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VISION

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**SUBHASH CHANDRA BOSE: AN ANALYSIS OF HIS CONTRIBUTION
IN THE INDIAN FREEDOM STRUGGLE AND ITS CONTEMPORARY
RELEVANCE**

Ankit Tiwari*

*Researcher,

Department of Political Science,

APSU Rewa University, Madhya Pradesh, INDIA

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ABSTRACT

The leadership style of Subhash Chandra Bose was profoundly characterized by a form of radical nationalism that explicitly called for unity between Hindus and Muslims, a theme he meticulously emphasized in his writings and speeches during the critical years spanning from 1939 to 1941. He perceived World War II not merely as a global conflict but as a significant struggle between imperial powers, advocating for a proactive and assertive approach to achieving independence, which included the ambitious proposal for the formation of a dedicated army aimed at liberation. His revolutionary ideas posed a direct challenge to the traditional leadership of the Indian National Congress, as he promoted a more militant and inclusive strategy that fundamentally reshaped the direction and urgency of the Indian independence movement, thereby leaving an enduring influence on its historical development.

This paper adopts a narrative literature review-based approach and is based on the analysis of the literature. It explores Bose's ideology, leadership strategies, and significant contributions to India's fight for independence, focusing on his role in galvanizing mass movements and forming the Indian National Army (INA). It highlights his legacy and how his revolutionary ideas continue to resonate in contemporary India.

KEYWORDS: *Freedom Struggle, Independence, Nationalism, Alliance.*

INTRODUCTION

The Indian struggle for independence was marked by a spectrum of ideologies ranging from moderate constitutionalism to revolutionary nationalism. Subhas Chandra Bose emerged as a radical figure whose vision and actions diverged sharply from those of the mainstream Congress leadership. Often referred to as Netaji (respected leader), Bose's contributions transcended the boundaries of traditional politics, emphasizing the necessity of armed struggle and global alliances. His dream of an India that stands united and thrives independently echoes the contemporary global strides toward autonomy and financial self-reliance. Bose's leadership style and his embracing vision for India serve as a powerful antidote to the prevailing divisive ideologies.

Bose's approach to leadership was characterized by his remarkable willingness to forge alliances with the Axis powers during the tumultuous period of World War II, his fervent advocacy for an armed struggle against colonial oppression, and his tireless efforts to unify the diverse populace

of India under a singular and compelling cause that transcended regional and communal divisions. Collectively, these multifaceted elements contributed to the enduring legacy of his impact on the movement for Indian independence, leaving an indelible mark on its historical narrative.

Early Life and Ideological Formation

Bose was born into a family characterized by substantial educational attainment and a heightened political consciousness. His father, Janakinath Bose, was a prominent legal practitioner and a staunch supporter of the Indian National Congress, likely instilling within Bose a profound sense of nationalism from an early age. The educational experiences that Bose underwent were instrumental in the formation of his political ideology. He pursued his studies at Presidency College in Kolkata, where he encountered a plethora of nationalist ideologies and movements. His academic environment fostered critical analysis and discourse regarding the prospective trajectory of India. Throughout his collegiate years, Bose found inspiration in notable nationalist figures such as Bal Gangadhar Tilak, who championed the principles of self-rule and swaraj (self-governance). The philosophies espoused by these leaders deeply resonated with Bose, compelling him to actively participate in the struggle for freedom. The harrowing incident of the Jallianwala Bagh massacre in 1919 exerted a significant influence on Bose's convictions. The merciless slaughter of countless unarmed Indians by British forces ignited within him a profound indignation towards colonial oppression and reinforced his dedication to the pursuit of independence. Bose gravitated towards more radical factions within the Indian National Congress, which advocated for the immediate and total liberation from British dominion. His conviction in the necessity for a more militant strategy to attain freedom differentiated him from his more moderate counterparts.

Bose and the Indian National Congress

Netaji Subhash Chandra Bose, influenced by Mahatma Gandhi, joined the Indian National Congress upon his return to India. He began working under Deshbandhu Chittaranjan Das, acknowledging him as a political mentor. His involvement in the Congress was significantly shaped by Bal Gangadhar Tilak and Sri Aurobindo. Bose moved to Kolkata to collaborate with Chittaranjan Das in the Swaraj Party. He rejected Gandhi's nonviolent approach to independence, advocating for a militant strategy.

In 1928, a divergence emerged at the Guwahati Session of Congress between the new and old factions. The younger leaders advocated for "total self-rule without compromise," contrasting with the older leadership's preference for a "dominion state under British rule." The Congress party opposed these ideas, attempting to suppress the aspirations of dissenting voices. This suppression caused considerable frustration for some members.

Bose was imprisoned during the Civil Disobedience movement in 1930 and released in 1931 following the Gandhi-Irwin Pact. He opposed the Gandhi-Irwin Pact and the cessation of the Civil Disobedience movement, particularly considering Bhagat Singh's execution. Subsequently, Bose was arrested under the Bengal Regulation and later released on health grounds, resulting in his banishment to Europe. Despite this, both Bose and Jawahar promoted the Karachi objectives of 1931, which emphasized rights and economic policies. The framework for future Congress strategy included economic planning, education reform, land reform, and civil liberties. After returning from Europe in 1936, he was arrested again, but released after a year. In 1938, he was

elected president of the Indian National Congress and established a planning committee for industrialization.

His election as Congress president marked a significant moment, as he received more votes than expected, offending Gandhi's faction and diminishing their interest in the party's independence agenda. Subsequently, Bose resigned from the presidency and established his Forward Block in 1940 following disagreements with Gandhi. The British authorities placed him under house arrest in Calcutta due to his actions, yet he managed to leave India clandestinely in 1941. He sought assistance from Germany and Russia for India's independence and later assumed leadership of the Indian National Army after reaching Japan in 1943.

Following points should be noted in the above regards:

- **Political Apprenticeship:** Subhas Chandra Bose's political journey began under the mentorship of Chittaranjan Das, a prominent leader in the All-India Bengali community. Bose regarded Das as his political guru, which significantly shaped his early political ideology during the 1920s. This period was crucial for Bose as he developed his understanding of Indian politics and the Congress's role in the freedom struggle.
- **Influence of Reformers:** Bose was deeply influenced by various social and political reformers, including Swami Vivekananda and Aurobindo Ghos. Their ideologies contributed to Bose's unique political vision, which combined traditional Indian values with modern political thought. This blend was essential in his approach to the Indian National Congress and its strategies for independence.
- **Ideological Development:** Throughout the 1920s and into the 1930s, Bose's political ideology evolved significantly. He integrated elements from various political systems, including Fascism, National Socialism, and Marxism, into his thinking. This eclectic approach allowed him to formulate a robust political strategy that aimed at mobilizing the masses for the armed struggle against British rule.
- **Dramatic Escapes and International Relations:** Bose's role in the Congress was marked by his dramatic escape from British home arrest, which underscored his commitment to the cause. His journey from India to Europe, particularly his attempts to garner support from Germany and Russia for India's liberation, highlighted his strategic thinking and willingness to seek international alliances. However, his efforts to secure assistance from these nations ultimately did not yield the desired results.
- **Caste and Social Issues:** Bose also addressed various social issues, including the caste system, which was a significant concern in Indian society. His perspectives on these matters were integral to his political ideology and his vision for a united India, which he sought to promote within the Congress framework.

Subhas Chandra Bose played a pivotal role in the Indian National Congress by developing a unique political ideology, influenced by various reformers and political systems, while also actively seeking international support for India's independence. His commitment to the cause and his strategic thinking were key elements of his contributions to the Congress and the broader freedom movement.

Formation of the Indian National Army

The Indian National Army (INA), led by Subhas Chandra Bose, took on a significant role in the battle for independence from British colonialism. The following delineates the principal dimensions of its contributions:

- **Formation and Ideology:** The INA was conceived as a revolutionary entity with the objective of emancipating India from British subjugation. Although Rash Behari Bose initially initiated the foundational aspects of the INA, it was Subhas Chandra Bose who assumed leadership and reorganized it into a potent military force. His efforts were critical in forging an alliance with Japanese military forces during the Second World War. Bose's leadership was of paramount importance as he endeavoured to integrate diverse factions within the Indian independence movement, encompassing leftist entities, to fortify the collective struggle against colonial oppression.
- **Support from Communists:** The Communist Party of India (CPI) played an essential role in endorsing Bose's endeavours. They facilitated his clandestine departure from India during World War II, which constituted a crucial juncture in his endeavours to galvanize support for the INA. Prominent individuals such as Achhar Singh Chhina and Ajoy Ghosh were instrumental in this undertaking.
- **International Alliances:** Bose aspired to cultivate alliances with international powers to garner support for India's quest for sovereignty. He reached out to Soviet leadership in an effort to solicit their alliance against the British colonial regime. This tactical initiative was an integral component of a comprehensive strategy aimed at leveraging international relations to bolster India's position during the conflict.
- **Military Strategy and Operations:** The INA actively engaged in military confrontations against British forces, particularly in the context of World War II. Bose's military strategy encompassed deception tactics and intelligence operations, which were vital for the INA's operational effectiveness. The establishment of a Provisional Government of Free India in the Andaman and Nicobar Islands represented a significant advancement in asserting Indian sovereignty.
- **Propaganda and Morale:** Bose adeptly harnessed propaganda to enhance the morale of Indian combatants and the civilian populace. He disseminated anti-British propaganda through the Voice of Azad Hind, underscoring the INA's unwavering commitment to India's liberation. This propagandistic effort was directed towards mobilizing support and inciting resistance against British hegemony.
- **Impact:** Despite confronting considerable adversities and ultimately facing defeat, the INA's initiatives inspired numerous Indians and contributed to the escalating discontent towards British rule. The sacrifices rendered by INA personnel and their unwavering dedication to the independence cause bequeathed a legacy within the broader narrative of the Indian freedom struggle.

The Indian National Army, under the aegis of Subhas Chandra Bose, undertook a multifaceted approach in the Indian freedom struggle, interweaving military action, international diplomacy, and strategic propaganda to confront British colonialism. (Roy, 2022)

Legacy and Ideological Impact

Subhas Chandra Bose's ideology continues to hold relevance in contemporary Indian politics through his emphasis on nationalism, socio-economic development, and international relations. His vision for a powerful, independent India and his strategies for achieving it resonate with current political narratives. Bose's ideas on nationalism, economic models, and foreign policy provide a framework that is still applicable in addressing modern challenges in India.

- **Realism in Foreign Policy:** Bose's advocacy for realism in the context of international relations served to motivate policymakers in the post-independence era to embrace a more pragmatic methodology. This entailed an acknowledgment of the significance of power relationships and national interests in the formulation of India's foreign policy, rather than exclusively depending on idealistic doctrines. His vision posited that India ought to assert its identity as a robust nation-state within a competitive global landscape.

Bose's approach to international relations, which emphasized strategic alliances and a strong independent stance, continues to influence India's foreign policy. His ideas on paradigm shifts in international relations are relevant in the context of India's current geopolitical strategies. (Abhinav, 2023)

His experiences and strategies during the freedom struggle, including forming alliances with Axis powers, highlight the importance of pragmatic diplomacy, a lesson applicable in today's complex international landscape. (Tumiotto, 2023)

- **Cultural Unity and National Identity:** Bose's vision of a multicultural and cohesive India significantly shaped the post-independence discourse on national identity. He posited that India's fortitude resided in its cultural plurality and unity, thereby encouraging leaders to cultivate a sense of belonging among diverse communities. This notion played a pivotal role in the development of policies designed to promote national integration and enhance social cohesion.

Bose's advocacy for Hindu-Muslim unity, along with his broader vision of national integration, remains highly relevant in the contemporary socio-political context, where communal tensions frequently arise. (Bose, Bose, & Bose, 2004)

His construct of nationalism, which transcends religious and ethnic barriers, resonates with modern appeals for unity amidst diversity within India. (Kodoor, 2022)

His ideology advocates for the notion of cultural resilience, which encompasses the modification of traditional cultural forms to fit contemporary contexts while preserving their essence. Through the promotion of a cultural renaissance, societies possess the capacity to forge a dynamic cultural identity that is deeply entrenched in tradition yet receptive to global influences, thereby ensuring both cultural continuity and diversity.

- **Economic Development and State Control:** Bose advocated the state intervention in critical industries alongside a focus on indigenous development. This stance impacted post-independence economic policies, fostering initiatives designed to promote industrialization and self-reliance. Policymakers found inspiration in his vision of a resilient, self-sufficient economy capable of withstanding external adversities.

Bose's ideas on socio-economic development, particularly his critique of capitalist structures and advocacy for a more equitable distribution of resources, align with current debates on economic inequality in India. (Zoller, 1990)

His vision of a socio-economic model that combines elements of socialism and capitalism, as seen in his concept of *sāmyavāda*, offers an alternative perspective to the neoliberal economic policies prevalent today. (Tumiotta, 2023)

- **Legacy of Direct Action:** Bose's invocation of direct action against British colonial governance resonated with subsequent movements within India. His conviction regarding the necessity of undertaking bold initiatives to realize national objectives galvanized future leaders to adopt more assertive measures in confronting social and political challenges, thereby reinforcing the concept that meaningful change often necessitates decisive intervention.
- **Direct Engagement in Global Politics:** Bose's realist perspective compelled him to endorse direct action and engagement with global powers, even those whose ideologies were antithetical to India's. This pragmatic orientation significantly influenced India's foreign policy to prioritize relationships grounded in mutual advantage, as opposed to rigid ideological conformity. For example, India's nascent foreign policy incorporated the establishment of diplomatic relations with a variety of nations, irrespective of their political frameworks.
- **Focus on Military Preparedness:** Acknowledging the critical role of military efficacy in international affairs, Bose's contributions encouraged post-independence leaders to prioritize defence and security priorities. This resulted in the formulation of policies aimed at enhancing India's military capabilities and safeguarding national security, particularly in response to threats emanating from neighbouring countries.
- **Promotion of Nationalism:** Bose's vision of nationalism underscored the importance of unity and strength in the face of colonial domination. This perspective profoundly influenced post-independence policies that sought to cultivate a robust national identity and foster cohesion among India's diverse communities, thereby counteracting any divisive elements that could undermine the integrity of the nation.

Bose was a passionate nationalist who espoused the notion of total sovereignty for India. He rejected the concept of dominion status and championed a complete severance from British authority. His renowned proclamation "Give me blood, and I shall give you freedom" succinctly encapsulated his dedication to securing independence through any means deemed necessary. (Banerjee, 2024)

- **Sāmyavāda:** A political ideology conceptualized by Subhas Chandra Bose, possesses considerable historical importance within the Indian independence movement as it epitomized a distinctive amalgamation of communism and fascism, tailored to India's anti-colonial context. The development of *Sāmyavāda* by Bose was significantly shaped by his interactions with various European political ideologies during his time in Italy and Germany. This ideology transcended mere imitation of Western political frameworks; instead, it represented an endeavour to establish a non-Western paradigm capable of bolstering India's quest for independence. Bose's methodology was characterized by both strategic acumen and

controversy, as it entailed forming alliances with Axis powers during World War II, which he postulated would facilitate India's emancipation from British colonial rule (Tumiotto, 2023).

The intention behind this ideology was to serve as an innovative construct that could underpin both anti-colonial and post-colonial aspirations, rather than functioning merely as a replication of European political frameworks. Bose's methodology, inclusive of his conceptualization of Sāmyavāda, enriched the plurality of nationalist discourse in India, which encompassed various viewpoints, including those articulated by figures such as Gandhi, Nehru, and Ambedkar (Lakhera, 2022).

