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Interactive Maps: Some Reflections on Their Design

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Abstract

Interactive maps involve both technical and design considerations that enhance user experience, facilitate real-time decision-making, and promote efficiency. These maps can transform how to design them with users in mind, and the tools and technologies that support their development. Interactive maps play a pivotal role in these systems, offering real-time visualization of different conditions. Interactive maps are built on Geographic Information Systems, which allow for the mapping and visualization of data. GIS is crucial for integrating different layers of data, from maps to real-time information, all displayed on a single, interactive platform. This technology provides a spatial context that enhances decision-making. The goals of communication of such maps are met by ensuring ease of the processing of information from the displayed map contents. A simultaneous consideration of the characteristics of the percipient and the map towards meeting the requirements of effectiveness in map image structure leads to the concept of compatibility between the two. Enhancing percipient map compatibility entails structuring of the sign system of map graphics into a map image in a way in which such structuring produces an increase in the efficiency of information processing system. This increase can be obtained through the minimization of the obstructive graphic characteristics in the map image and by ensuring availability, and a better quality in available information, from the map image as an input to the processing system.

Key Words: Visualizations, Human Visual Information Processing, Compatibility, Map Legend

The advances in information technology and its easy availability have made it possible to extend the use of interactive map images in the urban, environmental management. Since the management relates to spatial events, the map becomes the most effective tool in this application. The map display has a multiple role in this environment. At first, it serves as a visualization tool and at the second level; its role is seen as an efficient visual interface to the internet or any digital database. Interaction is made possible by pointing to locations or features on the maps, which serve as links that can be followed to the required file on the database or a gateway to internet and to any remote computer.

The communication goals of such maps are met by ensuring ease of the processing of information from the displayed map contents. At the same time an efficiency of comprehension is also required leading to successful visualizations in order to ensure formulation of search strategies for additional relevant information and the routes to its meaningful information for effective decision making. The first part of the goals can be met by adopting complexity reducing and pattern enhancing strategies at pre-map data analysis stages and by selecting suitable classification schemes. However, the second part involves use of carefully chosen design efforts.

However, like any other area of digital cartography much more attention is being paid to the design of the system vis-à-vis developments of more efficient graphical web browsers, more powerful search engines, and software for dynamic mapping. Little attention is given to the graphic design of its products particularly the products that are not the end products but form part of the cartographic processes. The present paper aims to point to the requirements of human visual information processing system for an easy and accurate comprehension of the displayed information, and successful visualization from it leading to its efficient use in further decision making. These requirements can effectively be used to develop design concepts for such maps using the notions of man / map compatibility. In addition, the nature of the media on which these maps are presented and the conditions of their use will have to be taken into account for such exercises.

The structuring of a map image, which meets the efficiency requirements of a medium of communication and a visualization tool necessitates a consideration of the map percipient as an active processor of the information, in terms of the functional aspects of the information processing. This consideration derives its importance from the more specific nature of map displays that puts them apart from other visual information sources and even from other symbolic displays. The nature of this symbolism, which takes the form of graphic map images, imposes particular constraints, specially, on the manner of its processing and storage.

The manner of input of information from such sources, unlike the case of textual displays, does not follow a definite sequence. In case of maps, the receptors can and do start the acquisition of input from any part of the image and can stop at any point (Robinson and Petchenik, 1976). These observations can be confirmed by several eye movement recordings of map percipients. Processing of information from map displays is also different from those of discursive propositional symbolism (Peterson, 1987). This distinction has been elaborated by Robinson and Petchenik (1976: 44-45). They have pointed that in case of discursive symbolic displays of languages i.e. texts, the intended meaning is processed and apprehended from a linear series of visual fixations over different symbols arranged in a linear sequence. Nevertheless, in case of displays like maps this intended meaning is carried by a whole figure that consists of a complex array of interacting sub-figures. The system receives the input from such sources in a variable unsystematic and non-linear sequence of fixations. It is processed as a whole through the relations of component parts within the total structure. In addition, the processing of the input from maps, as compared to textual displays, involves association of one visual stimulus to another in a relational context of a system of visual images that do not have fixed meanings rather than to relations of a visual stimulus to a system of invariant sounds and meaning.

Map Image / System Compatibility

A simultaneous consideration of the characteristics of the percipient and the map towards meeting the requirements of effectiveness in map image structure leads to the concept of compatibility between the two. This concept was developed in human factor engineering or engineering psychology, which is a field concerned with the man / machine interaction and how well these two go together along with the nature of human cognitive capacities.

Such concerns produced the questions about the best configurations for desired output patterns. Answers to these questions led to the notion of compatibility between the input and the human cognitive system for optimal performance (Fitts and Seeger, 1953; Lachman et. al. 1979) and allocation of attention resources between different tasks. These concerns are based on the notion that the design and operation of machines must take advantage of human information processing potential and must be able to accommodate with the limitations of human operator.

These notions can be extended to cartographic design research under the logic that what is considered essential for man / machine interaction must be equally applicable for man / map interaction in communication as well in visualization situations. Because, both machines and maps are artificial creations and in both cases the optimal performance is based on human information processing potential. This notion, in the present context, may not be necessarily limited to a fit between different stimuli and their response patterns but following Welford (1968) may be extended to cover the internal cognitive translations that intervene between input and human behavioural responses. Some cartographers have made passing references to such questions in map design earlier (Petchenik, 1983; Castner 1983). While Robinson and Petchenik, in this connection, have emphasized the need of taking into account the functioning of the human visual cognitive system "in predicting the potential of the map percipient for comprehending the map" (1976: p. 68). Wood (1972) and Board and Taylor (1976) have examined the role of human factors in map design and communication Eastman (1985).

Building or enhancing percipient map compatibility entails structuring of the sign system of map graphics into a map image in a way in which such structuring produces an increase in the efficiency of information processing system. This increase can be obtained through the minimization of the obstructive graphic characteristics in the map image and by ensuring availability, and a better quality in available information, from the map image as an input to the processing system. These objectives may be met through modulation of the image elements during its structuring. These modulations are required to be made in view of the behavior of the system in terms of the requirements of its functional components, functioning and organization of the processes and the operations of the mechanisms of these processes.

Modelling the system in terms of the operations performed by its functional components suggest that features in the icon are the initial representations of the input. The availability of the feature dimensions and their quality in these representations, to a large extent, depends on the nature of sensory data available from the map image and the effectiveness of the pre-processing of the input from the map. These factors, in turn, determine the effectiveness of the subsequent phases in the continuum of pre-attentive processing. This efficiency plays a crucial role in the information processing from maps because it is the stage where the system has to deal with the greatest load of information in the form of almost raw data. The processes, of the pre-attentive stage, have to perform operations which segment, segregate as well organize the input. These processes are also required to monitor the structured input from the map display for its important aspects, which are then used by the subsequent higher-level processes in the current context.

It is the stage in the processing where the need of compatibility for system efficiency improvement is most strongly felt. At the same time it is here that the system responds markedly to systematic efforts in building the compatibility through deliberate and planned design efforts. This contention has support in Phillips (1984) and Gill's (1988) results who found a greater effect of map design improvement on the initial pre-attentive stage of processing as evidenced in the improvements in the subjects' performance.

Requirements of Human Cognitive System

Starting with the initial mode of the input to the system where the retinal projections are internalized, there is evidence that these projections are preprocessed to a limited degree (Haber and Hershenson, 1973). The mechanism involved here are the lateral and spectral inhibition (Hurvich and Jameson, 1974) which respectively produce edge enhancement effect and simultaneous contrast effect. The extent to which this input is preprocessed during its transformation phase depends on the availability of information from the map. The optimization of this preprocessing, thus, will depend on the various modulations of different image elements while structuring the corporeal map. One of the modulators, required for edge enhancement is the degree of contrast between the surfaces of different map image elements. This contrast makes either of the sides of a form dominant or more articulated for an edge to be seen. In case of simultaneous contrast effect the modulators take the form of prominent contours (Bermen and Leibowitz, 1965) or of dividing lines to separate two stimuli (Gilmartin, 1981).

The subsequent functioning of the processes of the modeled system demands segmentation of the initial representations from a map image into figure and ground components during the earliest phases of the processing. Effective segmentation in the map image space, in these early phases, depends on the availability of information, which produces differentiation by separateness of the forms through continuous contours and edges and by the togetherness of their features. In addition, it also requires the presence of those feature dimensions that create heterogeneity in the visual field and leads to a protrusion of the figural fields. Dimensions of the stimulus which produce such heterogeneity are hue differences, differences of value and chroma, commonly described as brightness (Luke, 1996: 115) and differences in lower level shape features (Wever, 1927; Arnheim, 1969).

Once the input has been segmented in the initial phases, global level analyzers operating in parallel all over the image space organize the input for its focal attentive processing. This is also a requirement of the working memory unit in view of its spatial capacity constraints. This organization entails the grouping of the segmented input into larger units irrespective of their location through the structural links of relations. Such relations are defined by the principle of similarity. "This principle asserts that the degree to which parts of a pattern resemble each other in some perceptual quality will help determine the degree to which they are seen as belonging together" (Arnheim, 1969: 67). In case of the thematic maps too, similarity relations are obtained from the sensory information in the form of global properties. These properties are made available to the system from the graphic variables used in characterization of attributes in map image by the bottom up mechanisms. These relations of similarity are required to be so strong as to overcome the effects of spatial separations and influence of proximity.

These groups are also required to be simultaneously organized in a schematic hierarchy. The position of objects in such a hierarchy is a function of those feature dimensions, which among other things, produce relations of order along the dimension of depth or distance in the three dimensional space. Such relations are based on the information, in the form of secondary spatial cues, available from those feature dimensions, which produce perceptual gradients. A gradient in this context has been defined as "an increase or decrease of something along a given axis or dimension" (Gibson, 1950). These gradients can be of edges, surfaces, texture, colour, and of sizes. Experimental evidence from map use studies suggest that such schematic hierarchies are latter required in relating these chunks into the underlying multilevel constituent structure of map images for comprehension of displayed spatial information, through which this information is stored and recalled (Thorndyke and Stasz, 1980; Eastman, 1985).

The next stage of processing, which follows instantly, is seen to use these organizations and the global properties defining such organizations in selective guidance and allocation of focal attentive operations. In case of graphic displays like maps, such selectivity is likely to be based on representations which can be thought to be produced, during the pre-attentive processing, by those graphic characteristics of the map image elements which visually organize these into separate visual levels with different degree of figural prominence. This requirement of the processes of the modelled system can be met by transformation of referent content into graphic form through the modulations of graphic variables. Such graphic encoding establishes a syntax, which is embedded in the form itself by its definition. The embedded syntax organizes the relationships between the thematic symbols of the graphic statement of a map and at the same time establishes a sequence of order in the visual field. The employed graphic variables should posses those visual dimensions that not only characterize but also modulate the amplitudes of the required relationships of similarity, separateness and of order. Such organization of the relations and the acquired sequence of order in the global properties of the map image partly provide a basis for the selectivity in the allocation of focal attention.

This selectivity, in addition may also be taken to be further obtained from the pre-attentive monitoring of the unattended input for its relevance to current foal attentive activities in terms of the semantic informational context of the input (Norman 1968). It appears to be operated by accession of the locations in the schemata and their activation. The meaning context in case of the thematic maps can be translated in into relational contexts in terms of the concepts of like / unlike or more / less. This contextually relevant part of the map image may also be provided an identity cue pre-attentively by a two way interaction of the semantic knowledge about it, which has been acquired and stored in the current context, and the associated graphic attributes of that image part, as data input.

The selectively allocated focal attentive operations, in the earliest manifestations of constructive synthetic activities, can be seen to be concerned with the analysis of more detailed properties and features from the pre-attentively organized elements of the map image. This analysis relates to two basic aspects of spatial reality i.e. locations and the attributes at these locations and involve logico-mathematical and infra- logical operations. The first operation, in case of the thematic maps, particularly, in case of proportionally symbolized maps, is seen to yield information to the system about similarities and differences, which is based on the identification of the individual symbols in terms of the magnitude that they characterize.

The information on individual symbol identities, made available through these early analytical operations of focal attention, serves to connect the individual symbols in meaning. These links of meanings produce relation of similarity between symbols through the contextual relations of like/unlike on the basis of their acquired semantic identities. These links of meanings at the same time visually associate each symbol with the other in a relative order along the 'z' dimension of depth or distance. Such links may be thought to be produced at this stage by the relational contexts of more/less in terms of rank orders or intervals derived from the available semantic identities. This analysis simultaneously provides information on infra-logical relations. The information relates to the other basic component of the referent contents i.e. locations and provides another set of similarity relation i.e. similarity of locations or proximity.

The focal attentive processes synthesis the information available for each symbol in the chunks by linking various visual planes organized pre-attentively and at the same time linking symbols with their locations. This kind of information is available to the system at this stage in processing. The location of circle symbols and their attribute magnitudes, when integrated in this way, produce an organization of the symbol clusters into hierarchical constituent structure in the map text. Such constituent configurations are built from the symbols displaying similarity of attributes at proximal locations. Such configurations are at the same time distinguished from each other by their positional separation in the 'x' 'y' planar dimensions as well by their order in the 'z' dimension.

In this way these constituent symbol configurations are defined by the organization of symbols of identified magnitudes in terms of similarity as well their rank order or intervals. The magnitude similarity in this case can be defined in analysis of variance terminology in terms of minimum within group variance and maximum between group variance. Another kind of similarity in the current context arises due to locational proximity of like symbols.

This level of symbol interrelations is described by the supra-local syntax (Schlichtman, 1985). These interrelation are concerned with the underlying global meaning of the map text "which is elaborated in detail in the contents of the constituent symbol clusters " (Schlichtman, 1985: 28). Such interrelations may not be made formally explicit, but are available to the focal attentive processes through forward and back references provided by the relational contexts and at the same time by the contexts of distance or proximity discussed earlier.

The 'x' 'y' and 'z' coordinate positions of such configurations also place them at specific locations in the map image space which following Palmer (1992) can be described as 'common regions in map space'. Locations in such common regions of space have been found by Palmer (1992) to be a strong grouping factor, which is capable of overcoming the effects of such other powerful factors.

The manner of the construction of such configurations suggests that these units have a gestalt like unitary character, which resists interruptions. Palmer's experimental evidence (1992) in relation to only one of the factors which works in such constructions i.e. location in common region of space lends strong support for this contention. The meaningful symbol identifications and their resultant segregation into constituents largely depends on the effectiveness with which the system was able to the input from the map display at the level of pre-attentive processing and the resultant effectiveness and quality of information passed on to next higher processes. This efficiency in turns also depends on the quality and nature of sensory data available to the system from the input.

These symbol clusters or the regional subsets of the circle symbols are known to be systematically attended during the learning of the displayed map text or recall of patterns from the maps (Gatrell 1974; Thorndyke and Stasz 1980). Eastman (1982) has found evidence for the use of such upper level hierarchical organization of the displayed symbols into higher-order symbol chunks while memorizing information from the map texts.

Experimental evidence from the eye movements studies in cartography (Castner and Eastman, 1985) and the work of Eastman (1985) also points to the importance of such higher level organizations in the processing of information from map displays. Castner and Eastman on the strength of Tulving's (1962) experimental results have concluded that when such organizations are not possible, a map percipient, on his own imposes an organization, which was not built in the map text. Such organizations arise and seem to be guided more by the unrelated but available graphic details of the map display. As the consequence of such improvised organization, the focal attention is involved in processing the sensory data from map image for longer duration and in addition gets involved with closely spaced minor graphic details of the displays. As a result of which the inter fixation distances get shorter and duration of fixations increases. This results in an increase in the processing time. This pattern of eye movements manifests an effect in which focal attention is directed to and is engaged with those graphic characteristics of the map image that are relatively inconsequential rather than being engaged with comprehension of the displayed content. These patterns of eye fixations imply difficulty in processing and may cause problems in comprehension of the map text.

The semantic identities discussed above are made available to the processes through the map legend where the descriptive rules for coupling the graphic expression and referent contents are organized. The efficiency with which the semantic identities are processed depends much on the manner of organizing the descriptive rules in the legend and the structural properties of the legend itself. In view of the importance of such semantic identities in information processing and the role of map legends in providing these identities, it is another step in map image structuring where the efficiency of processing system can be increased by design efforts. This has support in experimental evidence (Meihoefer, 1969; Cox, 1976; Chang, 1980; Akhtar 1990; Dykes and Wood, 2010). This evidence brings out the role of legends and the effects of improvement in legend design on information processing from maps. Such design efforts are particularly significant in those cases where the form and content links are not specific and straightforward in as much as the descriptive rules do not directly link the sign-vehicles and meanings but provide these links indirectly through an anchor. These efforts involve the selection of a set of appropriate content units from the referent content array to serve as anchors. Such adequacy is determined by the representativeness of such anchors in terms of their approximation of a neutral reference point and their form qualities. The form qualities are related to those features, which produce specificity in selection of anchors and their memorability.

References

Akhtar, M. (1990) An Analysis and Evaluation of Dot Maps as spatial information Display System -A Study in Theoretical Thematic Cartography. Unpublished Ph.D. Thesis, University of Patna, Patna

Arnheim R. (1969) Art and Visual Perception 'a psychology of the creative eye' Faber and Faber, London

Berman, P. W., Leibowitz H. W. (1965) Some Effects of Contour on Simultaneous Brightness Contrast, Journal of Experimental Psychology, 69, 251-256.

Board, C., Taylor, R. M. (1976) Perception and Maps: Human Factors in Map Design and Interpretation, Transactions Institute of British Geographers, 19-36.

Chang, K. T. (1980) Circle Size Judgment and Map Design, American Cartographer, 7:2, 155-162.

Cox, C. W. (1976) Anchor effects and the Estimation of Graduated Circles and Squares, American Cartographer, 3:1, 65-74.

Dykes , J. , Wood, J. (2010) Rethinking Map Legends with Visualization, IEEE Transactions on Visualization and Computer Graphics , 16(6):890-899.

Eastman, J. R. (1982) Graphic Organization and the Structuring of Map Data into Memory, Unpublished Ph. D. Dissertation, Boston University U.S.A. quoted in Eastman, J. R. (1985) Cognitive Models and Cartographic Design Research, Cartographic Journal, 22:2, 95-101.

Eastman, J. R. (1985) Cognitive Models and Cartographic Design Research, Cartographic Journal, 22:2, 95-101.

Fitts, P. M., Seeger, C. M. (1953) S-R Compatibility: Spatial Characteristics of Stimulus and Response Codes, Journal of Experimental Psychology, 46, 199-210.

Gatrell A. C. (1974) On the Complexity of Maps, Pennsylvania State University Papers in Geography, No. II.

Gill, Graham A. (1988) Experiments in the Ordered Perception of Coloured Cartographic Line Symbols, Cartographica, 25:4, 36-49.

Gilmartin, Patricia. P.(1981) Influences of Map Context On Circle Perception, Annals, Association of American Geographers, 71:2, 253-258.

Haber, R. N. and Hershenson, M. (1973) The Psychology of Visual Perception Holt, Rinehart & Winston, New York.

Hurvich, L. M. and Jameson, D. (1974) Opponent Processes as a Model of Neural Organization, American Journal of Psychology, 29.

Lachman, R., Lachman, J. L., Butterfield, E. C. (1979) Cognitive Psychology and Information Processing: An Introduction, Erlbaum. Hilsdale, N. J.

Luke, J. T. (1996) The Munsell Colour System: A Language for Colour, Fairchild Publications, New York.

Meihoefer, Hans-Hoachim (1969), The Use of Circle in Thematic Maps A Study in Visual Perception of a Cartographic Symbol, Unpublished Ph. D. Dissertation, University of Washington.

Norman, D. A. (1968) Toward a Theory of Memory and Attention, Psychological Review, 75, 522-536.

Palmer, S.E. (1992) Common Region: A New Principle of Perceptual Grouping, Cognitive Psychology, 24:3, 436-447.

Petchenik, B. B. (1983) A Map Marker's Perspective on Map Design Research 1950-1980 In Graphic communication and Design in Contemporary Cartography, Taylor D.R.F., (Ed.) 37-68, Wiley, New York.

Peterson, Michael P. (1987) The Mental Image in Cartographic Communication, Cartographic Journal, 24:1, 35-41.

Phillips, R. J. (1984) Experimental Method in Cartographic Communication Research on Relief Maps, Cartographica, 21:1, 120-128.

Robinson, A. H., Petchenick, Barbara B. (1976) Seeing and Mapping, in Nature of Maps: Essays towards Understanding the Nature of Maps and Mapping, University of Chicago Press.

Schlichtman, H. (1985) Characteristic Traits of the Semiotic System Map Symbolism, Cartographic Journal, 22, 23-30.

Thorndyke, P. W. and Stasz. C. (1980), Individual Differences is Procedures for Knowledge Acquisition from Maps, Cognitive Psychology, 12, 137-175.

Tulving, E. (1979) Memory Research: What Kind of Progress? Inlars-Goran Nilsson (ed.)

Welford, A. T. (1968) Fundamentals of Skill, quoted in Cognitive Psychology and Information Processing: An Introduction, R. Lachman et. al. 1979, Erlbaum, Hillsdale

Wever, E. (1927) Figure and Ground in the Visual Perception of Form, 38, 194-226 American Journal of Psychology, 38, 194-226.

Wood, M. (1972) Human Factors in Cartographic Communication, Cartographic Journal, 9, 123-132.

The influence of brand equity on the purchasing decisions of Titan Watches customers in Jamshedpur

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Abstract

The aim of this research is to study how brand equity impacts consumer choices when making purchases Titan watches in Jamshedpur. Presently, Titanstands as the emphatic possession in the watch industry of India, holding the top position of market leader. In this research, I explore the brand equity of Titan with the estimation of that the brand equity of titan watches influences the customers in Jamshedpur. The research methodology applied involves a questionnaires survey making use of non-probability convenience sampling technique in which 150 questionnaires were distributed out of which 120 responses were collected for analysis in order to infest a meaning conclusion. To analysis the collected data, multi-correlation and regression analysis were applied between the five major factors of brand equity i.e. Brand Loyalty, Brand Awareness, Brand Association Perceived Quality and Brand Preference, and purchase intension. All hypotheses fixed which are tested on the basic of brand equity of Titan and its purchase decision is affirmed. The finding of this study suggested that the brand equity of Titan influence the purchase decision of its consumer.

Keywords: Brand equity, Brand Loyalty, Brand Awareness, Brand Association, Perceived Quality, Brand Preference, and Purchase Intension

Introduction

There are numerous time measuring instruments, out of which watch is a prominent example. Titan is a brand of Tata Group, which is famous for manufacturing various rang of watches over the several decades. During the 18^{th} and 19^{th} century, the existence of watch industries was seen only in western countries especially in Switzerland in the over world. In India the establishment of watch industries are seen during the second half of 20^{th} century and Titan story also starts during this period. Now Titan Company became India's largest and world's 5^{th} largest integrated watch manufacturing company. The vision of this company is to create elevating experiences for the people they touch and significantly impact the world they work in **[AR-2021-22 pg.06].**

1. Products of Titan: Titan is an Indian lifestyle company and leading the most respected and admired companies in India. With the assistant of trusted brand and better consumer experience, they have established leading positions in the Watches, Jewellery, and eyecare. They have also diversified into Indian Dress Wear, Fragrances & Fashion Accessories and Wearables and are working on them as per consumer preferences **[AR-2021-22 pg.06].** There are various segments of Titan watches ranging from luxury to mass market. The luxury watches include Favre-Leuba, the premium types of watches Nebula and Xylys, the mid-market category watches Titan, Fastrack and Zoop, and the mass market segment watches Sonata. This diversity states that Titan watches provides to various preferences and budgets, offering a wide range of qualities and prices. Titan is primary watch brand of the company and it covers major portion of watch industries organised in domestic markets. Fastrack is an autonomous youth oriented brand which is popular for offering fashionable watches at budget friendly and Sonata is economic price brand that fulfils the demand of value-conscious demographic. Time to time, Titan launches new products to reinvigorate their products portfolio. Currently, Titan launched different varieties of analog segments such as Octane Aerobatics, Titan Solidarity, Edge Ceramics, Raga Silver, Unending Beauty and Ladies' Edge. The latest innovation isthe 'Titan Smart' Watch which is Alexa enabled including features like heart rate monitoring, sleep and stress tracking, VO2 measurement, multi-sport modes, SpO2 monitoring, and a women's health monitor, and others. This innovation of Titan provided positive feedback from customers and up-to-date in watch industries. Out of Titan smart watches, Titan Smart Pro is one that offers advanced features such as AMOLED display, GPS, and a comprehensive health suite which has also received a favourable response from their customer **[AR-2021-22 pg. 14&15].** Titan seeks to delight their consumers by providing a unique and enjoyable experience.

2. Brand Equity and Brand Equity of Titan: Brand Equity refers to the value of brand which is determined on the basic of consumers' perception and satisfaction, if the value of brand is positive than the company charges premium price for its products and services. A company forms brand equity for their products and services so that they are famed, easily identifiable and reliable in term of quality.The aim of brand equity is to establish a connection with associated consumers based on quality, reliability, and credibility with the aim to generate excitement among loyal consumers for new products and their features.

Literature Review

In this research, the five major factors of brand equity are examined that how much to influence the purchase decision while purchasing Titan watches. Therefore, the concept brand equity and its major factors such brand awareness, brand loyalty, brand association, brand preference and perceived quality are justified with the assistance of the following ideas created by different scholars.

1. Brand Equity: "Brand equity can be defined as marketing and financial values linked to the power of a "Brand equity can be defined as marketing and financial values linked to the power of a brand on the market, including real patented brand assets, brand awareness, brand loyalty, perceived brand quality and brand associations" **[Pride & Ferrell, 2003, pp. 299].** Aaker defined brand equity "a set of assets and obligations related to the name and symbol that increase or decrease the value that a product or service brings to a company or corporate customers" **[Aaker, 1991, pp. 19].** Aaker also stated about the five major aspects of brand equity such as brand loyalty, perceived quality, brand awareness, brand association and other patented brand assets. According to Keller, brand equity is the impact of brand knowledge on a consumer's reaction toward branding in market, especially brand is well known and consumer has positive and strong brand association **[Keller, 1993].**

2. Brand Loyalty: Aaker defined brand loyalty as "symbolised by positive mindset toward a brand resulting in consistent and repeated purchases of that brand over time". Aaker also suggested that brand loyalty is an important element in assessing brand's value as it has potential to generate profits. **[Aaker, 1991]** According to Asseal, Samuelsen and Sanvik, in marketing literature, two approaches are used to understand brand loyalty one is behaviour approach and the second is cognitive approach. According to behaviour approach, it is believed that continuous and consistent purchase of a brand signifies brand loyalty. The second approach, cognitive approach challenges that behaviour alone represents brand loyalty is not enough **[Asseal, (1992, p.87-89) and Samuelsen and Sanvik (1997, p. 1123-1128)].** According to Yoo, the impact of brand loyalty shapes the consumer purchasing decision and promotes to choose the same product or brand repeatedly and decline to shift to competitors' brands. As result Yoo asserts that brand loyalty is the heart of a brand's intrinsic value **[Yoo, 2000].**

3. Brand Awareness: According to Aaker, brand awareness is an important and essential element of brand equity that is always overlooked **[Aaker, 1996].** Aaker also stated about the durability of brand that ingrained the memory of consumers. According to Pitta and Katsanis, there is a mutual connection between brand awareness and brand association by stating that a product's brand awareness can be established in the consumer's mind before the development and integration of brand associations into the consumer's memory **[Pitta and Katsanis (1995)].** According to Keller, brand awareness refers to the strength of a brand node or trace in the memory to measure through a consumer's capacity to identify the brand across various circumstances **[Keller, K. 2008 pp-73].**

4. Brand Association: Keller defined brand association as association with attitudes, attributes and benefits respectively **[Keller, 1998].** According to Severi & Ling Brand association plays its role and collect data as an instrument to measure the brand extension **[Severi & Ling, 2013].** According to A. Chaudhary, S. Dawar and other "the customers' attitude towards the brand associations holds a strong correlation with intent to create brand equity, and regression analysis also establishes this" **[A. Chaudhary et.al. 2023 p. 06].**

5. Perceived Quality: According to Aaker, perceive quality is a main element of brand equity and it is essential for evaluating brand equity **[Aaker, 1996].** Aaker also defined perception quality as the comprehensive customers' perception regarding brilliance and quality of products or services in comparing with the rivalry offering **[Aaker, 1991 pg. 85-86].** According to Kim et.al. perceived quality consists experiential, functional, and symbolic attributes and functionalities and further when perceived quality is high, consumers tend to perceive greater overall value **[Kim et.al.2021**]. According to Surücü et.al. "Perceived value is the key facet and is regarded as an important factor of most customer-based brand equity frameworks" **[Surücü et.al., 2019].**

6. Brand Preference: The concept of preference is considered by different departments of education in various way such as marketer, economist sociology, psychologist and other. In marketing according of Oliver and Swan, preference refers to the choice or desirability among alternatives **[20. Oliver and Swan, 1989].** According to Rossiter and Bellman, (2005), there are different types of brand preference as strong, moderate, neutral and negative brand preference which influence the consumers' purchase decision differently **[Rossiter and Bellman, 2005].** According to American Association of Marketing, brand preference is an indicator of the strength of a brand in the mind of consumers. Customers develop brand preferences in order to reduce the complexity of the purchasing decision process **[Gensch, D. 1987].**

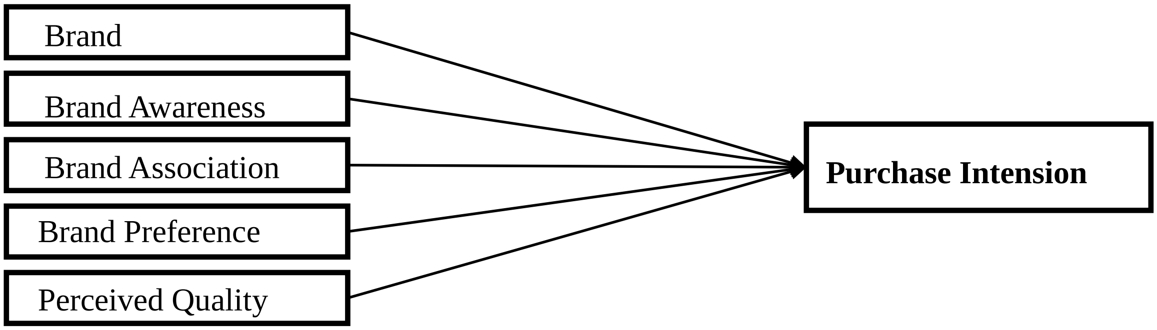
Objectives of the Study

- To study the influence of brand equity on the consumers' purchase decision.
- To analyse the relationship of the major factors of brand equity such as brand loyalty, brand association, brand awareness, perceived quality and brand preference with consumers' purchase intension.

