the United States, the study revealed a decline in occupational and educational mobility over time. Notably, mobility patterns exhibited significant gender disparities, with earlier cohorts of women and those from rural origins facing particular disadvantages. This decline is attributed to the market forces unleashed by China's economic reforms, initiated in 1978, which affect social mobility trajectories.

Objectives and Methodology

This study aims to investigate the intergenerational transmission of socio-economic status and educational attainment, specifically examining the impact of parental socio-economic status and educational background on their children's socio-economic outcomes and academic achievements. Secondly, this study seeks to explore potential disparities in opportunities and outcomes between white-collar workers from urban and rural origins, focusing on understanding whether the geographic location of upbringing influences socioeconomic mobility and educational attainment.

The present study makes use of both primary and secondary data. A snowball sampling is used to select a representative sample of individuals among the Group A officers in Mizoram. The study only focused on the officers directly recruited and who had completed less than twenty years of service. Primary data have been collected through personal interviews using structured questionnaires which are formed using Google

forms. Since most newly appointed officers are usually posted in different districts outside of Aizawl (the capital city of Mizoram), conducting personal interviews is not feasible. In these cases, the questionnaires are sent to the respondents either through WhatsApp or via electronic mail (e-mail). This process has been used more frequently in collecting the primary data for this study. As such, a total of 173 samples have been collected. The study also utilizes secondary data from documents and research papers published by the government, various researchers, or organizations. However, the present study primarily relies on primary data, which are analyzed and presented using descriptive statistical methods. The data analysis employs cross-tabulation and non-parametric tests, including the Chi-square test of independence, to examine the relationships and associations within the dataset.

Results and Discussion

Socio-Economic Status of Respondents and Their Parents

The demographic profile of the 173 respondents, as presented in Table 1, exhibits a gender composition of 53.8% male (n=93) and 46.2% female (n=80) participants. The age distribution of the respondents reveals a range from under 25 to 46 years and above, with identical proportions (4.6%) at both ends of the spectrum. The data further indicate that 19.7% of respondents were aged 26-30, while 23.7% fell within the 31-35 age category. Notably, the 36-40 age group constituted the largest proportion, 26%, of the sample, followed by 21.4% in the 41-45 age bracket.

Table 1 reveals the age and gender distribution of the respondents, with 4 males and 4 females under 25 years old. The 26-30 age group comprises of 21 males and 13 females, while the 31-35 age range comprises 23 males and 18 females. The largest age cohort, 36-40 years, has 22 males and 23 females, followed by 18 males and 19 females in the 41-45 age range. Additionally, 5 males and 3 females are above 46 years old. Notably, the youngest participant is a 21-year-old female from the Administrative sector, while the oldest participant is a 52-year-old female from the same sector.

An examination of Table 2 indicates that the respondents' educational background is predominantly characterized by postgraduate education, with 47.4% attaining this level, followed by 23.7% who have completed undergraduate studies. Additionally, 50 respondents, i.e., 28.9 percent, have completed higher studies and obtained Master of Philosophy (M. Phil), Doctor of Philosophy (PhD), Bachelor of Education (B. Ed), National Eligibility Test (NET), Bachelor of Law (LLB), Bachelor of Medicine and Bachelor of Surgery (MBBS), and Post Graduate Diploma in Information Technology (PGDIT). These respondents are mostly working in the Education and Judiciary categories.

Table 3 displays the educational background of the respondents' parents, providing insight into the familial academic profile. An examination of the respondents' mothers' educational background shows that 5.2% of mothers have no formal education, while 4.6% have attained a Primary level of educational attainment. 12.1 percent are under

the category "Under Matric", while 17.3 percent have completed education till the 12th Standard. A large proportion, i.e., 30.1 percent are Matriculate, 17.9 percent have completed graduation and 4 percent studied up to Post Graduation. Furthermore, 2.9 percent of the mothers have completed higher studies and, 5.8 percent are literate but do not receive formal education like the others.

Among the fathers of the respondents, 3.5 percent are illiterate while 2.3 percent have completed Primary level of education. 5.2 percent are under the category "Under Matric", 15 percent are Matriculate, and 13.9 percent have completed education till the 12th Standard. Furthermore, 42.2 percent have completed graduation while 12.1 percent studied up to post graduation. 1.7 percent have completed higher studies and, 4.0 percent are literate but do not receive formal education like the others.

To examine the relationship between respondents' educational attainment and their fathers' educational levels, cross-tabulation and Chi-square tests were utilized. The results of this analysis are presented in Table 4, which displays the association between respondents' academic qualifications and their fathers', while Table 5 reports the corresponding Chi-square test results. Since most existing literature excluded women in the mobility analysis, the current study mainly analyzes the relationship between the respondents and their fathers. However, mothers' conditions are also analyzed in some cases. Further, the levels of education attained by fathers are grouped into three categories: lower (including kindergarten to matriculate), intermediate (including post-matric level), and higher (comprising graduation and above). The educational levels achieved by the respondents were grouped into three categories: graduation, post-graduation, and higher studies.

According to Table 5, the Pearson Chi-square test yielded an asymptotic significance level (two-sided) of 0.689, surpassing the standard significance level of 0.05. Therefore, the analysis reveals no significant correlation between the respondents' educational attainment and their fathers' educational backgrounds. Among fathers who completed only the lower levels of education, 23.1 percent have children who graduated, 51.9 percent have children who completed up to post-graduation, and 25 percent have children who pursue higher studies. Meanwhile, among 24 fathers who have attained education up to intermediate level, 33.3 percent have children with Bachelor's degrees, 37.5 percent have children with Master's degrees, and 29.2 percent have children who have completed higher studies. Furthermore, among fathers who completed graduation and higher studies, 21.6 percent have children who have completed graduation, 47.4 percent have children who have completed post-graduation, and 30.9 percent have children who have completed higher studies. The data shows that nearly half of the fathers (43.9%, i.e., the sum of fathers who completed lower and intermediate levels) have children who attained a higher level of education than themselves. Thus, there is a high educational mobility. The higher levels of education completed by the respondents compared to their parents can be the outcome of motivation by their parents and the absence of opportunities, other than education, for improving one's socio-economic status in the state. The comparative analysis of fathers' upbringing conditions and respondents'

educational attainment reveals a significant advancement, as most respondents have secured a Bachelor's degree or higher, indicating enhanced educational accessibility.