CONCLUSION

Bose's insights resonate with the imperative to strike a balance between global integration and the safeguarding of cultural diversity. This paradigm advocates for proactive measures in the preservation and revitalization of cultural identities, ensuring their vibrancy and relevance within an increasingly globalized world. Despite the significance of Sāmyavāda as an ideological construct, it was not devoid of its critics. Some critics perceived Bose's alliances with fascist governments as a repudiation of democratic principles, while others regarded it as an indispensable tactic in the struggle against colonialism. This dichotomy illustrates the intricate nature of the Indian independence movement, wherein a multitude of ideologies and strategies coexisted and occasionally conflicted in the pursuit of a unified objective.

While Bose's ideology remains influential, it is important to consider the complexities and controversies surrounding his legacy. His associations with fascist regimes and the ideological synthesis he proposed have sparked debate and criticism. These aspects of his ideology require careful examination to ensure that the lessons drawn from his legacy are aligned with democratic and inclusive values in contemporary politics (Tumiotto, 2023). The ideology and contributions of Subhas Chandra Bose played a crucial role in directing the trajectory of India's fight for independence. While the approaches and alliances he employed continue to incite scholarly debate, his steadfast dedication to self-determination and his capacity to galvanize the masses remain incontrovertible. Bose's life serves as a testament to the myriad strategies that converged to facilitate India's liberation, reminding us of the intricacies and richness inherent in the fight against colonial dominion. His enduring legacy continues to galvanize individuals in India and globally.

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“A CRITICAL STUDY OF THE POSITION AND INFLUENCE OF THE ULEMADURINGTHE MAMLUQ PERIOD (1206-1290 A.D.)

Dr. Anurag*

*Associate Professor,
Guru Nanak Khalsa College,
Yamunagar Hrayana, INDIA
Email Id: dranuraggkn@gmail.com

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ABSTRACT

In this research paper a humble attempt has been made to see the status and contribution of the ulema during the Mamluq period (1206-1290 A.D.). To know the status and the contribution of ulema, we have available sufficient amount of contemporary Persian sources like Hasan Nizami's- 'Taj-ul- Maassir', MinhajSiraj's –'Tabaqat –i-Nasiri', ZiauddinBarani's 'Tarikh-i-farojshahi'and 'Fatwa-i-Jahandari etc. On the blasis of these sources, we canstate that the ulemaConstituted a very influential section of muslim society during the period under review.They were held in high esteem on account of their religious knowledge.

The ulema usually performed many functions. They were Jurists, scholars, teacher's, reciters of theQoranand functioners of the Mosques and so on. Besides this, during the period under review the uleme also contributed in the intellectual and literary field.

What role did play in contemporary polities? In this context, we get the information that Sultans of Delhi appointeduleme as a religions advisor because of their proficiency in Islamic knowledge. But in general, during the period under review the political influence of the ulema increased more during the weak and conservativeMamluq Sultans, but under the powerful Sultans, they remained with in proper limits.

KEYWORDS: *Fatawa, Alim, Theology, Mamluq, Ulema-I- Akhrat, Ulema-I-Duniya. Persian, Siddiqi, Persian, Turkan-I- Chahalgani. Muftis, Iskifta, Shariat.*

INTRODUCTION

The establishment of the Sultanate of Delhi in the beginning of the 13th century wasa efficacious point in the history of India.With the establishment of this independent muslim Sultanate in northern India, many new changes were introduced not only in the political-administrative field - but also in the sphere of Socio- religions and economic life. Gradually the effect of these changes in the related field become visible.

The Period from 1206 A.D. to1290 A.D. has a noticeable importanceas for as political and religious development is concerned.The first important Dynasty in the Delhi sultanate was that of the Mamluqs. The sultans who ruled from 1206 A.D. to 1290 A.D. they have been classified by Persian historians into classes like Qutbi, muizzi and shamsis etc. But Modern historians classified them by the name of slave's dynasty,Early Turks, Ilbari, Mamluqs and Pathan etc.¹But they certainly cannot be called Pathans. It is also not appropriate to call them slaves as some of

them were freed from slavery. In this context historian Habibullah² is of the opinion that it is more appropriate to call them 'Mamluqs'. He proposed this name by giving example from the history of medieval Egypt. There the dynasty established by independent slaves conquerors was named Mamluqdynasty. Now, most of the modern historians accepted this view point.

During the period under review the ulema appear as an important and influential section of the muslim society and they were held in high esteem on account of their religious knowledge.³ The circumstances in which muslim society was developed, it was natural for ulema's to occupy important position. At that time the Common muslim were not aware of the problems of the religion. And because of ulema's certified knowledge about religion, they became the religions advisor of the muslims. On the basis of their proficiency in Islamic knowledge, they used to decide whether or not the actions of muslims were based on principles of Islam.

Etymologically, ulema is the plural of Alim (learned). The primary meaning of the term is one who possesses theilm i.e. knowledge.⁴ The word's technical significance is a scholar of Islamic learning, theology and canon law.⁵ And in many traditions of the prophet- they are referred to as his heirs".⁶ The attitude of medieval muslim society towards them is very neatly expressed by a near contemporary historian in the following words- "All people known that after the apostles and prophets rank the truthful persons (siddiqin), Martyrs (Shahidan) and Scholars (Aliman). The scholars are included in the category of siddiqin and have preference the Martyrs. The prophet has Said- 'The ulema are the heirs of the prophets.' The laws of shariat are enforced by them and things illegal and not sanctioned by the Shariat are suppressed by them. The prophet further said that a single faqir is greater terror for devil than a thousand pious men..... The Best Kings and the best nobles are those who visit the doors of the ulema and the worst ulema are those who visit the doors of the kings and nobles. And the ulema are much superior in dignity and status to others."⁷

During the period under review, the ulema were divided into two categories- ulema - i - Akhirat i.e. those solely devoted to spirituality, devotion and worship of Allah and ulema-i-Duniyai.e. the worldly scholars.⁸ Especially this type of ulema utilized their knowledge of religion for worldly gain.

The ulema usually performed many functions. They were Jurists, scholars, religious teachers, readers of the Qoran, reciters of traditions and functioners of the Mosques and so on. Their essential duty was to preserve the knowledge of the 'Divine' will, and to sustain the society, as society and give it religious and moral guidance. It is important to note that the ulema carried on the teaching of Islam, enforced its morals, upheld its laws, proclaimed its doctrines, suppressed corrupt practices and vice, in simple terms promoted good and condemned evil in the society. So, the ulema were very respected.

In addition to government service there were some Muslim scholars (Alims) and Saints in large numbers who lead their life with the help of wazifas. But we know very little about the social base of this large and unorganized group of people. Generally, they were similar to the middle class though some ulema had reached up to the post of Qazi's and become the part of the ruling class.⁹ Most of the Alims (Scholars), Poets, historians and government employees come under this social class. And we can call these classes -inteligencia class or educated class. As we know the country in which most of the people are uneducated the educated people or those people can speak about religion are very respected. This was the case in this time also.¹⁰

We also get the information that the ulema also controlled the business as well as the cultic aspects of community's institutions. They were the managers, Scribes and accountants for the administration of Mosques, Schools, Philanthropies and their properties in trust. Here, arises an important question - What were the expectations of common people from ulema. In this context we get this information. that the people expected a very high standard of morality from the ulema. People believed, "When an illiterate man dies his sins also die with him, but when an Alim dies his sins outlive him."¹¹ Besides this, people also expected the ulemato be chaste, truthful, afraid of moral turpitude, scrupulously observing the shariat and Sunnah and free from worldly gain."¹²

It is important to indicate here that in medieval period, the worldly ulema were not respected Shaikh like Shaikh Sharfuddin and Shaikh Ahmed¹³ repeatedly warned Muslims to protect themselves from the evil influence of the worldly ulema. Sultan Balban's son Bugra Khan also suggested his son Kaiqubad to be cautious about worldly ulema.

The contribution of the ulema in this period is also visible in the compilation of Fatawa literature. According to historian Zafar-ul-Islam, medieval Fatawa literature has its own historical significance. It contains information about many legal decisions.¹⁴ Fatawa signifies legal opinions and verdicts of Jurists or Muftis on any point of law. And the act of seeking a legal opinion as well as the query itself is called Istifta.¹⁵ Some of the important Fatawa of medieval period were "Al-Fatawa-al-Ghiyathiyah" Fatawa-i-Firuzshahi, Al-Fatawa-al-Tatarkhani etc.¹⁶ We also get the information that most of the fatawa literature was written in Arabic language and by the directions of sultans and noble class.

Another important question that needs to be discussed is what role the ulema played in contemporary politics.

In this context, we get the information that Sultans of the Delhi appointed ulema as religious advisors because of their proficiency in Islamic knowledge. However, we find that the first two decades of the establishment of Turkish rule in Northern India, there is less influence of the ulema in the politics of the sultanate. Nor do we get any such information in the contemporary Persian sources. The Persian Historian Hasan Nizami¹⁷ repeatedly mentions Mamluq Sultan Qutubuddin Aibak's respect for the ulema, but nowhere does he mention any instance when the ulema intervened in political affairs. But when Iltutmish ascended the throne (1210-1236 A.D.), it can be said that ulema had become fully conscious of their position.

Mamluq Sultan Iltutmish had great respect for the ulema.¹⁸ At the reign of Iltutmish, a group of ulema was led by Qazi Wajihuddin who enquired the sultan about manumitted. But the sultan handled the ulema very tactfully and created such conditions that they became his actual supporters. Some contemporary and near contemporary Persian sources inform us that when Delhi became the abode of a large number of ulema from west & central Asia, they (ulema) noticed that the Dhimmis (Hindu) were being tolerated by the Sultan.¹⁹ And then, some of them led a delegation to Sultan Iltutmish and urged him to bring about forcible conversions through measures which were both unwarranted and impracticable. The Sultan Iltutmish referred them to the Wazir Nizam-ul-mulk Junaidi, who dismissed them with a diplomatic answer.²⁰ This clearly indicates that the state was not guided by the advice of the ulema.

After the death of Sultan Iltutmish (1236 A.D.) Rukun-din Firuz ascended the throne. But he was an incompetent sultan. During his time, his mother Shah Turkan²¹ had a lot of influence on

administration. Shah Turkan was famous for donating gifts to the Alims and sayyads. But due to his despotism, insurgency started against him and after his fall, Raiza become the sultan. Though Razia's time period (1236-1240 A.D.) as a sultan was limited, yet she was the most capable of Iltutmish's successors. Praising Razia contemporary Persian Historian Minhaj- sirajhas written that- "Sultan Raizawas a great ruler-wise, Justice loving, generous and well-wisher of the people".²² Although she had all the royal qualities, but she was a woman, perhaps that is why all her qualities were useless in the eyes of men. We also get the information from Persian sources that most of ulema were unhappy due to her entry in the court without Hijab. And they hatched conspiracies against Raiza along with some Nobles. It is important to mention here that some modern historians do not agree with this point of view. According to them, the main reason for the downfall of Razia was the ambition of the Turkish nobles i.e. "Turkan-i-Chahalgani".

After Raiza's decline the successors were not-capable to enhance the status of kingship. The last of the Iltutmish's successor Nasiruddin²³ was more a calm personality than a real ruler. During this period, the Sultan was only an emblem of political sovereignty. Political power passed out of his hand into the ministerial body which began to wield political power in the name of Kingship. During this period, the ulema also tried to increase their political influence. In this context Persian historian ZiyaBarni writes that at the time of Balban accession (1266 A.D.) the Sultan's power had practically dissolved. In his 'Tarikh-i-Ferojshahi'-Barni gives a cogent account of Balban's effort to resurrect that power.²⁴ In this connection Barni writes that - "Sultan Balban with all his sense of affection and Benevolence, justice and equality and fast and prayers was cruel and terrible in awarding punishment."

Actually Balban wanted to establish a state which was based on triple relationship between God, King and the people. It is important to mention that as a muslim Balban had his own ideals, but as a political and statesman his stand point in kingship was totally different. In matters of political exigency, Balban stuck to policy of "Iron and Blood", even religion could not control and tanned down his unchecked instinct for political power. According to Modern Historian IswariToppa - "Politics then become his guiding spirit".²⁵ We also get the information that although the ulema were not happy with the governance policies of sultan Balban, yet they could not oppose him either. It mattered nothing to Balban whether or not his political moves or acts were to be justified religiously. Thus, during this period the influence of not only the nobility but also of the ulema was very limited.

After the death of Balban, his grandson Muizzuddin Kaiqubad (1287-1290AD) ascended the throne. During his reign, the influence of the ulema on state policies had increased again. However, the influence of ulema declined again when the Khalji's (1290-1320 A.D.) come to power especially during the reign of Sultan Alaudin Khalji.²⁶

To sum up, we can conclude that during the Mamluq period (1206-1290 A.D.), the ulema constituted an influential section of muslim society and they were respected on account of their religions knowledge. During the period under review, the ulema played multiple roles. They were jurists, religious teachers, reciters of the Qoran and functioners of the Mosques and functioners of the Mosques and so on. And the Intellectual contribution of ulema is also visible in the compilation of Fatawaliterature. Last but not least, in politics also, they tried to play an important role. But in general the political influence of the ulema increased more during the weak and conservative Muslim Sultans. And under the powerful sultan like Iltutmish and Balban, they remained within proper limits.

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“FINANCIAL LITERACY, FINANCIAL BEHAVIOR, PAY SATISFACTION, AND FINANCIAL WELLNESS OF EMPLOYEES OF MEDIUM-SIZED ENTERPRISES”

Dr Nagendra Babu K*; Prof Vishakantta H L**

*Professor,
Department of Studies in Commerce,
Manasagangotri, University of Mysore, INDIA
Email id: nagendrababu280@gmail.com

**Assistant Professor,
Department of Commerce,
Government First Grade College,
Kuvempunagar, Mysuru, INDIA
Email id: vishakantta@gmail.com

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ABSTRACT:

This study intended to analyze the effects of financial literacy, financial behavior, and pay satisfaction on the financial wellness of employees of medium-sized enterprises in the Mysuru district of Karnataka state. Mysuru, a historical tourism hub with modern industry, is nestled in the Kaveri and Kabini river banks. This study explores how financial literacy, financial behavior, and pay satisfaction impact employee financial wellness in the district's medium-sized enterprises. Surveying 358 respondents from a population of 5015, researchers used questionnaires and SPSS tools to analyze data, results show significant correlations between variables. The study examines the moderating effect of financial behavior on financial literacy and financial wellness, and improved pay satisfaction also contributes to better financial wellness of the employee. These findings illuminate the interrelation among variables like financial literacy, and financial behavior pay satisfaction, with the financial wellness of the employees of medium-sized enterprises in Mysuru's evolving business landscape.