Conceptual Framework

There are five independent variables of this research's conceptual framework which influences a sole dependent variable. Each independent variable affects the dependent variable in different way. In this way it can be said that consumers' purchase decision is different on the basis of conceptual framework.

Independent Variables Dependent Variable



Description of Hypothesis

In this research study, hypothesis is determined as the correlation of one or more than one variables to study and to test the research problem that is to examine the influence of brand equity on consumer's purchase decision in Jamshedpur.

H1: There is a moderate relationship between brand loyalty and consumer purchase intension of titan watches in Jamshedpur.

H2: There is a moderate relationship between brand Awareness and consumer purchase intension of titan watches in Jamshedpur.

H3: There is a moderate relationship between brand association and consumer purchase intension of titan watches in Jamshedpur.

H4: There is a moderate relationship between brand preference and consumer purchase intension of titan watches in Jamshedpur.

H5: There is a moderate relationship between perceived quality and consumer purchase intension of titan watches in Jamshedpur.

Research Methodology

This research study is based on both types of data such as primary data as well as secondary data. According Kotler, et.al. for research, the secondary data is considered as better than other.

1. Secondary Data: Secondary data is the data that has been previously collected and is under consideration to be used again for additional purposes for which data not collected primarily **[Vartanian, 2010].** Therefore, my research begins from the study and analysis of secondary data such as books, annual reports, magazines, newspapers important notes and other to obtain an overview of research field. After gaining a detail insight view of research area from the secondary data to conduct the primary data is started to analysis.

2. Primary Data: In this study to obtain primary data, a questionnaire survey is used about the influence of brand equity on purchase intension while purchasing titan watches in Jamshedpur. The questionnaire survey was conducted through Google form so that questionnaires could be sent quickly and easily.

3. Data Collection Method: The data was collected through a particular questionnaire survey and 5 points Likert's scale answer method was used. The scaling technique was used to examine how much brand equity influences consumer's purchase intension. The survey was completed during the month of January, 2024 through internet especially WhatsApp. The secondary data was collected from books, journal, articles, magazines, newspapers, and annual reports of Titan Company.

4. Population and Sample Size: The target population of my research study is Titan watches' consumers from Jamshedpur and the sample size is 120 as questionnaires were sent to 150 respondents out of which only 120 responses were obtained. The demographic of respondents is as following:

Table:1. The Demographic of Respondents

Respondents	Frequency	Percentage (%)	Total
Gender			
• Male	55	45.83%	
• Female	65	54.17%	120
Age			
• 18 Years old and below	00	00	
• 19 – 29 years' old	91	75.83%	
• 30-39 years' old	18	15%	
• 40 years old and above	11	9.17%	120
Marital status			
• Single	63	52.5%	
• Married	57	47.5%	120
Employment Status			
• Students	47	39.17%	
• Private Sector	18	15%	

• Public Sector • Self Employed • Unemployed	18 09 28	15% 7.5% 23.33%	 120
Income Level • □3,00,000 and below • □3,00,001-□6,00,000 • □6,00,001-□10,00,000 • □10,00,001 and above • Not Prefer to reply	 18 09 09 18 66	 15% 7.5% 7.5% 15% 55%	 120

Source: Primary Data

The above table presents the analysis of demographic traits of respondents which includes gender, age, marital status, employment status and income level. The majority of respondents are female whose age is 19 years or more than 19 years and less than 30 years. The majority of respondents are students and unmarried. Mostly respondents have not disclosed their income.

Result and Discussion

1. The Result of Cronback's Alpha

Cronback's Alpha is a statistical technique that is applied to measure the reliability of survey questions used while collecting the data**.** It is helpful in to ascertain whether the consistency of a set of items measures a particular attribute. The result of Cronback's Alpha values suggests that the responses collected through a set of questions is consistent when its values is high that is nearest to 1. Here, the result of Cronback's Alpha of every sets of questions is more than 0.7 that indicates the the reliability of coefficient is consistent. The result of Cronback's Alpha of five independent variables and one dependent variable is as following.

Table: 2. The Result of Cronback's Alpha

Sl. No.	Variables	N	Cronback's Alpha
1	Brand Loyalty	4	0.996544
2	Brand Awareness	4	0.908694
3	Brand Association	4	0.851608
4	Brand Preference	4	0.97447
5	Perceived Quality	4	0.975828
6	Purchase Intension	4	0.984422

Sources: Result of the primary data processing

2. Analysis of Descriptive Statistics

Table: 3. Descriptive Statistics

Statistics	Dependent Variables					Independent Variable
	Brand Loyalty	Brand Awareness	Brand Association	Brand Preference	Perceived Quality	Purchase Intension
Mean	3.83	3.73	3.71	3.80	3.83	3.91
Standard Error	0.077	0.073	0.072	0.077	0.074	0.076
Median	4.00	4.00	4.00	4.00	4.00	4.00
Mode	4.00	4.00	4.00	4.00	4.00	4.00
Standard Deviation	0.80	0.84	0.79	0.84	0.79	0.84
Range	4	4	4	4	4	4
Minimum	1	1	1	1	1	1
Maximum	5	5	5	5	5	5
Sum	460	448	446	456	460	469
Count	120	120	120	120	120	120

Source: Result of primary data processing

From the above table of descriptive statistics of six different variables suggest the comprehensive overview of the distribution of central tendency of the data of each variable in which one purchase intension is dependent variable and remaining are independent variables. This table assists to know about the characteristics of Brand Loyalty, Brand Awareness, Brand Association, Brand Preference, Perceived Quality and Purchase Intension.

3. Variables and Their Relationship

The Karl Pearson's coefficient of correlation analysis is applied to find the relationship between dependent and independent variables. First of all, to calculate the median of the responses collected of each set of independent and dependent variables. Then the coefficient of correlation of every set of independent variables with the dependent variables is calculated with the help of Excel. The analysis of each types of variables and their relationship are shown below.

Table: 4. The coefficient of correlation of Brand Loyalty (IV) and Purchase Intension (DV)

Variables	Purchase Intension (DV)
Brand Loyalty (IV)	0.687

Sources: Result of the primary data processing

Based on above statistics it can be said that the relationship of brand loyalty of Titan and the consumers' purchase intension while purchasing is positive and strong. Therefore, it is concluded that the consumers can be convinced when their intension is to buy Titan's products. In this way, it can be said that brand loyalty is an important factor of purchase intension.

Table: 5. The coefficient of correlation of Brand Loyalty (IV) and Purchase Intension (DV)

Variables	Purchase Intension (DV)
Brand Awareness (IV)	0.779

Sources: Result of the primary data processing

Based on above result it can be said that the relationship of brand awareness of Titan and the consumers' purchase intension while purchasing is positive and strong. Therefore, it is concluded that the consumers are aware of Titan brand which convinces them while they want to buy Titan's products. In this way, it can be said that brand awareness is another important factor of purchase intension.

Table: 6. The coefficient of correlation of Brand Association (IV) and Purchase Intension (DV)

Variables	Purchase Intension (DV)
Brand Association (IV)	0.707

Sources: Result of the primary data processing

Based on above mentioned statistical result, it concluded that the relationship of brand association of Titan and the consumers' purchase intension while purchasing Titan's products is positive and strong. Therefore, it is stated that the consumers can be convinced when their intension is to buy Titan's products. In this way, it can be said that brand association is an important factor of purchase intension.

Table:7. The coefficient of correlation of Brand Preference (IV) and Purchase Intension (DV)

Variables	Purchase Intension (DV)
Brand Preference (IV)	0.781

Sources: Result of the primary data processing

Based on above stated result it can be said that the relationship of brand preference of Titan and the consumers' purchase intension while purchasing is positive and strong. Therefore, it is concluded that the consumers prefer titan watches while they are buying watches. In this way, it can be said that brand preference also is an important factor of consumes' purchase intension.

Table:8. The coefficient of correlation of Perceived Quality (IV) and Purchase Intension (DV)

Variables	Purchase Intension (DV)
Perceived Quality (IV)	0.777

Sources: Result of the primary data processing

Based on above stated result, it can be said that there is a moderate positive relationship of perceived quality and purchase intention. Therefore, it is concluded that the consumers consider quality of products while buying titan watches. In this way, it can be said that perceived quality also is an important factor of consumes' purchase intension.

4. Analysis of Hypothesis Testing

H1: There is a moderate relationship between brand loyalty and consumer purchase intension of titan watches in Jamshedpur.

Table:9. Descriptive Statistics-H1

Sl. No.	Variables	Mean	Standard Deviation	Sample Size
1	Purchase Intension	3.91	0.84	120
2	Brand Loyalty	3.83	0.80	120

Source: Result of primary data processing

Based on above result of data processing as descriptive statistics, the mean of purchase intension is 3.86 and brand loyalty is 3.83 both of these indicate that consumers have a relatively high intention to purchase. The standard deviation of purchase intension is 0.96 and brand loyalty is 0.89 which are the variability of score around the mean. Both purchase intension and brand loyalty have approximately equal that suggest that respondents have relatively high levels of both purchase intention and brand loyalty.

Table:10. Summary Output-H1

Regression Statistics	
Multiple R	0.687473
R Square	0.472618
Adjusted R Square	0.468149
Standard Error	0.612688
Observations	120

*Dependent Variable: Purchase Intension
*Independent Variable: Brand Loyalty

Source: Result of Primary Data Processing

Based on the above result of Regression Analysis, it can be said that regression analysis suggests a moderate to strong linear association between the independent variable Brand Loyalty and dependent variables Purchase Intension explaining approximately 47.26% of the variability in the dependent variable. The model states a reasonable fit, supported by the adjusted R-squared value, and the standard error indicates reasonably accurate predictions. Therefore, it can be concluded that alteration in brand loyalty significantly influence the consumers, purchase decision.

Table:11. ANOVA-H1

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	39.69601	39.69601	105.7469408	0.0426
Residual	118	44.29565	0.375387		
Total	119	83.99167			

Source: Result of Primary Data Processing
*Dependent Variable: Purchase Intension
*Independent Variable: Brand Loyalty

The above ANOVA table states the results of an analysis of variance (ANOVA) for a regression model in which it suggests that the regression model is statistically significant in explaining the variability in the dependent variable, as evidenced by the significant F-statistic. It is cleared by comparing table value that F-value is fair.
Now it is cleared from above studies and discussion that Hypothesis-1 is accepted.

H2: There is a moderate relationship between brand Awareness and consumer purchase intension of titan watches in Jamshedpur.

Table:12. Descriptive Statistics-H2

Sl. No.	Variables	Mean	Standard Deviation	Sample Size
1	Purchase Intension	3.91	0.84	120
2	Brand Awareness	3.73	0.84	120

Source: Result of primary data processing

Based on above result of data processing as descriptive statistics, the mean of purchase intension is 3.86 and brand loyalty is 3.73 both of these indicate that consumers have a relatively high intention to purchase. The standard deviation of purchase intension and brand loyalty are same 0.84 that suggest that the responses for both variables are spread similar levels of dispersion around their respective means. Both purchase intension and brand awareness have approximately equal that suggest that respondents have relatively high levels of both purchase intention and awareness.

Table:13. Summary Output-H2

Regression Statistics	
Multiple R	0.779768905
R Square	0.608039545
Adjusted R Square	0.604717847
Standard Error	0.528199788
Observations	120

*Dependent Variable: Purchase Intension
**Independent Variable: Brand Awareness

Source: Result of primary data processing

Based on the above result of Regression Analysis, it can be said that regression analysis suggests a strong linear association between the independent variable Brand Awareness and dependent variables Purchase Intension explaining approximately 60.80% of the variability in the dependent variable. The model states a reasonable fit, supported by the adjusted R-squared value and the low standard error states that the model provides accurate predictions of the outcome variable.

Therefore, it can be concluded that alteration in brand awareness significantly influence the consumers, purchase decision.

Table:14. ANOVA-H2

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	51.07025481	51.07025	183.0507784	.00938
Residual	118	32.92141186	0.278995		

Total	119	83.99166667			

Source: Result of primary data processing
*Dependent Variable: Purchase Intension
**Independent Variable: Brand Awareness

The above ANOVA table states the results of an analysis of variance (ANOVA) for a regression model in which it suggests that the regression model is statistically significant in explaining the variability in the dependent variable, as evidenced by the significant F-statistic.It is cleared that the independent variable Brand Awareness in the model significantly predict the dependent variable purchase Intension.

Now it is cleared from above studies and discussion that Hypothesis-2 i.e. "there is a moderate relationship between brand Awareness and consumer purchase intension of titan watches in Jamshedpur"is accepted.

H3: There is a moderate relationship between brand association and consumer purchase intension of titan watches in Jamshedpur.

Table:15. Descriptive Statistics-H3

Sl. No.	Variables	Mean	Standard Deviation	Sample Size
1	Purchase Intension	3.91	0.84	120
2	Brand Association	3.71	0.79	120

Source: Result of primary data processing

Based on above result of data processing as descriptive statistics, the mean of purchase intension is 3.91 and brand loyalty is 3.71 both of these indicate that consumers have a relatively high intention to purchase. The standard deviation of purchase intension is 0.84 and brand association is 0.79 that suggest that the responses for both variables are spread approximately similar levels of dispersion around their respective means. Both purchase intension and brand awareness have approximately equal that suggest that respondents have relatively high levels of both purchase intention and association.

Table: 16. Summary Output-H3

Regression Statistics	
Multiple R	0.70709057

R Square	0.499977075
Adjusted R Square	0.495739592
Standard Error	0.596584622
Observations	120

*Dependent Variable: Purchase Intension
**Independent Variable: Brand Association

Source: Result of primary data processing

Based on the above result of Regression Analysis, it can be said that regression analysis suggests a strong linear association between the independent variable Brand Association and dependent variables Purchase Intension explaining approximately 49.99% of the variability in the dependent variable. The model states a reasonable fit, supported by the adjusted R-squared value i.e. 49.57% and the low standard error states that the model provides accurate predictions of the outcome variable.

Therefore, it can be concluded that alteration in brand association significantly influence the consumers, purchase decision.

Table:17. ANOVA-H3

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	41.99390781	41.99390781	117.9891798	0.01712
Residual	118	41.99775885	0.355913211		
Total	119	83.99166667			

Source: Result of primary data processing
*Dependent Variable: Purchase Intension
**Independent Variable: Brand Association

The above ANOVA table states the results of an analysis of variance (ANOVA) for a regression model in which it suggests that the regression model is statistically significant in explaining the variability in the dependent variable i.e. purchase intension, as supported by the significant F-statistic which is less than table value. It is cleared that the independent variable Brand Association in the model significantly predicts the dependent variable purchase Intension.

Now it is cleared from above studies and discussion that Hypothesis-3 i.e. "there is a moderate relationship between brand Association and consumer purchase intension of titan watches in Jamshedpur" is accepted.

H4: There is a moderate relationship between brand preference and consumer purchase intension of titan watches in Jamshedpur.

Table: 18. Descriptive Statistics-H4

Sl. No.	Variables	Mean	Standard Deviation	Sample Size
1	Purchase Intension	3.91	0.84	120
2	Brand Preference	3.83	0.84	120

Source: Result of primary data processing

Based on above result of data processing as descriptive statistics, the mean of purchase intension is 3.91 and brand preference is 3.83 both of these indicate that consumers have a relatively high intention to purchase. The standard deviation of purchase intension and brand loyalty are same 0.84 that suggest that the responses for both variables are spread similar levels of dispersion around their respective means. Both purchase intension and brand preference have approximately equal that suggest that respondents have relatively high levels of both purchase intention and brand preference.

Table: 19. Summary Output-H4

Regression Statistics	
Multiple R	0.71872985
R Square	0.516572598
Adjusted R Square	0.512475755
Standard Error	0.586600904
Observations	120

*Dependent Variable: Purchase Intension

**Independent Variable: Brand Preference

Source: Result of primary data processing

Based on the above result of Regression Analysis, it can be said that regression analysis suggests a strong linear association between the independent variable Brand Association and dependent variables Purchase Intension explaining approximately 49.99% of the variability in the dependent variable. The model states a reasonable fit, supported by the adjusted R-squared value i.e. 49.57% and the low standard error states that the model provides accurate predictions of the outcome variable.

Therefore, it can be concluded that alteration in brand association significantly influence the consumers, purchase decision.

Table:20. ANOVA-H4

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	43.38779343	43.38779	126.0904248	0.0240
Residual	118	40.60387324	0.344101		
Total	119	83.99166667			

Source: Result of primary data processing
*Dependent Variable: Purchase Intension
**Independent Variable: Brand Preference

The above ANOVA table states the results of an analysis of variance (ANOVA) for a regression model in which it suggests that the regression model is statistically significant in explaining the variability in the dependent variable i.e. purchase intension, as supported by the significant F-statistic which is less than table value. It is cleared that the independent variable Brand Preference in the model significantly predicts the dependent variable purchase Intension.

Now it is cleared from above studies and discussion that Hypothesis-4 i.e. "there is a moderate relationship between brand Preference and consumer purchase intension of titan watches in Jamshedpur" is accepted.

H5: There is a moderate relationship between perceived quality and consumer purchase intension of titan watches in Jamshedpur.

Table: 21. Descriptive Statistics-H5

Sl. No.	Variables	Mean	Standard Deviation	Sample Size
1	Purchase Intension	3.91	0.84	120
2	Perceived Quality	3.83	0.79	120

Source: Result of primary data processing

Based on above result of data processing as descriptive statistics, the mean of purchase intension is 3.91 and perceived quality is 3.83 both of these indicate that consumers have a relatively high intention to purchase. The standard deviation of purchase intension is 0.84 and perceived quality is 0.79 that suggest that the responses for both variables are spread approximately similar levels of dispersion around their respective means. Both purchase intension and perceived quality have approximately equal that suggest that respondents have relatively high levels of both purchase intention and perceived quality.

Table: 22. Summary Output-H5

Regression Statistics	
Multiple R	0.777095664
R Square	0.603877671
Adjusted R Square	0.600520703
Standard Error	0.530996621
Observations	120

*Dependent Variable: Purchase Intension
**Independent Variable: Perceived Quality

Source: Result of primary data processing

Based on the above result of Regression Analysis, it can be said that regression analysis suggests a strong linear association between the independent variable Brand Association and dependent variables Purchase Intension explaining approximately 60.38% of the variability in the dependent variable. The model states a reasonable fit, supported by the adjusted R-squared value i.e. 60.05% and the low standard error states that the model provides accurate predictions of the outcome variable.

Therefore, it can be concluded that alteration in brand association significantly influence the consumers, purchase decision.

Table: 23. ANOVA-H5

ANOVA					
	DF	SS	MS	F	Significance F
Regression	1	50.72069209	50.72069	179.8877773	0.0175465
Residual	118	33.27097458	0.281957		
Total	119	83.99166667			

Source: Result of primary data processing
*Dependent Variable: Purchase Intension
**Independent Variable: Perceived Quality

The above ANOVA table states the results of an analysis of variance (ANOVA) for a regression model in which it suggests that the regression model is statistically significant in explaining the variability in the dependent Variable i.e. purchase intension, as supported by the significant F-statistic which is less than table value. It is cleared that the independent variable Brand Preference in the model significantly predict the dependent variable purchase Intension.

Now it is cleared from above studies and discussion that Hypothesis-5 i.e. "there is a moderate relationship between perceived quality and consumer purchase intension of titan watches in Jamshedpur" is accepted.

Discussion

This study explores the influence of brand equity that includes brand loyalty (H1), brand awareness (H2), brand association (H3), brand preference (H4) and perceived quality (H5) on the consumers' purchase decision. According to Sasmita and suki, the young consumers are familiar and trust on the company who engages in producing and selling of a particular product which brand appears in social media **[Sasmita and suki, 2015]**. The result obtained from the processing of primary date, it can be seemed that majority of young consumers involved i.e. 75.83% and out of the all elements of brand equity, brand awareness has the highest influence on the consumers' purchase decision by 60.80%. The relationship of the all elements of brand equity and consumers' purchase intension is almost similar that suggest all these elements influence the purchase decision of consumer through brand loyalty, brand awareness, brand association, brand preference and perceived quality. In additional the most respondents are students who are mostly active in social media other than remaining respondents, so it can be said that they are more familiar and aware of the brands of different products and their perceived quality. The results conclude that brand awareness of Titan has the highest influence on the decision of the consumers while they are buying watches.

Conclusion

In conclusion, the data about the influence of brand equity on the purchase decision were obtained and analysed. In this study, total 120 respondents are included from various age group and different income groups in the city of Jamshedpur. The five hypothesis regarding the relationship of brand loyalty (H1), brand awareness (H2), brand association (H3), brand preference (H4) and perceived quality(H5) with purchase intension can be accepted on the basis of data analysis. The study of results suggests that brand awareness has the highest influence on the purchase decision of the consumers in comparison of brand loyalty, brand association, brand preference and perceived quality. The strongest area of the Titan Brand is brand awareness among the five elements of brand equity which highly influence the purchase decision of the customers. Thus the Titan Company should work on the quality of product and brand association. The position of brand loyalty of Titan among the consumers is sufficient but not enough so it is required to make brand loyalty continuously. Moreover, Titan enjoys the benefits of favourable of brand preference of Titan compare to its competitors.

In summary, the analysis of collected data reveals a positive and moderate coefficient of correlation among the five aspects of brand equity i.e. brand loyalty, brand awareness, brand association, brand preference and perceived quality with the purchase intension which suggests that these brand equity elements significantly influence purchase decisions. The all hypothesis generated regarding the brand equity and purchase intension is accepted. After the discussion of overall, it can be said that higher the brand equity has higher purchase intension which assists to increase the sales volume of the company. According to Dilip, and other brands with higher levels of brand equity would generate higher levels of customer purchase decisions that helps to generate more profits **[Dilip and other, 2021 p.48].**

Limitation

In this research study, a total sample of 120 was collected via WhatsApp using Google Forms from a specific area, namely Jamshedpur city, with an approximate population size of 19,00,00 (estimated data in 2023). While this sample size is sufficient, increasing the number of sample data may alter the results.

References

1. Titan Company. (2022). Annual Report 2021-22 (pp. 06).
2. Titan Company. (2022). Annual Report 2021-22 (pp. 06)
3. Titan Company. (2022). Annual Report 2021-22 (pp. 14-15).
4. Pride, W. M., & Ferrell, O. C. (2003). Marketing: Concepts and Strategies. Boston, MA: Houghton Mifflin Company. Pp-299.
5. Aaker, D. A. (1991). Managing Brand EquityNew York: The Free Press. Pp-19
6. Keller, K. (1993). Conceptualizing, measuring, and managing customers-based brand equity. Journal of marketing, 1-22.

7. Aaker, A. A. (1991) Managing brand equity, New York, the free press.
8. Assael, H. (1992). Consumer behaviour and marketing action. Boston: PWS-Kent Publishing.
9. Simon, C. J., & Sullivan M. W. (1990). The measurement and determinants of brand equity: A financial approach. Working Paper, Graduate School of Business, University of Chicago.
10. Yoo, B., Donthu, N., & Lee, S. (2000). An Examination of Selected Marketing Mix Elements and Brand Equity. Journal of the Academy of Marketing Science, 195-21
11. Aaker, D.A. (1996) Measuring Brand Equity across Products and Markets. California Management Review, 38, 102-120.
12. Pitta, D. A. & Katsanis, L.P. (1995). Understanding brand equity for successful brand extension. Journal of Consumer Marketing, 12(4), 51 – 64.
13. Keller, K.L. (2008) Strategic Brand Management: Building, Measuring and Managing Brand Equity. 3rd Edition, Pearson Prentice Hall, Upper Saddle River, 73.
14. Keller, K. L. (1998). Strategic brand management: Building, measuring and managing brand equity. London: Prentice Hall International.
15. Severi, E., & Ling, K. Ch. (2013). The Mediating Effects of Brand Association, Brand Loyalty, Brand Image, and Perceived Quality on Brand Equity. Asian Social Science, 9(3).
16. Chaudhary, A., et al. (2023). Impact of brand association on brand equity in organised retail sector. Marketing and Management of Innovations, 3, 06
17. Aaker, A. A. (1996) Managing brand equity, capitalizing on the value of brand name, New York, the free press.
18. Aaker, A. A. (1991) Managing brand equity, new York, the free press.
19. Kim, E. J., Baloglu, S., & Henthorne, T. L. (2021). Signalling effects of branded amenities on customer-based brand equity. Journal of Hospitality Marketing & Management, 30, 508–527.
20. Surücü, O., Oztürk, Y., Okumus, F., & Bilgihan, A. (2019). Brand awareness, image, physical quality and employee behavior as building blocks of customer-based brand equity: Consequences in the hotel context. Journal of Hospitality and Tourism Management, 40, 114–124.

21. Oliver, R., & Swan, J. (1989). Consumer Perception of Interpersonal Equity and Satisfaction in Transactions. Journal of Marketing, 53, 21-35.
22. Rossiter, J. R., & Bellman, S. (2005). Marketing Communications: Theory and Applications. Pearson.
23. Gensch, D. (1987). A two-stage disaggregate attribute choice model. Marketing Science, 6(3), 223-231.
24. Dilip, D. at.al. (2021). The Influence of Brand Equity on Consumer Purchase Decisions at Starbucks, International Journal of Accounting & Finance in Asia Pacific 4(1):37-50.
25. Vartanian, T. P. (2010). Secondary data analysis. Oxford University Press.
26. Sasmita, J., & Suki, N. M. (2015). Young consumers' insights on brand equity: Effects of brand association, brand loyalty, brand awareness, and brand image. International Journal of Retail & Distribution Management, 43(3), 276-292. Retrieved online from.
27. Thuy, N. V. (2022). Impact of brand equity on consumer purchase decision: A case study of mobile retailer in Hochiminh City, Vietnam. Journal of Eastern European and Central Asian Research, 9(2).
28. David, A. & Makeswari, S. (2021). A study on consumer satisfaction towards Titan watches with special reference to Coimbatore city. EPRA International Journal of Multidisciplinary Research (IJMR), 7(7), 509-514.