Table 6 displays the occupational distribution of the respondents' parents, revealing that 34.1% of mothers are employed in the public sector, whereas 10.4% are engaged in entrepreneurial pursuits. The majority of them, 46.2 percent are engaged in home making activities, 8.1 percent are farmers, and 2 mothers are working in Non-Governmental Organization (NGO) and in the Corporate sector, each accounting for 0.6 percent. At the same time, among the fathers of the respondents, the majority, a total of 115 fathers, i.e., 66.5 percent, are Government Servants, followed by 34 fathers, i.e., 19.7 percent, who are Self-employed. Furthermore, 15 fathers, i.e., 8.7 percent are Farmers, 3.5 percent are working in NGO and, 1.7 percent are working in the Corporate sector. Similar to the results obtained by Azam (2013), occupational mobility is low, which means that most of the respondents (children) stayed in the same occupation as their fathers.

Building upon the occupational data presented in Table 6, Table 7 provides a further breakdown of the hierarchical levels within the government sector for parents employed in this domain. Among the Government servant mothers, nearly half of the total, i.e., 44.1 percent are categorized under Group B level, while 33.9 percent are classified as Group A officers. Only 16.9 percent are Group C workers and 5.1 percent are Group D workers. At the same time, among the Government servant fathers, the majority of them, accounting up to 34.1 percent are classified as Group A officers, followed by 42 fathers, i.e., 23.7 percent who are classified under Group B level. The smaller proportion of the fathers, i.e., 5.2 percent are categorized as Group C workers and, only 5 fathers, i.e., 2.9 percent as Group D workers. Based on this analysis, it has been observed that respondents whose fathers work in higher group levels also tend to work in higher group levels. This result indicates low occupational mobility among the participant officers and their parents, most working in Group A or B in the government sector.

Further, an analysis that examines the association between the designations held by the respondents and their educational qualifications is presented as follows. Table 8 presents the study of the association conducted using cross-tabulation, and Table 9 presents the corresponding Chi-square test.

The results of the Chi-square test presented in Table 9 indicate a statistically significant association between respondents' educational qualifications and designations, as evidenced by the Asymptotic significance values for Pearson Chi-Square ($p < 0.005$), Likelihood Ratio ($p < 0.005$), and Linear-by-Linear Association ($p = 0.041$). These findings suggest a strong correlation between educational attainment and occupational status among the respondents.

As depicted in Table 8, the respondents' designations are categorized into three groups: Administrative, Education, and Technical. The Administrative category encompasses respondents employed in various services, including the Mizoram Civil Service (MCS), Mizoram Planning, Economics and Statistical Service (MPESS), Mizoram Police

Service (MPS), Mizoram Finance and Accounts Service (MFAS), Mizoram Information Service (MIS), and Mizoram Judicial Service (MJS), as well as officers holding positions in diverse administrative departments. The Education category includes Lecturers and Professors working in several colleges and Mizoram University, while the Technical category includes Engineers, Architects, Scientists, and Medical Officers.

In the Administrative category, 60.7% of the respondents are post-graduates, 25.8% are graduates, and 13.5% have completed higher studies. The respondents holding a degree in higher studies are highly concentrated in the Education category, comprising 63%. The remaining portions, i.e., 35.2% and 1.9%, have completed post-graduation and graduation levels, respectively. Further, among those working in the Technical category, 56.7% are graduates, 30% are post-graduates, and 13.3% have completed higher studies. Accordingly, there is a higher concentration of graduates in the Technical category, post-graduates in the Administrative category, and those who completed higher studies in the Education category. This finding indicates that the educational requirements for the various categories exhibit significant variability.

Disparity in Opportunities Between Rural and Urban Origins

Table 10 presents the residential area of the respondents during most of their childhood and teenage years. Out of 173 respondents, more than half of them hailed from the urban area. Accordingly, 127 respondents spent most of their childhood and teenage years in the urban areas, comprising up to 73.4 percent of the total. The remaining proportion, i.e., 26.6 percent came from the rural areas.

Table 11 displays the distribution of respondents' educational backgrounds across various schooling levels, including Primary, Middle, Secondary, and Higher Secondary. An analysis of the Primary level data reveals a notable disparity in school attendance patterns: 33.5% of respondents attended Public institutions, whereas a majority of 55.5% opted for Private schools, leaving 11% who attended Deficit schools. The data indicates that Private schools were the predominant choice at the Middle School level, with 57.8% of respondents attending these institutions. In contrast, only 28.9% and 13.3% of respondents attended Public and Deficit schools, respectively. Similarly, at the Secondary and Higher Secondary levels, Public institutions were attended by 35.3% of respondents, while Private schools accounted for 40.5%. Additionally, a notable minority of 24.3% of respondents attended Deficit schools.

A comparative analysis of school attendance patterns across various educational levels reveals a notable trend. Although the proportion of respondents attending Private schools at the Secondary and Higher Secondary levels is lower than that at the Primary and Middle School levels, it remains higher than the corresponding proportions for Public and Deficit schools. This result suggests that a majority of respondents, exceeding half, had the advantage of accessing Private schools across multiple educational levels.

The survey inquired about respondents' experiences regarding educational pursuits beyond Mizoram's borders, specifically whether they had attended schools, colleges, or coaching classes in other regions. Table 12 displays their responses to this question. Out of 173 respondents, 78 percent were able to pursue studies in schools, colleges, or coaching classes outside Mizoram, while 22 percent did not pursue the same. This result suggests that most respondents came from a well-off socio-economic background. Further, those who have the chance of exposure outside of Mizoram have higher opportunities to occupy higher positions in the government sector. This indicates a disparity in educational standards, with other states demonstrating a superior standard of education compared to Mizoram.