KEYWORDS: *Financial Literacy, Financial Behavior, Financial wellness, Employees, Medium-Sized Enterprises, Mysuru District.*

1. INTRODUCTION

“People make bad financial decisions. We save too little for retirement”(Özgüner, 2020). Achieving good financial wellness depends on good financial decisions. Financial decisions depend on individual financial efficacy or referred financial self-efficacy" **Financial literacy refers to an individual's ability to comprehend, analyze, and effectively apply personal financial information and resources to make informed decisions about managing their economic well-being**"(Huston, 2010). Understanding the terms of finance and interest calculations in today's complex world is more important for an individual to make good financial decisions. Financial behavior refers to the habits and actions individuals take when managing their finances, including budgeting, timely bill payments, and consistent saving. According to

Rai et al. (2019), it involves making informed financial decisions, maintaining control over expenditures, and ensuring financial stability. Additionally, responsible financial behavior contributes to long-term financial security, reduces financial stress, and fosters wealth accumulation. Developing strong financial habits can lead to improved economic well-being and a better quality of life.(Rai et al., 2019). Individuals make different decisions in their daily lives, among various decisions financial decisions are more important and purely depend on his/her financial literacy, knowledge, financial management and individual behavior. Higher income and wealth are associated with greater financial efficacy, as they provide more opportunities to engage in financial decision-making(Xiao, 2008). Employee Financial efficiency is dependent on financial literacy and behavior. Every economic person needs an economic source to sustain his economic life. In the case of an employee, pay determines his economic sustainability. Employee financial efficacy and pay of the employee has a major decisive role in the financial wellness of the employee. “Individual profiles, such as gender, age, and education, can influence pay satisfaction. For example, women and younger workers often report lower pay satisfaction” (Ostroff & Atwater, 2003). Employee gender, age, and education have a direct relation with pay satisfaction. “Financial wellness is the ability to meet financial obligations, feel secure about the future, and make choices that allow enjoyment of life” (Kim & Garman, 2003). Financial wellness is a comprehensive derived concept. Financial wellness has direct and indirect effects from its determinants and is influenced by many factors. We the researchers try to find out the relation of medium-sized enterprises' employee financial efficacy in terms of financial literacy, behavior, and pay satisfaction on financial wellness.

2. Literature Review

Financial Literacy

“Financial literacy is widely regarded as the capacity to comprehend and apply essential financial competencies, encompassing personal finance management, budgeting, savings strategies, investment decision-making, and responsible debt handling. This skill set enables individuals to navigate complex financial systems, mitigate risks, and align their choices with long-term goals such as retirement security or wealth accumulation”(Lusardi & Mitchell, 2011). Financial literacy and knowledge make individuals better equipped to be informed about financial aspects and help to make good decisions about saving, investing, and borrowing(Hastings et al., 2013). Financial literacy has gained significant attention in recent years due to its critical role in personal and economic well-being, its determinants, and its impact on financial decision-making.

Financial Behavior

“Financial Literacy, Financial Education, and Downstream Financial Behaviors found that the effectiveness of financial education diminishes over time, suggesting the need for ongoing interventions”(Fernandes et al., 2014). “Higher financial literacy is associated with lower levels of debt and better debt management practices” (Lusardi & Tufano, 2015). Why Do Women Invest Differently Than Men? found that women tend to be more risk-averse and have different investment behaviors compared to men”(Bajtelsmit & Bernasek, 1996). Financial behavior examines how individuals, households, and organizations make financial decisions, the factors influencing these decisions, and the consequences of such behaviors.

Pay Satisfaction

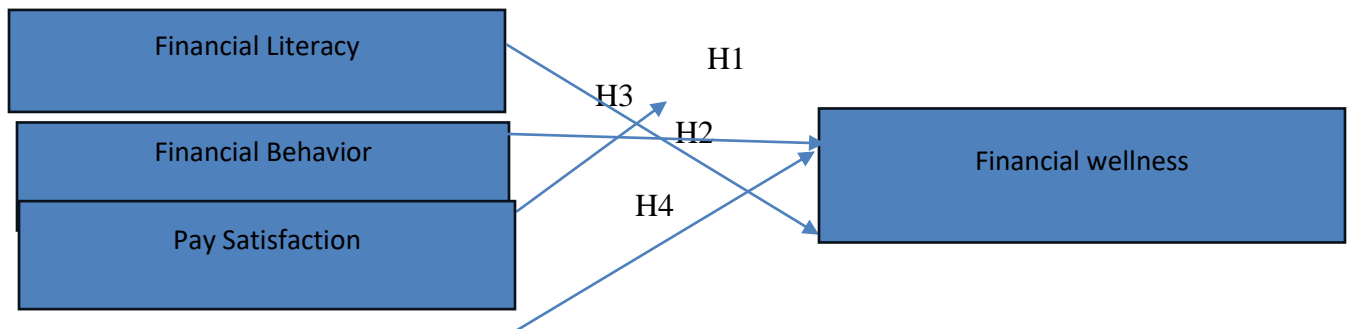
“Higher absolute pay levels are generally associated with greater pay satisfaction”(Judge et al., 2010).”Satisfied employees are more motivated to perform well and achieve organizational goals”(Lawler, 1971).”Personal characteristics, such as gender, age, and education, can influence pay satisfaction. For example, women and younger workers often report lower pay satisfaction “(Ostroff & Atwater, 2003) .Pay satisfaction is a critical factor in employee motivation, performance, and retention. It is influenced by pay level, equity, individual differences, and organizational policies.

Financial Wellness

“Financial well-being as a blend of financial stress and financial satisfaction, highlighting the psychological dimensions of financial health”(Netemeyer et al., 2018).a multidimensional construct encompassing financial satisfaction, objective financial status, attitudes, and behaviors" that directly impacts job productivity and life satisfaction”(Joo & Grable, 2004). Financial wellness can be understood from both objective and subjective perspectives. To gain a comprehensive understanding of an employee's overall financial well-being, it is essential to examine both aspects. Objective measures may include income, savings, and debt levels, while subjective factors encompass financial satisfaction, stress, and confidence in managing finances. A holistic approach that integrates both perspectives provides a more accurate and meaningful assessment of financial wellness.

3. Conceptual Model

From the literature review for the present study, a conceptual model is proposed. Details about the conceptual model and its hypotheses are as follows



Figure;1 Conceptualmodel (author's conceptualization)

4. Hypotheses for the proposed research

H1. There is a positive relationship between financial literacy and financial wellness.

H2. There is a positive relationship between financial behavior and financial wellness.

H3. Financial behavior moderates the relationship between financial literacy and financial wellness.

H4. Pay satisfaction has a positive effect on financial wellness.

5. Sampling and Methodology

This study encompassed 44 medium-sized enterprises with a combined workforce of 5,105 employees. To determine the minimum sample size, Slovin’s formula was applied (margin of error = 5%), yielding a requirement of 358 participants. To account for potential non-responses and ensure robustness, 500 questionnaires were distributed using a cluster sampling technique. Of these, 412 responses were received, with 44 excluded due to incomplete or inconsistent data, resulting in 368 valid responses for analysis. Prior to conducting formal statistical analysis, reliability assessments were performed. Cronbach’s α coefficients for all independent variables (Financial Literacy, Financial Behavior, Pay Satisfaction, and Financial Wellness) exceeded the threshold of 0.70, confirming internal consistency. Structural equation modeling (SEM) was subsequently employed to evaluate the hypothesized relationships between constructs.

6. Data Analysis and Result.

The analysis of respondent data provides insights into their demographic characteristics. In terms of age, the majority of participants in this study fall within the 30–40 age group, accounting for 131 individuals, or 36.7% of the total respondents. This suggests that a significant portion of the workforce surveyed consists of employees in their early to mid-career stages. On gender, the respondents are dominated by men (62.4%) totaling 223 people. Employees' educational background, (8.3%) or 30 are above post-graduation, (47.7%) with a total of 171 employees being postgraduates, graduates are 131 or (36.7%) and the remaining are below graduation (7.3%) or 26. while almost all of the employees are on payroll. For the duration of work, the majority of respondents 128 or (35.8%) were employees who have been working for below 5 years. It is an indication that employees are switching from one enterprise to another for one or the other reasons. Regarding the marital status, 223 respondents (62.4 %) are married, the income of the employees 179, or 49.9 % have an income below Rs 5,00,000, and finally the savings of the employee 82 or (22.9%) Rs 1,50 000 and above. Each variable has a mean value above the standard deviation. This shows that the data has a good distribution and no outlier data was found.

Table 1 :Scale Reliability Statistics

	<i>N</i>	Mean	SD	Cronbach's α
Financial Literacy	358	3.78	.680	.879
Financial Behaviour	358	3.79	.628	.793
Pay Satisfaction	358	3.39	.762	.634
Financial wellness	358	0.752	0.306	.675

First, we carried out a reliability test. Table -1 shows, the Cronbach's Alpha indicator also showed that all research instruments were reliable (< 0.50). SEM analysis result presented that relationships between constructs in the research model were different 1.00. All of the p-values

were very small, so the null hypotheses were rejected. Thus, four constructs in this study had discriminant validity.

Table 2: Relationships between Constructs

Relationship	R	se(r)	1 - r	Critical value	p-value
FW– FL	.463	.0372	.337	7.3476	.000
FW – PS	.603	.0241	.137	3.7872	
FL - FB	.455	.0436	.445	8.3578	.000
PS –FL	.263	.0172	.187	3.3446	.000
FB - FL	.435	.0417	.425	7.2789	.000
FW – FB	.276	.0236	.289	6.1212	.000

Table -2 presents the relationships between different constructs, along with statistical measures to evaluate the strength and significance of these relationships. Here's a breakdown of the columns and their interpretations This value indicates the strength and direction of the relationship between the two constructs. The correlation coefficient (r) ranges from -1 to +1. A positive value indicates a positive relationship, while a negative value indicates a negative relationship. The closer the value is to 1 or -1, the stronger the relationship FW– FL: r = 0.463 (moderate positive relationship) statistically significant., FW – PS: r = 0.603 (strong positive relationship) FL – FB: r = 0.455 (moderate positive relationship), PS – FL: r = 0.263 (weak positive relationship) FB – FL: r = 0.435 (moderate positive relationship), FW – FB: r = 0.276 (weak positive relationship). All p-values in the table are 0.000, indicating that all relationships are statistically significant at the 0.05 level. The strongest relationship is between FW and PS (r = 0.603). All relationships are statistically significant (p < 0.05). The weakest relationships are between PS – FL (r = 0.263) and FW – FB (r = 0.276).

Table 3: Result of Hypothesis Testing

Hypothesis	Path	Results				Conclusion
		Coefficient	Se	c.r	P-value	
H1	FL → FW	.406	.092	4.413	.002	Support
H2	FB → FW	.348	.082	4.240	.000	Support
H3	FB → FL	.433	.0954	.557	.045	Support
H4	PS → FW	.947	.1984	.7828	.043	Support

Detailed Interpretation

H1 is accepted as FL → FW (Financial Literacy → Financial Wellness), Coefficient: 0.406 (moderate positive effect), p-value: 0.002 (< 0.05). Financial Literacy has a statistically significant and positive effect on Financial Wellness. This means that individuals with higher financial literacy are more likely to achieve better financial wellness (e.g., reduced financial stress, better financial planning). H2 is accepted as FB → FW (Financial Behavior → Financial Wellness) Coefficient: 0.348 (moderate positive effect) and p-value: 0.000 (< 0.05). Financial Behavior has a statistically significant and positive effect on Financial Wellness. This means that individuals who exhibit positive financial behaviors (e.g., saving, budgeting, avoiding debt) are more likely to achieve better financial wellness. H3 result supports hypotheses and accepted FB → FL (Financial Behavior → Financial Literacy), Coefficient: 0.433 (moderate positive effect), p-value: 0.045 (< 0.05). Financial Behavior has a statistically significant and positive effect on Financial Literacy. This suggests that individuals who practice good financial behaviors are more likely to improve their financial literacy over time. H4 accepted PS → FW (Pay Satisfaction → Financial Wellness), Coefficient: 0.947 (strong positive effect) p-value: 0.043 (< 0.05). Pay Satisfaction has a statistically significant and strong positive effect on Financial Wellness. This means that individuals who are satisfied with their pay or income are more likely to achieve better financial wellness. The strongest relationship in the model is between Pay Satisfaction (PS) and Financial Wellness (FW) (Coefficient = 0.947). This indicates that pay satisfaction plays a critical role in achieving financial wellness. Moderate Relationships Financial Literacy (FL) and Financial Behavior (FB) both have moderate positive effects on Financial Wellness (FW). Financial Behavior (FB) also positively influences Financial Literacy (FL), suggesting a reinforcing relationship between the two. All Hypotheses Supported: All four hypotheses are supported, indicating that the proposed model is statistically valid.

CONCLUSION

This study seeks to examine and able to understand the relationship and impact of financial literacy, financial behavior, and pay satisfaction on the financial wellness of employees working in medium-sized enterprises. By analyzing these factors, the research aims to provide valuable insights into how financial knowledge, money management habits, and compensation satisfaction contribute to overall financial wellness. The findings could help organizations develop targeted financial wellness programs to enhance employee financial stability and job satisfaction. The independent variable pay satisfaction has a significant effect on financial wellness. Improving financial literacy can directly enhance financial wellness. Educational programs and resources should be promoted to increase financial knowledge. Encouraging positive financial behaviors (e.g., saving, and budgeting) can improve both financial wellness and financial literacy. Employers and policymakers play a crucial role in promoting financial wellness by ensuring fair and satisfactory compensation, as it directly impacts employees' financial well-being. However, when using cross-sectional data, it is important to recognize its limitations, as it captures information at a single point in time and cannot establish definitive causal relationships. Longitudinal studies or experimental research may be necessary to better understand the long-term effects of pay satisfaction on financial wellness.

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"A STUDY OF LOCAL COPING AND ADAPTIVE STRATEGIES TO CURRENT IMPACT OF CLIMATE CHANGE IN LEH DISTRICT OF LADAKH"

Padma Namgyal* ; Shyamal Sarkar**

*Researcher,

Padma Namgyal Department of Geography,
Panjab University Chandigarh, INDIA
Email id: Padmanamgyalshey@gmail.com

**Researcher,

Shyamal Sarkar Department of Geography,
Post Graduate Government College,
Sector 46 Chandigarh, INDIA

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ABSTRACT

The study highlights the livelihoods of rural communities in the study region, highlighting key socio-economic and environmental adaptations. Using a mixed-methods approach, we analyze various aspects of daily life, including healthcare accessibility, agricultural diversification, non-farm employment, water resource management, housing trends, government employment, and literacy patterns. Our findings reveal significant disparities in healthcare access, with remote villages facing limited medical services, often relying on traditional healers. The study also documents a shift in agricultural practices, as households increasingly cultivate exotic vegetables and mushrooms to adapt to changing climatic conditions. Additionally, economic diversification is evident, with many households supplementing agricultural income through non-farm activities, particularly in villages closer to district headquarters. Water availability remains a critical challenge, with seasonal variations affecting household access. Infrastructure initiatives like the Jal Jivan Mission Scheme have improved water accessibility, but disparities persist. Housing trends indicate a transition toward concrete roofs to mitigate water leakage, although traditional homes remain prevalent due to their climate adaptability. Government employment, especially in the armed forces, plays a crucial role in household financial stability, while literacy trends demonstrate a divide between villages with better educational access and remote areas with limited schooling opportunities. Overall, the study underscores the resilience and adaptability of these communities in navigating climate change and socio-economic transformations. These insights provide valuable guidance for policymakers and development agencies in formulating targeted interventions to enhance rural livelihoods and sustainability.

KEYWORDS: *Livelihood; Adaptation; Climate Change Resilience; Rural Communities; Sustainable Development; Socioeconomic Dynamics.*

INTRODUCTION

Climate change has emerged as a critical global challenge, manifesting through rising temperatures, shifting precipitation patterns, and an increasing frequency of extreme weather events (Masson-Delmotte et al., 2021; Fawzy et al., 2020; Parmesan et al., 2022). These changes have particularly profound effects on vulnerable and remote regions (Kagan & Dodge, 2023). One such region is Leh, located in the Union Territory of Ladakh, India. Known for its high-altitude desert landscape and rugged terrain, Leh faces unique climatic challenges that threaten its ecosystems, livelihoods, and overall well-being (Chevuturi et al., 2018).

Agriculture, the primary livelihood source for Leh's rural communities, is particularly vulnerable to climate change. The melting of glaciers, unpredictable rainfall, and growing water scarcity directly impact farming practices, endangering food security (Tuladhar et al., 2023; Malik et al., 2023). Additionally, extreme weather events such as flash floods and cloudbursts have become more frequent, posing risks to both life and property (Bhat et al., 2023; Bhattacharjee et al., 2023; Singh et al., 2022). Given these challenges, understanding how local communities adapt and cope with climatic changes is crucial.