Collective Violence, Genocide and Migration Policy in South Asia

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Castles and Miller, Diamond, Kraut and Sowell have argued that across the centuries and millennia, migration has been a major source of human survival, adaptation and growth (as cited in Marsella and Ring, 2003). Castells has advocated that the international networks of wealth, technology and power have resulted in globalization and informationalization which in turn has rapidly transformed all societies in the world. Production capacity has increased, cultural creativity has expanded and communication potential has multiplied. However, the same forces have also disfranchised the societies. The sudden transformations have led to the crumbling of existing mechanisms of social control and political representation. There has been increasing economic integration and governments have lost some control over their own borders. International economic integration and political sovereignty have been in conflict. As a part of globalization and informationalization, policies on labour market in one country may be a matter of concern for other countries in the area of international labour mobility. A policy can stimulate the flow of migration to other countries and dampen wages in the receiving countries. Political problems arise as the gain from migration is not equally shared by all groups of people in the country. There are losers and winners (as cited in Ananta and Arifin, 2004).

Carl Gundry-War has pointed out that global migration has changed the way people think about their political, cultural and economic maps. Movement has been much easier today and the states have become "borderless". Yet many are trapped between or within borders simply because they have crossed the borders (Ananta and Arifin, 2004).

Migration has emerged as one of the key issues of the age at the beginning of the 21st century. As the wealthiest state struggle to maintain intact the real porous borders in an increasingly interconnected world, human movement-and in particular how it should be controlled-has become a major political issue (Gardner and Osella, 2004).

Jorden and Duvell have said that there have been fundamental problems in all efforts to manage international population mobility in the globalizing world. On one hand, business is transnational and international business necessitates the unrestricted international flow of people while on the other hand politics is still national. The existence of supranational institutions and international organizations cannot supersede the importance of politics which prioritizes the security and protection of the citizens in a country and hence demands restriction on the international flow of people. This dilemma becomes evident as we have witnessed wars, internal conflicts, prosecution of minorities and global terrorism (as cited in Ananta and Arifin, 2004).

Diamond, Kraut and Sowell have also argued that the current migrants are victims of ethnic cleansing and genocide. In past as well as in present, entire populations have approached extermination, save only by migration to new lands often filled with as much risk as the lands they left behind them (as cited in Marsella and Ring, 2003).

Research into rural-urban migration in developing countries has been mainly concerned with its effect on urban economies and considerably less attention has been paid on its effect on rural areas. This may lead to the loss of more dynamic members of rural society and the diversion of national investment resources towards the towns (Oberai and Singh, 1980).

In this study an attempt has been made to analyze the trends and patterns of migration in South Asia. This theme has been further explored in the next section.

Migration in South Asia

Migration is an important historical and social reality in South Asia. Today, South Asia is the locus of extensive migrations that link cities and villages in the region to diverse places and that cut across the concerns of governments, policy-makers, migrants themselves and their families (Barbora, Theime and Seigmann, 2010).

The historic ties that link the various population across the region which is accentuated by the modern day dynamics of migration has given rise to multiple forms of population movement ranging from voluntary to involuntary, internal to external, long term to temporary (Haque, December 2005).

South Asia has a prominent place in the dynamics of migration in Asia. After the emergence of independent states in South Asia in 1947, during the past half a century, about 30 million people have moved from one part to another to either avoid prosecution or meet basic needs. Asia's migrant stock stands at 49.7 million migrants which is the second highest in the world after Europe. Out of the top 10 countries of emigration, three are from South Asia; Afghanistan, Bangladesh (4.1 million each), and Sri Lanka (1.5 million). The migrants from Bangladesh and Sri Lanka are mainly labour migrants while Afghanistan outflow has been in large measures due to the wars. India and Pakistan are the sixth and tenth top countries hosting the largest numbers of migrants. It can be said that migration to India is particularly for economic reasons while migration to Pakistan is primarily because of the displacement from Afghanistan. This snapshot analysis highlights the complex nature of migration in the region (Haque, December 2005).

Internal Migration

The flows of internal migration in South Asia are considered to be significantly larger than the international migration (Deshingkar, 2005). The internal migration within the country's border can be categorized as, rural to rural migration, rural to urban migration, urban to urban migration and urban to rural migration (Haque, December 2005).

An estimated 20 million people annually migrate temporarily in India. Internal migration dominated over all other forms of movement and accounted for about 62 per cent of all movements during the 1999-2000 period (Afsar, 2003). In the same period, rural-to-urban and urban to urban migration was 24.5 and 24.4 per cent respectively (as cited in Haque, December 2005).

In Pakistan the current urban growth rate is double that of the population growth rate. Rural-to-urban migrants accounted for 8.2 per cent of the total population according to a 1998 Population Census. A major characteristic of internal migration in the county is the significant movements related to marriage and family. 20 per cent of the total migrants are the economic migrants (as cited in Haque, December 2005).

14.45 per cent of the population migrated internally according to the 1994 Demographic Survey 3 in Sri Lanka. This figure shows an increase from 13.5 per cent of the 1981 Census. One of the major characteristic of migration in Sri Lanka is the high proportion of female migration, both internal and overseas. 13.3 per cent (down from 13.8 per cent in 1981) of the male population were migrants compared to 15.6 per cent of the female population (up from 12.5 in 1981) in 1994 (as cited in Haque, December 2005).

In South Asia, internal migration could be long-term or permanent. As far as the seasonal migration prevalent in South Asia is concerned, it is circular in nature with agricultural labour migrants migrating from rural-to-rural and urban-to-rural areas, as well as across-borders during harvest seasons (Haque, December 2005).

International Migration

In South Asia, three major types of voluntary international migration can be identified. First, the movement of emigrants as settlers to Europe, Australia or North America (long term permanent settlers), the movement of contract labour migrants to the countries of the Middle East, South East Asia and elsewhere (temporary migrant workers) and the international regional short-term movement of people within the South Asia region (seasonal economic migrants) (Haque, December 2005).

It is estimated that there are around 20 million Indians throughout the world, which comprises one of the largest diaspora communities. India also has a large percentage of its population working abroad as short-term contract labourers. The number of contractual labourers from India in 2002, was 0.37 million which is lower than 1993 when it was 0.44 million. The Middle East is the major destination for Indian contractual labour (75 per cent) (as cited in Haque, December 2005).

A large flow of international migrants can be found in Pakistan also. Many migrant workers get employed in the Gulf States. As many as 2 million Pakistanis had been employed in the Gulf States by 1980. It is estimated that labour migration outflow in 1997 was 153,929. Like India, Pakistan also has a significant diaspora population. An estimated 2 to 3 million people of Pakistani origin are living in developed countries.

Data from 1998 in Sri Lanka, showed that 158,287 migrants left Sri Lanka, of which 66.5 per cent were women. Most of the migration is towards the Middle East while other destinations include Lebanon, the Libyan Arab Jamahiriyah, Jordan, and Cyprus. A smaller number also goes to East Asian countries such as Singapore; Hong Kong, China and Malaysia (as cited in Haque, December 2005).

In South Asia, migration for higher education is also a major issue. Students from all over South Asia are studying abroad. India saw a maximum growth of students studying abroad in 2002-2003 with an increase of 11.6 per cent and is second only to China in terms of proportion of the international student population (as cited in Haque, December 2005).

Within this context, the study is proposing that internal and international migration is leading to collective violence and genocide respectively in the South Asian region on the basis of few case studies.

Collective Violence and Genocide in South Asia

David Bayley, a specialist on crime and the Indian criminal justice system, constructed three categories of riot or collective violence in India. They are- violence of remonstrance, violence of confrontation, and violence of frustration. The violence of remonstrance culminates from the efforts of a group of demonstrators to bring attention to a particular point of view, usually in the form of a set of perceived or experienced grievances while the violence of confrontation results from the conflict between two groups of private citizens over an issue. The final form of collective violence results from frustration and occurs when people perceive themselves to be in a situation they find unendurable (Bryjak, Summer 1986).

The case studies of collective violence in context of internal migration can be most appropriately placed in the third category of David Bayley.

Case Study 1

The assassination of Indira Gandhi's by her two Sikh bodyguards on October 31, 1984 resulted in some of the worst rioting in India since the time of independence and partition in 1947. The Hindus exploded in an all-out attack on Sikhs in many parts of Delhi on the death of their "mother". The Sikhs were savagely beaten, shot, and in many cases burned to death (Bryjak, Summer 1986).

Pran Chopra of New Delhi's Center for Policy Research argued that Indira Gandhi's death triggered violence rooted in "class antagonisms taking shelter under religious coverings." The rioters were members of Delhi's lowest economic class; many of them rural-to-urban migrants only recently arrived in the capital city. Their victims were often members of a Sikh business caste who were financially well-off by Indian standards. The Prime Minister's death provided them with both a cover and an excuse to vent their frustrations and hostilities toward a class of people whose economic prosperity they will probably never experience (as cited in Bryjak, Summer 1986).

Case Study 2

On 19th October, 2008, the Maharashtra Navnirman Sena activists beat up north Indian aspirants appearing for the Railway Recruitment Board entrance exam for the Western region, in Mumbai as a revival of its offensive against north Indians. They also created a ruckus outside exam centres, blocked roads and raised anti-north Indian slogans. They wanted Marathi people to be recruited.

This was an all-India entrance exam and candidates from across the country were eligible to apply. Maharashtra Navnirman Sena General Secretary Nitin Sardesai said “When there is availability here why should people from outside be called? They come here and are living on the platforms.”

The Maharashtra Navnirman Sena men also assaulted north Indian candidates outside the railway booking hall at Thane east station. Around fifty to sixty people, who were sleeping on the platform, were beaten with lathis and chased away.

Cases of rioting under sections 143, 147, 159 and 323 were registered against six "unknown persons" based on the footage from the closed circuit television at the station (Gaikwad, 2008, October 20).

Xenophobic and racist beliefs and attitudes are still widespread even in the early 21st century (Rydgren, 2004). The case study illustrated below gives an account of genocide in context of international migration in contemporary times.

Case Study 3

A group of four Indians were victims of brutal racial attack by Australian teenagers in Melbourne in May, 2009 (2009, May, 2009).

Case Study 4

Again in September, 2010 a 21-year-old man of Indian origin was brutally assaulted in Melbourne by some teenagers with baseball bats (2010, September, 2010).

Thus the study is further proposing that there is a need for an effective migration policy in South Asia addressing the issue of collective violence and genocide in the region.

Migration Policy in South Asia

Migration has become a major concern of government officials, political leaders, policy makers and scholars (Marsella and Ring 2003). It has become an increasingly complex area of governance in today's highly mobile world. It is inextricably interlinked with other key policy areas including economic and social development, national security, human rights, public health, regional stability and inter-country cooperation. Management of migration either at the national or regional level is a complex and multifaceted endeavour (Haque, December 2005).

Migration policy is becoming an important issue in some of the developed countries, and in particular, it has become a central issue in the elections held in these countries because of large number of migrants, the high unemployment rate in some of the host countries, xenophobia, and the perceived effect the migrants have on the local population (workers and capital owners) (Epstein, and Nitzan, October 2006).

Migration policy involves a large range of issues such as legal and illegal migrants, temporary and permanent migration, high-skilled and low-skilled migration, and asylum seekers and family unification. Many studies have been carried out regarding the optimal migration policy and the effects that different migration policies might have on the host country. Concern has been focused on whether to impose capital and skill requirements on the migrants by Benhabib in 1996, on the alternative future policy options, given past experience by Zimmermann in 1995, on whether a reform of immigration policy can alone resolve the fiscal problems associated with the aging of the baby-boom generation by Storesletten in 2000, on the preferred policy regarding temporary and illegal migration by Epstein 2003; Epstein in 1999; Hillman and Weiss in 1999, and on the migration policy implications of efficiency wage setting by Epstein and Hillman in 2003) (Epstein and Nitzan, October 2006).

International migration policies, particularly those dealing with labor migration, are also framed in economic terms, of which the underlying dynamics is the lack of capital and excess labor in the origin and the abundance of capital and labour shortage in the destination (Asis, July 2009).

Internal and international migration, as well as regular, irregular and forced migration poses critical challenges of management in the South Asian countries (Haque, December 2005).

Most policies regarding the movement of people are adhoc in nature and related mostly to the temporary international labour migration in South Asia. There is no comprehensive policy for the management of migration within the countries or on a regional basis. However, the countries in South Asia are now placing greater emphasis on addressing irregular migration, particularly trafficking in persons which emerge as an important issue. Nevertheless, in most South Asian countries, larger migration matters remain a relatively less important policy issue (Haque, December 2005).

Conclusion

Since the study is proposing that migration is leading to collective violence and genocide in the region and there is a wide gap at the policy level addressing these issues it can be said that that there is a need for collaborative and comprehensive initiatives in managing mobility in the region, if migration is to be beneficial both for migrants and countries. The national level policy may integrate all types of population movements, whether they are regular and irregular, in a coherent manner and in harmony with the development process of the country. The countries in South Asian may consider adopting an appropriate, balanced and integrated national migration management policy supported by a conducive and productive regional migration framework (Haque, December 2005).

References

Ananta. Aris. and Arifin. Evi N. (2004). Should Southeast Asian Borders be Opened? In Ananta. Aris. and Arifin. Evi N. (Eds), (2004), International Migration in Southeast Asia. Singapore: ISEAS Publications.

Asis, Maruja. M. B. (July 2009). Transnational Solidarity: Migrant-Homeland Cooperation for Development in Asia, United Nations Expert group Meeting on International Migration and Development in Asia and the Pacific, United Nations Economic and Social Commission for Asia and the Pacific. p. 1-18.

Barbora. Sanjay, Theime. Susan and Seigmann, Karin, Astrid, (2010), Patters and Politics of Migration in South Asia. In H, Hans. Hurni., and Wiesmann, Urs. (Eds), (2010), Global Change and Sustainable Development: A Synthesis of Regional Experiences from Research Parternership. Switzerland: Georgraphica Bernesia, Bern.

Bryjak, George. J. (Summer 1986). Collective Violence in India, Asian Affairs, 13 (2), pp.35-55

Epstein, S. Gil and Nitzan, Shmuel. (October 2006). The Struggle over Migration Policy, Journal of Population Economics, 19 (4), pp. 703-723

Gaikwad, Rahi. (2008, October 20). North Indians attacked in Mumbai, The Hindu, p. 1.

Gardner. Katy. and Osella. Filippo (2004), Migration, Modernity and Social Transformation in South Asia: An Introduction. In Osella Filippo. and Gardner. Katy. (Eds), 2004), Migration, Modernity and Social Transformation in South Asia, New Delhi: Sage Publications India Pvt. Ltd.

Haque, Md. Shahidul, (December 2005). Migration Trends and Patterns in South Asia and Management Approaches and Initiatives, Asia-Pacific Population Journal, 20 (3), pp.39-60

Laczko, Frank. (29 April 2002). New Directions for Migration Policy in Europe, Philosophical Transactions: Biological Sciences, 357 (1420), pp.599-608

Marsella, Anthony J. and Ring. Erin. (2003), Human Migration and Immigration: An Overview. In Adler, Leonore Loeb, and Gielen, Uwe Peter (Eds), (2003), Migration: Immigration and Emigration in International Perspective. United States of America: Greenwood Publishing Group.

Oberai, A. S. and Manmohan Singh, H. K., (March-April 1980), Migration Remittances and Rural Development: Findings of a Case Study in the Indian Punjab, International Labour Review, 119 (2), p. 229

Rydgren, Jens. (2004). The Logic of Xenophobia. Rationality and Society, 16 (2), pp.123-148

___ (2009, May, 2009). A.P. student attacked, The Hindu, p.1.

___ (2010, September, 2010). Indian attacked in Australia, The Hindu, p. 1.

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A Theoretical Framework of Climate Change and Green and Sustainable Finance

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Introduction

In 21st Century environmental concern has increased with changing pattern of global issues and thus the concept of Sustainable development becomes more important. Air pollutants and Green house gases are continuously increasing worldwide. Alarming situation of Global warming affects the clean energy and renewable sources. The problem of distorting Climate conditions not only related with environment but also related with health, optimization of resources in a nation. By investing in Environment friendly projects, a nation cans allign with sustainable development. So, Green finance deals with the investment as well as environment science. According to G20 Summit Report on Green Finance Synthesis, concept of Green finance is a broader term that connects financial investments with Environment oriented projects. Economic growth, Industrial Growth and environment degradation are interconnected and also responsible for Carbon emission. Economy can use green finance as a tool to correct the environment by investing in pollution free/ low polluting investment and getting return on such projects.

Climate Change is one of the most crucial challenge for earth today. Generation to generation and globally its effects are seen. The main reason behind the climate change is Green House Gases (GHG) in the atmosphere. Mainly Green House Gas consists of carbon dioxide, methane and nitrous oxide in the Atmosphere, which has significantly increased over the decades.

The impact of Climate Change tends to be more pronounced for the disadvantaged, making them even more vulnerable to climate risks. Developing countries are especially vulnerable, many with limited capacity to adapt to rising sea levels or recover from associated losses which poses a key threat to Sustainable Development.

Review of Literature

Mishra, Neelam (2024) had done a research on **"Climate finance a sectoral analysis of Uttar Pradesh"**. From the aforementioned ongoing discussion is that even while all departments spend very little money on climate change initiatives, the state plan, which is largely sponsored by state funds, is responsible for a sizeable amount of the state's climate-related initiatives. The importance of state assistance for climate change adaptation and mitigation strategies must thus not be underestimated.

Prakash, Nisha (2023) had conducted a study on "**An empirical investigation of determinants influencing climate finance flows**". The results of the study raise concerns as donors have pledged new and additional resources to support developing countries adapt to climate risks. Further, the results also indicate that the green bond market is crowded by developed countries. The current situation leaves no room for low-income countries, vulnerable to climate risks to utilize green bonds as a tool for raising capital. This raises questions on green bonds being positioned by the multilateral agencies as a capital-market-based tool to channelize climate finance to low-income, developing economies.

Sakshi (2023) existing research on **"Green marketing and sustainable development an empirical analysis of hospital in Punjab"** This topic was selected to understand the reality that green marketing is either an ongoing trend or is adopted for the real change in society. It was found that the majority of the respondents are aware of the benefits of green products both for health and environment. Even the decisions of government should be on the basis of sustainable development.

Singh, Neetu (2022) had conducted a study on **"Green accounting A path O sustainable development NT in India an analytical study"**. It conclude that the most of 50% companies adhere Green accounting India adherence Green policy hence, there is significance of green accounting is present in India. In India, it is not legally obligatory on companies that adherence of Green accounting and reporting also, disclosing the mater related to environment issues in their annual report that's why Environmental problems of the companies are handled on voluntarily basis but foundation is only positive. Therefore, there is a need to promote environmental benefits reporting under the corporate sector.

Megahed, Alaa Samy Hafez (2021) has done research on **"Study on climate change and its impact on sustainable development in rural area of Mysore district of India".** The perceived impact of climate change on sustainable development aspects in the study area, detect the constraints experienced by respondents in adaptation to climate change, and suggest suitable strategies to combat climate change for sustainable development.

Objectives

Given paper is theoretical in nature. The aims of research paper are:

1. To discuss the concept of Climate change and international response to Climate change.
2. To study Climate Change and Sustainable Development Goals
3. To establish linkage among Climate, Green and Sustainable finance.

SDG Goals and Climate Change

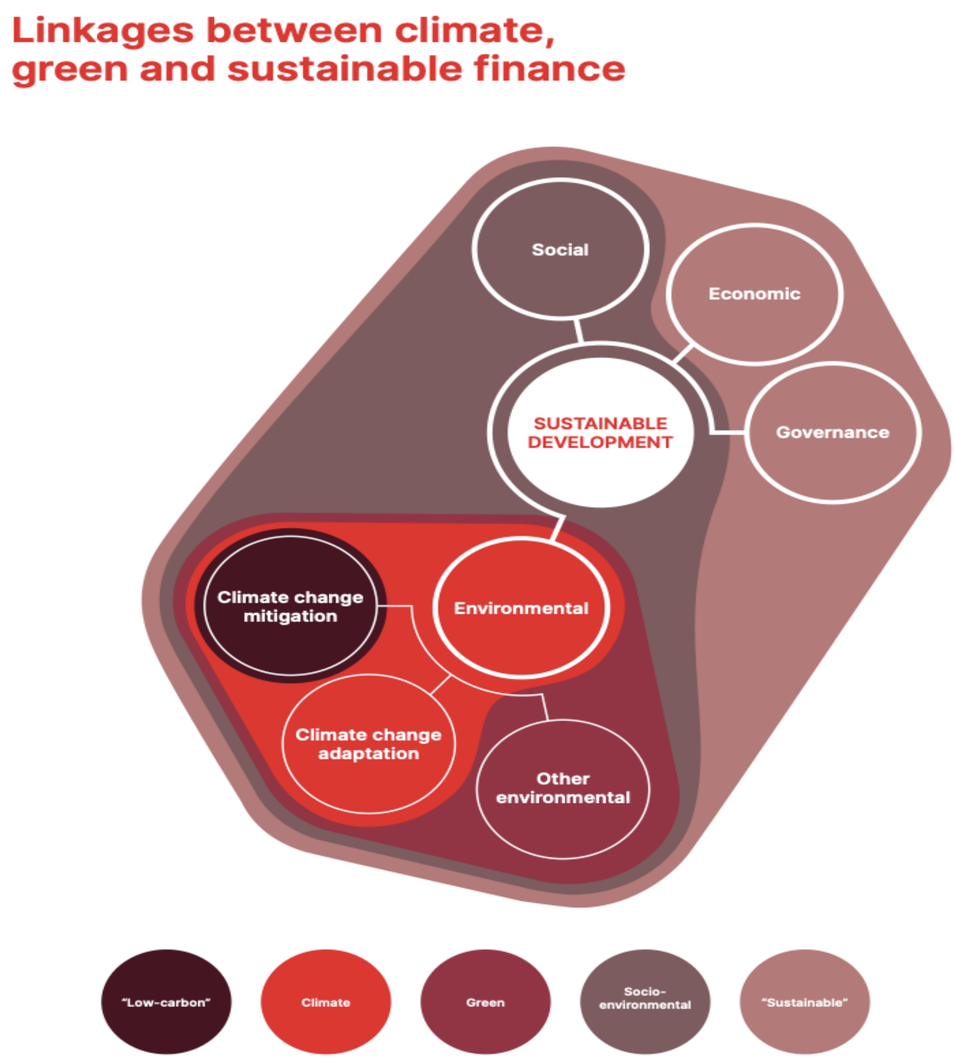
To bring sustainable development in mainstream UN in 2015 launched the 17 goals and 169 specific targets which tend to make the world a better place to live by fulfilling its targets within stipulated time of 15 year. The SDG's are interlinked with climate change in directly or indirectly way whereas some of the goals are directly related with climate too.

goal 7: clean and affordable energy: The goal of providing more efficient and clean energy to help sustain the environment and economic growth.

goal 13: climate action: The warming's of earth's atmosphere has led to extreme weather events, rising sea level, melting glaciers, and displacement of millions of people. Despite increased global carbon dioxide emissions the global community has yet to commit to reversing the climate crisis.

goal 14: life below water: This goal protect and promote the sustainable use of seas, oceans, and marine resources. Oceans and seas cover 70% of planet, provide food energy and water and help mitigate climate change by absorbing a quarter of annual CO_2 emission.

goal 15: life on land: SDG 15 aims to protect and restore terrestrial ecosystems, combat desertification, sustainably manage forests, and halt biodiversity loss. Biodiversity and forests are essential to human prosperity, providing clean water and air, food security, absorbing CO_2 emissions, and offering a basis for environmental development.



The International response to climate action

On 21 March 1994, The United Nations" Framework Convention on Climate Change the **United Nations" Framework Convention on Climate Change (UNFCCC)** came into force.

In 1992 at Rio Earth Summit, 196 Countries participated in the convention. The main aim was to Balance Green House Gas at a level that could not harm climate system with human induced dangerous components. It states that "such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to Climate Change, to ensure that food production is not threatened, and to enable economic development to proceed in a sustainable manner." The idea is that, as they are the source of most past and current Green House Gas emissions, industrialized countries are expected to do the most to cut emissions on home ground. They are called Annex I countries and belong to the **Organization for Economic Cooperation and Development (OECD)**. It was projected that share of green house gas emission will grow in developing countries in coming years. So, such countries must be supported through policy measures so that Emission can be controlled without restricting the economic development.

The Kyoto Protocol

Japan announced the Kyoto Protocol on 11 December 1997 and started from 16 February 2005. It is the international program of Climate Change initiated by United Nations that set the targets for reduction in emission rates. At its first commitment period i.e. 2008-12, 37 industrialized countries and the European Countries assured to lowering down the GHG emission to 5% on an average of 1990s level of GHG emission. On its second commitment period (2013-20), parties promised 18% reduction in GHG emission against 1990 level of emission. To fulfill the targets of protocol, parties were using National measures. Three more additional mechanisms were also introduced in protocols: (i) International Emissions Trading (IET); (ii) Clean Development Mechanism (CDM); and (iii) Joint implementation (JI). These channels are introduced to boost green investment and also following the cost benefit method to achieve their emission targets.

The Bali Road Map

The Bali Road Map was adopted at the 13th Conference of the Parties and the 3rd Meeting of the Parties in December 2007 in Bali. It includes: The Bali Action Plan which is a comprehensive process to enable the full, effective and sustained implementation of the Convention through long-term cooperative action, up to and beyond 2012, in order to reach an agreed outcome and adopt a decision. The Bali Action Plan is divided into five main categories: shared vision, mitigation, adaptation, technology and financing

The Copenhagen Accord

The 15th session of the Conference of the Parties to the UNFCCC and the 5th session of the Meeting of the Parties to the Kyoto Protocol which took place in Copenhagen, Denmark in December 2009, produced the Copenhagen Accord. Key features: The long-term goal of limiting the maximum global average temperature increase to no more than 2 degrees Celsius above pre-industrial levels, subject to a review in 2015. A reference to consider limiting the temperature increase to below 1.5 degrees - a key demand made by vulnerable developing countries. Developed countries promised to provide US$30 billion for the period 2010-2012, and to mobilize long-term finance of a further US$100 billion a year by 2020 from a variety of sources.

The Cancun Agreements

The Cancun Agreements reached on 11 December 2010 in Cancun, Mexico, at the 16th Conference of the Parties in November – December 2010. The main objectives include: Mitigation; Transparency of actions; Technology; Adaptation; Forests; Capacity building; and Finance. Setting up of the Green Climate Fund to disburse $100 billion per year by 2020 to developing countries to assist them in mitigating Climate Change and adapting to its impacts

The Durban Outcomes

The 17th Conference of the Parties in Durban, South Africa, in November 2011, delivered a breakthrough on the international community's response to Climate Change. Key features: Second commitment period of the Kyoto Protocol. The launch of a new platform of negotiations under the Convention to deliver a new and universal Green House Gas reduction protocol, legal instrument or other outcome with legal force by 2015 for the period beyond 2020, Conclusion in 2012 of existing broad-based stream of negotiations and To scope out and then conduct a fresh Global Review of the emerging climate challenge based on the best available science and data.

The Doha Climate Gateway

At the 18th Conference of the Parties in Doha, Qatar in December 2012, the Governments consolidated the gains of the last three years of international Climate Change negotiations and opened a gateway to necessary greater ambition and action on all levels Among the many decisions taken, Governments: Strengthened their resolve and set out a timetable to adopt a Universal Climate Agreement by 2015, which will come into effect in 2020, Launched a new commitment period under the Kyoto Protocol, Made further progress towards establishing the financial and technology support and new institutions to enable clean energy investments and sustainable growth in developing countries.