The data presented in Table 13 indicates a strong association between school type and residential location of respondents during formative years. Across various educational levels, a consistent pattern emerges: a significantly higher proportion of urban residents attended Private schools, whereas a comparatively lower proportion of rural residents had access to such institutions. Accordingly, at the Primary level, among the 96 (out of 173) respondents who pursued an education in Private schools, 87.5 percent were residents of the urban area and only 12.5 percent were from rural areas.

Similarly, at the Middle school level, out of 100 respondents who pursued education in Private schools, 87 percent were urban residents, while 13 percent were from rural areas. A similar trend is observed at the Secondary and Higher Secondary levels despite a decrease in Private school attendance. Specifically, urban residents comprise a substantial majority (85.7%) of Private school attendees, while rural residents represent a smaller fraction (14.3%) at these educational levels. Since most respondents attended Private schools at different levels of education, the quality and facilities provided in these schools were more advanced than those of Public schools. This observation suggests that urban respondents had better access to advanced education than their rural counterparts.

An analysis was performed to examine the association between the residential area where the respondents spent their childhood and teenage years and their pursuance of studies in schools, colleges, or coaching classes outside Mizoram. The analysis utilized cross-tabulation to facilitate data presentation in Table 14, with the corresponding Chi-Square test outcomes displayed in Table 15 to provide inferential statistical insights.

The Chi-Square test results, presented in Table 15, reveal a statistically significant association between the residential area and the likelihood of pursuing education outside Mizoram, with a significance value of 0.007, which falls below the conventional significance threshold of 0.05, indicating a strong association. According to the data in Table 14, a substantial proportion of urban residents (83.5%), specifically 106 out of 127 respondents, have had the privilege of accessing educational opportunities beyond Mizoram's borders. Meanwhile, only 21 respondents, comprising 16.5 percent, did not attend the same. At the same time, among the residents of rural areas, 29 respondents, i.e., 63 percent, have completed any of the mentioned educational levels outside

Mizoram. At the same time, 17 respondents, i.e., 37 percent did not attend the same. Therefore, the percentage of respondents growing up in the urban areas who pursued studies in schools, colleges, or coaching academies outside Mizoram is greater than their counterparts growing up in the rural areas who attended the same.

A further examination of the association between respondents' childhood and teenage residential areas and their current designations is conducted through cross-tabulation and Chi-Square analysis. The resulting cross-tabulation matrix, presented in Table 16, is subsequently subjected to Chi-Square testing, with the corresponding outcomes displayed in Table 17.

For the analysis, the respondents' designations are categorized into three types: Administrative, Education, and Technical. The residential areas are urban and rural. According to Table 17, the Chi-Square test yields an Asymptotic significance level of 0.034 for the Pearson Chi-Square statistic, surpassing the conventional significance criterion of 0.05, thereby confirming the existence of a statistically significant relationship.

An examination of Table 16 reveals that the Administrative category, comprising 51.4% of the total respondents, exhibits a significant urban-rural dichotomy, with 80.9% of respondents hailing from urban areas and 19.1% from rural counterparts. In contrast, the Education category, representing 31.2% of the total, displays a slightly more balanced distribution, with 61.1% of respondents originating from urban areas and 38.9% from rural areas. Furthermore, the Technical category, constituting 17.3% of the total, exhibits a pronounced urban bias, with 73.3% of respondents from urban areas and 26.7% from rural areas. Overall, 73.4 percent of the respondents working in different categories were of urban origin, while 26.6 percent were of rural origin. This data indicates that more than half of the white-collar workers in various Government departments have an urban background.

Limitations and Suggestions

The present study aims to examine the white-collar workers in Mizoram, focusing on Group A officers directly recruited and joining since 2010, requiring a substantial investment of time and effort in identifying the eligible officers. It is challenging to locate and contact eligible officers due to their postings in different parts of Mizoram, leading to a smaller sample size. Further, the lack of comprehensive data regarding social mobility in the study area, Mizoram, as well as in India, acts as a hindrance to conducting in-depth research. Researchers in this field would greatly benefit if the government could provide a list of officers and their designations, facilitating the identification and collection of desired research samples.

The study reveals that a greater number of Group A officers who took part in the survey were educated at private schools or institutions. This result suggests that students who attended private schools at different levels, such as primary, middle, secondary,

and higher secondary, have a greater likelihood of attaining higher positions in the government sector. Additionally, it implies that private institutions excel in providing quality education compared to public schools. Consequently, the government is compelled to formulate and enact policies for augmenting and guaranteeing the provision of superior educational resources and infrastructure within public schools, given their pivotal role in serving a substantial segment of the state's populace. This would improve the chances of students from rural areas and those with a low socio-economic background to secure higher positions in the government sector.

Further, more than half of the current Group A officers in Mizoram have pursued their studies at schools, colleges, or coaching academies outside the state. This finding implies that the educational standards prevalent in other regions of the country may be comparatively superior to those in Mizoram, indicating a potential disparity in the quality of education. Therefore, a concerted effort to upgrade the educational landscape in Mizoram is essential. This endeavor will unlock the transformative power of education, thereby facilitating increased social mobility and contributing to a more meritocratic society. This study also indicates that only a few respondents attended skill or value enhancement courses before securing their jobs, and these respondents are the ones who studied outside Mizoram. Attending such programs and courses can help individuals pursue further studies and adapt quickly to a new working environment. Hence, acknowledging the complementary role of these courses and programs in augmenting conventional educational pathways is vital.

Conclusion

The analytical findings indicate a lack of statistically significant correlation between paternal educational attainment and that of their offspring (the respondents). Nevertheless, a notable trend emerges, wherein most respondents surpassed their fathers' academic levels, exemplifying a pronounced upward educational mobility. Additionally, most officers came from affluent socio-economic backgrounds, indicated by their possessions of material wealth like lands and buildings before they started their career as Group A officers. Another supporting factor is the large proportion of respondents who pursued their studies in schools, colleges, or coaching academies outside Mizoram.