Adaptation involves proactive strategies that reduce vulnerability and enhance resilience, including infrastructure improvements, agricultural diversification, and efficient water management (Altieri & Nicholls, 2017; Lal et al., 2011; Anderson et al., 2012). Coping strategies, on the other hand, are immediate responses to climate shocks, such as emergency relief efforts and temporary livelihood adjustments (Berman et al., 2015; Mengistu et al., 2011). This study explores the adaptation and coping mechanisms employed by rural communities in Leh, with the aim of informing policymakers, researchers, and practitioners involved in climate resilience efforts.

Study Area Descriptions

The study area, Leh district, is situated in the Trans-Himalayan region of Ladakh, characterized by its cold, arid, and fragile ecosystem. Bounded by the Karakoram range in the north and the Greater Himalayas in the south, it sits at an average altitude of 3,514 meters and extends from 34°10'12" N to 77°34'48" E (Haq et al., 2021). Leh shares borders with China and Himachal Pradesh to the east and Jammu & Kashmir and Pakistan to the west. The region relies on glacial meltwater from Kang Yangtse, Siachen, and smaller glaciers to sustain its streams and the Indus River. Traditional livelihoods include subsistence farming, livestock rearing, and agro-pastoralism, though tourism has become a key economic driver since 1974. As of the 2011 census, Leh district has a population of approximately 274,281. Leh's climate is marked by extreme conditions, with annual rainfall of only 50-70 mm due to the rain shadow effect (Kumar et al., 2017). High altitude and low humidity intensify solar radiation, shaping its delicate ecosystem. Temperatures fluctuate between 35°C in summer and -45°C in winter. Politically, Ladakh is divided into Leh and Kargil districts, with Leh covering 45,110 square kilometers, making it one of India's largest districts. It is subdivided into regions such as Nubra, Changthang, and Sham, encompassing 113 villages. Climate change has significantly impacted the region over the past two decades, posing challenges for its ecosystem and traditional livelihoods. As Leh navigates modernization, understanding these changes is crucial for sustainable development in fragile mountain environments.

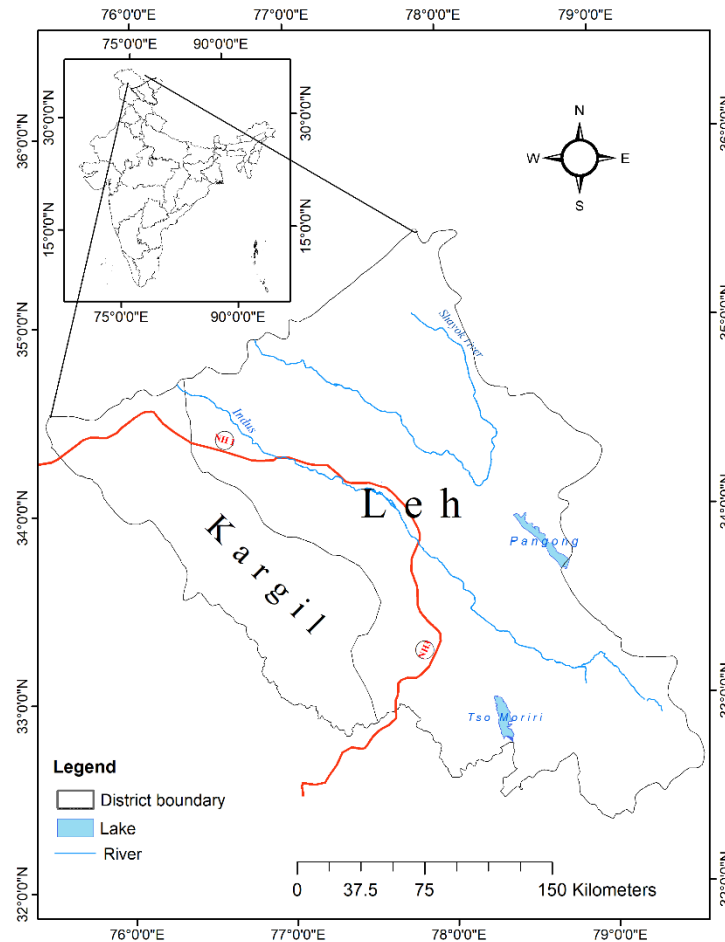


Fig. 1 Study area in Leh in Ladakh

Database and Methodology

To investigate the adaptation and coping strategies of Leh's rural farmers, a mixed-methods approach was employed. The study was informed by a review of existing literature, exploratory field visits, and structured surveys conducted among local farming households. Survey data served as the primary source for identifying key adaptation strategies and assessing their effectiveness. Farmers were asked about their perceptions of climate change, observed environmental shifts, and the measures they have adopted to mitigate its impacts. The study identified a range of locally developed adaptation strategies, including the use of artificial glaciers, shifts to climate-resilient crops, and participation in non-agricultural income-generating activities (Tripathi & Mishra, 2017; Aguiar et al., 2018; Aryal et al., 2020). By analyzing these responses, the study aims to provide insights into the factors influencing adaptation choices and resilience-building efforts in Leh. The findings contribute to a broader understanding of how high-altitude communities navigate climate challenges and offer recommendations for sustainable adaptation planning.

Results and Discussions

In our research, we have identified a set of significant adaptation measures reported by rural households in the study area. These measures encompass the following aspects: household

access to healthcare facilities, utilization of artificial glaciers, seeking assistance from social networks such as neighbors and relatives, the use of chemical fertilizers to enhance crop production, the adoption of new crop varieties, engagement in non-farm activities to augment income sources, awareness of climate change among household heads, ownership of at least one vehicle, access to electricity, availability of mobile network communication, access to in-home water supply, the presence of concrete roofs in households, the employment of household members in government positions, and the literacy of household members.

Our analysis primarily focuses on enhancing household livelihood resilience in the face of climate change, which encompasses all the major adaptation measures mentioned above. These measures are instrumental in bolstering the households' ability to withstand the adverse impacts of climate change, such as water scarcity, flash floods, and heavy rainfall. It is evident that these adaptations are of paramount importance and have the potential to significantly enhance the well-being of rural households. Throughout our survey, it became apparent that these adaptive capacities are held by the rural households we studied. Figure 5.1 shows the frequency with which the different options were employed by the rural households.

Table 1 Respondents response to distinct adaptive measures to vulnerability.

Adaptive capacities	Percentage of affirmative response	Percentage of negative response
Household members literate	79.4	20.6
Household member with government job	15.9	84.1
Concrete roof	22.3	77.7
Household having source of water at home	54.3	45.7
Household having mobile communication	69.2	30.8
Household having electricity	97.2	2.8
Household with vehicle	74.9	25.1
Household head having climate knowledge	67.5	32.5
Household members engaging in non-farm activities	48.0	52
Household planting new crops	68.2	31.2
Household using chemical fertilizer	38.7	61.3
Household seeks help from social networks	100	0
Household taking advantage of artificial glaciers	52.4	47.6
Household accessibility to Hospital	85.8	14.2

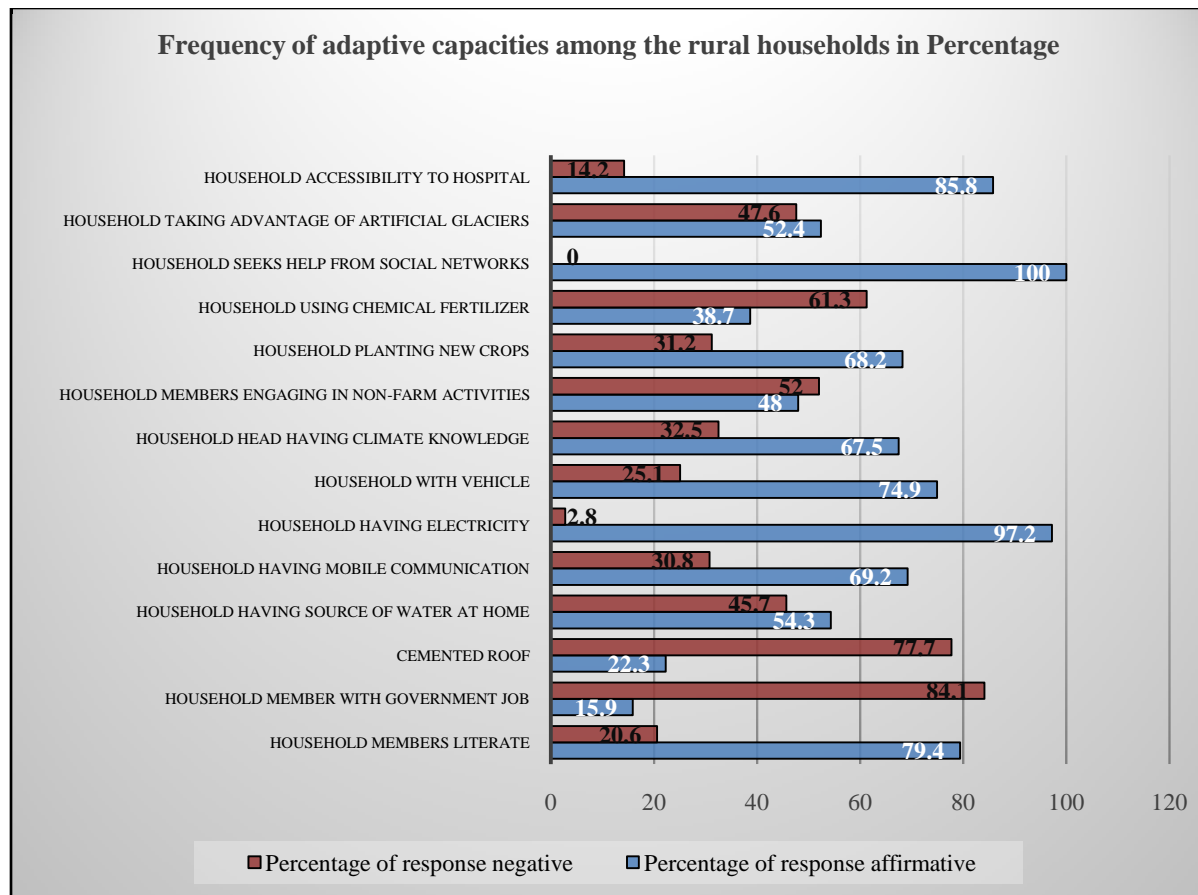


Fig.2 Graph showing frequency of adaptive capacities employed by the households in the region.

Household Accessibility to Hospital

In the course of our survey, a significant observation came to light concerning healthcare accessibility in the surveyed villages. While each village was equipped with a primary health center, it was evident that several villages, including Chushul, Hunderdok, Gya, Hemya, Likte, and Kaya, were situated more than 50 kilometers away from the nearest hospital. Conversely, villages like Shey, Nang, Shang, Stakmo, Umla, and Chilling were relatively closer to the hospital, with distances of less than 50 kilometers. The data analysis unveiled that approximately 85.8% of the respondents reported having access to the hospital, whereas 14.2% expressed their lack of access to hospital facilities. Notably, respondents residing in villages distant from the hospital mentioned their reliance on traditional healers within their localities for medical advice. Furthermore, they indicated that when conventional medicine failed to yield positive results, they sought out traditional Ayurvedic remedies from these healers. It is worth noting that respondents from both remote and proximate villages to the hospital acknowledged that for advanced medical emergencies, doctors often recommended seeking treatment at esteemed institutions such as PGIMER Hospital in Chandigarh or AIIMS in Delhi. However, some respondents raised concerns about the financial constraints associated with the expenses incurred for travel, medical treatment, and accommodation in these major cities. This highlighted a significant barrier to accessing specialized healthcare services for a portion of the population (Singh et al., 2022).

Household Taking Advantage of Artificial Glacier

Our extensive fieldwork in the study area has brought to light the prevalent reliance on snow and glacier meltwater for agricultural purposes in the majority of the villages. Specifically, Chushul, Hemya, Likse, Gya, Shang, Ego, Nang, Stakmo, Chilling, Kaya, Umla, and Hunderdok predominantly rely on these crucial water sources, with the notable exception of Shey, which sources its water from the Indus River. Notably, the presence of artificial glaciers was a common sight in most of the villages dependent on snow and glacier meltwater. Upon close examination, it became evident that these communities grappled with water shortages, leading to the strategic construction of artificial glaciers in the lower valleys at higher elevations.



Fig.3 Image of an artificial glacier in the study region.

Our data revealed that 52.4% of respondents made use of artificial glaciers, while 47.6% reported not benefiting from them due to either unsuccessful implementation or their absence of such initiatives in the village. For instance, a respondent from Stakmo village reported that although an artificial glacier was constructed in the village, it proved unsuccessful, resulting in continued water shortages during peak seasons. The artificial glacier, a pioneering human-made technology, was first conceptualized and implemented by Chewang Norphel in 1987 as a proactive response to the pressing issue of water scarcity within these communities (Norphel&Tashi, 2015). The inception of artificial glacier techniques dates back to their experimental deployment at PhuktsePhu in 1987, marking a pioneering milestone. Their remarkable success in augmenting water resources precipitated the dissemination of this technology to numerous other villages. Presently, this innovative approach finds application across various districts, testifying to its widespread adoption.

The construction of an artificial glacier comprises a sequence of integral components, each serving a crucial role in the overall effectiveness of the technology:

Data Collection: Initial stages involve the comprehensive collection of data regarding the persistence of water during the winter months, allowing for informed site selection.

Site Selection: The selection of sites is underpinned by a multifaceted criteria framework. Factors such as the site's orientation (favoring north-facing mountain locations to minimize direct sunlight exposure), topography featuring gentle slopes, lower altitudes (typically around 13,000–14,000 feet) to expedite early melting, and proximity to villages to reduce water transit losses collectively inform the strategic site choice.

Diversion Channel Construction: The construction of the diversion channel across hill slopes plays a pivotal role in channeling water towards the glacier formation site.

Snow Barrier Bund: Dry stone masonry snow barriers are meticulously erected along the lower edge of the diversion channel at the glacier formation site. The number and dimensions of these bunds are contingent upon the slope characteristics.

Water Release and Ice Formation: The next critical phase entails the controlled release of water at the glacier site through designated outlets, allowing for a gradual freezing process. This operation is executed over a period spanning from May to October, commencing when temperatures reach the freezing point at 0°C. The resultant stabilized ice mass persists until March when the natural melting process commences.

During periods characterized by overcast weather conditions or protracted snowmelt durations, the water reservoir can be judiciously employed for irrigation purposes, further accentuating the technology's multifaceted utility. It's notable that artificial glaciers exhibit an earlier onset of melting when compared to their natural counterparts, primarily due to their lower altitudinal placement. This complementarity with natural glaciers plays a pivotal role in ensuring a continuous and reliable water supply for the local community (Norphel&Tashi, 2015).

Help from Social Networks

Our comprehensive observations within the study area have unveiled a pervasive sense of companionship and neighbor bonds among the households. The respondents consistently attested to a deeply ingrained practice of mutual assistance within their communities. This spirit of cooperation extends to virtually every major aspect of household life, encompassing agricultural activities, the construction of homes, and the elaborate arrangements of marriage ceremonies. In particular, our investigations shed light on the significant role played by these interconnected social networks in times of adversity. Respondents who had experienced the distressing consequences of flash floods in both 2010 and 2015 emphasized that they were not alone in facing these challenges. Rather, they received invaluable support from their immediate neighbors, extended family members, and even external organizations. The data we gathered underscores the extent of this communal reliance, as nearly 100% of the respondents reported seeking assistance from their neighbors, relatives, and various organizations during emergency situations. It is evident that these social networks are not merely a cultural tradition but also serve as vital safety nets in times of crisis, playing a pivotal role in the livelihood and resilience of the entire community (Kumar et al., 2023).