Warsaw Outcomes

The 19th Conference of the Parties of the UNFCCC and 9th Meeting of Parties to 10 Kyoto Protocol took place in Warsaw, Poland from 11 to 23 November 2013. The key features: It was decided to either initiate or intensify domestic preparations for their Intended Nationally Determined Contributions (INDC) towards the 2015 Agreement (scheduled to be agreed in Paris in the late 2015 at the 21 Session of COP) that will come into force from 2020. It was decided that nationally determined contributions would be put forward in a clear and transparent manner by the first quarter of 2015. The "Warsaw International Mechanism for Loss and Damage" was created with a provision for setting up of an International Mechanism to provide technical support, finance and capacity building to help the poorer and vulnerable countries. The Warsaw Framework for Reduction in Emission from Deforestation and Degradation (REDD+) is backed by pledges of 280 million dollars financing from the US, Norway and the UK

Lima Call for Climate Action

The 20th Session of the Conference of the Parties and the 10th Meeting of Parties to the Kyoto Protocol took place from 1 to 14 December 2014 in Lima, Peru. The key features: The Lima Call for Climate Action urged developed country Parties to provide and mobilize enhanced financial support to developing country Parties for ambitious mitigation and adaptation actions, especially to Parties that are particularly vulnerable to the adverse effects of Climate Change; and recognized complementary support by other Parties. Nations concluded by elaborating the elements of the new agreement, while also agreeing the ground rules on how all the countries can submit contributions to the new agreement during the first quarter of 2015. Progress was made in Lima on elevating adaption onto the same level as the curbing and cutting of curbing Greenhouse Gas emissions.

India and its Initiatives

India needs sufficient, timely, and directed investments to achieve its Nationally Determined Contributions (NDCs). By 2030, India has committed to reduce the emissions intensity of its GDP by 33-35% below 2005 levels; achieve 40% of cumulative electric power installed capacity from non-fossil fuel sources; and enhance forest and tree cover to create an additional carbon sink equivalent of 2.5-3 billion tons of carbon dioxide. While India has made progress towards these targets, much more needs to be done. Given the urgency, Prime Minister Narendra Modi presented 'five nectar elements', or Panchamrit, at the COP26 Summit in Glasgow, as India's additional contribution to climate action. These are:

By the year 2030, India will:

1. scale up its non-fossil energy capacity to 500 GW
2. meet 50% of its energy requirements from renewable energy
3. reduce the total projected carbon emissions by one billion tons from now
4. reduce the carbon intensity of its economy by more than 45%
5. India will achieve the target of Net-Zero by 2070

India's NDCs estimate that the country will require ~INR 162.5 lakh crores (USD 2.5 trillion) from 2015 - 2030, or roughly INR 11 lakh crores (USD 170 billion) per year for climate action (UNFCCC, 2015). India would need cumulative investments of INR 716 lakh crores10 (USD 10.1 trillion) to significantly scale up the climate transition and achieve Net-Zero emissions by 2070 (CEEW, 2021).

Linkage among climate, green and sustainable finance

Green finance is one of a number of terms used to describe activities related to the two-way interaction between the environment and finance and investment. It has become a familiar expression over the last decade, partly due to the creation of many national green investment banks and a rapidly growing green bond market. But green finance is closely associated with related concepts, such as climate finance and sustainable finance. A good description of what each refers to is given by the United Nations Environment Programme:

- **Sustainable finance** includes environmental, social, governance and economic aspects.
- **Green finance** includes climate finance but excludes social and economic aspects.
- **Climate finance** is a subset of environmental (green) finance. Sustainable finance is therefore the broadest term, covering all financing activities that contribute to sustainable development.

There are several green and sustainable finance instruments, including:

- **Green bonds:** These bonds are issued by corporations, governments, or organizations that are committed to environmental sustainability. The proceeds from green bonds are used to fund projects that are environmentally friendly, such as renewable energy, clean transportation, and green buildings.
- **Green loans:** These loans are a prominent way to finance projects that are beneficial to the environment.
- **Green equity:** This type of equity is for investors who want to support companies that have sustainable models.
- **Debt-for-nature swaps:** These swaps can help address the issues of debt and environmental degradation in the Global South.
- **Impact investing:** This type of investing is a significant force that is helping to steer private capital towards sustainable development.

• **Sustainability-linked instruments:** These instruments can vary based on whether the issuer or borrower meets their ESG goals. For example, a bond's coupon rate may increase if the issuer doesn't meet its ESG goals.

• **Blue bonds:** These bonds are used to fund projects that are based on water and oceans and that have positive environmental benefits.

Conclusion

Climate change refers to a long term shifts in temperature and weather patterns. It is a single big threat facing humanity, adverse climate harming health through air pollution, extreme weather events, and so on. In sustainable economic and financial development, green finance become as a global concern. All the nations are concerned about change of environment and environment pollutions. For more sustainable development we need i) to identify the possible green projects and verify them weather they are green financing or not, ii) finance to generate less waste, recycle waste into composts or other articles projects, iii) increase finance in all green projects, iv) awareness creation at grassroots level among rural populace is necessary, v) set up of green projects and facilitate replication, vi) plant trees were ever possible, viii)encourages developers to build green buildings, ix) finance in eco-friendly products, x) micro finance to be increased to produce green produce green products with very low interest rate, and xi) finance in rain water harvesting and solar lights and other renewable energy sources. In this paper green financing is discussed in detail and try to show that it is essential for the development of a country. Global warming is creating various problems in the world. Scientists and environment expert believe that it is due to greenhouse gas emissions. This study stressed that green financing will reduce greenhouse gas emissions significantly. Thus, it can be concluded that India has a great potential to create a green infrastructure needed for green finance by overcoming the barriers and creating awareness among the corporate citizens for more sustainable development. We hope in near future green finance will be popular in all societies of the globe.

References

Akomea-Frimpong, I., Adeabah, D., Ofosu, D., & Tenakwah, E. J. (2022), A review of studies on green finance of banks, research gaps and future directions, Journal of Sustainable Finance & Investment, 12(4), 1241-1264.

Al-Sheryani, K., & Nobanee, H. (2020), Green Finance: A Mini-Review. Available at SSRN 3538696.

Andreeva, O. V., Vovchenko, N. G., Ivanova, O. B., & Kostoglodova, E. D. (2018). Green finance: trends and financial regulation prospects. In Contemporary Issues in Business and Financial Management in Eastern Europe, Emerald Publishing Limited

Arkhipova, V. (2017). "Green Finance" as Recipe for Solving Global Problems, HSE economic journal, 21(2), 312-332

Azhgaliyeva, D., Kapsalyamova, Z., & Low, L. (2019), Implications of fiscal and financial policies on unlocking green finance and green investment, In Handbook of Green Finance (pp. 427-457), Springer, Singapore

Bal, Y., Faure, M., & Liu, J. (2014). The role of China's banking sector in providing green finance, Duke Envtl. L. & Pol'y F., 24, 89.

Berensmann, K., Volz, U., Alloisio, I., Bak, C., Bhattacharya, A., Leipold, G., & Yang, Q. (2017), Fostering sustainable global growth through green finance–what role for the G20, T20 Task Force on Climate Policy and Finance

Berrou, R., Dessertine, P., & Migliorelli, M. (2019), An overview of green finance, The rise of green finance in Europe, 3-29

Breitenfellner, A., Pointner, W., & Schuberth, H. (2019), The potential contribution of central banks to green finance. Vierteljahrshefte zur Wirtschaftsforschung, 88(2), 55-71

Cai, R., & Guo, J. (2021). Finance for the environment: A scientometrics analysis of green finance. Mathematics, 9(13), 1537

Ermakova, E. P. (2020). The development of the legal framework for "green" finance in Russia, the EU and China: a comparative legal analysis. RUDN Journal of Law, 24(2), 335-352.

Fedorova, E. P. (2020). Role of the state in the resolution of green finance development issues, Finansovyj žhurnal—Financial Journal, (4), 37-51

Ge, T., Cai, X., & Song, X. (2022). How does renewable energy technology innovation affect the upgrading of industrial structure? The moderating effect of green finance, Renewable Energy, 197, 1106-1114

Gu, B., Chen, F., & Zhang, K. (2021). The policy effect of green finance in promoting industrial transformation and upgrading efficiency in China: analysis from the perspective of government regulation and public environmental demands. Environmental Science and Pollution Research, 28(34), 47474-47491.

Guild, J. (2020), The political and institutional constraints on green finance in Indonesia, Journal of Sustainable Finance & Investment, 10(2), 157-170

Guild, J. (2020), The political and institutional constraints on green finance in Indonesia, Journal of Sustainable Finance & Investment, 10(2), 157-170

Role of M K Gandhi in Women Empowerment in India

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Abstract

Women throughout the world have faced several man-made disabilities in varying degrees through the ages, be it ancient civilizations or medieval or modern. The disabilities like inferiority or subordination, seclusion to domestic walls, deprivation of public spaces, the carrier of assumed bodily purity or chastity, death on the pyre of husband, child marriages, being 'abala', weak, fragile, gate to hell etc. across the cultures. The experience of India also matches such assumptions in different ages. From the higher and independent equity with men in Vedic period through extreme deprivation in medieval period to relatively less shackles in modern period with gradually loosening of it in 21st century. But journey has not been easy one. The lifelong struggles of several socio-religious reformers and thinkers have been the prime denominators for women's upliftment. M K Gandhi is one of them. The present paper enquires the questions like what was Gandhi's approach towards women emancipation; what was the status of women during Indian freedom struggle? How were they encouraged to participate in freedom struggle? What role did women actually play under Gandhi's leadership? How it can help the women to take greater part in current socio-economic and political activities etc.

Keywords: women empowerment, freedom struggle, socio-religious reforms, Gandhi and women, Satyagraha, women emancipation, abala vs sabala, gender equality

Introduction

Although women issues like gender equality, gender justice, share in policy/decision making etc. have gained prominence during last few decades world over, the initiative to inculcate women into public life in its modern connotations had prominently taken place during our freedom struggle itself. In the beginning, the process of women empowerment took place through socio-religious reform movements. Social thinkers, reformers and philosophers like Rajaram Mohan Roy, Ishwarchand Vidya Sagar, Ramkrishna Paramhansa, Vivekananda, Swami Dayananda saraswati etc. devoted their life to erode the malpractices of several evils like Sati, child marriage, polygamy, devadasi etc. from Indian society. Later on, with the advent of M. K. Gandhi on the theater of Indian national movement, the scope of women activities and empowerment expanded to political sphere through their active participation in political movements, processions, demonstrations etc. M K Gandhi differed significantly from the social reformers of the 19th century regarding the instrumentality of women in the freedom struggle to bring about new social order. Therefore, he insisted on the close relations between public and private life and bringing women to the public forum through their participation in freedom struggle. However, he could not apprehend that the oppression of any section of society including women depends more on the history of socio-economic conditions than moral positions. Although, he reiterated that women originally belonged to home, he succeeded to create conditions in which women could break the shackles of domesticity.

The concept of women empowerment is a modern and comprehensive one. It encompasses almost every aspect of human life which is important for her all round development such as social, political, economic, religious, cultural, identity, freedom of thought and expression, education, health, reproduction etc. More importantly, today women empowerment is considered to result in development of all, society as well as individuals related to her. "When woman, whom we call abala becomes sabala, all those who are helpless will become powerful"[1]. This significantly reflects the deep conviction of Gandhi about the freedom and strength of women and as a creator of a humane and exploitation free society. He believed that women are not only the object for any purpose, no matter how pious, but moreover a self conscious arbiters of their own destiny. This is also how he differs from 19th century reformers notion of women as passive recipient than active enlightening agents of their own life. They do not need the pity and effort of any enlightened male, rather they themselves to be awake and strive for their self-set destination.

The socio-political and personal spheres of life are inextricably linked with each other. Gandhi realized this only when he got indulged in people's mobilization for freedom struggle through peaceful methods. He saw that hitherto overlooked and domesticated women could become a significant force for peaceful Satyagraha and endurance. This opinion about women's strength was facilitated by his personal life style, socio-cultural and emotional environment where he did not make any difference between public and private appearance of women. It was also added by his experiments regarding the new types of relations between women and men.

Social and moral empowerment: During modern period in Indian history, women were suffering from various kind of socio-religious and cultural disablements. Their position in society was largely that of servitude, though several social reformers were engaged in uplifting them by disseminating the awareness about the true nature and dictates of socio-religious texts. They opposed the degrading customs of polygamy, purdah, child marriages, sati etc. and worked relentlessly for widow remarriage and establishing educational facilities for women, to persuade governments to enact favorable legislations for women. Gandhi took two fold stands to uplift the women from their secondary social position. First, he opines that moral upliftment of women is foremost necessity. Second, socio-political inclusion of women in public affairs must follow but in tune with tradition. "It is good to swim in the waters of tradition, but to sink in them is suicide!'[2] These words of Gandhi, in a way, sum up his entire social, political philosophy and technique of mass action. It is nowhere more apparent than in the use that he made of traditional Indian symbols to convey a contemporary social-political message. Sita, Damyanti and Draupadi were the three ideals of Indian womanhood that Gandhi repeatedly invoked as inspirations for the downtrodden women of India. But Sita or Draupadi of Gandhi was not the commonly accepted lifeless stereotype of subservience. They were symbols versatile enough to incorporate the qualities that he chose to endow them with. In fact, sometimes, he tended to overburden the symbols with meanings they were ill-equipped to carry. For example, Sita was used as a symbol of Swadeshi, to convey an anti-imperialist message. Sita only wore "cloth made in India" or homespun, and thus kept her heart and body pure.[3] Gandhi rightly realized that it was more a matter of psychological fear and helplessness, culturally imposed upon women by society, than physical weakness which kept women crippled. His constant message to them was that bravery and courage were not the monopoly of men. "Let no one dismiss the example of Sita as legendary ... It was that higher type of valour which he wanted Indian womanhood to cultivate ... women in our country was brought up to think that she was well only with her husband or on the funeral pyre. He would far rather see India's women trained to wield arms ... than that they should feel helpless."[4] But arms, for Gandhi, were a symbol of one's weakness. The real strength of a woman was her consciousness of her 'purity' and 'chastity'. This 'dazzling purity' could disarm even the most beastly of men.[5] In fact, according to Gandhi, Hinduism's essential postulate was the absolute freedom of every individual, man or woman, to do whatever he or she liked for the sake of self-realization, for which alone every human being was born.

To those who argued that the political struggle ought to have primacy over everything else, he answered: "To postpone social reform, till after the attainment of Swaraj, is not to know the meaning of Swaraj'[6] Gandhi had designed his strategy and chosen his particular forms of struggle very consciously and deliberately so as to encourage this: "My contribution to the great problem [of women's role in society] lies in my presenting for acceptance of truth and ahimsa in every walk of life, whether for individuals or nations. I have hugged the hope that in this woman will be the unquestioned leader and, having thus found her place in human evolution, will shed her inferiority complex"[7].

Gandhi pronounced that women also have to play their part in the journey of their emancipation. They cannot play dolls or decorative objects at the hand of men. Rather, women must assert themselves in every sphere of life like men did for themselves. It will make their presence felt at both national and global levels. Gandhi insists on the inviolability of the personal dignity and autonomy of women. She had the right to say 'No' even to her husband. "I want woman to learn the primary right of resistance. She thinks now that she has not got it"[8]. The woman has the right to her own body which she does not surrender for a lifetime with marriage. However, this view is intimately linked with his view of a noble woman as a sexless being and legitimate sex as only that which is meant for the purpose of procreation.

Child marriage and widowhood: In Gandhi's view, one of the glaring abuses of Indian womanhood was the custom of child marriage. He saw this evil as intimately related to that of child widow-hood. "It is irreligion, not religion, to give religious sanction to a brutal custom" and by countenancing them '"we recede from God as well as Swaraj"[9]. Thus, the oppression of women was linked to social and national health. He opined that the age of marriage should have been raised to 16 to 18 in place of 14 under Sharada Act. "A woman should have the same freedom to remarry 'without incurring any odium' as men had"[10]. Gandhi asserted that a high number of widows in a society where a serious threat to its existence and smooth survival. It was like "sitting on a mine which may explode at any moment"[11].

However, Gandhi favoured a repressive asceticism to a healthy assertion of life. He saw 'voluntary enlightened widowhood' as a great social asset and believed that "a real Hindu widow is a treasure. She is one of the gifts of Hinduism to humanity[12]." This was because a Hindu widow had "learnt to find happiness in suffering, has accepted suffering as sacred"[13]. Her suffering is not suffering but is happiness. However, no matter how repressive this may seem, Gandhi wanted men to emulate the same ideal of pleasure in suffering. He was very much convinced that men must accept the enlightened suffering like women to make Hinduism perfect religion. Gandhi seems to have been very influential in moulding the personal aspirations of many a woman, who came into the national movement, away from marriage. His Sita obsession notwithstanding, the message that emerges most forcefully from his speeches, conversations and writings is that while marriage has to be tolerated as a social necessity, it is neither desirable nor ennobling. He held up many of those women as role models who stepped out of the confines of marriage, like Mirabai, to devote themselves to a higher cause. Gandhi opposed the husband's complete control over wife because he believed that role of women in society is neither subordinate nor less important. For example, he termed any attack on family as 'hysterical exaggeration'.

Dowry: Gandhi vehemently attacked the discriminatory and exploitative tradition of dowry. He used to say that it would be better if girls live unmarried life in place of being disrespected and humiliated by men. "If women wanted to resist these evil customs, some of them will have to begin by remaining maidens either for life, or at least for a number of years"[14]. This message greatly influenced the freedom movement. When the movement was in full swing, the workers and leaders of Congress started a new type matrimonial ceremony called 'Gandhi Lagan'. It promoted and stood for simple and traditional ritual free marriages, wherein the bride and groom would exchange the garlands and the relatives and friends would simply bless them for a happy married life. The claps and blessings would be the only gifts for the new family.

Gandhi saw education as an essential means which could make women understand their rights and exercise them wisely and work for their expansion. Still, he believed that women could give their life a definite purpose or direction even without having the basic literacy. And their illiteracy or less education does not authorize men to deprive women of their equal rights in every sphere of life and development. The liberation of women, therefore, was set as a fundamental task before Congressmen: "Let Congressmen begin with their own homes"[15]. He called upon Congressmen that the women reform must begin from home- the wives, mothers, sisters and daughters. They should believe that the freedom is the natural entitlement of an individual. The women must be liberated through education from the evil customs and conventions that restrict their all-round healthy development.

Untouchability was another sphere for the women to play an important role for its eradication. "If the Hindu heart is to be cured of the taint of untouchability, women must do the lion's share of the work"[16]. Gandhi considered the occasion of freedom struggle as great opportunity for 'self-purification' by women through their greater capacity of renunciation and penance. He regarded it as their duty towards depressed classes and society. His call for the collective effort to remove untouchability met with several organizational responses. He exhorted that the sanitary service cannot be the basis of seclusion and deprivation because every mother does it for her children. And no one considers her or his mother as untouchable. So, dualism for personal and social platforms cannot be accepted as social norm.

He exhorted women to connect the concern for their emancipation with that of other oppressed and deprived people. Thus, by directly linking women's aspirations with national aspirations, he gave the freedom movement a wider perspective and a greater legitimacy. Women were not to confine their concerns only to what are normally seen as women's issues but have a say in the rebuilding of the whole society. For that, he insisted that "the few educated women we have in India will have to descend from their western heights and come down to India's plains to with the questions of liberation of women, liberation of India, removal of untouchability, amelioration of the economic condition of the masses and the like resolve themselves into penetration, into the villages, reconstruction or rather reformation of the village life"[17]. The untouchability had been a black spot on the face of humanity. Its existence and practice upon the women belonging to depressed class symbolized the insane double exploitation and suppression vehemently opposed by Gandhi.

Political empowerment: The politics is the most powerful tool for the socio-economic and political reconstruction and development in the entire history of humanity. Therefore, the equal share in political space for women will significantly improve the marginal condition of women and in turn the condition of state itself. The political space for women should not be available legally only as the Constitution of India has done but the more important factor is the attitudinal change of society, especially the male and dominant segments. The attitude change can effectively rationalize the age-old outdated rituals, beliefs, and disabilities etc. of socio-cultural spheres and offer women a more respectable, humane, and egalitarian dignified life conditions. It was this conviction of Gandhi which made him moved for the inclusion of hitherto excluded women into mainstream politics of national independence.

Gandhi sensed the power and potential of women for the first time in Africa during the agitation against the Black Act in 1913. He saw that women have sufficient leadership qualities for the

Satyagraha not because of bookish knowledge but due to their faith in humanity and sufferings of life they went through, the strength and endurance. The Satyagraha in Africa succeeded due to huge moral force they brought to it. Gandhi was quick to learn this lesson: "Many of our movements stop half way because of the condition of our women. Much of our womenfolk do not yield appropriate results; our lot is like that of the penny-wise and pound-foolish trader who does not employ enough capital in his business"[18].

M K Gandhi adopted the similar strategy in India during Non-cooperation movement. He asked women to join the national freedom struggle along with their struggle for gender equality in India. Their role was devised in such a way that they could contribute to national struggle for freedom and perform their domestic duties at the same time. The non-cooperation included the boycott of government institutions such as colleges, law courts and legislatures etc. on one hand and on the other it had the constructive works like wearing khadi and spinning charkha for cotton cloths. Therefore, women were not required to come out of households but they could significantly contribute to the national cause while staying at home. This political space and opportunity for women with the safety of home added a new and original flavor to their lives, a kind of missionary objective to their largely monotonous lives. "The restoration of spinning to its central place in India's peaceful campaign for deliverance from the imperial yoke gives her women a special status. In spinning they have a natural advantage over men. Spinning is essentially a slow and comparatively silent process. Woman is the embodiment of sacrifice and therefore, non-violent. Her occupations must therefore be, as they are, more conducive to peace than war"[19].

This remarkable insight of Gandhi for women helped significantly to expand the mass base of national movement. Moreover, it did not disturb the traditional role for women in India. So, without creating any social structural upheaval, Gandhi succeeded to win the favor of both men and women equally for freedom struggle. Same way, he also burdened the students and peasantry to link their aspirations with the national aspiration of political freedom to be peacefully. "The economic and the moral salvation of India thus rest mainly with you. Because Khadi was seen as a symbol of self-reliance and regeneration, it seemed to provide solutions to various problems. I swear by this form of Swadeshi, because through it I can provide work to the semi-starved, semi-employed women of India. My idea is to get these women to spin yarn and to cloth the people of India with Khadi woven out of it”[20].

There were few pragmatic reasons also to make women part of Swadeshi movement. Gandhi knew very well that any movement could not succeed if its womenfolk remain indifferent and passive. They were important tools to fight communalism and ensuring national integration through individual Satyagraha in every house. “If you are convinced that the Hindu-Muslim unity is a sine qua non, I ask you to use against your own countrymen the same weapon of Satyagraha that you used so effectively against the government”[21]. The salt Satyagraha marked a new high watermark of women's participation in the movement. Salt is one of the cheapest of commodities which every woman buys and uses as a matter of routine, almost without thought.

Hundreds of women accompanied Gandhi during Dandi March coming from mostly villages and poor families. Ofcourse, the role of Kasturba cannot be denied because she also joined hands with M K Gandhi by leading 37 women volunteers for the abolition of salt tax imposed by British as a symbol of unjust law. Sarojini Naidu along with Manilal raided the Dharsana Salt Works and Kamla Devi led a raid on Wadala Salt Works with more than 1500 people. Many women volunteers carried lotas of water from the Chowpatty beach to make salt at home, and many others went out onto the streets selling this contraband salt at fancy prices.

Several other women wanted to play greater and direct role at par with men in the famous Dandi March. They requested Gandhi to allow them to cover all the distance from Ashram to Dandi as part of core group of dissenters. They demanded the active political roles now, and not the supporting roles only along with taking care of family. Gandhi saw it as healthy sign for national cause but asked women to be patient enough and stick largely to picketing of liquor and foreign cloth shops. He was convinced about the innate capacity for non-violence of women. He believed that if in place women, men were involved in picketing of cloths and liquor shops, the act would turn in violence and imperial rule would get a genuine cause to crush the uprising national spirit which was largely peaceful. So did happen during non-cooperation movement. "Drink and drugs sap the moral well-being of those who are given to the habit. Foreign cloth undermines the economic foundations of the nation and throws millions out of employment. The distress in each case is felt in the home and therefore by the women'[22]. Again, their personal lives and problems were shown to them as being linked with the national cause. Moreover, this agitation of picketing was to be "initiated and controlled exclusively by women. They may take and should get as much assistance as they need from men, but the men should be in strict subordination to them"[23].

There was a ban on women's participation in the Salt Satyagraha. But on the request and insistence of Durgabai and other women leaders of Congress, the doors were opened up by Gandhi ji. The women took it very enthusiastically and disobeyed the salt law throughout India. Thousands of women took part in it. Their opportunity for participation in the Satyagraha also ensured their entry into future politics for once and all. Their activism provided them a new prestige and status in the eyes of men. It also compelled the Congress to adopt the policy of gender equality in Karachi Session, 1931 irrespective of socio-economic and educational status.

Quit India Movement: Women, especially school and college girls actively participated in the movement. Names of Aruna Asaf Ali, Sucheta Kriplani, and Usha Mehta etc. are significantly associated with underground activities for the movement. They led the movement when male leadership of Congress was put into jail. Usha Mehta operated an underground nationalist radio station to communicate with the masses and disseminate revolutionary and patriotic ideas of jailed leaders. They raided several governmental edifices, mobilized people significantly and made the running of administration paralyzed.

Gandhi had given the women a new sense of self perception, the pride and power so that they cultivated the self-confidence of facing men eyes into eyes. Brailsford observes that the movement would have been worthwhile even "if it had done nothing more than emancipating women"[24] Thus, Gandhi converted successfully the traditional Indian women into a momentous political tool for attaining the national interests of independence and social unification. Many women leaders like Sarojini Naidu and Annie Besant surfaced on the political sea under the influence of M K Gandhi. Sarojini Naidu was in fact elected as the president of Congress in 1925 after Gandhi himself in 1924. Later on, a separate women wing of Congress was started to look into women issues and advise the party in policy formulation towards women.

Economic Empowerment: Gandhi was very keen to ensure equal economic rights to women. The stree-dhan had sources like personal ornaments, gifts from parents and husband, share in maternal property, share in husband's property, income from their own economic activities like spinning and weaving the Khadi etc. Addressing the Gujarat Hindu Stri Mandal, Gandhi said that "spinning and weaving were for women the first lesson in the school of industry"[25]. While for the middle class women the charkha would supplement the income of the family, for poor women it was a means of livelihood. Further, "the spinning-wheel should be, as it was, the widows' loving companion"[26].

For the educated women coming from rich families, Gandhi regarded the spinning of Charkha as the performance of their dharma which would significantly connect them with the thousands of poor women. Khadi was expected to be a linking thread for women of different ranks and file. Sarla Devi Chaudharani was very enthusiastic and used to wear the khadi sari even in the parties. She traveled the country popularizing the khadi Sari. Gandhi used to call her as a modern woman who symbolized the model of self-sacrifice, determined for the national freedom. Gandhi, by insisting on necessity of Charkha and Khadi, intended to bring every home, even the remotest, to the fold of national freedom and nationalism. That is how the spirit of freedom struggle could be imbibed by the ordinary men and women.

Although he envisaged the equal economic rights for women, but he was not in favour of women doing heavy physical labour like men. He believed in the natural physical division of women and men and accorded the division of labour correspondingly. That is, women's body is not made for hard physical work outside the household. However, the women's body is more capable and suitable for the management of household affairs like child rearing, giving emotional support to male relatives in times of crises etc. For Gandhi, works done by women at home are no less important. They have in fact more value because they make men capable of doing outside works. So, he offers a natural division of labour and asks women to accept it willingly. He is also convinced that this natural division of suitability never makes men and women unequal or men superior and women inferior. It's just the matter of 'compatible mutuality' between men and women for smooth and happy family life.

Gandhi recommends the equal economic rights for women, but he did not support women for spending the 'streedhan' by their arbitrary will. Rather, they must spend it in consultation with father or husband, especially in the crisis period. Further, he says that the real ornaments of women are not the gems and jewelry or any other valuable belonging, but the purity of heart and deeds. So, unnecessary affection to external belongings would invite pain and impurity for women.