Another remarkable observation revealed by this study is that most children (i.e., the respondents) stayed in the same occupation as their fathers. This result demonstrates a low mobility in occupation as the respondent's occupation is strongly related to their fathers. As such, occupational mobility is lower than educational mobility among white-collar workers. Research findings indicate that nearly half of the participants are the youngest among their siblings, with a smaller portion being either the eldest or in the middle position. According to this observation, younger siblings are more likely to pursue higher education than older siblings. As a result, a relatively low percentage of respondents have siblings employed as Group A officers. The study also indicates unequal opportunities between respondents from urban and rural backgrounds, with a higher number of respondents pursuing education at private schools and outside Mizoram originating from urban areas.

In conclusion, this paper has yielded profound understandings regarding the interplay between familial background, educational achievement, and social mobility among white-collar professionals in Mizoram, thereby contributing meaningfully to the existing body of knowledge. There is a low intergenerational social mobility among the officers since most came from affluent socio-economic backgrounds with parents working in higher positions in the government sector despite a few exceptions. Since this study mainly focuses on education as the only dimension to determine social mobility and on directly recruited Group A officers, the significance may be limited. Therefore, more efforts should be made to conduct more studies relating to social mobility to delve into the impact of wider dimensions.

Table 1. Gender-Wise and Age Group-Wise Distribution of Respondents

		Male	Female	No. of Respondents	Percent
Age Groups	Under 25	4	4	8	4.6
	26-30	21	13	34	19.7
	31-35	23	18	41	23.7
	36-40	22	23	45	26.0
	41-45	18	19	37	21.4
	46 and older	5	3	8	4.6
Number of Respondents		93	80	173	100
Percent		53.8	46.2	100	

Source: Field Survey, 2024

Table 2. Educational Qualification of Respondents

Level of Education	No. of Respondents	Percent
Graduate	41	23.7
Post Graduate	82	47.4
Higher studies (PhD, MBBS)	50	28.9
Total	**173**	**100**

Source: Field Survey, 2024

Table 3. Educational Qualification of Parents of Respondents

Educational level	Mothers	Percent	Fathers	Percent
Illiterate	9	5.2	6	3.5
Primary Level	8	4.6	4	2.3
Under Matric	21	12.1	9	5.2
Matric	52	30.1	26	15.0
Post Matric	30	17.3	24	13.9
Graduate	31	17.9	73	42.2
Post Graduate	7	4.0	21	12.1
Higher studies (PhD, MBBS)	5	2.9	3	1.7
Others	10	5.8	7	4.0
Total	**173**	**100.0**	**173**	**100.0**

Source: Field Survey, 2024

Table 4. Association of Educational Qualification of Respondents & Fathers

			Respondents' Educational Qualification			
			Graduate	Post Graduate	Higher Studies	Total
Fathers' Educational Qualification	Lower	Count	12	27	13	52
		Percent	23.1%	51.9%	25%	100%
	Intermediate	Count	8	9	7	24
		Percent	33.3%	37.5%	29.2%	100%
	Higher	Count	21	46	30	97
		Percent	21.6%	47.4%	30.9%	100%
Total		Count	41	82	50	173
		Percent	23.7%	47.4%	28.9%	100%

Source: Authors' calculation from primary survey data

Table 5. Chi-Square Tests for Table 4

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.253a	4	.689
Likelihood Ratio	2.194	4	.700
Linear-by-Linear Association	.443	1	.506
N of Valid Cases	173		
Note: a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.69.			

Source: Authors' calculation from primary survey data

Table 6. Occupation of the Respondents' Parents

Occupation	Number of Mothers	Percent	Number of Fathers	Percent
Government servant	59	34.1	115	66.5
Self-employed	18	10.4	34	19.7
Housewife	80	46.2	-	-
Farmer	14	8.1	15	8.7
NGO worker	1	0.6	6	3.5
Corporate employee	1	0.6	3	1.7
Total	**173**	**100**	**173**	**100**

Source: Field Survey, 2024

Table 7. Group Level for Parents who are Government Servants

Group Level	Number of Mothers	Percent	Number of Fathers	Percent
Group A	20	33.9	59	51.3
Group B	26	44.1	42	36.5
Group C	10	16.9	9	7.8
Group D	3	5.1	5	4.3
Total	59	100	115	100

Source: Field Survey, 2024

Table 8. Association of Respondents' Designation and Educational Qualification

			Educational qualification			Total
			Graduate	Post-Graduate	Higher Studies	
Designation	Administrative	Count	23	54	12	89
		Percent	25.8%	60.7%	13.5%	100.0%
	Education	Count	1	19	34	54
		Percent	1.9%	35.2%	63.0%	100.0%
	Technical	Count	17	9	4	30
		Percent	56.7%	30.0%	13.3%	100.0%
Total		Count	41	82	50	173
		Percent	23.7%	47.4%	28.9%	100.0%

Source: Authors' calculation from primary survey data

Table 9. Chi-Square Tests for Table 8

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	63.244a	4	.000
Likelihood Ratio	64.094	4	.000
Linear-by-Linear Association	4.165	1	.041
N of Valid Cases	173		
Note: a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.11.			

Source: Authors' calculation from primary survey data

Table 10. Residential Area During Childhood & Teenage Years

Residential area	Number of Respondents	Percent
Urban	127	73.4
Rural	46	26.6
Total	173	100

Source: Field Survey, 2024

Table 11. Types of School Attended by Respondents

		Educational level					
		Primary	Percent	Middle	Percent	Secondary & Higher secondary	Percent
Types of school	Public	58	33.5	50	28.9	61	35.3
	Private	96	55.5	100	57.8	70	40.5
	Deficit	19	11	23	13.3	42	24.3
	Total	173	100	173	100	173	100

Source: Field Survey, 2024

Table 12. Pursuance of Studies Outside Mizoram

Response	Number of Respondents	Percent
Yes	135	78
No	38	22
Total	173	100

Source: Field Survey, 2024

Table 13. Association of Types of School Attended by Respondents & Residential Area