Introduction of New Crops

Observations from the study area reveal significant variations in vegetation across different villages, particularly between the eastern and western parts of the region. Chushul village, located in the easternmost part, exhibited sparse vegetation, whereas villages such as Hemya, Liktse, Shang, Egoo, Nang, Stakmo, Gya, Shey, Chilling, Umla, Kaya, and Hunderdok displayed more abundant greenery. Furthermore, differences were noted in household vegetable cultivation.

In the western part of the region, where vegetation is more abundant, respondents reported growing a diverse range of vegetables. Traditionally, crops such as turnips, radish, potatoes, carrots, and onions were cultivated. However, recent findings indicate a shift toward exotic vegetables, including broccoli, cauliflower, zucchini, and capsicum.

An interesting development was the cultivation of subtropical fruits such as watermelon and muskmelon in Shey village, as well as a rising trend in mushroom cultivation, with households receiving training for effective production. Survey data revealed that 68.2% of respondents actively diversified their crops and vegetables in response to the region's challenging climatic conditions. Conversely, 31.2% of households did not opt for diversification due to harsh climatic constraints, underscoring the complexity of agricultural adaptation in the region. The shift toward new crops and techniques reflects the resilience of farming communities in adapting to climate change, ultimately increasing household adaptive capacities.

Non-Farm Activities

The study indicates a growing trend among households diversifying their income sources through non-farm activities. Many respondents emphasized a shift from traditional agriculture to multiple income streams. A 75-year-old participant reflected on how life today has become much faster-more paced compared to previous generations. Spatial variations in non-farm activity participation were evident. Villages closer to the district headquarters reported higher engagement in occupations such as shopkeeping and tourism. Survey data revealed that 48% of respondents were involved in non-farm activities, while 52% were not. Additionally, education levels played a key role in occupational diversification—household members with higher education were more likely to engage in alternative livelihoods, leading to improved economic well-being. This shift underscores the evolving nature of rural economies, where non-farm activities contribute significantly to household income.

Household Access to Water at Home

Water availability is crucial for subsistence farming in the study region, where communities depend on snow and glacier-fed water sources. Water scarcity was particularly evident in villages such as Nang, Stakmo, and Umla during peak crop cultivation periods. A seasonal shift in water sources was observed—during summer, households relied on pipeline water for drinking, but in winter, freezing temperatures rendered these pipelines unusable, forcing residents to rely on nearby streams. Additionally, ground excavation activities under the Jal Jivan Mission Scheme (JJMS) were noted, reflecting efforts to improve water access. Survey data showed that 54.3% of households had access to water within their homes, while 45.7% still relied on nearby streams. Pipelines and hand pumps played a crucial role in providing drinking water, demonstrating the adaptive capacity of these communities in managing seasonal water challenges.

Houses with Concrete Roofs

A significant shift in housing construction has been observed, with many villages transitioning to concrete-roof houses. Traditional houses with earth-rammed roofs were reported to be ineffective in preventing water leakage during rainfall, prompting households to adopt modern construction methods, particularly in villages experiencing higher rainfall levels.

However, variations were noted—remote villages like Chushul and Hunderdok still predominantly feature traditional houses, while villages closer to district headquarters exhibit a greater inclination toward concrete roofs due to easier access to construction resources.

Data analysis revealed that 22.3% of surveyed households had concrete roofs, while 77.7% continued to reside in traditional homes. Despite issues like water leakage, traditional houses remain popular due to their climate-adaptive features. Built with dry mud bricks and wooden log roofing, these structures help regulate indoor temperatures, keeping interiors warm in winter and cool in summer.

Household Members with Government Jobs

Differences in living standards were evident between households with government-employed members and those without. Respondents widely perceived that families with government jobs enjoyed higher financial stability. A notable trend emerged in the prevalence of government employment within the armed forces, particularly in remote areas. In Chushul and Hunderdok, many household members have migrated to Leh town for private-sector jobs, particularly in tourism. A generational shift was also observed—while older generations remained engaged in agriculture and livestock farming, younger individuals showed a preference for employment in the armed forces or other non-farm sectors. Survey data indicated that 15.9% of respondents had household members in government jobs, while 84.1% did not. These findings highlight the evolving employment patterns and economic disparities within the region.

5.3.14 Literacy of Household Members

A notable disparity in literacy rates was observed among villages in the study area. Villages closer to the district headquarters, such as Shey, Stakmo, Nang, and Shang, exhibited higher literacy levels due to better access to educational facilities. In contrast, remote villages like Chushul and Hunderdok had lower literacy rates. Respondents from Chushul highlighted the absence of a local school, forcing children to travel to Puga for education. Historically, older generations in this village had limited access to schooling, contributing to higher illiteracy rates. The nomadic lifestyle further hindered educational development in these communities. Survey data showed that 79.4% of household members were literate, while 20.6% remained illiterate. Most illiterate individuals belonged to older generations, indicating a need for targeted educational initiatives to bridge this gap. Despite challenges, the presence of primary schools in most villages represents progress toward improving literacy levels in the region.

CONCLUSIONS

Our study provides a comprehensive understanding of the evolving livelihoods within these villages, emphasizing how communities adapt to climate change and socioeconomic challenges. Healthcare accessibility remains a significant concern, with disparities in medical services. While many villages have primary health centers, remote villages such as Chushul, Hunderdok, and Kaya are over 50 kilometers away from the nearest hospital. Approximately 85.8% of respondents have hospital access, while 14.2% face medical service challenges, often relying on traditional healers. Innovative water conservation methods, such as artificial glaciers, have emerged as adaptive strategies. First pioneered in 1987, these structures provide essential water sources, though some villages, such as Stakmo, have encountered implementation challenges. Social networks play a critical role in these communities, fostering cooperation in agriculture, construction, and daily life. Nearly all respondents seek support from neighbors and

organizations during hardships, highlighting the importance of communal resilience. The shift from traditional to chemical fertilizers has increased crop yields but raised concerns about long-term soil health. Crop diversification is becoming a common adaptation strategy, with 68.2% of households actively diversifying crops to counter changing climatic conditions. A growing number of households are engaging in non-farm activities, with proximity to Leh headquarters playing a key role. Education levels strongly influence employment choices, with better-educated individuals more likely to pursue diversified occupations. Infrastructure improvements, such as concrete roofing, have gained traction in response to water leakage issues, though traditional homes remain prevalent due to their climate-adaptive design. Government employment continues to influence household living standards, with the armed forces providing a crucial source of stable income. Finally, literacy disparities highlight the need for targeted educational initiatives, especially in remote villages. While 79.4% of household members are literate, remote areas still face educational accessibility challenges. In conclusion, these observations highlight the resilience and adaptability of these communities as they navigate environmental and socioeconomic changes. These insights offer valuable guidance for developing strategies to enhance livelihoods and improve adaptive capacities in these remarkable villages.

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ASSESSING AWARENESS AND EFFECTIVENESS OF POVERTY ALLEVIATION PROGRAMMES: A SOCIO-ECONOMIC STUDY IN DHEMAJI DISTRICT, ASSAM

Chiranjeeb Biswas* ; Jayanta Kr. Dutta**

*Assistant Professor,
Moridhal College, Assam, INDIA
Email id: chiranjeebbiswas1@gmail.com

**Assistant Professor,
Moridhal College, Assam, INDIA
Email id: jayantadutta45@gmail.com

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ABSTRACT

The socioeconomic traits of rural households in Dhemaji, Assam, as well as their knowledge of important initiatives aimed at reducing poverty, are investigated in this study. The study uses a multi-stage sampling technique to examine awareness levels and involvement in programs including Mahatma Gandhi National Rural Employment Guarantee Act, Orunodoi, and Indira Gandhi National Old Age Pension Scheme. It is based on a primary survey of 303 households. The results show that although a large portion of respondents are aware of employment and food security programs, there is still a low level of awareness regarding pension plans. The study emphasizes the necessity of improved policy interventions and outreach to close knowledge gaps at the local level.

KEYWORDS: *Awareness, Poverty Alleviation Programmes, Socio-Economic Characteristic, Occupational Distribution.*

INTRODUCTION

World Bank defines poverty is a social phenomenon that occurs when a portion of the population is unable to meet their fundamental necessitiesWorld Bank (2011). It is a terrible plague on humanity that is causing hardship in many developing nations, including India. It may have a variety of political, social, and economic causes and consequences. 6.7% of Indians, according to the government, live below the country's official poverty threshold as of 2019 (Government of India, 2019). According to World Bank estimates, 763 million Indians were living below the poverty line in 2011 (World Bank, 2011). In India, 29.8% of the population is below the national poverty line, according to the United Nations Development Programme's (UNDP) 2010 Report. About 21.9% of India's population, according to the most recent United Nations Millennium Goal Programme Report, live below the poverty line (United Nations, 2019).

The Indian government has implemented a number of initiatives to end poverty. Three stages were assigned to each of these initiatives (Government of India, 2019). First, from the 1950s to the end of the 1960s, improving the status of the tenants and redistributing land were the primary priorities. Poor families, marginal farmers, and landless laborers received the majority of attention during the second phase of poverty reduction programs, which began at the end of the

1960s and ended with Integrated Rural Development Programs. The Indian government has implemented a number of initiatives to end poverty. Three stages were assigned to each of these initiatives (Government of India, 2019). First, from the 1950s to the end of the 1960s, improving the status of the tenants and redistributing land were the primary priorities. Poor families, marginal farmers, and landless laborers received the majority of attention during the second phase of poverty reduction programs, which began at the end of the 1960s and ended with Integrated Rural Development Programs.

BRIEF OUTLINE OF SOME POVERTY ALLEVIATION PROGRAMMES:

Some major poverty alleviation programmes (PAPs) that are executing in Assam may be explained as follows:

a. MUKHYAMANTRI ANNA SURAKSHA YOJANA (MMASY):

On October 2, 2010, the then Chief Minister of Assam launched the MukhyaMantri Anna SurakshaYojana. Following the implementation of this program, a notified selection committee led by the Deputy Commissioner chose 10,000 households from each Legislative Assembly Constituency (LAC). Later on, it was raised to 15,000 households under each LAC. The recipients of this program received 20 kg of rice each month at a price of Rs. 6 per kg against a Family Identity Card (FIC) (Government of Assam, 2011).

Since then, the program has evolved into the National Food Security Act (NFSA), 2013, which currently includes the majority of MMASY households. The program has distributed rice at a rate of Rs. 3.00 per kilogram since it began in Assam in December 2015, reaching 84.17 percent of the rural population and 60.35 percent of the urban population. Antyodaya Anna Yojana (AAY) cards and Priority Household (PH) cards are the only two ration card types available in Assam under the NFSA. In Dhemaji district, there are 1,04,465 MMASY beneficiaries out of 24,776 ration cards (Government of Assam, 2015).

b. MAHATMA GANDHI NATIONAL RURAL EMPLOYMENT GUARANTEE ACT (MGNREGA):

The Government of India launched MGNREGA in 2005 with the goal of giving the nation's rural poor 100 days of unskilled manual labor annually in order to increase the livelihood security of rural households. Additionally, a third of the jobs created for women under the MGNREGA are guaranteed. After verification, job cards are issued by the GaonPanchayat to all adult family members who want to perform physical labor that requires no ability.

All 32 districts of Assam were covered by this program in the 2019 fiscal year (Ministry of Rural Development, GOI, 2019 Report). The Assam government spent Rs. 637.56 crores in 2015–16. Nearly Rs. 46.64 crores, or 7.32%, of this was spent in the district of Dhemaji (Government of Assam, 2016). As a percentage of all applications in the Dhemaji district, 85.58 percent of job cards were issued during the 2019–20 fiscal year. Also, 83.56 jobs provided as percentage of total job demanded to the job card holders in Dhemaji district in the same financial year (Government of Assam, 2020).

c. ORUNODOI:

Orunodoi or Arunodoi scheme is an important poverty alleviation programme introduced by the Government of Assam on 2nd October, 2020. It is a brand-new program designed to empower women and give impoverished families financial support. Under this program, the Government

of Assam gives 20 lakh eligible families a monthly financial support of Rs. 1000 to buy basic food supplies. After that, 24 lakh families would be covered under the Orunodoi plan. The Direct Benefit Transfer (DBT) program would be used to transfer the funds to the beneficiary's account. Based on eligibility/ineligibility criteria, the recipients are chosen at the Gaon Panchayat (GP), Village Council Development Committee (VCDC), and Urban Local Body (ULB) levels. The Government of Assam's most recent statistics indicates that 19,32,903 people in the state are overall beneficiaries of this scheme (Government of Assam, 2021).

d. INDIRA GANDHI NATIONAL OLD AGE PENSION SCHEME (IGNOAPS):

The social sector program known as the Indira Gandhi National Old Age Pension Scheme (IGNOAPS) began its operation on August 15, 1995. It is a part of the National Assistance Programme (NSAP). Under this system, the Government of India and Assam, respectively, give each pensioner with a Minimum Mandatory Provision (MMP) of Rs. 200 and Rs. 50 per month. All Indians 60 years of age and older who live below the poverty level are covered by this program. Every beneficiary between the ages of 60 and 79 receives a pension of Rs. 250 per month, while those 80 and above receive a pension of Rs. 500 per month.

The scheme is implemented in all the Panchayats under five development blocks of Dhemaji district. According to the most recent data gathered from the office of Dhemaji Zila Parishad, there were 17,845 beneficiaries overall (Government of Assam, 2019).

REVIEW OF LITERATURE:

Das, K. (2004) focused on the research of the Integrated Rural Development Program (IRDP) in Mizoram in her book "Rural Development in Mizoram." He claims that although the IRDP is a crucial program for creating self-employment in Mizoram, it has been observed over time that it no longer significantly affects rural development or the reduction of poverty.

Bandopadhyay (2007) in his book 'Poverty Alleviation and Pro-Poor Growth in India' examined how poverty alleviation tactics have changed and evolved over the course of consecutive five-year plans and policymaking concerns, while addressing development and justice. He claims that there is a high level of societal unrest as a result of the unequal distribution of wealth and income. In order to guarantee pro-poor growth, he promoted creating an efficient structure to eradicate poverty challenges more quickly. He made the argument that inadequate accessibility and connectivity are the main contributors to poverty that never goes away.

In his unpublished doctoral thesis, "Effectiveness of Poverty Alleviation Programs: A Case Study of Self Help Group in Lakhimpur District of Assam," Hazarika (2015) claimed that despite numerous attempts by the Indian government to enhance the economic standing of rural communities through poverty alleviation initiatives, nothing has changed. In contrast, there were nearly twice as many poor individuals in 2015 as there were in 1947.

Chowdhury (2019) in her paper 'Role of MGNREGA in Poverty Alleviation: A Study of Karimganj District in Assam, India', observed that during her study period, the overall number of families employed under MGNREGA decreased. She noted that, in comparison to 2017–18, the overall amount of assets created in 2018–19 increased significantly. Compared to 2017–18, the budgetary allotment for various MGNREGA projects grew in 2018–19, with labor spending reaching its highest level during this time.

RESEARCH GAPS:

The following are the key research gaps that emerged from the analysis of earlier works on poverty reduction programs:

1. There aren't many empirical studies on grassroots poverty reduction initiatives in Dhemaji district of Assam.
2. The majority of previous research discussed how poverty alleviation programs operated, but they said little about people's knowledge of the current programs in the Dhemaji district.
3. The Orunodoi Scheme of the Assam government and public awareness of it were not adequately explained in the majority of empirical literatures.