Hurdles: Though Gandhi is generally regarded as the liberating face of women during freedom struggle, he is not free from criticisms. They are as under:

Despite all the efforts and appeals to the women by Gandhi and his associates, less than expected number of women came out to take part in the freedom struggle. And most of active women belonged to the middle class urban families. The rural women participated in phases and with new vigour and aggression. Gandhi believed that the grassroot reconstruction of polity and rural economy was necessary. Therefore, he gave a clarion call to Congress workers to work tirelessly for the purpose. He also requested the urban and educated women to join the hands with their rural sisters. He himself traveled through the depth and width of the country for one to one communication with people, majority of Congressmen did not do the same. Even the active urban women went to the villages with their male relatives only, otherwise not. These dedicated women were very few in number and therefore less effective for the national cause. His call for women's activism often met with male rigidness. Gandhi realized soon that the economic dependence and pressure of socio-cultural bonds were the reasons for their detrimental attitude and inability to participate. Apart from the paucity of urban activists, rural women also could not develop them into full time dedicated volunteers under the contextual and family belief systems.

The middle class women in towns and cities also participated occasionally, mainly in picketing foreign cloth and liquor shops, distributing the pamphlets, joining local meetings and demonstrations etc. Active involvement in Congress activities was confined to a few outstanding women such as Sarojini Naidu, Kamaladevi and Hansa Mehta etc. The policy program of the 'All India Women's Conference' for the 1930s spells out this policy of maintaining a certain apolitical stance. In 1932, Sarojini Naidu succeeded in getting the constitution of AIWC amended which said that it would not directly take part in the party politics or elections but it would actively take part in debate and discussions on issues of common welfare in general and on issues related to children and women in particular. Since then, it has completed a successful long journey for women emancipation and empowerment.

In the quest for striking a balance between tradition and needs of the time, Gandhi did not advocate the equal and independent economic rights for women. His program of Khadi was focused on the helping the family economically, he did not even allow the women to spend the money earned by them for themselves independently. The ownership rights of property were still a distant dream for women which significantly discouraged them for active participation in the movement. This also caused a disinterest in moral development of women. His appeal for participation in the movement out of women's moral consciousness fell on deaf ears as merely a form of lip service for women's empowerment. The ordinary women did not see any hope for change in their material conditions, nor any effective economic roadmap for their upliftment in Gandhian economic conceptions. He also divided the labour in such a way that kept the existing social relations intact, women in domestic fold and men as outside worker. So, the equality at the level of idea was presented as the real one, which women did not digest smoothly. Gandhi should have realized that the exploitation takes place in concrete socio-economic condition and not at the abstract plain.

Gandhi did not envisage any fundamental change in the traditional role-relationship of women. "Even the fact that in rural India, women among the agricultural labourers and small peasants are equally, if not more, involved in the actual production process could not shake Gandhi's belief that the woman might supplement the meager resources of the family, but man remains the main bread-winner"[27]. This he saw as 'the most natural division of spheres of work'. Gandhi saw the motherhood as the quality of women gifted by nature itself, so it should not be expected from men. "She is passive, he is active. She is essentially mistress of the house. He is the bread winner; she is the keeper and distributor of the bread"[28].

Conclusion

The above account of Gandhi's take on women, their role in society and in freedom struggle makes him one of the most influential leader and reformer for women in India. His contributions to the cause of women lay in his absolute and unequivocal insistence on their personal dignity and autonomy in the family and in society. Personal and social experience had convinced him that hitherto "Man has regarded woman as his tool. She has learnt to be his tool and in the end found it easy and pleasurable to be such, because when one drags another in his fall the descent is easy."[29]**.** Though men owed it to themselves to help in the cause of women, but it must be women themselves who could decide what they needed and aspired for and not the men. This conviction of Gandhi indicates his full belief in the capacity of women regarding their issues of life and empowerment.

Gandhi believed from core of his heart that the method of non-violence could play a revolutionary role. It would easily beat the mightiest power on earth making it devoid of its moral power and legitimacy. Further, it would not attract the naked power of imperial government which would be most conducive for volunteers, especially women, for freedom struggle. The programs chosen under it would make women feel equal to men as there would not be any need of muscle power possessed mostly by men. This would also give women a sense of pride ensuing from their traditionally conceived qualities. He regarded the life of women, especially the Indian women, as the personification of suffering and sacrifice. So, her participation in public life must have a purifying impact on her life in terms of liberty, equality and dignity. That is why he called women to be the moral guardians of society, to be well wisher and good doers without looking to the status of men, especially in power and politics. The rivalry of women and men would mark the reversion of barbarity of old times.

His ideas on the life of women and its empowerment, if contextualized in modern globalized world, will invite certain grave challenges from both men and women, especially the feminists. Opposed to him, the modern conceptions of work and its division do not believe in gender difference. It is now universally believed that women at par with men are all capable of doing every work including the works of defense forces, aerospace engineering, entertainment, politics, scientists etc. The focus of life in 21st century has been tilted towards the material well being of women than towards the 'moral and spiritual' development which is against the socio-cultural scheme of M K Gandhi. The woman of 21st century is steadily claiming the greater space for herself in every sphere of life. Her approach to life has changed drastically breaking the traditional shackles to enter the new horizons of development. The traditional roles of caregivers, personification of sacrifice, limited to domestic walls, living under the shadow of male relatives, being the child bearer primarily etc. have all been accommodated to the contemporary socio-political and economic contexts and necessities.

Although the modern social consciousness has advanced very far from the values and beliefs of our freedom fighters, but the initiatives taken and recommended by the Father of Nation also mark significant advancement on the prevalent socio-political and economic values in the first half of 20th century. His call for women's involvement in the peaceful protests, boycott of foreign liquors and clothes, and spinning the Charkha for indigenous cotton clothes etc. have no prior example before him. These steps were the very primary necessities of convincing the traditional society that women indulged in such activities directed towards national independence would in no way challenge the domestic and social fabric, rather they would enhance the family, social and gender cohesion for better life. The women's self perception would rise. Gandhi ji also tried to dissociate women's self from the shadow of men. He encouraged women to have a distinct individual identity but without striking a blow to socio-economic fabric. That is why he used to exemplify the character of Sita as a 'morally independent' woman but staunchly dedicated to the role of responsible daughter, wife, mother and queen. For Gandhi, Sita nowhere flees from her individuality as well as social persona.

Thus, no matter what journey by women today in what direction but the role of M K Gandhi as a path breaking initiator and crusader for women's emancipation, especially in a society full of misconceptions, vices, ill concepts, malpractices towards women in 20th century, cannot be undermined or overlooked. Convergence of the so diverse issues like national freedom, economic development or self-dependence, fight against the divergent social tendencies and practices, narrowing down the gender gap, keeping the social fabric intact and larger unification of Indian society was never an easy task. This could have been made possible only by a stalwart and determined crusader like M K Gandhi, the Mahatma.

References

1. "The Collected Works of Mahatma Gandhi", Volume LXIV, 1936-37, page 165. Navajivan Trust, Ahmadabad, 1982.
2. Navajivan, June 28, 1925. C. W Vol XXVII, page 308.
3. C W Vol. XXVII, page 126. Speech at women's meeting, Mymensingh, May 19, 1925.
4. Harijan, March 1, 1942, C W Vol. LXXV, p 338.
5. Young India, June 28, 1928, cited in "To the Women", op cit, p 217.
6. Harijan, February 24, 1940. C W Vol. LXXI, p 208.
7. Harijan, January 25, 1936. C W Vol. LXII, p 158
8. Young India, August 26, 1926. C W Vol. XXXI, pp 329-30.
9. Young India, September 23, 1926. C W Vol. XXXI, p 443.
10. Young India, August 5, 1926. C W Vol. XXXI, p 264.
11. Young India, August 19, 1926. C W Vol. XXXI, p 314.
12. Navajivan, June 28, 1925. C W Vol. XXVII, p 307.
13. 'Advice to Girl Students'. cited in "To the Women"' op cit, p 120, November 29, 1927
14. Cited in D G Tendulkar, "Mahatma", Publications Division, Vol. 6, p 24.
15. Harijan, March 9, 1934, cited in "The Role of Women", op cit, p 76.
16. Young India, May 23, 1929. C W Vol. XL, pp 417-18.
17. Harijan, December 2, 1939. C W Vol. LXX, p 381.
18. Anima Bose, 'Women in Gandhi's India', India International Center Quarterly, Vol.2 No.4, 1975, pp.280-291
19. M K Gandhi, "Autobiography", p 413
20. Young India, April 10, 1930. C W Vol. XLIII, p 220.

21. M K Gandhi, 'Gandhi and Communal Problems', Compiled and Published by Center for Study of Society and Secularism, 1994, p.17 (https://www.mkgandhi.org/ebks/Gandhi_communalproblems.pdf)
22. Harijan, February 24, 1940. C W Vol. LXXI, p 208.
23. Sampurna Gandhi Wangmaya, Part 43, pp.226-228
24. Madhu Kishwar, 'Gandhi on Women', Economic and Political Weekly, Vol.20, No.40, 05 October 1985, pp.1691-1702
25. Upasana Pandey, 'Arthik Pariprekshya me Stree Shakti', Gandhi aur Stree Shakti (Edt by CK Padia), Center for Women's Studies and Development, BHU, Varanasi, 2007, p 91
26. Ibid
27. Ibid, p.96
28. Ibid
29. Harijan, January 25, 1936, C W Vol. LXII, p 157.

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Online Shopping Trends in Dhanbad District: Insights from Covid-19 Era

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Abstract

The pandemic era emerged as an awful time in and out for everyone. It was the harshest phase as people around were fighting for survival and livelihood. Our country went into complete lockdown from 23rd March, 2020. Almost all factories and services were suspended, economy was deeply affected and the gap of Balance of Payment (BOP) widened. Nothing good was done to anyone except online business. A turning point was observed when people transited from their traditional shopping habit of purchasing from brick and mortar stores to online purchasing. The study focuses on the reasons that forced people to purchase online. It also gives regards to the behaviour of people of Dhanbad towards online shopping. The data has been collected using structured questionnaire through convenience sampling method. 150 individuals were approached of whom 120 valid responses were receivedwhich is about 80% response. Statistical tools were used for data analysis. The analysis incorporates demographic profiling, statistical tools and insights into the motivations behind online shopping. The paper also addresses gaps in existing literature, contributing to a deeper understanding of regional e-commerce trends and the long term implications of this behavioural shift in context of global pandemic. The study also delves into how various e- companies like Flipkart, Amazon, Walmart etc.reaped high gains as their sales grew beyond limits during the pandemic. People relied greatly on online shopping for essential and non- essential goods.

Introduction

The years 2020 add 2021 will be remembered in the history as an awful phase for everyone. Almost all the factories, services, industries, shops, retail and wholesale business underwent complete closure. The spread of VIRUS became life threatening. People lost their near and dear ones, their sources of income, their health and wealth, educational prospects. The economy was deeply affected. Hopelessness prevailed everywhere. However, e-commerce saw huge prospects and prosperity during this time.

A turning point was observed when people transited from their traditional shopping habit of purchasing from brick and mortar stores to online purchasing. This disease forced people to stay home and so no other way was left for them other than online shopping. The most common purchased products were groceries, personal hygiene products, household cleaning products, medicines etc.

The data from Kantar world panel showed that COVID pandemic pushed sales of fast moving consumer goods(FMCGs- food, toiletries, beverages, stationery etc.) online, with an estimate 10.7 million households buying such products between April, 2020 and March, 2022. The penetration of FMCGs as a category in e-commerce stood at 15.6% for 12 months ended April, 2022 up from 10%, a year earlier.

Additional Aspects

Here are some of the factors that show how online shopping became a key part of daily life during COVID-19. Several aspects that can be included to provide a comprehensive understanding are-

- **Adoption of digital platforms for payments**– As online shopping grew, people increasingly used digital payment methods like UPI, wallets and contactless transactions which made payments easy and safe.
- **Challenges for shoppers**- At first, people faced problems like late deliveries, out of stock items and concerns about product quality which affected their trust in online shopping.
- **Use of technology**– E-commerce platforms used technology like smart recommendations, easy to use websites and personalised services to make shopping more convenient and enjoyable.
- **Support for small business**- Many small shops and online sellers started selling online which helped them survive during the lockdown.

- **New shoppers-** People from rural areas and older generations, who really shopped online before, started using e-commerce during the pandemic.
- **Change in brand loyalty-** Online platforms gave shoppers more options, encouraging them to try new brands instead of sticking to their usual ones.

Reasons that forced people to buy goods and services online-

- Restricted mobility
- Stores working under definite hours.
- People embracing social distancing.
- People minimising stayingout.
- Closure o retail shops.
- Avoiding time wastage by standing in long queues.
- Offers provided by websites.

Significance of Online Shopping During Covid-19-

The Covid-19 pandemic drastically transformed consumer behaviour, making online shopping a crucial alternative to traditional retail. With lockdowns, movement restrictions and social distancing measures in place, physical access to markets and stores became severely limited. In this scenario, online shopping emerged as a vital solution enabling people to fulfill their needs while adhering to safety protocols.

Online platforms played a key role in ensuring access to essential goods, such as groceries, medicines and hygiene products, at a time, when physical stores were either closed or overcrowded. The convenience of ordering products from home, combined with features like contactless delivery and digital payments provided a sense of safety to consumers. This shift also reduced unnecessary physical contact, helping curb the spread of the virus.

For businesses, particularly, small and medium enterprises e-commerce served as a lifeline, allowing them to continue operations and connect with customers digitally. Moreover, the pandemic accelerated digital literacy as individuals previously unfamiliar with online shopping began to adopt it out of necessity.

In essence, online shopping not only addressed immediate challenges posed by the pandemic but also transformed consumer habits, highlighting its role as a resilient and effective solution during times of crisis.

E-commerce in India and its staggering growth during COVID-19

Opposing slow economic growth and spiral inflation, e-commerce explosively grew in India at a rate of 88% in 2013 to $16 billion. Some famous online stores gained huge profits.Amazon reaped high gains as its sales grew beyond limits. It was infact unable to meet the growing demand for grocery, hosiery and other essential products. Jeff Bezos (founder of Amazon.com) himself exclaimed this statement. Walmart, another largest company created great wealth during the pandemic. The grocery, health and wellness categories were standout.

As one of the India's leading e-commerce platforms, Flipkart saw a substantial increase in user engagement during the pandemic. The platform surpassed 1.5 billion visits per month, with a 45% growth in monthly active users and a 30% increase in transactions per consumer (Wikipedia). Specialising in fashion and lifestyle products, Myntra achieved significant technological and financial milestones under CEO Nandita Sinha. The company became EBITDA – positive and recorded a 25% revenue growth, despite a 31% increase in losses (Vogue Business).

As a prominent online grocery delivery service, Big Basket experienced asurge in demand during the pandemic, with consumers increasingly turning to online platforms for essential purchases. The platform's growth contributed to the expansion of quick commerce (q-commerce) market in India, which is expected to grow 10 to 15 times over the next five years to touch $ 5 billion(Wikipedia).

Scope of the study

This study explores the perception of people towards online shopping during COVID-19 in Dhanbad district, a region with both urban and semi urban population. It focuses on understanding changes in consumer behaviour, common factors influencing online shopping adoption, challenges such as limited digital literacy, delivery delays and Internet issues. The study analyses responses across various demographics including age, gender and income level to provide localised insights into preferences, trust, satisfaction with e-commerce platforms. The findings aim to assist e-commerce companies and policymakers in improving the digital infrastructure and addressing consumer needs in semi-urban areas. This research also serves as a basis for future studies on post pandemic shopping behaviour in similar districts.

Literature Review

The Covid-19 pandemic brought unprecedented disruptions to daily life forcing people to adapt to new ways of fulfilling their needs. Online shopping emerged as a vital tool during lockdowns, providing access to essential goods and services while minimizing physical contact. Research also highlights key factors influencing online shopping including convenience, safety, time savings and variety. However, challenges such as delivery delays, product quality concerns and digital illiteracy remain significant barriers particularly in semi-urban areas.

1. Claudia Andruetto et al. (2021) titled " Transition from physical to online shopping alternatives due to Covid-19 pandemic" examines the shift from physical to online shopping during the pandemic, highlighting the factors influencing this transition. It highlights the driving factors including health concerns, convenience and lockdown restrictions. E- commerce became a critical alternative during the crisis, reshaping consumer habits.(arXiv)
2. A paper journaled "Online shopping behaviour during COVID-19 pandemic: An Indian Perspective (2021)" by Amit Ranjan, Madhvendra Misra,Dr.Jitendra Yadav.It explores the main components determining consumer behaviour towards online shopping during COVID-19. The study also examines challenges such as limited digital literacy and delivery delays in rural areas. It includes the trust in platforms, product availability and digital accessibility which played a crucial role in shaping consumer preferences, emphasizing the need for improved infrastructure to support e-commerce in semi-urban and rural regions.(SSRN)
3. A study by Rashmi Sharma (2021) titled "Expansion in Online Shopping Trend during COVID-19 Pandemic in East Singhbhum District of Jharkhand" (IOSR Journals) highlights the advantages of online shopping during the pandemic, such as safety, convenience and access to a wider range of products. These benefits

led to a significant increase in online adoption in the region. While this study focuses on east Singhbhum, Its findings are relevant to understand consumer perception in neighbouring towns like Dhanbad district.

4. A study by Ali Rizwan, M. Syed and James Chitra (2024) titled " Challenges faced by consumers in Online Shopping During Covid-19" in B-Research identifies several obstacles faced by consumers during era of corona. It includes delivery delays, product quality concerns, cybersecurity threats and limited digital literacy, particularly in semi-urban regions like Dhanbad district. Such challenges have hindered the seamless adoption of online shopping despite its increased necessity during COVID-19. (Semantic Scholar)

5. Research on e-commerce during covid-19 reveals significant shifts in consumer behaviour. A study by Supriyo Ghose et al.(2020) in International Journal of Management found that discounts and offers positively impacted online shopping in India during the pandemic (ashwinanokha.com). Globally, an IMF working paper by Bo Li et al.(2022) reported that the share of online transactions in total consumption increased more in economies with higher pre-pandemic e-commerce shares, increasing the digital divide across economies(eLibrary.imf.org). These studies highlight the accelerated adoption of e-commerce and challenges of digital inequality during the pandemic.

6. "Covid-19 Impact on Online & In-store Shopping Behaviours" by J Lee and S Lee, Journal of Retailing and Consumer Services (2022). This research examines the shift from physical stores to online shopping during the pandemic, highlighting factors such as perceived health risks and changing consumer attitudes.

Objectives

The current study aims to analyse the consumer behaviour ofDhanbad towards online shopping during COVID-19. It mainly studies:

- Perception of people towards online shopping during pandemic
- Impact of COVID-19 on online shopping.

Research gap

Many studies have been conducted on factors influencing people to purchase online during COVID-19 but all of them have majorly been conducted on other states and cities of India. The state Jharkhand and the district town Dhanbad has remained untouched. This study aims to cover the perception of people of Dhanbad towards online shopping especially with reference to COVID era i.e. 2020 to 2021.

Research Methodology

The studies descriptive and exploratory in nature, the subject matter were researched in India but we have tried to get a greater insight into the topic especially with reference to Dhanbad. Structured questionnaire consisting of close ended questions has been used. The source of data is mainly primary. However, information has also been sought through secondary sources such as journals, articles, reports etc. The sampling method used is convenience because of lack of much resources.The questionnaire was sent via Google link in Google form. Out of 150 people, 120 individuals responded properly with fully completed questionnaires. The respondents ensure that they used Internet on regular basis during COVID-19.

Discussion and Interpretation

The analysis of data focuses on understanding demographic influences such as occupation, age group, gender and educational status, how these factors shape preferences, challenges and opportunities related to online shopping. By analysing the responses from a diverse group of participants, the study aims to uncover trends, behavioural patterns and perceptions regarding online shopping in Dhanbad. This will contribute to understanding how the pandemic has accelerated digital adoption and its implications for future of e-commerce in the region.

Table 1. Demographic Distribution of Respondents

Categories	Subcategory	Frequency	Total
Occupation	Service people	33	**120**
	Business	5	
	Students	82	

Age-group	15-25	51	**120**
	25-35	47	
	35-45	11	
	45 and above	11	
Gender	Female	58	**120**
	Male	62	
Educational Status	School Students	35	**120**
	College Students	54	
	Professionals*	31	

Professionals* refer to individuals who are either working all have completed higher education but are not currently students.

The demographic distribution of respondents highlights diverse backgrounds. Occupation wise 33were service professionals, five were business professionals and 82 were students.In terms of age, majority fell within the 15-25 age group (51), followed by 25-35 (47), 35-45 (11) and 45-60 (11). Gender distribution was fairly balanced with 58 females and 64 males. Educational status revealed 35 school students, 56 college students and 31 professionals or graduates.

The distribution provides a well-rounded representation, capturing a mix of age groups, gender, occupation and educational levels, allowing for a comprehensive understanding of online shopping behaviour during COVID-19.

Table 2. Online Shopping Behaviour During Covid-19

Category	Subcategory	Frequency	Total
Product type	Essentials	71	**120**
	Non-Essentials	9	
	Both	40	
Online Shopping (Yes/No)	Yes	100	**120**
	No	20	
Frequency during Covid-19	Daily	7	**120**
	Weekly	16	
	Fortnightly	7	
	Monthly	90	
Frequency during Normal days	Daily	1	**120**
	Weekly	16	
	Fortnightly	18	
	Monthly	85	

1. **Product Category-** Essentials were the most purchased (71 respondents) reflecting priority for basic needs during the pandemic. Non essentials were minimally bought (8 respondents) indicating reduced discretionary spending. Both essentials and non essentials were purchased by 43 respondents showing a balanced approach among a segment of shoppers.
2. **Online Shopping (Yes/No)-** A vast majority (100 respondents) adopted online shopping during COVID-19, showcasing the shift towards digital platforms. Only 20 respondents refrained likely due to lack of access or preference for traditional shopping.
3. **Frequency during Covid-19-** Monthly shopping dominated (90 respondents) highlighting planned, bulk buying behaviour. Weekly purchases (16 respondents) showed moderate dependency, while daily and fortnightly shopping (7 respondents) reflected urgent or occasional needs.
4. **Frequency during Normal days-** Monthly shopping remained consistent (8 respondents) pre and during the pandemic, showing minimal change in long term habits. Weekly and Fortnightly buyers (17 and 18 respondents respectively) demonstrated similar patterns across both periods. Daily shopping dropped from 7 during pandemic to 1 in normal times, indicating a shift to more structured buying during covid 19.

Table 3. Reasons for online purchases during COVID-19

Reasons	Males	Females	Total
Maximize staying out of residence	17	29	46
Practicing social distancing	27	27	54
Closure of retail shops	11	12	23
Avoid time wastage	9	12	21
Offers attracted them	13	10	23
Ease in selection	18	14	32
Home Delivery	22	33	55
Fear of formal penalties	01	02	03
Shopping Accessibility all the time	16	21	38
Delivery time duration being less	05	04	09
Wants of products couldn’t be postponed	03	04	07

- **Top reasons for online purchases:** Home delivery was the most preferred reason, chosen by 55 people (22 males, 33 females). Practising social distancing was the second most significant factor, selected by 54 individuals equally divided between genders.
- **Gender specific Trends:** Females showed higher preferences for reasons like maximise staying out of residence (29 females versus 17 males) and home delivery (33 females versus 22 males). Males leaned slightly more towards reasons like easein selection(18 males versus 14 females).
- **Least cited reasons:** Fear of formal penalties (3 totals) and delivery time duration being less (9 total) were the least cited reasons for online purchases during COVID-19.
- **Overall Insights:** The data reflects that safety (social distancing and avoiding physical shopping), convenience (home delivery, ease in selection) and accessibility were the primary drivers for online shopping during COVID-19. Both genders displayed similar patterns overall, but females appear to value convenience and safety related factors slightly more.

This analysis highlights how the pandemic reshaped consumer preferences, emphasising the need for safety and convenience in shopping practises.

Limitations

The studies geographically limited to Dhanbad district and may not be generalizable to the other regions. The sample size of 120 respondents may not fully represent the entire population. The data collection faced constraints such as limited access of respondents and excluded those without Internet access.

Findings

The research reveals significant insights into the perception of online shopping in Dhanbad during COVID-19:

1. **Increased online business**- Online shopping surged manifold during the pandemic, as website owners like Jeff Bezos struggled to meet growing demands particularly for FMCGs.
2. **Gender differences**– Men were found to shop online more frequently and spend a larger share of their income compared to women, indicating that they are more techno-savvy.

3. **Key motivators**– Factors like minimising stay out time, practising social distancing, retail shop closures and home delivery significantly influenced online shopping behaviour.

4. **Consumer preferences-** Convenience, safety and availability of essential products were pivotal in driving online purchases.

5. **Impact on Local Retailers**- The rise of online shopping led to a significant shift in the local retail market. Many small retailers inDhanbad struggled to retain their customers, while some adapted by listing their products on e-commerce platforms finding you avenues for growth during the pandemic.

6. **Trust in online Platforms-** Consumers inDhanbad initially faced trust issues regarding quality of products and timely deliveries. However, as e-commerce platforms improved their logistics and consumer services, trust among consumers gradually increased, leading to repeated purchases.

7. **Technological Barriers**- Despite the growth in online shopping, some consumers particularly in rural areas of the district, faced challenges due to lack of familiarity with digital tools, limited Internet access and smartphone usage which acted as barriers to full adoption.

These findings provide a broader perspective on the perception and behaviour of people towards online shopping in Dhanbad during the pandemic.

Suggestions

To improve online shopping experiences, efforts should focus on increasing digital literacy, especially among women to reduce the gender gap in technological use. Online retailers should enhance their delivery systems and logistics to meet a growing demand efficiently. Localised marketing strategies can cater to specific needs of regions like Dhanbad, making production services more relevant. Building trust through secure transactions and reliable deliveries is essential to ensure customer satisfaction. Additionally, supporting local businesses to transition to online platforms can boost the local economy and create healthy competition in the online marketplace, benefiting both consumers and sellers.

References

I. Yadav, J. (2021) "Online Shopping Behaviour During Covid-19 Pandemic: An Indian Perspective." International Journal of Research and Analytical Reviews (IJRAR) Source: Research Gate
Link: www.researchgate.net/publication/353057164

II. Kumar,S. &Ayedee,N. (2021) "The impact of Covid-19 Pandemic on E-commerce: A Study of Indian Consumers" Journal of Management Research
Source: IMI Bhubaneshwar
Link: jim.imibh.edu.in/

III. Sharma, R. (2020) "Expansion of Online Shopping Trend during COVID-19 Pandemic in East SinghbhumDistrict of Jharkhand" International Journal of Advanced Research, Source: Research Gate
Link:www.researchgate.net/publication/343057164

IV. Rizwan, A.& Sayed, M. (2020) " Challenges faced by Consumers in Online Shopping During Covid-19" Journal of Electronic Commerce in Organizations
Source: IGI Global
Link: www.igi-global.com/gateway/article/278152

V. Chitra, J. (2020) "Transition from Physical to Online Shopping Alternatives due to Covid-19 Pandemic" Journal of Retailing and Consumer Services
Source: Elsevier
Link:www.sciencedirect.com/science/article/abs/pii/S096969892301058

VI. Aggarwal, B. & Kapoor, D. (2021) " A Study on Influence of Covid-19 Pandemic on Customer's Online Buying Behaviour" MDIM Business Review
Source: MDI Murshidabad
Link: www.mdim.ac.in

VII. Statista Research Department (2021) "Impact of COVID-19 on E-commerce in India" Statista Report
Source: Statistics
Link: www.statista.com

VIII. "Understanding the Covid-19 Effect on E-commerce in India" (2021) DesignNBuy Blog
Source: DesignNBuy
Link: www.designbuy.com/blog

Cyber Security Challenges and Risk Mitigation Strategies in the Digital Economy: An Analytical Study

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Abstract

In the dynamic digital economy, technological advancements offer unprecedented opportunities but, it is also expose to organizations to diverse cybersecurity challenges. This study delves into the intricate web of digital threats, emphasizing the strategic importance of cybersecurity due to the escalating dependence on digital assets. From data breaches to advanced seamless threats, the digital landscape poses risks extending beyond finances to reputational damage. Organizations respond with comprehensive risk mitigation strategies, from security awareness training to Artificial Intelligence (AI)-driven threat detection. The study utilizes secondary data to assess the evolving threat landscape, highlighting the Reserve Bank of India's (RBI) role in shaping cybersecurity frameworks, with a focus on payment vision 2025, DAKSH initiative. The research proposes innovative solutions like advanced threat detection and blockchain to fortify and identifying regional specializations in Indian digital ecosystem. This research advocates a collaborative and adaptive approach for the security and resilience of digital ecosystems.