			Residential Area		Total
Educational Level	**Types of School**		**Urban**	**Rural**	
Primary	Public	Count	29	29	58
		Percent	50%	50%	100%
	Private	Count	84	12	96
		Percent	87.5%	12.5%	100%
	Deficit	Count	14	5	19
		Percent	73.7%	26.3%	100%
Middle	Public	Count	23	27	50
		Percent	46%	54%	100%
	Private	Count	87	13	100
		Percent	87%	13%	100%
	Deficit	Count	17	6	23
		Percent	74%	26%	100%
Secondary & Higher Secondary	Public	Count	34	27	61
		Percent	55.70%	44.30%	100%
	Private	Count	60	10	70
		Percent	85.70%	14.30%	100%
	Deficit	Count	33	9	42
		Percent	78.60%	21.40%	100%
Total		Count	127	46	173
		Percent	73.40%	26.60%	100%

Source: Authors' calculation from primary survey data

Table 14. Association of Respondents' Residential Area & Pursuance of Studies Outside Mizoram

			Pursuance of studies outside Mizoram		Total
			Yes	**No**	
Residential Area	Urban	Count	106	21	127
		Percent	83.5%	16.5%	100%
	Rural	Count	29	17	46
		Percent	63%	37%	100%
Total		Count	135	58	173
		Percent	78%	22%	100%

Source: Authors' calculation from primary survey data

Table 15. Chi-Square Test for Table 14

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	8.216a	1	.004		
Continuity Correctionb	7.068	1	.008		
Likelihood Ratio	7.651	1	.006		
Fisher's Exact Test				.007	.005
Linear-by-Linear Association	8.168	1	.004		
N of Valid Cases	173				
Note: a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.10.					
b. Computed only for a 2x2 table					

Source: Authors' calculation from primary survey data

Table 16. Association of Respondents' Designation and Residential Area

			Residential Area		Total
			Urban	Rural	
Designation	Administrative	Count	72	17	89
		Percent	80.9%	19.1%	100.0%
	Education	Count	33	21	54
		Percent	61.1%	38.9%	100.0%
	Technical	Count	22	8	30
		Percent	73.3%	26.7%	100.0%
Total		Count	127	46	173
		Percent	73.4%	26.6%	100.0%

Source: Authors' calculation from primary survey data

Table 17. Chi-Square Tests for Table 16

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	6.742a	2	.034
Likelihood Ratio	6.607	2	.037
Linear-by-Linear Association	.643	1	.422
N of Valid Cases	173		
Note: a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.98.			

Source: Authors' calculation from primary survey data

Author Contribution

LRK conceived the idea of study. LRK led the analysis of the paper's first draft. TC conducted primary survey, data tabulation and manuscript writing. Both authors approved this preliminary manuscript.

Data Availability Statement

Primary data sources and tabulation is also available at 10.6084/m9.figshare.26462893.

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Social Stratification among the Kisan Claimants of Bhutni Chor, Malda, West Bengal: A Study in the Light of Structural-Functionalism

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Abstract

The structural arrangement of every society is based on the social relation and functional specification of the institutions. Social stratification is a universal phenomenon and product of differences between individuals or groups. Differences based on social, cultural and economic factors influence the structural arrangement.Theories and empirical studies submitted functional existence of stratification system. This paper is made an attempt to study the social structure of a community named Kisan, who are fighting for their social identity, residing in Malda district of West Bengal. A well stratified society has been found among the said population, which is divided into several meaningful Khoms and gottars. The hierarchical arrangement of the Khoms, regulation of marital ties between the strata and the arrangement of the gottar(unilineal kinship group) have been considered for understanding the social structure of the population group. The stratification within the society is acting as an enduring force to maintain the social structure as well as group identity.

Introduction

Radcliffe Brown (1952, 1965) observed that human beings are connected by a complex network of social relation and a particular social relation between two persons exists only as part of a wider network of social relation involving many other persons. So, the component of social structure are human beings. By social structure Evans Pritchard (1940) meant interaction between social groups, instead of individuals.Social structure refers to the arrangement of the inter-related institutions, agencies and social patterns, as well as the statuses and roles of the individuals in group. Fortes (1953) stated that 'social structure is to be regarded as the foundation of the whole social life of any continuing society'. In every society there is a structural system, which the society wishes to preserve. The structure of the society has considerable impact on the other institutions, it tends

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to mould other social and religious relations. The concept of structural functionalism is the combination of social structure and function. Linton (1962) noted that functioning of societies depends upon the presence of patterns for reciprocal behaviour between individuals. Malinowski (1945) one of the leading thinkers of functionalism, stressed on the importance of social institution for satisfying basic human needs. Malinowski's theory focussed on seven individual bio-psychological needs for satisfaction of which the social organism or culture was a vast instrumental reality (Mann, 1977). Merton (1968) opined that social functions of an organization help determine the structure and the structure ensures functions to be fulfilled by the social units. The latent function as he mentioned refers to unintended and unorganised consequences of the social order meant for adjustment or adaptation.

Both Malinowski and Radcliffe Brown viewed culture as an integrated whole. The functional view of culture focus on the importance of every custom and belief. As a structural-functionalist Radcliffe Brown attempted to see the social life of people as a whole, as a functional unity (Mann, 1977). The interaction pattern between human social groups as a driving force of social structure can be understood through stratification system.

Social stratification is basically the system of differentiating a population into some social layers. These layers are represented by some group of people who poses certain social characteristics. Each layer differs in power, status, position, possession etc. from other groups. In the words of Gisbert(1957) "Social stratification is the division of society into permanent groups of categories linked with each other by the relationship of superiority and subordinates." Davis and Moore (1945) calls stratification as universal necessity which differs from society to society. They emphasised social stratification serves as an important function in any society which is necessary for society to motivate individuals to perform several complex social roles. Weberet. al. (1946) defined social stratification as the division of society into distinct groups which is based on three components viz, class, status and power. Mayer (1955) defined it as "an arrangement of positions in a graded hierarchy of socially superior or inferior ranks". Parsons (1954) viewed social stratification as unavoidable and necessary. In his words "stratification in its valuation aspect is the ranking of units in a social system in accordance with the standard of common value system." Social stratification is functional in the context of a social system. If we consider 'strata' to be the collectives or groups, each of them has a function to fulfil in the society.