The current study is an attempt to close the information gap and add a new perspective to the field of research on programs aimed at reducing poverty and the degree of awareness among the local population in the studied area.

SIGNIFICANCE OF THE STUDY:

This study is important because it assesses the socioeconomic status of rural households in Dhemaji, one of Assam's most impoverished and flood-prone districts, and determines how well-informed they are about important initiatives aimed at reducing poverty. The study finds awareness gaps and implementation difficulties by examining participation levels in programs including MMASY, MGNREGA, Orunodoi, and IGNOAPS. The results show that in order to guarantee the accessibility and inclusion of these programs, better outreach initiatives, legislative changes, and focused interventions are required. Additionally, by addressing the dearth of empirical research on grassroots-level awareness of poverty alleviation activities in Assam, the study adds to the body of current literature. The knowledge gathered from this study can help NGOs, government organizations, and policymakers create more efficient development plans, increase program effectiveness, and support sustainable rural development. The study also lays the groundwork for future investigations on reducing poverty in areas that are prone to natural disasters and economic vulnerability.

OBJECTIVES:

The main objectives of the paper are as follows-

- a. To highlight the socio-economic characteristics of the surveyed households.
- b. To examine awareness about poverty alleviation programmes among surveyed households.

METHODOLOGY:

The current study was mostly an empirical investigation. Both primary and secondary data served as the foundation for the investigation. The Dhemaji district was chosen as the universe of study, and this is where the primary data were gathered. Multiple-stage sampling was used to get primary data. Purposive sampling was used in the first stage to choose the district under investigation. For instance, Dhemaji district, where a sizable fraction of the population lives below the poverty line, was chosen for the study. As per Human Development Report of Assam, 2014, 37% of the state's population is below the poverty level. One development block, the Dhemaji Development Block, was purposefully chosen for the second stage in order to guarantee adequate representation of various population groups, including SC, ST, and OBC.

Three villages—Kechukhana No. 1, Kuwaphola, and Nepalikhuti—were chosen from the block for the third stage based on their distance from the block headquarters. 303 beneficiaries were chosen at random in the last round based on BPL and APL families.

RESULTS AND DISCUSSION:

SOCIO-ECONOMIC CHARACTERISTICS OF THE SURVEYED HOUSEHOLDS:

The thorough socio-economic characteristics of the surveyed families are highlighted in the following table-

TABLE-1: DETAILS OF SAMPLE HOUSEHOLDS

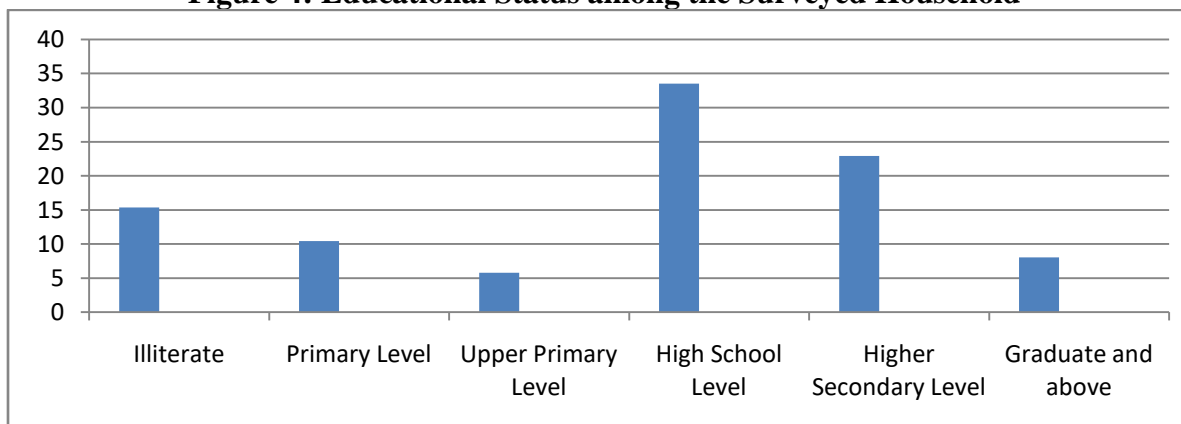
Total Sample Households	303
Total Population in the Sample Households	1283
Female in the Sample Households (Percentage)	50.66
Male in the Sample Households (Percentage)	48.48
Average Family Size of the Surveyed Households (Persons)	4
Members of Work force in the Households (Active) out of the Labour force (Percentage)	30.24

Source: Field Survey

The information about the sample households in the surveyed locations is highlighted in the above table. It was discovered that there were 303 sample households overall, with 1283 people living in those households. Males made up 50.66 percent of the overall population in the houses polled, while females made up 48.48 percent. However, 30.24 percent of the entire labor force was determined to be actively employed, and the average family size of the households examined was 4 persons.

Figure 1 below shows the results of an analysis of the educational attainment of the households surveyed. It demonstrates that the sampled homes in the studied villages have a low overall level of education. High school education accounted for 33.51 percent of the households polled, with higher secondary education coming in second at 22.91 percent. There were just 8.02 percent of households with a graduate or above.

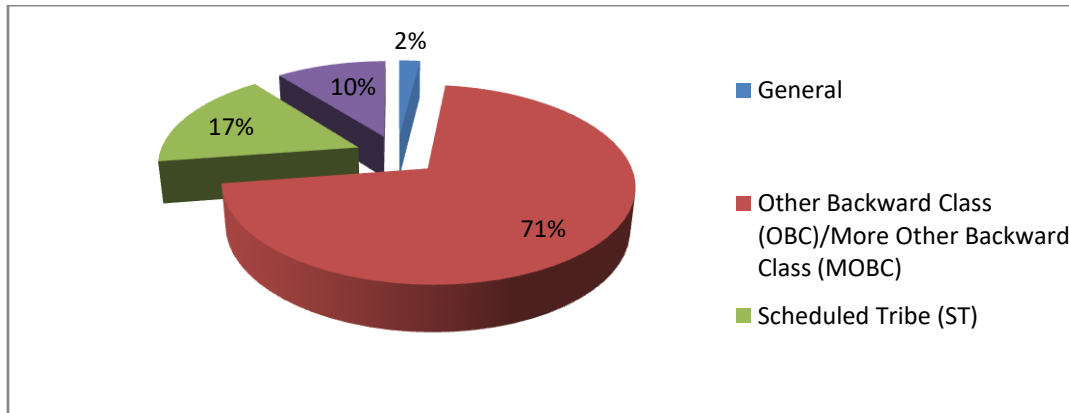
Figure 4: Educational Status among the Surveyed Household



Caste is frequently found to be a significant factor in the rural economy when it comes to choosing an occupation, and it may also serve as a barrier to just taking specific types of

vacation. Figure 2 shows the specifics of caste status in the area under survey. In the Dhemaji district, 70.62 percent of the families questioned were OBC, 1.99 percent were General Caste, 16.83 percent were ST, and 10.56 percent were SC. The details is shown in the figure 2-

Figure 2- Status of Caste among the Surveyed Household



Source: Field Survey

Occupational distribution of a population is defined as the proportion of total workforce engaged in different occupation. The scenario of occupational distribution of Head of the surveyed households is shown in the table-2.

Table-2: Distribution of Occupation of the Surveyed Households (Percentage)

Occupation	Percent
Agriculture	79.53
Service	0.99
Business	4.95
Daily Labour	4.29
Others	6.27
Total	100

Source: Field Survey

It was discovered that the majority of the heads of the households surveyed worked in agriculture (79.53 percent) and in the military (0.99%). At the same time, 6.27 percent of households were involved in various activities, 4.29 percent were daily laborers, and 4.95 percent ran a business.

An attempt is also made to examine the size of family in the surveyed areas as it is an important factor of all round development of a household. The details are shown in table-3.

Table-3: Family Size of the Surveyed Households (Percentage)

Family Size	Percent
Less than 4	34.00
4 to 6	60.72
Above 6	5.30
Total	100

Source: Field Survey

According to Table 3, the majority of households in the examined area had four to six people (60.72 percent), followed by those with less than four members (34.00 percent). In the Dhemaji district, families with more than six members had the lowest percentage (5.30 percent).

Human life depends on three essential elements: food, clothes, and shelter. Although all three of these elements are equally significant, the final one—the home—is essential to fostering a sense of community within the family. The details of the surveyed area are displayed in table 4 below

Table-4: Types of House in the Surveyed Area (Percentage)

Types of House	Percent
Kutchha	60.39
Semi Pucca	36.96
Pucca (RCC)	2.31
Total	100

Source: Field Survey

According to Table 4, 60.39 percent of the 303 households in the Dhemaji district that were polled lived in kutchha homes, while 36.96 percent lived in semi-puccas. Pucca dwellings were occupied by just 2.31 percent of the households surveyed.

One significant factor influencing the execution of programs aimed at reducing poverty is the household's financial situation. An analysis of households' economic situation was attempted, and the results are shown in Table 5

Table-5: Economic Status of Surveyed Households

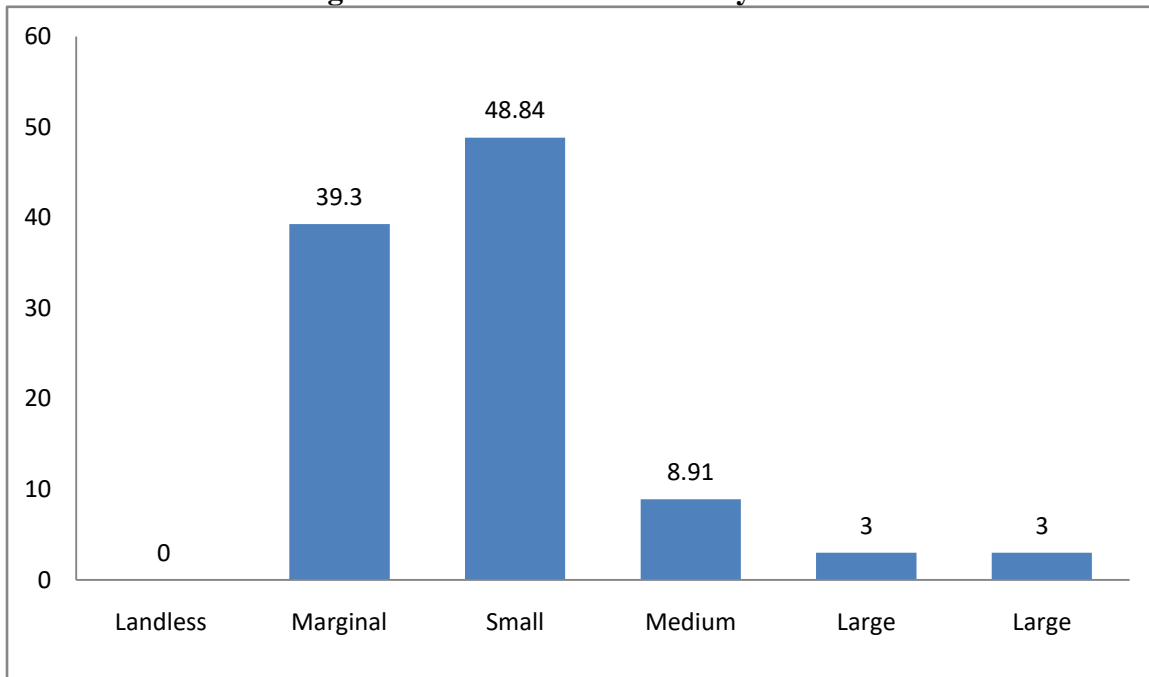
Characteristics	Percent
BPL	98.34
APL	1.65
Total	100

Source: Field Survey

It was discovered that 98.34% of the homes in the Dhemaji district that were examined fell into the BPL category, while the remaining 1.65% fell into the APL category. It is evident that the majority of the homes surveyed had very poor overall economic position.

For rural areas, land is seen as a valuable productive resource. In light of this, an effort was made to look at the households that were polled based on their land ownership. The following figure 3 displays the specifics. It indicates that the majority of households in the district under study had land that was between one and two hectares in size (48.84 percent), with the marginal size of land holder coming in second (39.30 percent). It was discovered that 8.91 percent of the families questioned owned land that was between 4 and 10 hectares in size. It was discovered that only 3% of the households questioned owned land larger than 10 hectares. But surprisingly, not a single surveyed household was found to have landless category.

Figure-3: Land Size of the Surveyed Households



Source: Field Survey

AWARENESS ABOUT POVERTY ALLEVIATION PROGRAMMES AMONG SURVEYED HOUSEHOLDS:

It was observed that a number of poverty alleviation programmes are functioning (either newly launched or restructured old programmes) in the surveyed villages of the district. It is interesting to know whether the surveyed households are aware about the poverty alleviation programmes. This is because if they are not aware about their own rights for their own benefits it is expected to be easy for the corrupt people to deprive the beneficiaries.

An attempt was made in this regard to explore awareness level of beneficiaries about the poverty alleviation programmes. For this, actual or potential beneficiaries were asked whether they were aware about different poverty alleviation programmes. Based on the responses of the respondents, a table was prepared which is shown in Table-6.

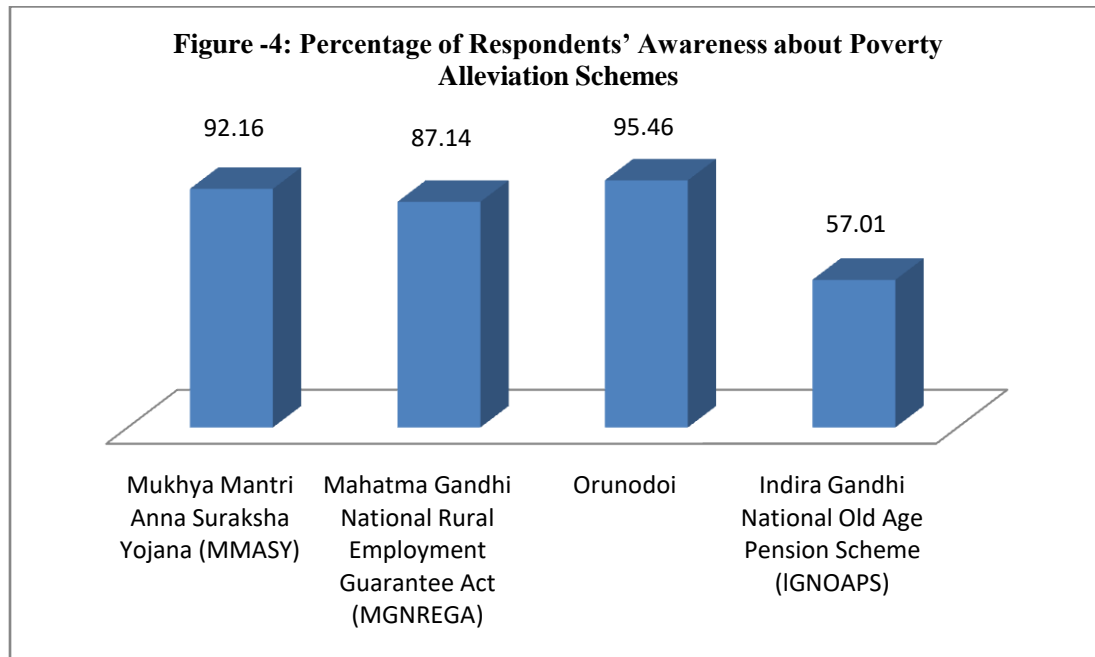
Table-6: Percentage of Respondents’ Awareness about Poverty Alleviation Schemes

Name of the Schemes	Respondent’s Awareness
MukhyaMantri Anna SurakshaYojana (MMASY)	92.16
Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA)	87.14
Orunodoi	95.46
Indira Gandhi National Old Age Pension Scheme (IGNOAPS)	57.01

Source: Field Survey

Table-9 shows that 92.16 percent of surveyed households were aware about MMASY followed by MGNREGA (87.14 percent), Orunodoi (95.46 percent). However, the awareness regarding IGNOAPS was quite low (57.01 percent). If people are not aware about their own rights in the form of benefits it will be quite easy for the corrupt officials to deprive them. So, one of the important requirements to avail leakages of PAPs is to ensure that the beneficiaries are aware of the benefits of the programmes.