Keywords: Cyber Security; Digital Economy; Risk Mitigation Strategies; Innovative Solutions

Introduction

In the rapidly evolving landscape of the digital economy, the fusion of technology and commerce has begun the unprecedented opportunities, transforming the way businesses operate globally. As organizations leverage digital platforms, cloud computing, and emerging technologies to enhance efficiency and innovation, they are simultaneously exposed to a myriad of cybersecurity challenges. This analytical study delves deep into the intricate web of cybersecurity challenges prevalent in the digital economy and meticulously explores the multifaceted strategies employed to mitigate these risks. The digital economy, characterized by the pervasive use of digital technologies in all aspects of business, has become a driving force behind global economic growth. With the advent of Industry 4.0, AI and the Internet of Things (IoT), businesses are interconnected and data-driven, fostering unparalleled connectivity and innovation. However, this digital transformation has brought forth a new frontier of vulnerabilities that threat user, posing significant challenges to the security and integrity of digital ecosystems.

In the digital economy, a critical concern arises from the escalating dependence on digital assets. Organizations handle extensive sensitive information within digital infrastructures, encompassing customer data, financial records, and intellectual property. This study aims to unravel the diverse cybersecurity challenges organizations face in this realm. From the looming threat of data breaches to the insidious nature of ransomware attacks and the persistence of advanced threats, the digital landscape is fraught with peril. These threats extend beyond financial consequences, encompassing reputational damage and legal repercussions.

The data breaches, once sporadic, now target organizations of all sizes and sectors, posing financial risks and eroding customer trust. Ransomware has evolved into a sophisticated criminal enterprise, employing advanced techniques for financial gain. The rising tide of APTs compounds the challenge, with state-sponsored actors and cybercriminal groups using stealthy tactics to compromise high-value targets. Understanding these challenges requires an in-depth exploration of the contemporary threat landscape.

In response to the pressing cybersecurity challenges, organizations are compelled to implement comprehensive risk mitigation strategies. This study explores the multifaceted approaches adopted by organizations to safeguard digital assets and fortify cybersecurity defences. The spectrum of risk mitigation strategies encompasses proactive measures and reactive responses, reflecting the dynamic nature of the digital threat landscape. Proactive initiatives include security awareness training and robust network security measures. Reactive strategies involve the development and implementation of incident response plans, fostering a collaborative ecosystem through threat intelligence sharing.

The study delves into the transformative role of AI and machine learning, bringing about a paradigm shift in threat detection and response. This research provides valuable insights for organizations and policymakers, advocating for a proactive, adaptive, and collaborative approach to ensure the security and resilience of digital ecosystems.

Objectives

1. To study the cybersecurity challenges in the digital economy to identify threats and vulnerabilities.
2. To evaluate the effectiveness of current risk mitigation strategies for addressing security concerns.
3. To comprehend the innovative solutions to enhance cybersecurity and reduce risks in the digital economy.

Methodology

This research employs a secondary data methodology to analyse "Cybersecurity Challenges and Risk Mitigation Strategies in The Digital Economy." Gathering information from existing scholarly articles, RBI's reports, and relevant publications, the study aims to comprehensively understand the landscape of cybersecurity challenges. It systematically reviews available data to identify prevalent threats, assesses the effectiveness of existing risk mitigation strategies, and evaluates the role of technologies like AI and machine learning. This analytical approach provides valuable insights into fortifying the digital economy against evolving threats, offering a comprehensive understanding derived from a curated collection of existing knowledge in the field.

Cyber Security Challenges in the Digital Economy: Identifying Threats and Vulnerabilities

In today's interconnected world, the digital economy is crucial for global business, providing conveniences, efficiencies, and innovations. However, it poses formidable cybersecurity challenges, leading to financial losses, reputational damage, and privacy breaches in various types of fraud, as described in mentioned Table

1.1. Globalization complicates cybersecurity, necessitating international cooperation. A shortage of cybersecurity professionals limits defence capabilities, while persistent social engineering attacks require comprehensive education programs for mitigation.

Crooks are taking advantage of flaws in online payment methods, which have grown in popularity in recent years. Fraudsters have also improved their ability to avoid detection by law enforcement. "Fraudsters often upgrade their skills and use innovative methods to steal people's hard-earned money."

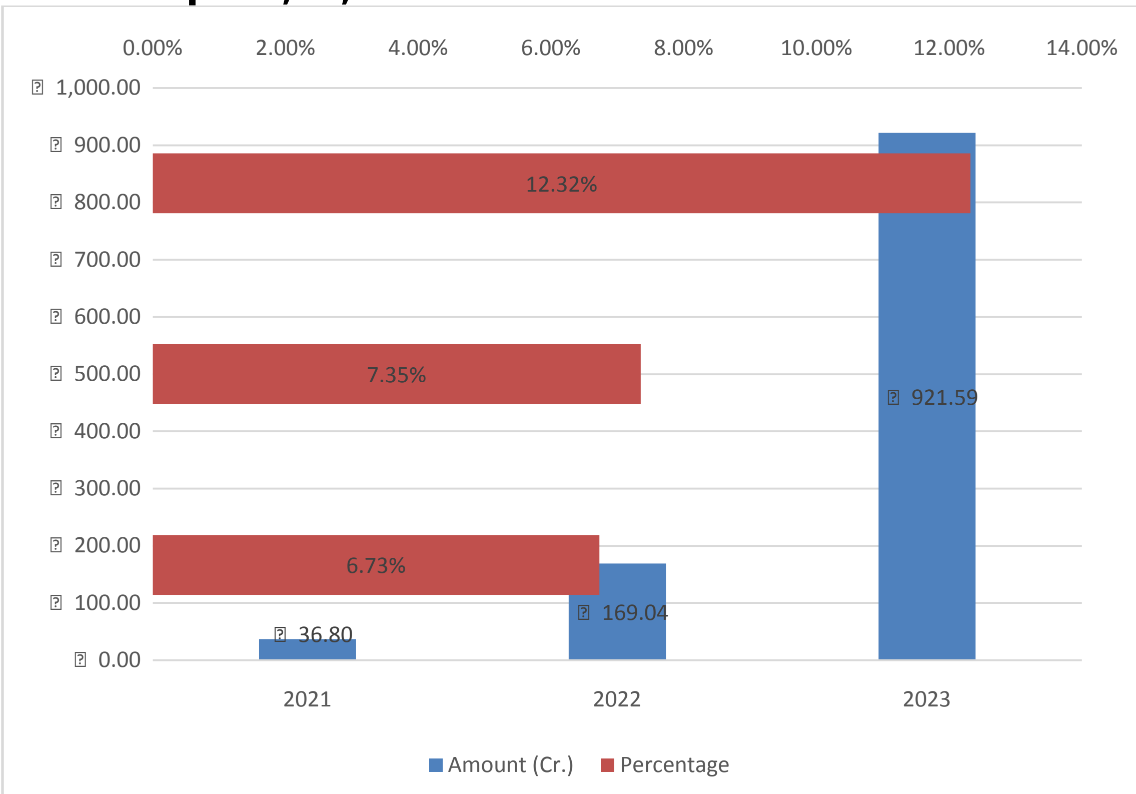
Table: 1.1: Types of Cyber Frauds in Indian Banking Sector

➢ Email Compromise	➢ Email Takeover	➢ Internet Banking
➢ Sim Swap Fraud	➢ Debit & Credit Card Fraud	➢ UPI Related Frauds
➢ Demat-Depository Fraud	➢ E-Wallet Related Fraud	➢ Vishing

Source: https://economictimes.indiatimes.com/news/india/cyber-crimes

Delhi Police has a central cyber unit IFSO (Intelligence Fusion & Strategic Ops) in addition to one cyber police station in each district. Cops maintain that they are constantly uncovering and closing loopholes. This, however, has not resulted in much relief. In many cases, conmen masquerade as customer service representatives, bank officials, family, friends, security people, and so on, and induce victims to reveal One Time Passwords (OTPs), according to police records. They even impersonate law enforcement officers and target people by intimidating them with false cases.

Figure: 1.1: Per Capita Cybercrime Reporting and Recovery: Incidents per 1,00,000 Citizens



Source: https://www.hindustantimes.com/india-news/delhi-records-highest-per-capita-cyber

The recovery of defrauded funds in India has shown a positive trajectory over the years, indicating strides in addressing cybercrimes. In 2021, efforts resulted in the recovery of 6.73% of defrauded money, amounting to □36.38 crore. Subsequent years witnessed a notable increase, with recovery rates reaching 7.35% (□169.04 crore) in 2022 and a significant surge to 12.32% (□921.59 crore) in 2023 as described in Fig: 1.1. This progress can be attributed to the National Cybercrime Reporting Portal (NCRP), inaugurated in August 2019, which has become a focal point for reporting cybercrimes. The portal has seen over 3.26 million complaints since its launch, leading to the registration of 66,000 First Information Reports (FIRs). Notably, almost half of these complaints, totalling 1.56 million, were registered in 2023 alone.

The integration of the Crime and Criminal Tracking Network and Systems (CCTNS) with the NCRP has played a pivotal role in streamlining the process. An impressive 99.9% of police stations, encompassing 16,597 stations across the country, are covered by CCTNS. In these stations, 100% of FIRs are digitized, providing a wealth of data crucial for leveraging machine learning, data analytics, and artificial intelligence in combating cybercrimes. A staggering 289 million police records have been digitized onto CCTNS, facilitating interstate linkage of cybercriminals through the National Automated Fingerprint Identification System (NAFIS), which has successfully integrated 1,05,80,266 records.

To counteract cybercrime, authorities, including law enforcement agencies and the Department of Telecommunications (DoT), initiated the blocking of International Mobile Equipment Identity (IMEI) numbers in 2023. This strategic move aimed to prevent cybercriminals from accessing the telecom network using existing devices, resulting in the blocking of 46,229 IMEI numbers. Additionally, the Indian Cyber Crime Coordination Centre (I4C) took action against 2,95,461 SIM cards between July and December 2023. Notably, 1,29,000 SIM cards belonged to one Telecommunications Service Provider (TSP), 89,000 to another, and over 72,000 to a third.

Although specific TSPs were not named, hotspots for the sale of such Subscriber Identity Modules (SIMs) were identified in Odisha, West Bengal, and Assam. Under Section 69A of the Information Technology (IT) Act, the I4C also blocked 2,810 websites, primarily phishing sites, and 595 mobile apps deemed "against economic and national interests." Addressing the communication and financial channels exploited by cyber fraudsters is a key strategy in preventing cybercrimes. The collaborative efforts of the Department of Telecommunications, Ministry of Electronics and Information Technology, RBI, and banks have been instrumental in executing this strategy.

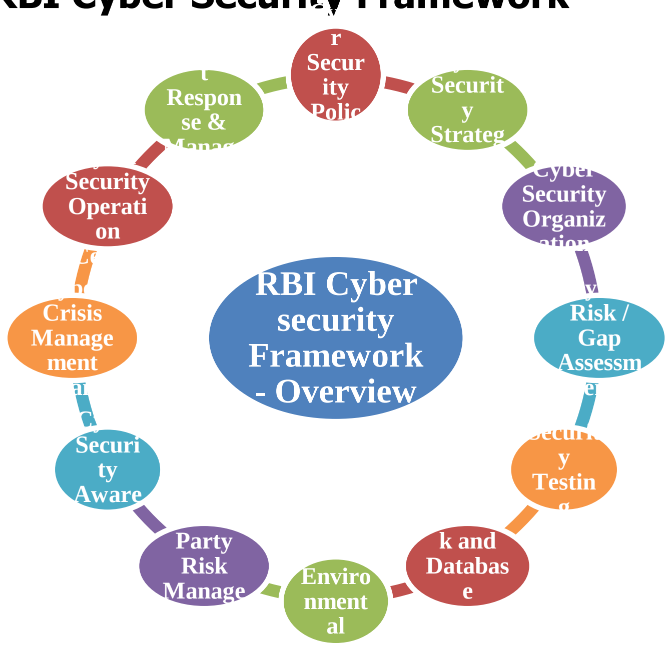
Further analysis reveals regional specializations in various types of online frauds across different states. For instance, Jharkhand, Bihar, and West Bengal account for 35% of cyber frauds related to false customer care numbers, fake refunds, and Know Your Customer (KYC) expiry. Haryana, particularly in Nuh, Bharatpur, Alwar and other areas, is identified as a hotspot for online sextortion scams, constituting 24% of such cases. This region also accounts for 22% of online booking, fake franchisee, Quick Response (QR) code-based frauds, including prevalent (On-Line Exchange) OLX and e-commerce scams. Tamil Nadu has its specialization in frauds related to call centers and SIM boxes, highlighting the diverse landscape of cyber threats across different regions in the country.

Therefore, the analysis of cybersecurity challenges in the digital economy underscores the imperative of identifying threats and vulnerabilities. Recognizing the multifaceted nature of cyber risks is pivotal for developing effective mitigation strategies. This study has provided valuable insights into the evolving landscape, laying the foundation for proactive measures to enhance the security posture of the digital economy. The identification of specific threats enables stakeholders to prioritize resources and implement targeted solutions, fostering a resilient and secure digital environment. Continued vigilance and adaptation to emerging threats will be crucial for sustaining the integrity and trustworthiness of the digital ecosystem.

RBI Cyber Security Framework: An Overview

The circular "Cyber Security Framework in Banks" issued by the RBI serves as a comprehensive guide for Indian banks to enhance and implement advanced cyber defence capabilities which described below with the help of circular chart in Fig: 1.2.

Figure: 1.2: RBI Cyber Security Framework



Source: https://valuementor.com/en-in/rbi-cyber-security-framework

The RBI aims to ensure that banks are equipped with the necessary tools and strategies to address evolving cyber threats, fostering a secure and resilient banking environment in the digital age. This multifaceted framework delineates a strategic roadmap for banks in India to fortify their cyber defences, acknowledging the dynamic nature of digital threats. The following components outline a detailed approach to the implementation of this framework:

1. **Cyber Security Policy:** A foundational step involves formulating and adopting a comprehensive cyber security policy, providing a clear framework for subsequent strategic initiatives.
2. **Cyber Security Strategy:** Aligning with business objectives, a tailored cyber security strategy is crafted, ensuring a cohesive integration with the overarching security policies and organizational goals.
3. **Cyber Security Organization:** Establishing a dedicated cyber security function is imperative, delineating roles and responsibilities for the implementation, management, and continuous improvement of cyber defence measures.
4. **Cyber Risk / Gap Assessment:** A meticulous assessment of cyber risks, aligned with the Cyber Security Framework requirements, is conducted to identify gaps and inform strategic planning.
5. **Security Testing:** Rigorous security testing, including penetration testing of systems, applications, and networks, is executed to uncover vulnerabilities, followed by the formulation of robust mitigation plans.
6. **Network and Database Security:** Critical examination and enhancement of network and database security configurations are undertaken to minimize potential attack vectors and fortify system integrity.
7. **Physical & Environmental Security:** Implementing controls for physical and environmental security ensures that information assets are safeguarded against unauthorized access or compromise.
8. **Third Party Risk Management:** Identifying critical third-party relationships, such as vendors, facilitates a comprehensive assessment of risks introduced through these associations.

9. Cyber Security Awareness: Recognizing the human element in cybersecurity, extensive education initiatives are undertaken to raise awareness among employees, contractors, and customers, reducing the likelihood of human errors.

10. Cyber Crisis Management Plan: Aligning with guidelines from Computer Emergency Response Team (CERT-In), RBI Cyber Security Framework (CSF), and the national cyber crisis management plan, banks establish crisis management plans to respond effectively to cyber incidents.

11. Cyber Security Operation Centre: The establishment of a dedicated Security Operations Center (SOC) equipped with sophisticated monitoring tools ensures proactive surveillance for prompt threat detection and response.

12. Incident Response & Management: Define an incident response and management process, coupled with established reporting mechanisms, facilitates the prompt notification of cyber security incidents to regulatory authorities.

In adhering to the "Cyber Security Framework in Banks," the meticulous implementation of these twelve components underscores a holistic and strategic approach to cybersecurity in the banking sector.

RBI Rules for Cyber Security in Financial Institutions

Cyber security regulations for financial institutions, as stipulated by the RBI, have become increasingly crucial in light of the integration of data and technology within the banking sector. While technology offers convenience, it also brings about the risk of cybercrime. The market value of cybersecurity in banking reached $38.52 billion in 2021 and is projected to grow at a compound rate of 22.4% by 2029. In response to the changing landscape and the inadequacy of the existing framework, the RBI took action, prompted by Indian banks reporting 248 data breaches in 2022, accounting for 20% of the global total. Recognizing the need for an updated IT governance and cybersecurity framework, the RBI released a draft of new IT guidelines in October 2022, followed by the notification of the master direction on 'Information Technology Governance, Risk, Controls, and Assurance Practices' on November 7, 2023.

This directive is set to take effect from April 1, 2024, and applies to all RBI-regulated entities, excluding local area banks and Non-Banking Financial Company (NBFC)-core investment companies. The master direction outlines procedures and frameworks for strategic alignment, risk management, resource management, performance management, and business continuity/disaster recovery management.

Additionally, RBI must appoint a senior-level executive as the 'chief information security officer' with no direct reporting relationship with the head of the IT function. Disaster recovery drills for critical information and backup data are also recommended on a semi-annual basis. The RBI has expanded the responsibilities of the boards of regulated entities, emphasizing the need for periodic reviews related to IT, information assets, business continuity, information security, and cyber security. The audit committee will now oversee the information system audit of regulated entities.

Cyber Incidents Reporting

In the event of cyber incidents, regulated entities are obligated to report details to the RBI, the board, senior management, customers, and CERT-In. Although the guidelines do not explicitly outline penal provisions, any non-compliance with the master direction may lead to penalties under Section 46 of the Banking Regulation Act, 1949. Aligned with the Digital Personal Data Protection Act, 2023, the master direction aims to eliminate the threat of data breaches and enhance cybersecurity. Consequently, regulated entities, whether handling cybersecurity in-house or through outsourcing, need to make substantial investments in cybersecurity and IT resources. Despite the immediate costs, the long-term benefits include increased customer confidence, financial stability, data privacy, robust cyber resilience, a strengthened brand reputation, and the institutionalization of good practices.

RBI's Payments Vision 2025 and Enhanced Oversight through DAKSH initiative

In pursuit of realizing the Payments Vision 2025, the Reserve Bank is actively consolidating and expanding its efforts in enhanced outreach, customer centricity, cyber security, and digital deepening. Anchored in the principles of integrity, inclusion, innovation, institutionalization, and internationalization, these measures aim to propel India's payment systems to new heights. Future priorities include a continued focus on innovation, customer protection, and a heightened emphasis on inclusion and internationalization. The UPI's scope is set to broaden, enabling payments from pre-sanctioned credit lines, while the migration of the cheque truncation system to 'One Nation One Grid' promises a unified approach. The Reserve Bank envisions extending payment systems outreach globally, fostering cross-border payments and remittances through linkages with fast payment systems, reminiscent of the successful UPI-PayNow linkage with Singapore.

Furthermore, a significant development is the migration of payment fraud reporting to DAKSH, the RBI's Advanced Supervisory Monitoring System. Effective January 1, 2023, DAKSH not only facilitates bulk upload reporting of payment frauds but also introduces features such as maker-checker facility, online screen-based reporting, information requests, alert/advisory issuance, and the generation of dashboards and reports. This integration signifies a proactive approach to strengthen oversight, ensuring a resilient and secure financial ecosystem in line with the forward-looking Payments Vision 2025.

Evaluating Effectiveness: Current Security Risk Mitigation

The RBI serves as a key repository of data, offering valuable insights into the effectiveness of measures deployed to address security concerns. This analysis aims to assess the current state of risk mitigation in the Indian digital economy, utilizing these data as a prime source:

1. **Cybersecurity Challenges in the Indian Digital Economy:** India's digital transformation has led to increased interconnectivity, efficiency, and innovation. However, it has also given rise to a myriad of cybersecurity challenges. From data breaches to ransomware attacks, malicious actors exploit vulnerabilities in digital systems, posing threats to individuals, businesses, and the government.

2. **Analysing RBI's comprehensive Database:** It's provided a wealth of information on digital transactions, cybersecurity incidents, and regulatory measures. By scrutinizing these datasets,

we can identify patterns, trends, and potential areas of improvement in the current risk mitigation strategies:

- **Incident Analysis:** Examining RBIinformation on cybersecurity incidents allows us to quantify the frequency and nature of threats faced by the Indian digital economy. Understanding the types of incidents, such as phishing attacks or payment frauds, provides insights into the evolving tactics employed by cybercriminals.
- **Regulatory Compliance:** The RBI implements and updates regulations to enhance cybersecurity measures. Analysing compliance data helps evaluate the extent to which organizations adhere to these regulations. Assessing regulatory compliance is crucial in determining the overall resilience of the digital ecosystem.
- **Financial Impact:** RBI facts can shed light on the financial consequences of cybersecurity incidents. By quantifying the losses incurred by businesses and individuals due to cyber threats, we gain a comprehensive understanding of the economic impact, guiding the assessment of the effectiveness of risk mitigation strategies.
- **Evolving Threat Landscape:** Continuous monitoring of RBI statistics enables us to track the evolving threat landscape. Understanding the emergence of new threats provides insights into the adaptability of cybercriminals and highlights areas where risk mitigation strategies may need reinforcement.

3. **Evaluation of Risk Mitigation Strategies:** With a foundation established through RBI facts analysis, the evaluation of risk mitigation strategies becomes more nuanced:

- **Effectiveness of Existing Measures:** Assessing the impact of current risk mitigation strategies involves examining their success in preventing, detecting, and responding to cyber threats. RBI facts can be leveraged to measure the reduction in incidents and financial losses attributed to these strategies.
- **Gap Analysis:** Identifying gaps in the current risk mitigation framework is crucial for refining strategies. By comparing cybersecurity incidents against the implemented measures, we can pinpoint areas where improvements or additional safeguards are needed.

4. **Proposing Innovative Solutions:** Armed with insights from the analysis of RBI statistics, the next step involves proposing innovative and practical solutions to enhance the cybersecurity posture of the Indian digital economy. Recommendations may include advancements in technology, increased collaboration between stakeholders, and the implementation of cutting-edge security measures.

The study contributes valuable insights to fortify the digital ecosystem against evolving threats. The collaborative efforts of regulators, businesses, and individuals are essential in achieving a resilient and secure digital future for India.

Innovative Solutions for Cybersecurity Enhancement in the Digital Economy

Focused on proactive strategies, the research seeks to contribute insights that can fortify the digital ecosystem against evolving threats:

1. **Advanced Threat Detection Technologies:** Incorporating cutting-edge technologies for advanced threat detection is pivotal in safeguarding the digital economy. Machine learning algorithms, AI, and behaviour analytics can identify anomalous patterns indicative of potential cyber threats. By leveraging these technologies, organizations can detect and neutralize threats in real-time, minimizing the impact of cyber-attacks.
2. **Blockchain for Data Integrity:** The adoption of blockchain technology can revolutionize data integrity and security. Implementing a decentralized and immutable ledger system ensures the integrity of digital transactions, making it challenging for malicious actors to tamper with sensitive information. In the financial sector, for instance, blockchain can enhance the security of transactions, reducing the risk of fraud and unauthorized access.
3. **Zero Trust Security Models:** The traditional perimeter-based security model is increasingly inadequate in the face of sophisticated cyber threats. Adopting a Zero Trust approach involves validating every user and device, regardless of their location within the network. This comprehensive authentication ensures that only

authorized entities gain access, significantly reducing the risk of unauthorized breaches.

4. Collaborative Threat Intelligence Sharing: Establishing collaborative platforms for sharing threat intelligence among organizations, government agencies, and cybersecurity experts is pivotal. Timely sharing of information on emerging threats and attack vectors enables a collective response, enhancing the overall resilience of the digital ecosystem. Public-private partnerships can play a crucial role in facilitating such collaborative initiatives.

5. Cybersecurity Education and Awareness Programs: Human factors remain a significant vulnerability in cybersecurity. Implementing comprehensive education and awareness programs can empower individuals and organizations to recognize and thwart potential threats. This includes training on identifying phishing attempts, understanding the importance of strong passwords, and promoting a culture of cybersecurity vigilance.

6. Regulatory Framework Enhancements: Strengthening the regulatory framework governing cybersecurity is imperative for creating a secure digital environment. Regular updates to regulations, stringent compliance requirements, and swift punitive measures for non-compliance incentivize organizations to prioritize cybersecurity. A robust regulatory environment fosters accountability and ensures that cybersecurity is integral to business operations.

By prioritizing cybersecurity education and awareness, coupled with regulatory enhancements, establishes a holistic approach to risk reduction. By embracing these innovative strategies, India can fortify its digital infrastructure, mitigating threats and ensuring the sustained growth and security of its digital economy. Ongoing collaboration between stakeholders, adaptability to emerging threats, and a commitment to technological advancements are crucial for navigating the dynamic landscape of cybersecurity in the digital age.

Findings and Analysis

The study on cybersecurity challenges and risk mitigation strategies in the digital economy reveals a complex landscape shaped by the rapid evolution of the digital realm. Examining RBI data, cyber incidents surged by 200% in 2023, costing victims ₹168.5 crore. The study underscores the significance of the RBI's cybersecurity framework, effective from April 1, 2024, emphasizing comprehensive measures from incident response plans to third-party risk management. Analysis of existing strategies, guided by RBI data, identifies incident patterns, compliance effectiveness, payment vision 2025, DAKSH initiative and its financial impacts. The study advocates innovative solutions including advanced threat detection, blockchain for data integrity, and collaborative threat intelligence sharing to fortify India's digital resilience.

The recovery of defrauded funds portrays a positive trend, increasing from 6.73% (□36.38 crore) in 2021 to a notable surge of 12.32% (□921.59 crore) in 2023, The NCRP, operational since 2019, played a pivotal role, processing over 3.26 million complaints with a substantial spike of 1.56 million in 2023. The integration of the CCTNS with the NCRP covers 99.9% of police stations nationwide, fostering digitization and aiding machine learning and AI applications. The blocking of IMEI numbers, action against SIM cards, and the blocking of websites and mobile apps under Section 69A showcase a multi-pronged strategy against cybercrime. Regional specialization in cyber threats is evident, with Jharkhand, Bihar, and West Bengal specializing in false customer care number frauds, Haryana in sextortion scams, and Tamil Nadu in call center and SIM box-related frauds. Such insights underscore the need for tailored interventions across states.

Discussion

The integration of the CCTNS with the NCRP emerges as a critical success factor, covering 99.9% of police stations and aiding in machine learning applications. The collaborative efforts against cybercrime, including the blocking of IMEI numbers, action against SIM cards, and website and mobile app restrictions, exemplify a multi-faceted approach. The regional specialization in cyber threats underscores the need for targeted interventions, acknowledging diverse threat landscapes across states. The positive trajectory in the recovery of defrauded funds indicates strides in addressing cybercrimes, with the NCRP playing a pivotal role.

Evaluation of the RBI's cybersecurity framework, payment vision 2025, DAKSH initiative and its financial impacts provides insights into the effectiveness of current risk mitigation strategies.

The study advocates for collaborative, adaptable, and technologically advanced approaches to address the ever-evolving cybersecurity landscape in the digital age.Innovative solutions, from advanced threat detection to blockchain implementation, zero-trust security models, collaborative threat intelligence sharing, and robust cybersecurity education, emerge as proactive measures. The study envisions a resilient digital ecosystem through ongoing collaboration, adaptability, and a commitment to technological advancements.