In India, the diversified society is stratified on the basis of class, caste and gender. Caste system is further subdivided into many sub strata, in which clan or *gotra* plays a greater role. However, tribals are categorized as sub tribes, clans and so on. Srinivas and Dumont explained social stratification in India on the basis of caste system. Srinivas(1962) mentioned Caste as an institution of great complexity, having deep roots in history, basically a fivefold hierarchy. He added the real unit of this system is *jati*or sub caste in each linguistic area. He finds hierarchy is the core of the caste system. He defined caste as a hereditary, endogamous and usually localized group, having a traditional

association with an occupation, and occupying a particular position in the local hierarchy of castes. Relations between castes are determined by the rules of purity and pollution. Dumount(1970) divided the whole Indian society into a number of hereditary groups. These groups are castes which are limited to definite geographical area. He opined caste is not a form of stratification but a special form of inequality. He defined caste as a pan Indian institution, a system of ideas and values, a formal comprehensive rational system. He opined it's moreover a set of relationship of economic, political and kinship system which are mostly religious in nature. Ghurey (1969) defined caste system as a system in Hindu society which is divided into small and complete social worlds in themselves which are determined not by selection but by birth. These small worlds are marked off from one another,though subsisting within a large society. He added the idea of sub caste as well "….which were divided about two thousand smaller units- generally known as sun castes fixing the limits of marriage and effective social life and making for specific cultural tradition." He explained caste system is based on six distinctive characteristics: segmental division of society, hierarchy, restrictions of feeding and social intercourse, civil and religious disabilities and privileges of the different sections, lack of universal choice of occupation and restrictions on marriage. Madan (1970) viewed caste as a closed system. He opined caste as any of the ranked, hereditary, endogamous social groups, most often linked with-occupation that is uniquely developed in India.

The present study was done on the Kisan, a community in search of identity. The literal meaning of the term 'Kisan' is the farmer. In India there are several communities who are traditionally farmers. But there is also a Kisan Scheduled Tribe community in India as well as in West Bengal. The studied group claim themselves to be Kisan Scheduled Tribe. Due to unavailability of considerable evidence, they are yet to get such recognition in West Bengal. Therefore, they have been termed as Kisan claimants in this article. The population under study is settled in the Bhutni Chor of Malda District, West Bengal. The Kisan claimants are grouped under general caste in the studied area. They have a well elaborated social structure. The community is divided into several *Khoms* and these *Khoms* are further divided into *gottars.* This stratification produces a cognitive structure which rule over the social relationships.

The aim of the study was to explore the hierarchical stratification system found among the Kisan claimants and its structural-functional arrangement in the society.

Research Methodology

The study was conducted in the first few months of 2020 among several villages of Bhutni Chor of Malda district of Indian state West Bengal. Bhutni Chor is an island on the river Ganges, situated under Manikchawk community development block. Intensive fieldwork among 54 rural villages was carried out in two phases from January to March 2020. Sampling was done in purposive mode. Focused group interview was approached for this study. Complete and-in depth data about the social structure of the mentioned community has been obtained. The data was analysed as per researchers' impression. The informants of the study include leaders of the community as well as normal inhabitants of these selected villagers.

Studied Population

As the name suggests, the Kisans are agriculturist by profession. As per Census 2011, the total population of Kisan in Malda district was 92,598. This population probably includes the claimant Kisan also. Kisan claimants are mainly residing at Bhutni Chor of Malda district. They have traced their origin in Tin Pahari area, which is in Rajmahal hills covering part of West Bengal and Jharkhand states. They move on to the North West and entered Shahibganj and Purnia district of Bihar. The studied population have their own agricultural land while some work as agricultural labour or other kind of labours. They consider their mother tongue as Kisani. They are conversant with a mixture of regional languages such as Bengali, Oriya and Hindi. They do speak a language close to the language of their present inhabiting areas.

There are different views regarding the identity of the Kisan community. According to Dalton (1872) the name Kisan, is believed to be acquired by the tribes due to their innovation in agriculture. He described Nagesia, Nageswar, Kisan as small Dravidian tribe of Chotanagpur. They have two sub groups; one uses vermillion in their marriage ceremony (*Sindhuriya Kisan*) while others substitute oil (*Teliya Kisan*) in marriage. Risley (1891) mentioned that Kisan is synonymous to Nageswar and Oraon Tribes. The Kisan Scheduled Tribe is present in several Indian states namely Odisha, Jharkand, Bihar, West Bengal, Chhattisgarh. But the studied population is not recognised as the Scheduled Tribes. They claim themselves to be Hindus. Lord Shiva is the supreme deity of the community.

Analysis

The social structure of the Kisan (claimant) society has been analysed through three aspects; 1. The hierarchical arrangement, 2. The pattern of marriage, 3. The system of *gottar* (unilineal kinship group).

Different opinions regarding the hierarchical arrangement of the *Khoms* have been found in the studied villages, which are generalised into two segments and presented through the tables and charts.

Findings

Social Structure of the Kisan Community

The stratification system found among the Kisan claimants of Bhutni Chor is unique. They have a well stratified patrilineal society which is divided into *Khoms* and *gottars.* This system moulds the relationship between each stratum.