The awareness level of the surveyed households regarding the selected four Poverty Alleviation Schemes was shown diagrammatically in Figure-4.



Source: Field Survey

CONCLUSION:

The broad conclusion emerging from both primary and the secondary data in the present study is that the surveyed district was dominated by rural population. A good percentage of people consisted of socially disadvantaged groups like scheduled caste, scheduled tribes as well as backward caste. The district was also found to be economically backward and dominated by agriculture and allied sector. The surveyed households engaged in services or business remained insignificant. But if we looked in case of agricultural land owning status of surveyed households, it was found that around 85 percent of surveyed households belonged to marginal and small category in both the districts.

As a result, majority of surveyed households remained poor. This is also reported by the data that around 98.34 percent of surveyed households belongs to BPL category. They availed the benefits of at least one or two of the poverty alleviation schemes among four selected poverty alleviation programmes namely MMASY, MGNREGA, Orunodoi and IGNOAPS.

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MICROPLASTICS IN AQUACULTURE: A BIBLIOMETRIC ANALYSIS BASED ON WEB OF SCIENCE DATA

Dr. Parul Puri*

*Assistant Professor,
Department of Zoology,
Maitreyi College, University of Delhi,
Delhi, INDIA

ORCID ID: <https://orcid.org/0000-0003-2648-6101>

Emailid: parul_acemail11@rediff.com

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ABSTRACT

This study aims to analyze bibliometric repertoire on the topic microplastics in aquaculture with an understanding that occurrence of microplastics contribute to aquaculture pollution resulting in environmental hazards. Rising concerns on the theme is in relation to hazardous biotic as well as a biotic build-up of microplastics from off shore, on-shore anthropogenic activities in aquaculture practices, distressing ecosystem balance and global health. Bibliometric analysis on the search string 'microplastics in aquaculture' was obtained from Web of Science database dating publications 2011 onwards, signifying the recent and surging discourse on the issue. Country and organization based bibliographic outcomes depict larger participation of China with other regions in expanding its research initiatives. Besides the main theme, drawing relations to greater co-occurrence of key terms identifies with words such as fish, pollution, toxicity, sustainability and ingestion. Association to attainment of seven Sustainable Development Goals (SDGs) can also be deduced from analyzed records.

KEYWORDS: *Aquaculture; Microplastics; Sustainability; Hazard; Pollution; Bibliometric Analysis.*

1. INTRODUCTION

Adequate and quality protein supply in human diet is linked to food security(Coles et al., 2016). 20% of animal protein requirement to three-billion world population is fulfilled from fish diet, with 52% share of fish coming from aquaculture productions(FAO, 2018). Aquaculture products are nutritious source of proteins, essential amino acids, vitamins and minerals fulfilling global food demands. Rising dependance on seafood with increasing world population deems aquaculture productions to cater future nutrimental demands.

Microplastic pollution is an alarming problem in aquaculture as it thwarts environmental safety as well as food safety(Wu et al., 2023). Microplastics (MPs) are fragments of plastics below 5mm length entering the environment directly as primary MPs, or indirectly by breakdown'secondary MPs'. Microplastic pollution is considered as an environmental hazard of appalling global concern. Growing findings indicate leakage of microplastics into aquaculture settings by abiotic and biotic factors as well as by humanactivity.Major pathways of aquaculture entry of MPsinclude cultured fish,fish feed, wastewater, fishing and farming

equipment(Iheanacho et al., 2023). Fish are biological indicators of MP ingestions; with uptakes in the gastrointestinal tract of fish reflecting level of MP pollution at the site (Bray et al., 2019). Microscopic plastics are directly ingested by pelagic and bottom dwelling (demersal) organisms from surface waters or aquatic sediments in search for food. G20 countries, as a matter of trepidation generate nearly two-third of global plastic waste(Fadeeva and Berkel, 2021).Highest MP contaminated fish species (nearly 44.2 %) has been found from Asian regions (Kibria, 2022). MPs have toxic effects on fish physiology, related to neural toxicity, oxidative damage, depleted food intake, behavioural abnormalities, impeding growth and survival (Bubu-Davies and Anwuri, 2022; Bhuyan, 2022). MPs adsorbtoxic chemical pollutant such as polycyclic aromatic hydrocarbons, heavy metalsandharmfulmicrobes hitchhiking unnecessary translocation to biotic tissues of aquatic species (fish, crustaceans, bivalves, phytoplanktons and zooplanktons) as well as humans(Wang et al., 2016; Kirstein, et al., 2016). Chemical additives used in preparation of plastic such as bisphenol A and persistent organicpollutantscan easily leach in water posingneurotoxic, immunotoxic health impacts to terrestrial and aquatic forms.Direct and indirect exposure to MPs is related to cellular and tissue toxicity with likely health risks to humans(Wright and Kelly, 2017). MPs have problem of bioaccumulation and biomagnification across food webs. Because of their ease of mobility and pervasiveexistence in aquafarmingecologies MPs are speculated to be slow form of disasters(Bergmann, 2022). Assessment and ensuing management of plastic loads from aquaculture is an impending and demanding issue for aquaculture sustainability as well an imminent concern for monitoring and management of aquatic and terrestrial ecosystems (Tian et al., 2022). Present analysis explores available bibliometric data to draw relationships amonggrowth of publications and citations over time; commonco-occurring terms concerning the topic; co-authorship links of research groups among regions, organizations; and strength of these collaborative linkages for building better understanding on the pressing theme.

2. MATERIALS AND METHODS

2.1 Collection of bibliometric data

Bibliometric data pertaining to the search term ‘Microplastics in Aquaculture’ was obtained from Web of Science (WoS) database. Bibliometric analysis attempts to provide improved understanding of the research setting, organization, and interrelationships(NOAA, 2024).Web of Science (WoS) earlier known as Web of Knowledge, is a popular, structured database for retrieval, analysis and distribution of comprehensiveinformation about the research data. Since2016, WoS is maintained by Clarivate Analytics(Pranckute, 2021). WoS core collection supports *ten* citation indexesincluding*four*Journal citation indexes (Science Citation Index Expanded, Social Sciences Citation Index, Arts and Humanities Citation Index, Emerging Sources Citation Index); *two*Conference Proceedings Citation Index in Science (CPCI-S),Social Science and humanities (CPCI-SSH);*two*Chemical indexes (Current Chemical Reactions- CCR expanded, Index Chemicus);*two*Books Citation Index in Science (BKCI-S), Social Science and humanities (BKCI-SSH).

Individual fields selected for analysis in WoS were ‘Author’, ‘Title’, ‘Times Cited Count’ (under ‘Author, Title, Source’); ‘Abstract’, ‘Document Type’, ‘Keywords’, ‘WoS Categories’, ‘Research Areas’ (under “Abstract, Keyword, Addresses”); ‘Highly Cited’ (under ‘Cited References and Use’). Citation report with cumulative h-index of publications was generated.

2.2 Analysis of bibliometric data

Analysis of bibliometric data is supported by VOSviewer, a data mining software for construction and elucidation of bibliometric links. Obtained clusters included bibliometric network visualization of a) co-authorship as per countries and organizations, with weightage determined through total link strength, b) co-occurrence of keywords, with criteria set to filter 5 co-occurring keyword entries in publications.

3. Results and Discussion

A total of 655 publications were retrieved pertaining to the topic ‘Microplastics in Aquaculture’ from search results, having cumulative h-index of ‘72’. ‘Articles’ with record count of 578 accounted 87.976% of total document types followed by ‘Review article’ (record count of 75, percent contribution 11.416%), early access (12, 1.826%); editorial material (3, 0.457%); bibliography and proceeding paper both 1 each at 0.152%.

Publications earlier since 2011 are documented. Ahead 2014, an empirical rise in citations has followed by subsequent growth in publications (Fig.1). An escalating trend in number of publications and citations is indicative of increased participation in contribution to investigation on the pressing issue. Out of 11,737 citing articles 11,211 were without self-citations. Total times cited were at 21,076 out of which 19,003 were without self-citations with an average 32.18 citations per publication a number depicting high referencing of research topic.

3.1 Analysis of bibliographic network

Bibliographic network analysis investigates and envisions relationships created amid publications on the basis of authorship, citations, or common words (NOAA, 2024), detailing on collaboration; semantic; as well as citation networks.

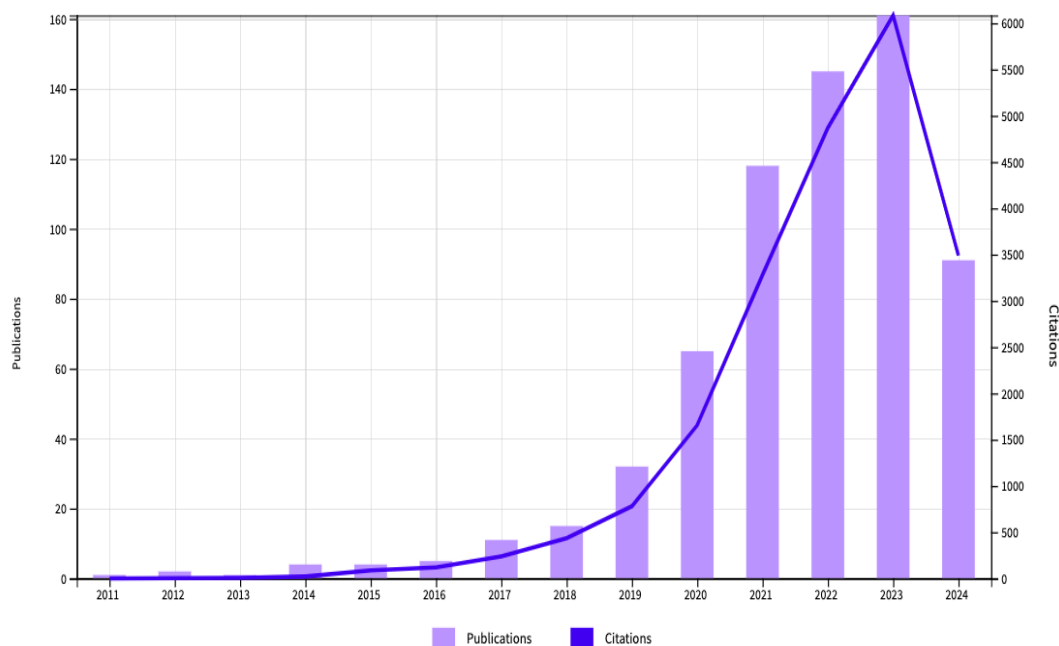


Fig. 1: Publications and citations over time on the topic ‘Microplastics in Aquaculture’.

Source – Author, 2024 (WoS, 2024)

3.1.1 Co-authorship according to countries

Visualization of bibliographic network on the theme generated 91 entries with co-authorships according to countries. Links were drawn based on 90 countries, since 1 record contained no data in the field being analysed. Stronger connections of top 10 countries based on their link strength of co-authorships with other regions in brackets, involve countries such as Spain (*link strength* 105), People’s Republic of China (PRC) *link strength* 98, Germany *link strength* 98, Italy *link strength* 98, France *link strength* 86 ; followed by England (*link strength* 82), Portugal (*link strength* 79), US, (*link strength* 77), India (*link strength* 68)and Greece (*link strength* 63) explicable from Fig. 2.

Collective resolute for effective participation in attaining sustainable development goals SDGs as G20 agenda among nations including PRC, Germany, Italy, France, England, US, India, Brazil, Canada, Australia, Saudi Arabia, European Union can be the reason for greater collaborations in terms of linkages (Zhao and You, 2024). Markedly, China among East Asian countries is a major user of plastic with overbearing concerns pertaining to microplastics due to higher MP uptakes from dietary contaminations (Zhao and You, 2024).

Maximum publication records are communicated from People’s Republic of China with highest citations (Table1) indicating higher referencing of their research communications. Interestingly all publications retrieved are in English; globally, most shared language of scientific communication (Eberhard, Simons and Fennig, 2024).

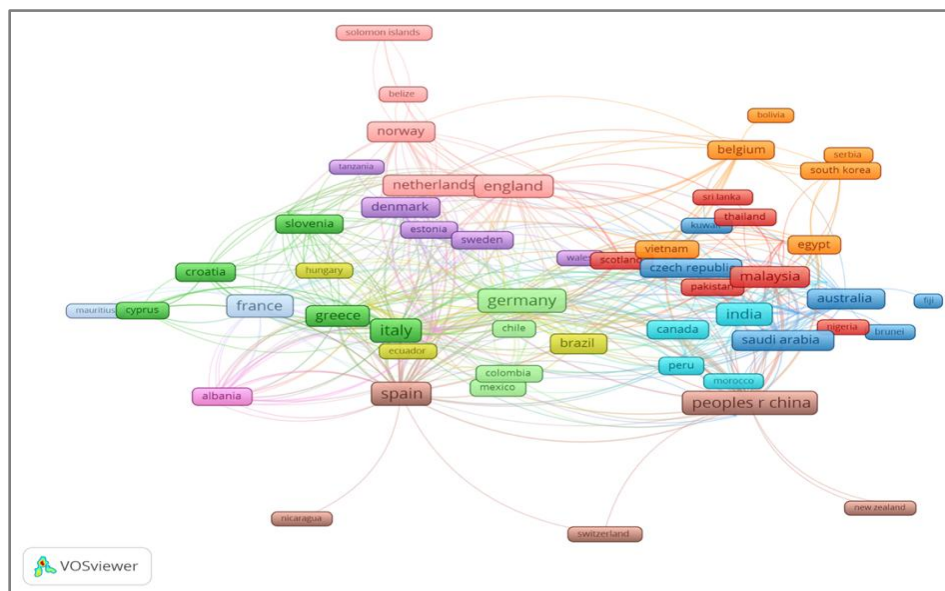


Fig. 2: Bibliometric network visualization of co-authorship as per countries, on the topic ‘Microplastics in Aquaculture’.

Source – Author, 2024 (WoS, 2024)

Table 1: Top 25 countries with publications on the topic ‘Microplastics in Aquaculture’.

Countries/Regions	Record Count	% of 655	No. of citations
Peoples R China	232	35.42	6387
England	55	8.397	4255
India	48	7.328	686
USA	48	7.328	1623
Italy	46	7.023	2304
Spain	46	7.023	1937
Malaysia	38	5.802	1498
France	37	5.649	1694
Germany	31	4.733	1262
Portugal	30	4.58	1375
Brazil	27	4.122	626
Bangladesh	26	3.969	403
Australia	24	3.664	1081
Iran	23	3.511	706
Norway	22	3.359	669
Canada	20	3.053	1667
Netherlands	17	2.595	1200
Greece	15	2.29	508
South Korea	15	2.29	802
Saudi Arabia	14	2.137	130
Vietnam	14	2.137	188
Denmark	13	1.985	887
Thailand	13	1.985	294
Belgium	12	1.832	950
Czech Republic	12	1.832	177

Source - Author, 2024(WoS, 2024)

3.1.2 Organisation wise co-authorships

As per 1151 organisations identified, 888 show co-authorships weighted through total link strength. Chinese Academy of Science, PRC has close clustering with several organisations co-authorship wise, indicating at stronger, astute collaborativelinks, defined from Fig.3. Expansion of research through concerted collaborations offer higher publication visibility (seen in section 3.1.1 as increase in publication counts) and growing citations. Distant clusters of Kerala University of Fisheries and Ocean Studies, India; University of Cadiz, Spain indicate limited research collaborations. Unique cluster, exist between Alfred Wegener Institute, Germany; University of Austral de Chile University of Catolica del Norte, Chile; Sorbonne University, France elaborating on close collaborations.