Conclusion

This analytical study illuminates the intricate challenges and dynamic landscape of cybersecurity in the digital economy, particularly in the context of India. The escalating dependence on digital assets has elevated cybersecurity from a technical necessity to a strategic imperative. The study underscores the multifaceted nature of cyber threats, ranging from data breaches to advanced persistent threats, and their far-reaching consequences, including financial losses and reputational damage. Through a comprehensive analysis of RBI data, the study provides valuable insights into the effectiveness of current risk mitigation strategies. It emphasizes the critical role of the RBI’s cybersecurity framework, set to take effect from April 1, 2024, in fostering a secure and resilient banking environment. The positive trajectory in the recovery of defrauded funds, regional specialization in cyber threats, and collaborative efforts against cybercrime exemplify progress in addressing challenges, while the payment vision 2025 and the DAKSH initiative are instrumental in guiding the trajectory towards enhanced cybersecurity. Moreover, the study advocates innovative solutions, such as advanced threat detection, blockchain for data integrity, and collaborative threat intelligence sharing, to fortify India’s digital resilience. It envisions a proactive and adaptable approach, emphasizing the importance of ongoing collaboration, technological advancements, and a commitment to cybersecurity education for sustained growth and security in the digital age.

References

1. Anish Kumar (2023). Cybersecurity Challenges in Indian Digital Transformation. https://www.techchef.in/blog/cybersecurity-challenges-in-indian-digital-transformation/

2. Sushma Devi (2019), Cyber Security in The National Security Discourse. The Journal of International Issues Vol. 23, No. 2 (Summer 2019 (April-June)), Pp. 146-159
3. Dr. Aparajita Bhatt (2019). Cyber Security and Sustainable Development strategic Policy Analysis of India and Canada. National Law University, Delhi. https://nludelhi.ac.in/pep-fac-new-pro.aspx?Id=50
4. Nandkumar Saravade & Ambuj Bhalla (2018). Emerging trends and challenges in cyber security. https://rebit.org.in/ReBIT/whitepaper/emerging-trends-and-challenges-cyber-security
5. Teoh, C. S., & Mahmood, A. K. (2017). National Cyber Security Strategies for Digital Economy. Journal of Theoretical and Applied Information Technology, Vol.95. No 23.
6. G. Nikhita Reddy & G. J. Ugander Reddy (2014). A Study of Cyber Security Challenges and Its Emerging Trends on Latest Technologies.file:///C:/Users/drmdm/Downloads/A_Study_Of_Cyber_Security_Challenges_And_Its_Emerg.pdf
7. https://economictimes.indiatimes.com/news/india/cyber-crimes-soar-in-delhi-complaints-jump-200-in 2023/articleshow/102741548.cms?from=mdr
8. https://valuementor.com/en-in/rbi-cyber-security-framework/
9. https://www.thehindubusinessline.com/business-laws/rbi-rules-for-cybersecurity-in-financial-institutions/article67647265.ece
10. https://www.wionews.com/technology/cyber-threats-pose-serious-challenges-to-indias-digital-transformation-dreams-648982
11. https://www.pwc.in/assets/pdfs/consulting/cyber-security/role-of-ceos-and-question-they-should-ask.pdf
12. https://www.hindustantimes.com/india-news/delhi-records-highest-per-capita-cyber-crime-complaints-in-2023-101704306414600.html
13. RBI Annual Report 2022-23

Marine Fisheries Sector in Odisha: An Overview

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Abstract

The fishery sub-sector constitutes a significant portion of the primary sector of the Indian economy at both national and regional levels. The present paper is an attempt at a brief and factual presentation of the marine fisheries sector of Odisha and the government policies related to it. The study uses secondary data from sources like the Directorate of Fisheries, the Government of Odisha, the Marine Fisheries Census complied by CMFRI, the Hand Book of Fisheries Statistics, etc. The results indicate that about 76 per cent of the potential MSY is being exploited annually at present. Marine fish production has recorded sluggish growth in recent years, and the export of marine products is almost stagnant, far below the export potential. Lack of cold storage, processing, packaging as well as transportation facilities to reach other markets, adversely affected value addition to the catches. Women accounted for at least half of the workforce in marketing, curing/processing and peeling activities. The existing infrastructure is not sufficient to accommodate all the mechanised boats of the State. To improve the production and condition of fishers, the government and other stakeholders must provide sustained assistance in the form of an efficient management structure, fair procurement practices, and suitable infrastructure arrangements.

JEL Code: Q22
Key Words: Marine fishery, production, processing, handling, export, Odisha

1. Introduction

The fishery sector plays an important role in the Indian economy in terms of providing livelihood, food security, and export earnings through a series of forward (ice plants, old storage, processing, curing yards, transportation, marketing, and other related facilities) and backward (investment, employment, and growth in fishing crafts and gear) linkages. Despite being as ancient as human civilisation, the realisation of its immense potential as a foundation for international trade has been a gradual process over time. Innovation in fishing techniques, developments in harvest and post-harvest infrastructure, growing demand for seafood products in domestic and international markets, and favourable government policies have made the fishery sector witness commendable growth since the 1990s.

Odisha possesses abundant marine water reserves by virtue of its 485 km long coastline along the Bay of Bengal, which accounts for eight per cent of India’s coast length. Of the 30 districts in the state, six are coastal. The continental shelf of Odisha, which extends to a depth of 200 meters, encompasses an area of 24,000 square kilometres, constituting 4.5 percent of India's total continental shelf. These geographical features provide immense opportunities for the development of marine fisheries in the State. According to the Fishery Survey in India, 2015, Odisha has a fisheries potential of 513667 metric tonnes (MT). The State stood fourth in the country in terms of fish production during 2021–22. About 8.06 lakh people in the state rely on marine fisheries, while 8.9 lakh depend on inland fisheries for their livelihoods, accounting for 4 percent of the state’s total population. As per recent estimates, 2.2 percent of the agriculture sector’s contribution to the GSDP was from the fisheries subsector (Odisha Economic Survey, 2022-23). Researchers estimate the MSY of commercially important marine species up to 200 meters depth to be 0.161 MT, with only 76 per cent currently exploited.

However, despite its high potential, the fisheries resources in the State remain underutilised due to excessive dependence on neighbouring States for infrastructure. The production and export of marine fish remain small and unstable. For the sector to achieve its optimum potential, a clear understanding of its dynamics and corrective measures is required.

There are five sections in the paper. The first section is the introduction. The next section spells out the objectives of the study. The third section discusses the database and methodology. The concluding section follows the presentation of the results in the fourth section.

2. Objectives of the Study

The present study seeks to provide an overview of the marine fisheries of the State of Odisha. In tune with it, the specific objectives of the paper are outlined below:

- To study the marine resources and production in the state
- To obtain information about infrastructure facilities in the sector
- To map the socio-economic profile of the coastal fisher folk
- To study the current Marine Fishery Policies of the state

3. Database and methodology

This paper is based mainly on secondary data collected from the Directorate of Fisheries, Government of Odisha, data from the Marine Fisheries Census compiled by the Central Marine Fisheries Research Institute (CMFRI) on behalf of the Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Union Government of India, and the Hand Book of Fisheries Statistics published by the same Department.

The data have been analysed using simple tabular analysis along with rates and ratios, etc.

4. Results and Discussion

4.1. Economic Significance of the Fisheries Sector

The contribution of the fisheries sector to the Gross State Domestic Product (GSDP) is not very significant; however, it serves as an important livelihood option for a bulk of the socio-economically weaker masses. Between 1960–61 and 2022–23, the total share of fisheries in GSDP increased from Rs. 9839 lakh to Rs. 1574400 lakh, while its share in total GSDP increased merely from 0.34 percent to 2.17 percent (Table 1). Though in absolute terms the value of production has been increasing throughout, the proportionate share shows a rising trend up to 2000-01 with a CAGR of 7.16 per cent and a decreasing trend thereafter with a CAGR of 5.80 per cent. This may be attributed to the dominance of emerging subsectors under the service sector in recent years. However, its share in the agricultural GSDP has been steadily increasing over the years.

Table 1: Contribution of Fisheries Sector to GSDP (2014-15 Base)

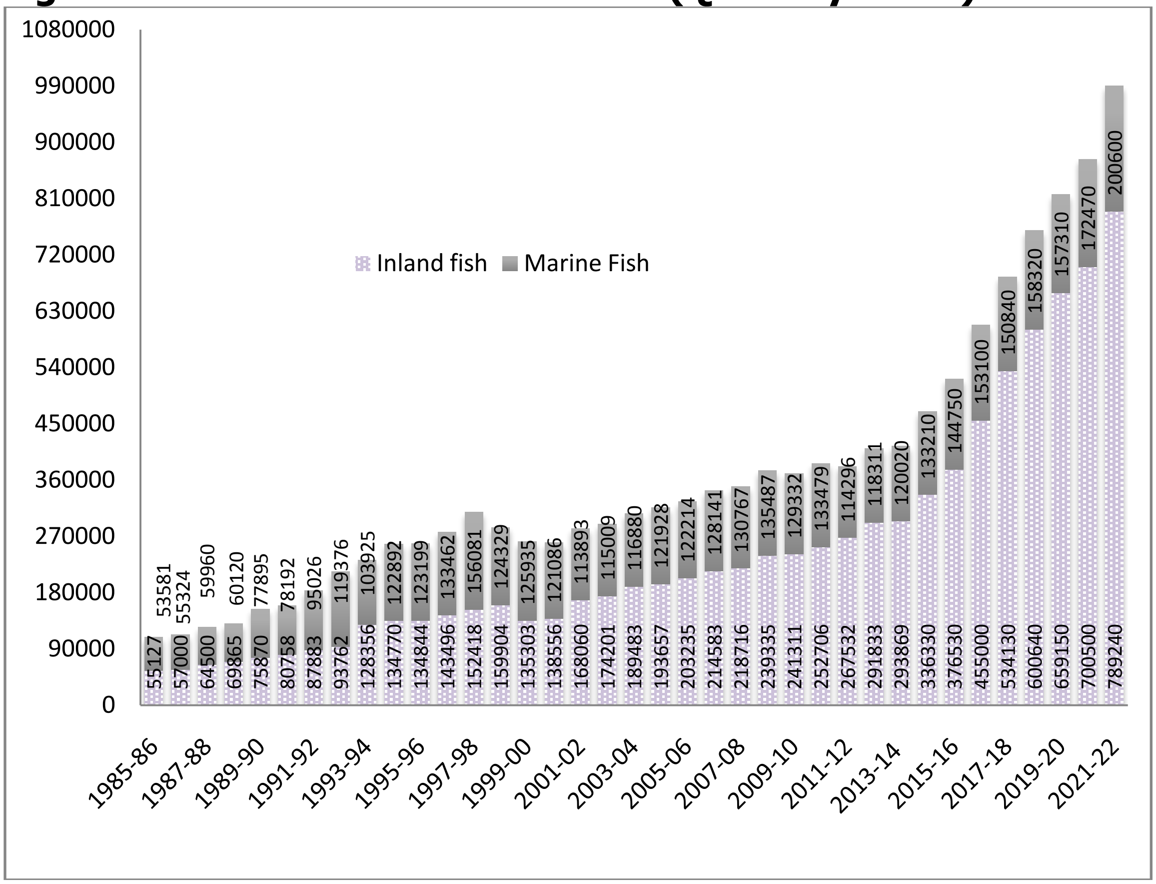
Year	Total GSDP (Rs. in lakh)	Share of Fisheries in GSDP (Rs. in lakh)		% Share of Fisheries in GSDP	
		Agriculture	Fishing	Agricultural GSDP	Total GSDP
1960-61	2892542	1653950	9839	0.59	0.34
1970-71	4244828	2556978	24309	0.95	0.57
1980-81	5360930	2803618	39521	1.41	0.74
1990-91	6893700	2520145	86685	3.44	1.26
2000-01	10350550	2691046	156668	5.82	1.51
2010-11	22214265	3996478	246056	6.16	1.11
2022-23	72492800	14797800	1574400	10.64	2.17

Source: Economic Surveys of Odisha

4.2. Production

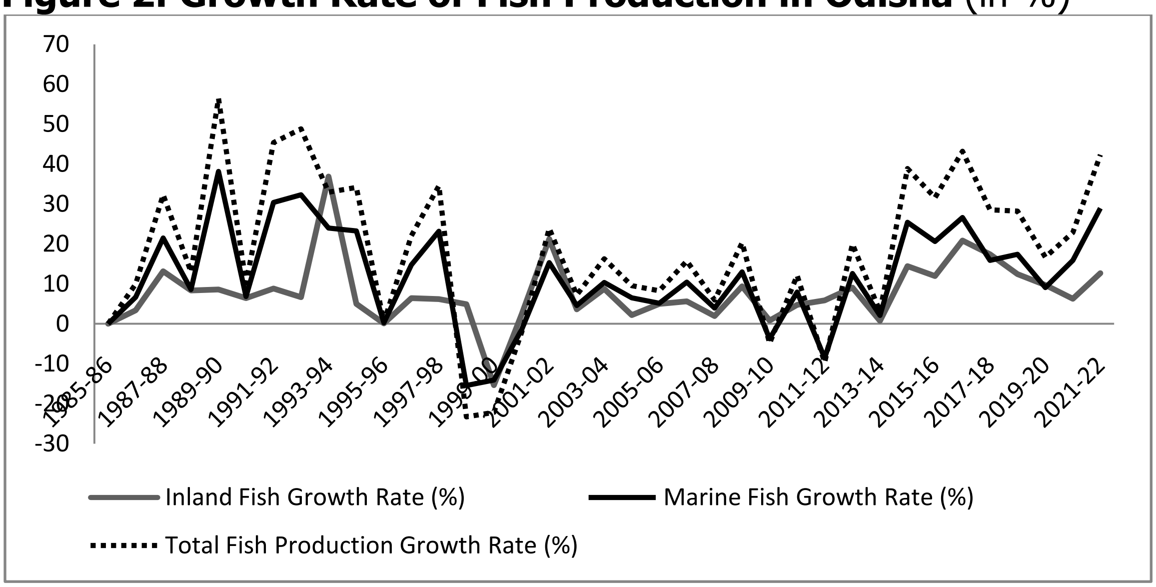
Of the total catch, 49 per cent is quality fish, while the remaining are small and miscellaneous varieties. Odisha contributes approximately 6 percent to the overall fish production in India, thereby securing the fourth position among the States. During 2021-22, Odisha produced 989840 MT of fish, 789240 MT from inland and 200600 MT from marine sources respectively. Marine fish production increased from 53581 MT in 1985-86 to 200600 MT in 2021-22, witnessing a boom till 1997-98, followed by a drop and mostly a sluggish trend thereafter. Inland fish production has been rather consistent and dynamic. Since independence, it has recorded a CAGR of 5.94 per cent, surpassing the rates of total fish production (4.72 per cent) and marine fish production (2.82 per cent). Figures 1 and 2 illustrate these points.

Figure 1: Fish Production in Odisha (Quantity in MT)



Source: Compiled from Economic Surveys of Odisha

Figure 2: Growth Rate of Fish Production in Odisha (in %)



Source: Compiled from Economic Surveys of Odisha

4.3. Handling and Processing

Fishing boats typically undertake one-day or overnight trips. For longer-duration trips, carrier boats ply daily to bring the catch from the fishing sites to the landing centres (open beaches or river banks). To preserve valuable species, the crafts sometimes carry ice on board.

The Department of Fisheries in Odisha estimates that they market 71 percent of the catch in a fresh state, process 22 percent through drying and salting, and preserve 7 percent by freezing. Local vendors distribute the recently marketed fish in local regions, or they transport it to more remote markets via bicycle, lorry, and railway. They pack the fish with ice in baskets, then cover them with leaves and gunny bags.

Fish that cannot be sold fresh are dried using various techniques, like drying without salt, dry salting, wet salting, etc., depending on the species. Consumers prefer certain species, such as ribbonfish, whitebait, silver belly, and catfish, especially in their dried form. Fish drying and curing is an important cottage industry in Odisha's entire coastal belt. The freezing plants primarily handle prawns, which arrive at the landing centres after undergoing deheading and meticulous ice packing. Of India's 367 freezing plants, 21 are located in Odisha with a capacity of about 342 MT per day. The total capacities of the ice plants, cold storage, chill rooms, peeling sheds, and processing plants are 1519 tonnes, 5102 tonnes, 220 tonnes, 125.4 tonnes, and 388 tonnes, respectively.

4.4. Marketing and Pricing

Both domestic and international markets sell marine fish from Odisha. Locals consume about 40% of the catch, with coastal districts accounting for nearly 90% of this consumption. Middlemen transport better-quality fish directly from landing centres to wholesale markets in Cuttack, Berhampur, Bhubaneswar, and Rourkela, where they retail it through a complex network of marketing channels. The participation of middlemen has relatively reduced the involvement of the women of the fishing community, who earlier used to take a lead role in fish marketing, though it still forms a significant part of their livelihood. In Odisha's coastal districts, itinerant women vendors undertake fish vending within close proximity of their habitats, carrying an average headload of 15–20 kg of fish, prawns, and crabs in locally made bamboo baskets. Their daily earnings range from Rs. 100 to 300, yet they are subject to significant fluctuations. Limited mobility due to poor investment capacity, communication facility, perishable nature of the commodity, and seasonal variation in catches seem the pertinent reasons for the wide fluctuations in their earnings. Outside the State marine fish find the biggest market in Kolkata.

In general, the wholesale prices of marine fish in Odisha show an annual rising trend: 10.58 indices for bigger varieties and 8.05 indices for smaller varieties. Balasore district saw the highest rise in annual price indices for big varieties (15.48 per cent), while Ganjam saw the lowest rise (5.20 per cent). All coastal districts except Ganjam, i.e., Balasore, Bhadrak, Kendrapara, Jagatsinghpur, and Puri, record higher trend values than the state average. Balasore district exports a major portion of its marine catch, leading to excess demand over supply and the highest price rise among all coastal states.

The marine fish market in Odisha records the lowest price for big categories of fish in March (97.21) and the highest price for small categories of fish in April (97.63). The price analysis of the Odisha marine fish market reveals a lack of a consistent price cycle, likely due to the presence of numerous middlemen. Since local consumption accounts for only a small portion of the total catch, the middlemen primarily dictate prices to the fishermen at various stages of marketing, and the State Government appears to lack control in this regard.

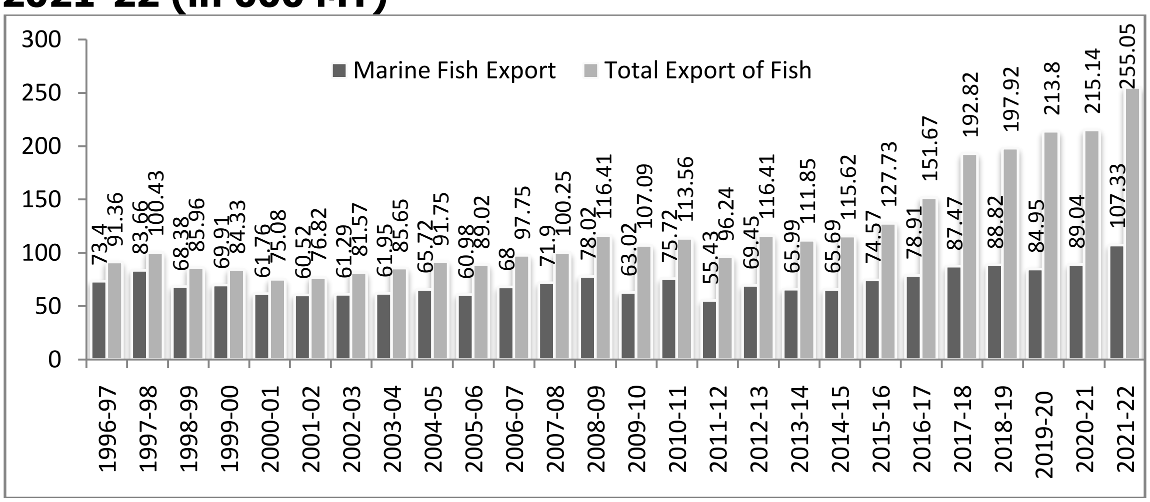
4.5. Exports of marine fish

The role of exports has been pivotal in the advancement of infrastructure within marine fisheries, significantly influencing the socio-economic landscape of the rural coastal regions. The establishment of ice plants, pre-processing centres, processing facilities, export houses, and the subsequent development of transport and ancillary services demonstrate this influence. The availability of fresh fish has now achieved significant market penetration, even in remote regions where it was previously scarce. Domestic markets distribute approximately 80 percent of the total catch, with the remainder destined for exportation. The primary components of marine product exports to international markets include frozen prawns, headless cleaned (HC), pomfret, and ribbon fish. Notable importers of these products encompass Japan, China, the United States, the United Kingdom, the United Arab Emirates, Indonesia, and Hong Kong. Frozen prawns represent a significant portion, accounting for nearly one third.

In 2022–23, Odisha exported 270.6 TMT of fish to foreign countries and other States. The marine fish export from Odisha equalled 85.33 TMT, and its value was Rs. 4546 crore. Presently, Odisha has 23 exporters and 19 modern processing plants spread across the six coastal districts, out of which 5 plants are of European-approved standard. Out of the remaining 14, only a small number of plants meet the high international standards required by international markets. Figures 3 and 4 depict the trend of total fish exports from Odisha from 1996-97 to 2021-22. The export of marine products appears to be nearly stagnant and significantly lower than its potential.

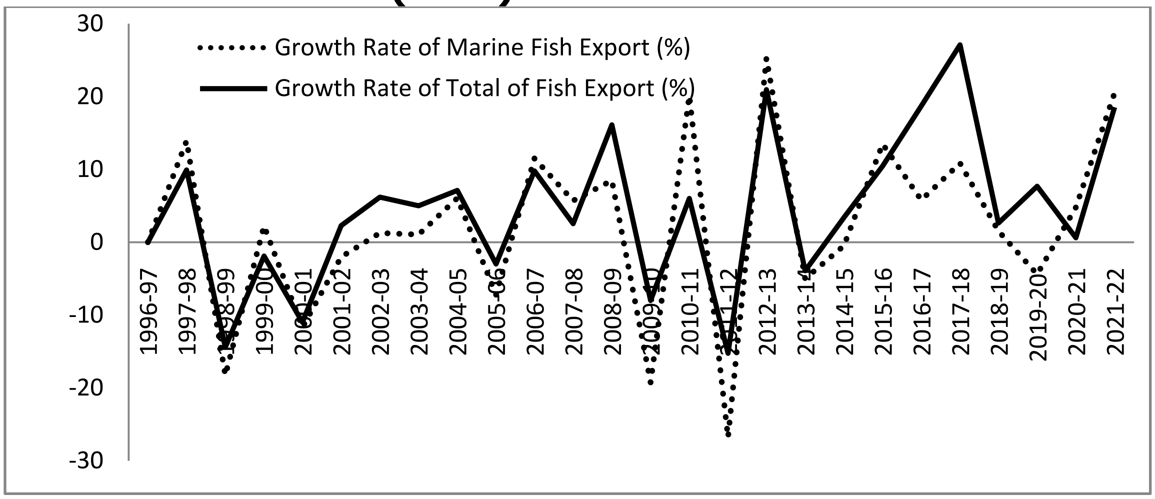
While exports play a vital role in development, it is imperative to closely monitor the WTO framework governing exports. Simultaneously, we should pursue the establishment of a robust domestic marketing system as a precautionary measure to mitigate potential shocks arising from fluctuations in international markets.

Figure 3: Export Growth of Marine Fish in Odisha, 1996-97 to 2021-22 (in 000'MT)



Source: Compiled from Economic Surveys of Odisha

Figure 4: Trend of Growth Rate of Marine Fish in Odisha, 1996-97 to 2021-22 (in %)



Source: Compiled from Economic Surveys of Odisha

4.6. Ownership of Fishing Fleet

Availability of the quantity and type of fishing fleet and gears impacts production in the sector. There are three types of fishing crafts: mechanised, motorised, and non-motorised. Similarly, fishing gears vary from trawlnets to scopnets, among others. There is a noticeable variation in the ownership patterns of fishing equipment due to the differences in the marine ecology between southern and northern Odisha. South Odisha, encompassing Ganjam and Puri, features a narrow continental shelf characterised by open sandy beaches. North Odisha, comprising Jagatsinghpur, Kendrapara, Bhadrak, and Balasore, stands out with its expansive continental shelf, tidal regions, and extensive river deltas. The primary catches in the southern regions consist of sardines, anchovies, mackerel, and prawns, whereas the northern areas are characterized by hilsa and pomfret as the predominant species.

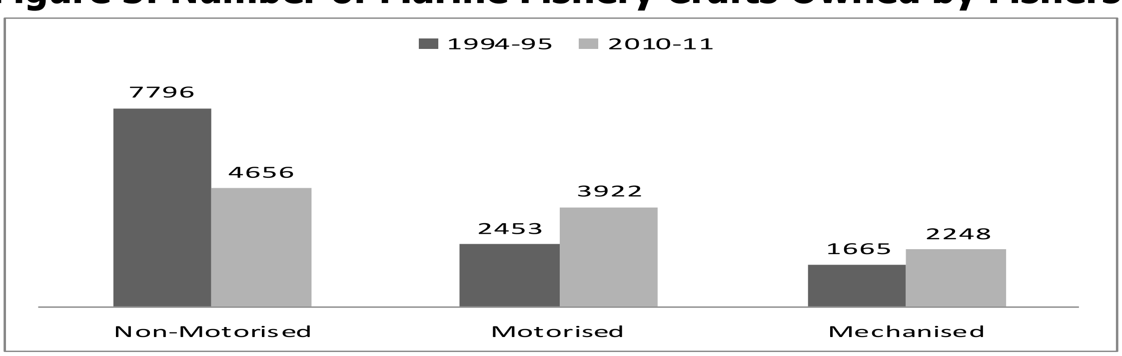
4.6.1. Fishing Craft

Operation of log rafts—kattumarams and barboats—take place all year round from the open beaches in Ganjam, Puri, and partly Kendrapara, along with the seasonal migration of displacement crafts like navas from Andhra Pradesh. In northern Odisha, various displacement crafts such as Salti, Dhingy, Danga, Patia, Botali, Chhoat, and motorised gillnetters predominantly operate, typically originating from creeks and rivers. In recent years, the proliferation of multi-day vessels and inboard ring seiners, which necessitate substantial capital investment, has led to a decline in ownership. Besides, people from non-coastal villages too are investing in the possession of a substantial number of fishing units.

Between 1994–95 and 2010–11, the number of fishing crafts has gone down from 11,914 to 10,826, mainly on account of a fall in non-motorized crafts from 7796 to 4656, though the number of mechanised crafts rose by 583 (20.76%) and the number of motorised crafts by 1469 (36.23%) during the same period (shown in Figure 5).

Table 2 shows the distribution of marine fishery crafts in the State based on the 2010 Marine Fisheries Census by CMFRI. There are 10826 crafts plying in Odisha, of which the majority are non-motorised (4656), followed by mechanised (2248) and motorised (3922) respectively. Trawlers make up 58% of the mechanised sector, followed by gillnetters at 35%, liners at 5%, and bagnetters at 2%. The districts of Balasore and Jagatsinghpur hold a significant share of mechanised fishing vessels, specifically trawlers, accounting for 39 percent and 45 percent of the total, respectively. These districts collectively account for 84 percent of all trawlers in Odisha. Similarly, when it comes to gillnetters, the districts of Balasore and Jagatsinghpur collectively account for 61 percent and 24 percent, respectively, contributing to 85 percent of the total gillnetters in the state. The Jagatsinghpur region exclusively uses mechanical liners, whereas Kendrapara (27%) and Ganjam (24%) use a large number of non-motorised boats, while Puri (43%) and Ganjam (20%) use the majority of powered boatshed in Puri (43% of all boats) and Ganjam (20%).