Structural Arrangement of *Khoms*

Many scholars believed that social structure is about the relationship between groups. *Khoms* are sub groups of the Kisan (claimant) society. It means *goshti* or section. It is the major social group among the Kisans based on their descent. People belonging to

the same *Khom* believe in a common ancestor, but the genealogical links are difficult to trace accurately as the group is very large. *Khoms* are normally endogamous in nature. Marriage outside the *Khom*is not preferred. However, some rules have been established to accept inter group marriages. Each section has specific occupational specialization and hence the groups are functional. The groups could be identified with land holding pattern and occupational specialization. There is essence of superiority or inferiority among these sections. In past people from superior *Khoms* used to reserve all the important posts like religious specialists, village headman or member of elder's council. Individuals belonging to lower *Khoms* had to abide by the higher *Khoms.*

The community is divided into four major *Khoms*. Two different opinions have been found regarding the hierarchical arrangement of the *Khoms*. In one opinion (of folklore) the *Khoms* are – *Saresat ghoriya*, *Chak-boila*, *Chuna-koila* and *Dosaua*. The *Saresat ghoriya* has the highest status. Their land holdings are distinctly larger than other sub-sections. They employed labourers to their agricultural field and occupied all the posts of village organizations. *Chak-boila* is next in status within the Kisan (claimant). They are identified by the occupation of singing in marriage ceremonies of the Kisans. They also have agricultural lands, but the sizes are less than *Saresat ghoriyas.* The *Chuna-koila* usually has meagre landholdings, as a result professionally they had to work as agricultural labourers in other's land, especially those of *Saresat ghoriyas.*Their name *Chuna koila* suggests people whose life is full of hardships and their life has become *koila* means coal*. Dosaua* has the lowest social status within the Kisan and provide manual services to others specially those of the highest *Khoms.* They mostly worked as maid free of cost in *Saresat ghoriyas* houses in return they were provided food. In earlier times, they had the concept of pure and impure, in which the three sections i.e., *Saresat ghoriya*, *Chak-boila*, C*huna-koila* were touchable. Despite being lower in status *Chuna koila* was treated as touchable as they were employed as agricultural labour. *Dosaua* was treated as untouchables. These people faced several humiliations; they could not enter inner house of other sections of the population. People of other sections used to purify their belonging with cow dung water if things were touched by these people.

Figure 1.1 : Diagram Showing *Khom* Hierarchy (in First Opinion)

Another strand in folklore records that the *Khoms* are- S*atghoriya*, *Dosala*, *Bahisi* and *Tehisi*. *Satghoriya* stands at the top of the hierarchy in respect of boooth social and economic status with ownership of larger parcels of agricultural land. The next in hierarchy were the *Dosala* who were also economically strong with ownership of agricultural land but their land sizes were smaller than that owned by the *Satghoriya*. These two groups were considered superior among the *Khoms*, people from other groups in the community provided their services to these two groups. The lower two groups were hierarchially situated in order of *Bahisi* and *Tehisi. The Tehisis* were the last priviledged with little or no possession of wealth and assets and both these two lower groups were occupationally agricultural labourers who worked in farmlands of the other two superior groups of the *Khom.*

Figure 1.2 : Diagram showing *Khom*hierarchy (in second opinion)

A third interpretation and narrative on the community emphasizes that there were many *Khoms* with *Saresatghoriya/Satghoriya* at the top of the hierarchy in terms of social position and land ownership. This group often compared themselves with higher caste Hindus. The *Pathans* were the next in hierarchy with ownership of land holdings and were held in esteem for their valour and courage. The *Dosala* were the next in social hierarchy with position of land holding and specializing in agricultural activities. The *Bahisi* were next in order and had less endowed with land and other wealth assetsand a majority of them were agricultural labourers by occupation.The *Chak-boila,* almost having no land were in the lowest rung of the social order and were mostly manual labour who rendered services in the farmlands and houses of the *Saresatghoriyas*.

Although the accounts on social and economic hierarchial order of the *Khom* community have three different strands of narratives as per the folkoric tradition and social accounts, it nevertheless exhibits a similar trend of social classification where the *Saresatghoriyas* and *Dosalas* are found to enjoy a higher social and economic status.

Figure 1.3 : Daigram Showing *Khom*hierarchy (in Third Opinion)

The *Khom* hierarchy and social ordering is based on economic endowment mostly possession and ownership of land. Kisan being the agricultural community depend on land. The social status of a group depends on possession of land. Land owners have the power to control others. Distribution of economic responsibility within the Kisan society runs the whole system.

Marriage Alliance Between *Khoms*

Marriage as a social institution forms the basis for various social and economic relations and influences the process of social transformation. Cultural practices and social beliefs help guide various rituals and practices in repsect of marriage and social functions. The institution of marriage and various rituals and practices prevalent among the *Khoms* community is one of the important cultural aspect that have helped in continuing the social fabric and organic structure of the society.

Khoms are traditionally endogamous. But in some special cases marriages are allowed within two *Khoms.* Some restrictions were found to exit among the sample group of *Khoms* under present study. When a superior *Khom* man marries a woman from lower strata of the community, it is believed that their ritual purity remains undisturbed but the children are considered of lower status than their father. It is upheld that in such a marriage, the bride and her family enjoys an upward vertical social mobility, and this kind of marriages are socially approved. In cases where a man from lower strata of the *Khom* community marries a *Khom* woman from higher social hierarchy of the community, the marriage is known as *namo.* Socially these marriages are construed as 'impure' where the bride and her family is considered to go down in social hierarchy as the daughter is given away in marriage to a boy of lower social strata in the community.

Both bride price and dowry practice is prevalent among Kisan society. The families from lower strata of *Khom* society have to give dowry (*pun*) to families from higher social hierarchy during marriage, irrepective of the fact whether they belong to groom's side or bride's side. In other words, dowry practices are in consonance with economic

position and not as seen in other communities where bride's family pay dowry to groom's family. Thus, if a man from higher social strata in *Khom* community marries a woman from lower strata in *Khom*, then groom's parents are compensated with a payment, mostly money or other movable assets e.g. a bicycle or a motorcycle, and the payment is called *pun*. Likewise, if a man from lower strata of *Khom* community marries a woman from upper strata of *Khom* community, then bride's parents receive the payment. This kind of payment is higher in denomination and value compared to the payment of *pun,* where groom's family usually gift clothes, cash, agricultural implements and food items. However, the groom's parents have to pay bride price to bride's family for marriages between same *Khom*. However, the traditional practice of paying bride price has changed over time and in lieu dowry payment by brides family is reportedly practised among the *Khom* community much in congruence with similar pratice of dowry reported among other communities across India. Like the hierarchical system there are two opinions regarding marriage alliance between the *Khoms*.