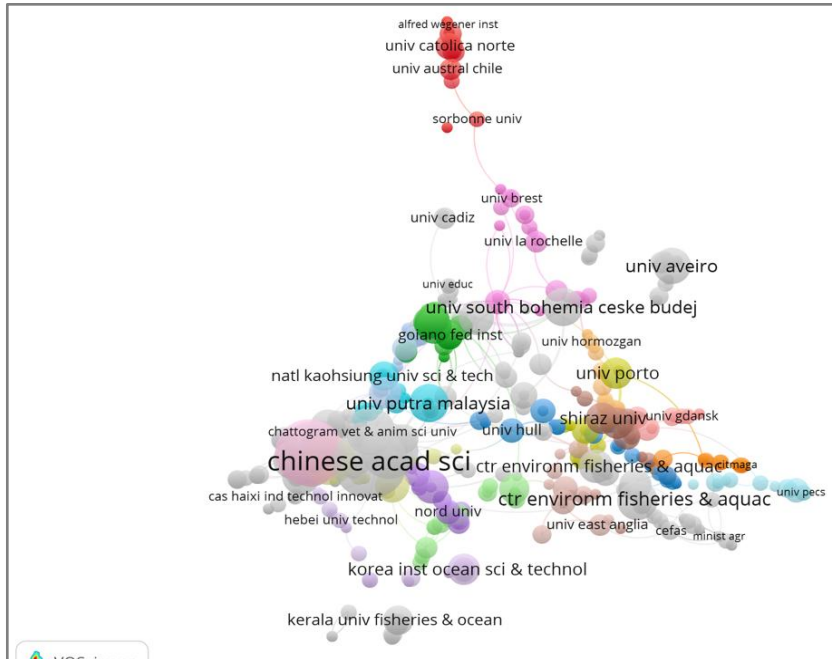


Fig. 3: Co-authorship as per organisations.

Source – Author, 2024 (WoS, 2024)

3.1.3 Keyword co-occurrence

Outlining importance of the topic in documented works can be perceived through intense clustering around original search terms ‘microplastics’, ‘aquaculture’; (Fig.4).

Six clusters with closely linked co-occurring terms are identified as;

Cluster 1 including words-microplastics, aquaculture, environment, plastics, fresh-water, soil, sustainability, antibiotics, carbon, hitchhikers, microplastic pollution, biodegradation, adsorption, antibiotic resistant genes, heavy metals, pahs, biofilm, biofilm formation, wastewater, sorption, bioremediation, metals, nanoplastics;

Cluster 2 consisting of co-occurring words-fish, bioavailability, performance, diet, toxicity, polystyrene microplastics, oxidative stress, virgin microplastics, zebrafish, aquatic organisms, daphnia magna, aquatic, environment, fishes, tissue, reproduction, rainbow trout, micro, mytilus coruscus, gene expression, apoptosis, inflammation, damage, gut microbiota, liver, aquatic organisms, microplastic, oyster, expression, nanoplastics, gut, survival, health;

Cluster 3 of terms such as- sediments, sediment, surface water, source, fate, sandy beaches, marine litter, distribution, yellow sea, china, mariculture, ftir, guangzhou city, pearl river;

Cluster 4 ingestion, sea, contamination, coastal waters, extraction, protocol, bivalves, wild, oysters, fibers, food safety, atlantic, coastal, mytilus-edulls, mussels, seafood, demersal fish;

Cluster 5 plastic debris, mediterranean sea, larvae, spatial distribution, india, beach, marine litter, pollution, litter, monitoring, polypropylene;

Cluster 6 Nile red, bioindicators, 1st observations, ocean, model, zooplankton.

Concentration of clusters over the keywords - ‘toxicity’; ‘pollution’; ‘fish’, ‘environment’; ‘sustainability’, ‘ingestion’ gives sound backing to interrelationships among related issues. It is known that microplastics in aquaculture have toxic impacts in aquaculture settings causing pollution. Presence of microplastics in fish feeds and meal from fish is threat to aquaculture sustainability and consumer health (Mahamud et al., 2022). Linkage to terms ‘fish’, ‘ingestion’, highlights seafood and dietary transfers of microplastics.

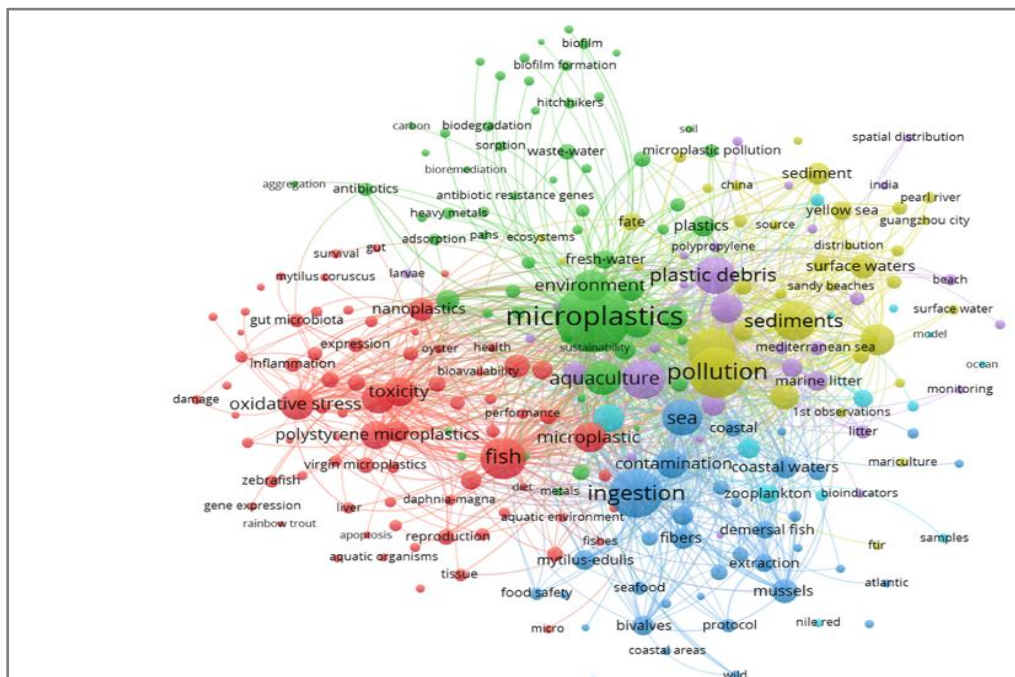


Fig. 4:Co-occurrence of keywords.

Source - Author, 2024 (WoS, 2024)

Correlation of data to seven SDGs given in table 2, corresponds to UN 2030 agenda of sustainability for prosperity of people and planet at large (United Nations, 2015). Goal 14 - *life below water* has largest count 592 out of 655 publications seconded by goal 15-*life on land* (11 counts) underlining considerable impact of microplastics in aquaculture on aquatic life as well as terrestrial life forms; goal 3- *good health and well being*, goal 6 *clean water and sanitation* each with 10 records; goal 13- *climate action* (8), goal 12- *responsible consumption and production* (2), goal 2- *zero hunger* (1).

Most numerous documents under the WoS category were from environmental science carrying 73.28% of total publications. 29.47% research was represented from Marine freshwater ecology, Engineering Environmental 10.23%, Toxicology 9.47%, Fisheries 7.79%, Water Resources 4.89%, Multidisciplinary Science 3.05%, Ecology 2.75% accounting top 8 categories specified from Fig.5.

Table 2:Publications covering Sustainable Development Goals

Sustainable Development Goals	Record Count	% of 655
14 Life Below Water	592	90.382
15 Life On Land	11	1.679
03 Good Health And Well Being	10	1.527
06 Clean Water And Sanitation	10	1.527
13 Climate Action	8	1.221
12 Responsible Consumption And Production	2	0.305
02 Zero Hunger	1	0.153

Source - Author, 2024 (WoS, 2024)

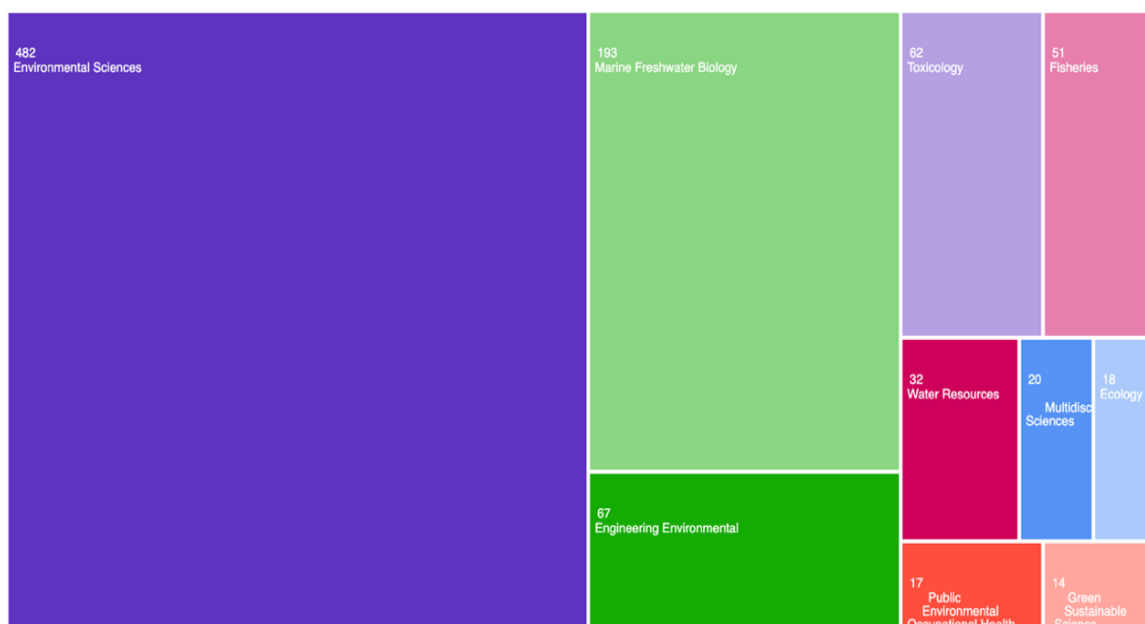


Fig. 5:Publications as per Web of Science categories on the topic ‘Microplastics in Aquaculture’.

Source – Author, 2024 (WoS, 2024)

138 publication titles addressed the theme. Table 3 provides documents in publication titles. Among top 10 publication titles a larger share is endorsed by *Marine Pollution Bulletin* (14.351%) following *Science of the Total Environment*(12.824%), *Environmental Pollution*(6.718%), *Journal of Hazardous Materials*(4.733%), *Chemosphere* (4.275%), *Frontiers In Marine Science*(3.969%),*Environmental Science and Pollution Research*(2.901%), *Aquatic Toxicology*(2.137%), *Ecotoxicology and Environmental Safety*(2.137%), *Environmental Research*(1.832%).In top 10 Elsevier titles account 49.007% of the total.

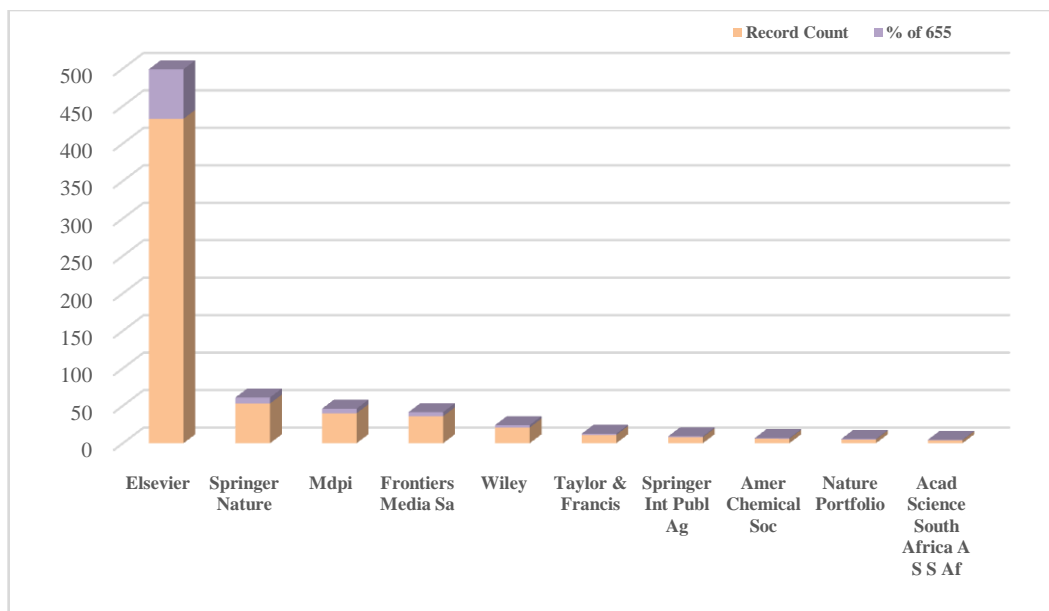


Fig. 6:Top 10 publishers on the topic

Source – Author, 2024 (WoS, 2024)

Table 3: Top 10 publication titles on the theme

Publication Titles (Publisher)	Record Count	% of 655
Marine Pollution Bulletin (Elsevier)	94	14.351
Science Of The Total Environment (Elsevier)	84	12.824
Environmental Pollution (Elsevier)	44	6.718
Journal Of Hazardous Materials (Elsevier)	31	4.733
Chemosphere (Elsevier)	28	4.275
Frontiers In Marine Science (Frontiers)	26	3.969
Environmental Science And Pollution Research (SpringerNature)	19	2.901
Aquatic Toxicology (Elsevier)	14	2.137
Ecotoxicology And Environmental Safety (Elsevier)	14	2.137
Environmental Research (Elsevier)	12	1.832

Source – Author, 2024 (WoS, 2024)

Thirty-eight publication entries had research works on the topic. Among top10 publishers Elsevier’s has highest record count of 433and proportions 66.107%, followed by Springer Nature (53, 8.092%),Mdpi (40, 6.107%), Frontiers Media S.A. (36, 5.496%), Wiley (21, 3.206%) , Taylor and Francis (11, 1.697%), Springer International Publisher AG (8, 1.221%), American Chemical Society (6, 0.916%), Nature Portfolio (5, 0.763%), Academy of Science South Africa ASAAf (4, 0.611%), as listed in Fig.6.

CONCLUSION

Microplastics are side effects of globally escalating plastic production and ensuing usage. Their rising proportions in aquaculture environment and biomagnification through aquaculture productions has hazardous health impacts encompassing aquatic and terrestrial food webs. From the bibliometric analysis it is evident that the subject is relatively recent with publications beginning 2011, and pertinent to addressal of global apprehension on the theme, with noticeable surge in publications since 2014. The topic is a meeting point of several SDGs stating concerns of environment sustainability. Representation of theme in publication titles related to pollution, hazard, toxicity, marine sciences and environment safety, specifies interlinkages of the issue. It is obvious that build-up of microscopic forms of plastics in environment and in organisms can pose serious threat to ecological and biotic survivals. Careful investigation of aquaculture systems is a prerequisite for development and deployment of future strategies to avert microplastic hazard covet into a slow budding disaster.

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