Table 1.1: Preferred Forms of Marriages Between *Khoms* as per One Tradition

Khom	Man allowed to select mates from	Woman allowed to select mates from
Saresatghoriya	Saresatghoriya	Saresatghoriya
	Chak boila	
	Chuna koila	
	Dosaua	
Chak boila	Chak boila	Saresatghoriya
	Chuna koila	Chak boila
	Dosaua	
Chuna koila	Chuna koila	Saresatghoriya
	Dosaua	Chak boila
		Chuna koila
Dosaua	Dosaua	Saresatghoriya
		Chak boila
		Chuna koila
		Dosaua

In both the cases upward movement of the women through hypergamy is accepted among the studied population, but hypogamy is not accepted. This kind of marital regulation is adhered so as to continue the traditional structural arrangement of the society.

Table 1.2: Preferred Forms of Marriages Between *Khoms* as Per Alternative Tradition

Khom	Man allowed to select mates from	Woman allowed to select mates from
Satghoriya	Satghoriya	Satghoriya
	Dosala	
	Bahishi	
	Tehishi	
Dosala	Dosala	Satghoriya
	Bahishi	Dosala
	Tehishi	
Bahishi	Bahishi	Satghoriya
	Tehishi	Dosala
		Bahishi
Tehishi	Tehishi	Satghoriya
		Dosala
		Bahishi
		Tehishi

Structural Arrangement of *Gottar*

Radcliffe Brown gave importance to dyadic relationship in social structure. The kinship patterns are guided by the principle of dyadic relation. *Gottar* (clan) is a unilineal kinship group among the studied Kisan claimants. *Gottar* is associated with a mythical ancestor, found among the Hindu caste population. These *gottar*s are exogamous in nature, marriage partners essentially come from two different *gottar.* However, marriage within same *gottar* is solemnized, but in such a case *praeshchito* (atonement) has to be performed.

The following clans were found among the studied population: *Mugrishi*, *Agnishi*, *Aladoshi*, *Irish-pirishh*, *Bagrishi*, *Talwar*, *Kangsarishi* and *Dandoshi. Mugra* is an important agricultural implement among them and people of *Mugrishi clan* are believed to have originated from *Mugra*. *Agni* means fire in Sanskrit- people belonging to *Agnishi gottar* are believed to have originated from fire. *Alo* means light- people who are believed to have originated from light are known as *Aladoshi*. People of *Irish-pirishh clan* are believed to have originated from *rish. Rish* is an important part of agricultural implement plough. *Bagrishi* clan is believed to have originated from *bag* meaning tiger. People belonging from *Talwar* clan are assumed to have originated from stick. *Kangsa* is related to Hindu mythology, he is maternal uncle of Lord Krishna. *Kangsarishi* clan is said to have originated from Lord Krishna. Members of each *gottar* respect and worship their ancestor, whether it is an instrument or animal or an individual.Since men and women of same *gottar* consider each other as brothers and sisters, marriage within same *gottar* is considered as a sin and social arrangement of *gottar* is presumed to be performing a latent function of maintaining the social order.

Discussion and Conclusion

Structural-functionalists theory is mainly about maintaining a social order. The structure of society is based on social interaction between individuals and groups. Groups are made up of functional units, maintained through social institutions, guided by the culture to serve interrelated social actions. How the societies maintain the social systems vary accordingly. Social stratification in India is mainly based on caste system. Castes are endogamous occupational groups and a part of hierarchical social arrangement. The present study was based on the stratification system present among the Kisan claimant of Bhutnichor in Malda district (West Bengal). The studied Kisan community is neither regarded as Scheduled Caste nor as Scheduled Tribe in West Bengal. They are traditionally farmers and their society is divided on the basis of attachment with agriculture and specifically land holding pattern. The studied population is divided into *Khoms* and *gottars. Khoms* are grouped in four or seven strata (as per different traditions folklore), associated with different occupation, land holding and having particular status and roles.The *Khoms* in higher social strata tend to be associated with more landholdings while *Khoms* from lower strata have lower size classes of landholdings. Hence, in this society, the social status or hierarchical social order is directly proportionate to the ownership and possession of agricultural land sizes. The more agricultural land one group has the more prestige or higher status it is alluded with. Similarly, the less farmland one group has, lower social status is accredited to them in their community. Occupation is basis of organic relation and the primary indicator of social structure together with wealth and asset ownership especially land holdings among the Kisan claimants.This tends to influence the entire social system of the community. The concept of pure and impure is also associated with the *Khoms*. The hierarchical arrangement of the society exists since long. With relaxations in the orthodox nature of hierarchical arrangement, the social order is maintained through marriage rules and ensures the functionalisty of the hierarchial arrangement. Practice of hypergamy and restriction of hypogamy of the women is the main functional approach for maintaining the social order. The unilineal kinship group *gottar* or clans also mould the relationships in this society. There are eight exogamous *gottars* in this community with their different stories of origin. Although there is no concept of superiority or inferiority between the *gottars*, but these are important social unit for maintaining an enduring social relationship.

The structure of studied Kisan society is dependent on the hierarchical system. Individual members of this stratified system are aware of their position; status and role. The *Khoms* are not only providing economic support, but are also performing the social function of maintating the social order of the community. However, like every social system, this hierarchical arrangement too is not static. There are visible postive changes where traditional notion and practice of untouchability is found to be on the wane in Kisan (claimant) society. The orthodox nature of *Khom* endogamy and preference of hypergamy of women have also undergone changes as newer contacts and social interactions developed with forces external to the society. Expansion and access to education has brought in new changes where the younger generation are moving

out for alternative livelihoods in lieu of choosing farming as a profession. All societies have evolved with time and have undergone changes as newer concepts percolated with spread of education and possibilities of newer social arrangemets with alternative occupations and it is within this flux that the structure of this stratified society continues to evolve and exist in a modified form and function with its newer forms of structural order.

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