Figure 5: Number of Marine Fishery Crafts Owned by Fishers



Source: Compiled from Marine Fisheries Census of CMFRI, 2010

Table 2: Distribution of Marine Fishing Crafts in Coastal Districts of Odisha

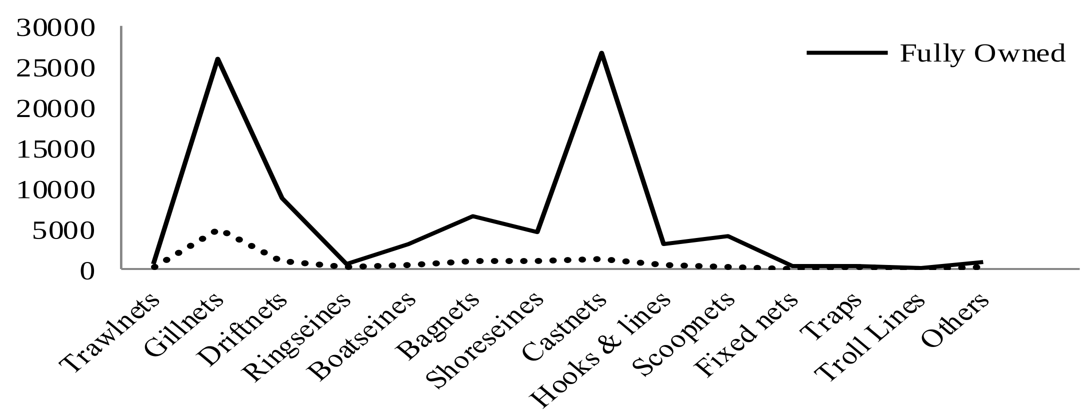
Districts	Mechanised					Motorized	Non-motorised	Total
	Trawlers	Gillnetters	Dolnetters	Liners	Total			
Balasore	511	478	0	0	989 (51.22)	455 (23.56)	487 (25.22)	1931 (100)
Bhadrak	189	111	50	0	350 (34.55)	558 (55.08)	105 (10.37)	1013 (100)
Kendrapara	0	0	0	112	0 (0.00)	228 (15.43)	1250 (84.57)	1478 (100)
Jagatsinghpur	583	190	0	0	885 (48.02)	208 (11.29)	750 (40.69)	1843 (100)
Puri	22	2	0	0	24 (0.90)	1698 (63.93)	934 (35.17)	2656 (100)
Ganjam	0	0	0	0	0 (0.00)	775 (40.68)	1130 (59.32)	1905 (100)
Total	1305	781	50	112	2248 (20.76)	3922 (36.23)	4656 (43.01)	10826 (100)

Source: Marine Fisheries Census of CMFRI, 2010
Note: Figures in parentheses are percentages

4.6.2. Fishing Gears Owned by Fisherfolk

The operation of different types of fishing gear depends on the geo-climatic conditions and the type of catch. The southern coastal districts primarily use boat seines, lift nets, and small and medium-sized gillnets for sardine netting. Medium and large sizes, primarily aimed at hilsa and pomfret, are employed on the northern side, in addition to various other types, such as bagnets, tidal wall nets, and encircling gillnets, among others. Figure 6 presents information regarding the ownership status of different categories of fishing gear, delineated as 'fully owned' or 'partially owned.' Among the entirely owned equipment, gillnets are the most abundant comprising 25,930 fully owned units, while castnets follow closely with 26,802 units. Conversely, trawlnets exhibit the lowest degree of ownership, comprising merely 536 units. In the realm of partially owned equipment, gillnets dominate with a total of 4,817 units, whereas 'fixed nets' exhibit the lowest count of partially owned units, totalling merely 4. The aggregate number of fully owned units markedly exceeds that of partially owned units, with a total of 84,447 fully owned units in contrast to 9,808 partially owned units. This trend underscores a prevailing inclination or necessity among fishermen to possess complete ownership of their equipment. It is noteworthy that 'ringseines' and 'boatseines' exhibit a comparatively equitable distribution between full and partial ownership when juxtaposed with other gear types, suggesting that these particular implements may be more frequently utilised in a shared manner among fishermen. The categories that are utilised less frequently, such as 'troll lines' and fixed nets, exhibit a minimal degree of ownership overall, indicating that they are not pivotal to fishing practices within this particular context. Thus, the data indicates a pronounced inclination towards full ownership of fishing apparatus, particularly for commonly utilised equipment such as gillnets and castnets.

Figure 6: Fishing Gears Owned by Fishermen, 2010



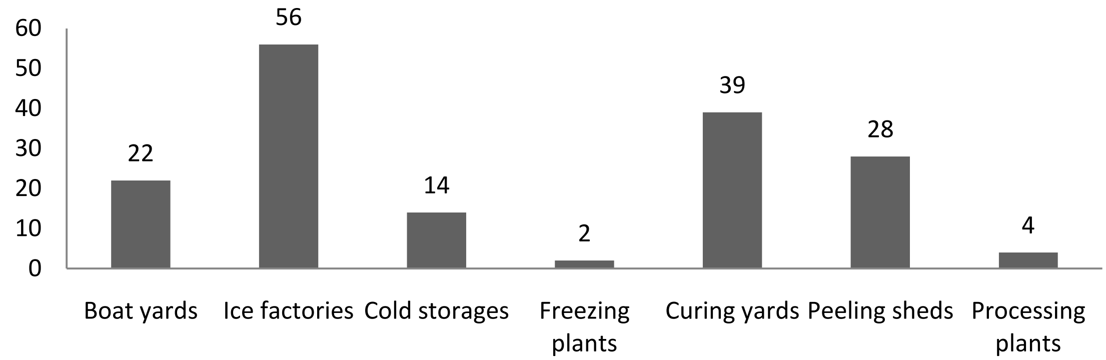
Source: Marine Fisheries Census of CMFRI, 2010

4.7. Infrastructure and service facilities

Open beaches or river banks serve as the landing or berthing grounds for the vast majority of fishing craft. There are 73 landing centres along Odisha's coast, catering to the needs of fishermen from 647 villages. The important landing centres for both mechanized and traditional fishing crafts in Balasore and Kendrapara districts are the mouths of rivers: Dhamra in Dhamra, Subarnarekha in Kirtania, Mahanadi in Paradeep, Devi in Astarang, Burhabalang in Chandipur, Gomei in Chudamani, and Panchapara in Kasafal. There are small servicing centres present for mechanised boats. Roads connect these major landing centres well with other areas, but there are numerous small landing centres that suffer from poor communication and lack of drinking water facilities. Mechanised fishing boats operate from 20 landing centres, three minor fishing harbours in Gopalpur, Nuagarh (Astarang), and Dhamara, and a major one located in Paradeep. The Paradeep harbour had been constructed entirely with Central

Government assistance, but construction of all the other harbours and landing centres has been funded by both the State and the Centre on a 50-50 basis. There are six net-making units, and 22 boatyards belonging to private and public sectors mainly concentrated around Paradeep. The Fisheries Census conducted in 2010 reveals that Odisha is a home to 56 ice factories, 39 curing yards, 28 peeling sheds, 14 cold storage facilities, and 2 freezing plants, as detailed in Figure 7.

Figure 7: Fishery Related Infrastructure Available in Fishing Villages, 2010



Source: Marine Fisheries Census of CMFRI, 2010

4.7.1. Life-Saving and Electronic Equipment

Approximately 45.8 percent of the life-saving equipment is utilised in Jagatsinghpur district, whereas there is no usage recorded in Ganjam district. In contrast, Balasore district exhibits the highest utilisation rates for mobile phones and GPS, at 52.63 percent and 79.42 percent respectively (Table 3).

Table 3: Life-Saving Equipment and Electronic Equipment

Districts	Life-saving equipment	Mobile phone	GPS	Others
Balasore	1871 (22.20)	18646 (52.63)	355 (79.42)	864 (27.67)
Bhadrak	492 (5.84)	2255 (6.36)	3 (0.67)	202 (6.47)
Kendrapara	2119 (25.14)	5065 (14.30)	60 (13.42)	1272 (40.74)
Jagatsinghpur	3860 (45.80)	7474 (21.10)	4 (0.89)	781 (25.02)

Puri	86 (1.02)	1005 (2.84)	25 (5.59)	3 (0.10)
Ganjam	0 (0.00)	984 (2.78)	0 (0.00)	0 (0.00)
Total	8428 (100.00)	35429 (100.00)	447 (100.00)	3122 (100.00)

Source: Marine Fisheries Census of CMFRI, 2010
Note: Figures in parentheses are percentages

4.7.2. Infrastructure Facilities in Fishing Villages

The infrastructure within the fishing communities mirrors the advancement of the fisheries sector to some extent. In 2010, the Marine Fisheries Census revealed that only 63.59 percent of fishing villages have electricity, 18 percent have bus stops, and 89 percent have cell phone coverage (Table 4). There are 35 hospitals serving 813 villages. The financial needs of the fishing villages are met by 121 banks and 657 cooperative societies, including 230 fishery cooperative societies, which are mostly concentrated in the Balasore district.

Table 4: Infrastructure Facilities Available in Fishing Villages

Districts	No. of villages	Villages having				Numbers		
		Electricity	Bus stops	Hospitals	Mobile phone coverage	Banks	Fisheries Co-operative Societies	Other Co-operative Societies
Balasore	415	280 (67.47)	62 (14.94)	16 (3.86)	391 (94.22)	78	126	219
Bhadrak	95	43 (45.26)	42 (44.21)	9 (9.47)	45 (47.37)	9	45	31
Kendrapara	117	52 (44.44)	18 (15.38)	5 (4.27)	101 (86.32)	8	8	28
Jagatsinghpur	119	76 (63.87)	17 (14.29)	1 (0.84)	119 (100.00)	20	18	23
Puri	41	41 (100.00)	5 (100.00)	2 (100.00)	41 (100.00)	0	25	15
Ganjam	26	25 (96.15)	1 (96.15)	2 (96.15)	25 (96.15)	6	8	111
Total	813	517 (63.59)	145 (17.84)	35 (4.31)	722 (88.81)	121	230	427

Source: Marine Fisheries Census of CMFRI, 2010
Note: Figures in parentheses are percentages

4.8. Fishermen Families Engaged in Coastal Aquaculture

The Government has established brackish water development agencies in the coastal districts to extend fish culture technology, providing training and financial support to landless labourers and small and marginal farmers under various employment generation schemes. The government also encourages larger farmers, capable of investing their own capital, to participate. According to the fisheries census 2010, 3480 families of fishermen are involved in aquaculture, with 1380 of them undergoing training. The largest number of families who have acquired training are in the Jagatsinghpur district, followed by Kendrapara, Bhadrak, Balasore, Puri, and Ganjam, respectively (Table 5).

Table 5: Fishermen Families Engaged in Coastal Aquaculture

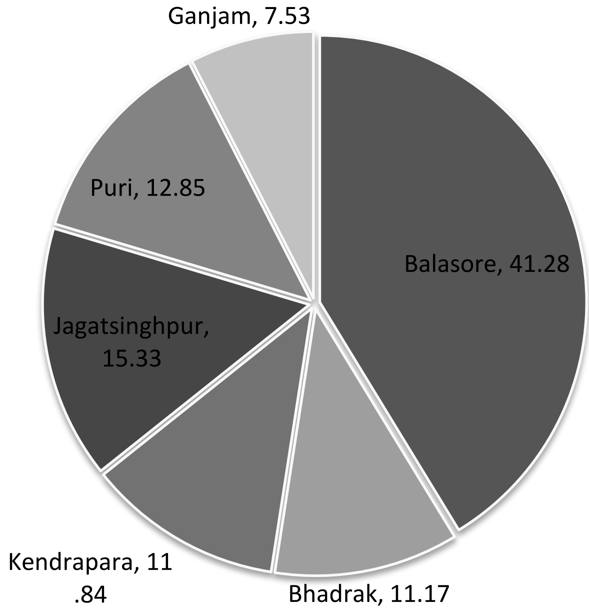
Activity	Balasore	Bhadrak	Kendrapara	Jagatsinghpur	Puri	Ganjam	Total
Fish	20	56	79	2035	8	1	2199 (63.19)
Prawn	2	1	0	823	0	0	826 (23.74)
Crab	9	0	1	162	1	0	173 (4.97)
Lobster	0	0	0	1	0	0	1 (0.03)
Clam	0	0	0	0	213	0	213 (6.12)
Ornamental Fish	0	0	0	0	44	0	44 (1.26)
Seaweed	0	0	0	18	1	0	19 (0.55)
Others	0	0	0	0	5	0	5 (0.14)
Total	31	57	80	3039	272	1	3480 (100)
Acquired Training	166	190	311	514	154	45	1380 (39.66)

Source: Marine Fisheries Census of CMFRI, 2010
Note: Figures in parentheses are percentages

4.9. Socio-Economic Profile of Fisherfolk

There are 114238 marine fisherfolk households in Odisha (Marine Fisheries Census 2010), the largest number being in Balasore district (47162) followed by Jagatsinghpur (17508), Puri (14675), Kendrapara (13527), Bhadrak (12765) and Ganjam (8601). Figure 8 represents their proportional distribution across coastal districts. While the number of fishers has steadily increased from 450391 to 605514 between 2005 and 2010, the number of active fisherfolk has also increased from 121282 to 162411. However, their proportion in the fishermen population decreased marginally from 26.92 per cent to 26.82 per cent. Table 6 reveals that of the total active fisherfolk population, 83.48 per cent (135581) work in actual fishing, while 16.52 per cent (26830) are involved in fish seed collection.

Figure 8: Fishermen Families in Coastal Districts of Odisha (in %)



Source: Marine Fisheries Census of CMFRI, 2010

Table 6: Active Fishermen Population in Coastal Districts of Odisha

Districts	Actual Fishing			Fish Seed Collection			Total Active Fisherfolk Population
	Full Time	Part Time	Total	Full Time	Part Time	Total	
Balasore	43498	18975	62473 (85.98)	5097	5086	10183 (14.02)	72656 (100.00)
Bhadrak	10552	5889	16441 (99.44)	50	42	92 0.56)	16533 (100.00)
Kendrapara	8951	3687	12638 (67.56)	3599	2469	6068 (32.44)	18706 (100.00)
Jagatsinghpur	18281	3331	21612 (72.81)	5450	2622	8072 (27.19)	29684 (100.00)
Puri	12387	1768	14155 (86.14)	1100	1178	2278 (13.86)	16433 (100.00)
Ganjam	6303	1959	8262 (98.37)	39	98	137 (1.63)	8399 (100.00)

Total	99972	35609	135581 (83.48)	15335	11495	26830 (16.52)	162411 (100.00)

Source: Marine Fisheries Census of CMFRI, 2010

Note: Figures in parentheses are the share in total active fisherfolk population

4.9.1: Women in Marine Fishery Sector

Among the coastal districts, the total number of employed persons is highest in Balasore district, followed by Jagatsinghpur, Kendrapara, Puri, Bhadrak and Ganjam. The presence of active fishermen is also highest in Balasore District, followed by Jagatsinghpur, Kendrapara, Bhadrak, Puri, and Ganjam. In terms of the percentage of active fishermen employed, Bhadrak district stands out at 74.03 per cent, closely followed by Balasore district at 72 per cent, with the remaining districts lagging behind. Among those employed in the fishery-allied activities (i.e., other than active fishermen and those not into fishery-allied activities either), the highest number in Balasore district is engaged in making or repairing nets; in Bhadrak and Jagatsighpur districts, the highest number is engaged in marketing fish; and in Kendrapara, Puri and Ganjam districts, the highest number are engaged as labourers. This can be observed from Table 7.

Fishery-related secondary sector activities, such as fish marketing and physical work for various tasks extending from landing centres to retail points, employ more than 34.46 per cent of the fishermen. Marketing, curing/processing, and peeling activities are mainly dominated by women, with the male-to-female ratio in those activities being 1:2, 1:4.5 and 1:3.1, respectively. Among the fisher population involved in the secondary sector, women represent 54.1 percent, resulting in an overall male-to-female ratio of 1:1.2. Activities primarily involving physical work like making/repairing nets and working as labourers, etc. are mostly undertaken by men, with the male-to-female ratio being 1:0.6 and 1:0.7, respectively (Table 8 A,B & Figure 9).

Table 7: Occupation Profile of Marine Fisherfolk

Districts	Active Fishermen	Engaged in Marketing of fish	Engaged in Making/ repairing net	Engaged in Curing/ processing	Engaged in Peeling	Engaged in Labourer	Engaged in Other activities	Total allied	Other than fishing	Total Employed
Balasore	72656 (72.00)	5245 (5.20)	7503 (7.43)	3426 (3.39)	724 (0.72)	6429 (6.37)	411 (0.41)	23738 (23.52)	4521 (4.48)	100915 (100.00)
Bhadrak	16533 (74.03)	3011 (13.48)	698 (3.13)	347 (1.55)	45 (0.20)	815 (3.65)	5 (0.02)	4921 (22.03)	879 (3.94)	22333 (100.00)
Kendrapara	18706 (48.01)	5905 (15.16)	2270 (5.83)	1425 (3.66)	254 (0.65)	10030 (25.74)	61 (0.16)	19945 (51.19)	311 (0.80)	38962 (100.00)
Jagatsinghpur	29684 (57.98)	10698 (20.89)	4213 (8.23)	2384 (4.66)	713 (1.39)	1956 (3.82)	150 (0.29)	20114 (39.29)	1401 (2.74)	51199 (100.00)
Puri	16433 (58.56)	3794 (13.52)	2002 (7.13)	475 (1.69)	344 (1.23)	4008 (14.28)	82 (0.29)	10705 (38.15)	925 (3.30)	28063 (100.00)
Ganjam	8399 (44.82)	3984 (21.26)	1186 (6.33)	435 (2.32)	120 (0.64)	4469 (23.85)	44 (0.23)	10238 (54.64)	101 (0.54)	18738 (100.00)
Total	162411 (62.42)	32637 (12.54)	17872 (6.87)	8492 (3.26)	2200 (0.85)	27707 (10.65)	753 (0.29)	89661 (34.46)	8138 (3.13)	260210 (100.00)

Source: Marine Fisheries Census of CMFRI, 2010

Note: Figures in parentheses are percentages

Table 8-A: Gender-wise Occupation Structure in Secondary Sector, 2010

Occupation	Districts	Balasore		Bhadrak		Kendrapara	
	Gender	No.	%	No.	%	No.	%
Marketing of fish	Male	3,154	60.1	500	16.6	1,090	18.5
	Female	2,091	39.9	2,511	83.4	4,815	81.5
	Total	5,245	100	3,011	100	5,905	100
Making/ Repairing Net	Male	3,864	51.5	474	67.9	905	39.9
	Female	3,639	48.5	224	32.1	1,365	60.1
	Total	7,503	100	698	100	2,270	100
Curing/ Processing	Male	693	20.2	87	25.1	43	3
	Female	2,733	79.8	260	74.9	1,382	97
	Total	3,426	100	347	100	1,425	100
Peeling	Male	219	30.3	17	37.8	45	17.7
	Female	505	69.8	28	62.2	209	82.3
	Total	724	100	45	100	254	100
Labourer	Male	5,567	86.6	581	71.3	6,802	67.8
	Female	862	13.4	234	28.7	3,228	32.2
	Total	6,429	100	815	100	10,030	100
Others	Male	282	68.6	3	60	46	75.4
	Female	129	31.4	2	40	15	24.6
	Total	411	100	5	100	61	100
Total	Male	13,779	58	1,662	33.8	8,931	44.8
	Female	9,959	42	3,259	66.2	11,014	55.2
	Total	23,738	100	4,921	100	19,945	100

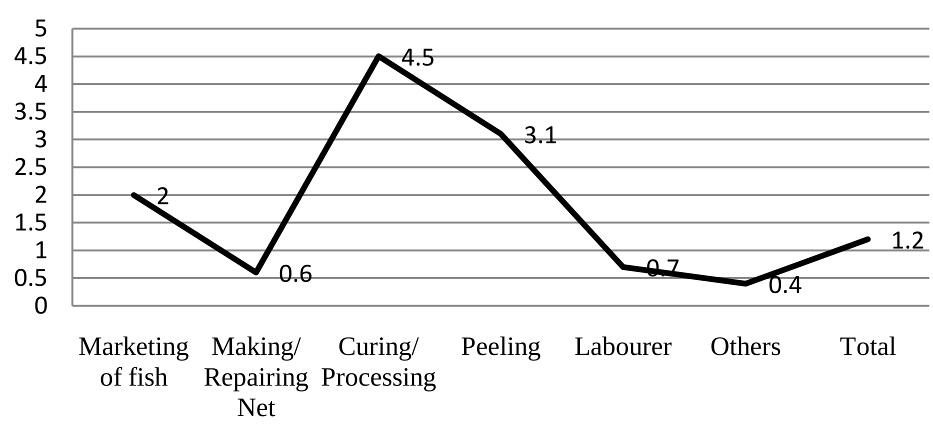
Source: Marine Fisheries Census of CMFRI, 2010

Table 8-B: Gender-wise Occupation Structure in Secondary Sector, 2010

Occupation	Districts	Jagatsinghpur		Puri		Ganjam		Total	
	Gender	No.	%	No.	%	No.	%	No.	%
Marketing of fish	Male	3,863	36.1	1,622	42.8	767	19.3	10,996	33.7
	Female	6,835	63.9	2,172	57.3	3,217	80.8	21,641	66.3
	Total	10,698	100	3,794	100	3,984	100	32,637	100
Making/ Repairing Net	Male	2,917	69.2	1,634	81.6	1,102	92.9	10,896	61
	Female	1,296	30.8	368	18.4	84	7.1	6,976	39
	Total	4,213	100	2,002	100	1,186	100	17,872	100
Curing/ Processing	Male	583	24.5	126	26.5	24	5.5	1,556	18.3
	Female	1,801	75.6	349	73.5	411	94.5	6,936	81.7
	Total	2,384	100	475	100	435	100	8,492	100
Peeling	Male	119	16.7	96	27.9	43	35.8	539	24.5
	Female	594	83.3	248	72.1	77	64.2	1,661	75.5
	Total	713	100	344	100	120	100	2,200	100
Labourer	Male	1,025	52.4	2,060	51.4	613	13.7	16,648	60.1
	Female	931	47.6	1,948	48.6	3,856	86.3	11,059	39.9
	Total	1,956	100	4,008	100	4,469	100	27,707	100
Others	Male	111	74	53	64.6	31	70.5	526	69.9
	Female	39	26	29	35.4	13	29.6	227	30.2
	Total	150	100	82	100	44	100	753	100
Total	Male	8,618	42.8	5,591	52.2	2,580	25.2	41,161	45.9
	Female	11,496	57.2	5,114	47.8	7,658	74.8	48,500	54.1
	Total	20,114	100	10,705	100	10,238	100	89,661	100

Source: Marine Fisheries Census of CMFRI, 2010

Figure 9: Male Female Participation Ratio



Source: Marine Fisheries Census of CMFRI, 2010

4.10. Fisheries administration and institutions

At the state level, a Cabinet Minister is responsible for the oversight of the fisheries department. Nonetheless, the Secretary to

Government functions as the administrative head of the Department of Forestry and Fisheries. Founded in 1956, the Directorate of Fisheries serves as a specialised department that focuses on service and extension, executing plans, programs, and policies relevant to the fishery sector in Odisha.

4.10.1. Industry Organisations

4.10.1.1. Fisheries Corporations

A newly established agency, the Odisha Maritime and Chilka Area Development Corporation, has taken the place of the previously inactive Odisha Fisheries Development Corporation, which had not been operational for an extended period. The corporation currently operates a freezing facility and a diesel distribution outlet at Paradeep. The organisation intends to engage in offshore fishing and brackish water aquaculture in the foreseeable future.

The Odisha Pisciculture Development Corporation (OPDC), a singular public sector undertaking, represents the fishery sub-sector in the state of Odisha. It fundamentally advocates for the practice of pisciculture across various aquatic environments. The five hatcheries located at Bhanjanagar, Saramanga, Chiplima, Binika, and Bayasagar encompass a total area of 103 hectares, collectively possessing a production capacity of 21 crore spawns. OPDC operates the fish-seed hatchery at Kausalyaganga, near Bhubaneswar, which has a capacity of 10 million. The initiative has also assumed control of over 17 government-operated farms dedicated to the cultivation of fish seed. In the fiscal year 2011-12, the initiative sold a total of 18.63 crore fry of superior quality for Rs. 2.63 crore, out of an overall production of 20.50 crore. Additionally, they sold 7300 kg of fish for Rs. 6.58 lakh. Furthermore, it addresses the requirements of trawlers and mechanised vessels utilised by fishermen through its seven diesel dispensing outlets. Nevertheless, the OPDC encountered a financial deficit amounting to Rs. 2.19 lakh in the current fiscal year. In the fiscal year 2013-14, the entity recorded sales of 9,364 kilolitres of high-speed diesel (HSD), 22.4 kilolitres of lubricants, and 3,420 kilolitres of motor spirit, collectively valued at Rs. 70.88 crore. Additionally, it produced 51 metric tonnes in its own unit, with a net worth of Rs. 1.89 crore.

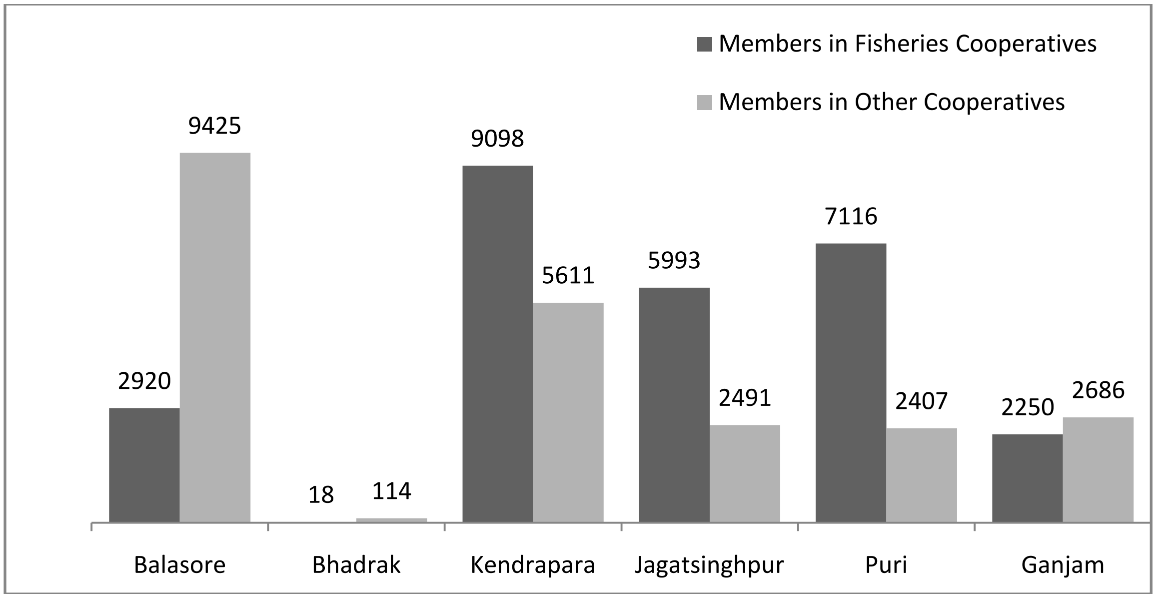
4.10.1.2. Fisheries Cooperatives

The apex body for all fisheries cooperatives in Odisha is the Fisheries Federation (FISHFED), which takes care of the social and economic well-being of its members. It affiliates about 362 PFCSs, boasting a membership of 70000 fishermen and women. The Federation engages in the marketing of fish products, supplies fishery inputs, leases fishery outlets (sairat) in Chilika, and procures fish seed, among other activities. FISHFED reported a business revenue of Rs. 2.40 lakh in the fiscal year 2012-13, and its aggregate income from various sources reached Rs. 13.65 lakh. But it has been incurring continuous losses over the years. However, it expects to turn a profit with its new venture of live fish marketing in the BMC area, where 8 KIOSKS are already operational and 12 more are under construction.

The number of active fishermen who are members of fishery cooperatives in the State is 27395, while 22734 are members of other cooperatives, amounting to a total membership of 50129 in different cooperatives, which is 30.87 per cent of the total number of active fishermen (162411) present in the State. Kendrapara district has the highest proportion of its active fisherfolk tied to some cooperative (78.63 per cent) while in other districts the participation rate is much lower, the lowest being in Bhadrak district (0.80 per cent). In terms of membership in fisheries cooperatives, Kendrapara district has the highest number of members among the six coastal districts, while in terms of membership in other cooperatives, Balasore district has the highest number of members. Out of the total number of active fishermen in Kendrapara (18706), Jagahtsinghpur (29684), and Puri (16433) districts, more are members of fisheries cooperatives than other cooperatives. However, in Balasore (72656), Bhadrak (16533), and Ganjam (8399) districts, more active fishermen are members of other cooperatives than fisheries cooperatives (Figure 10 and Figure 11).

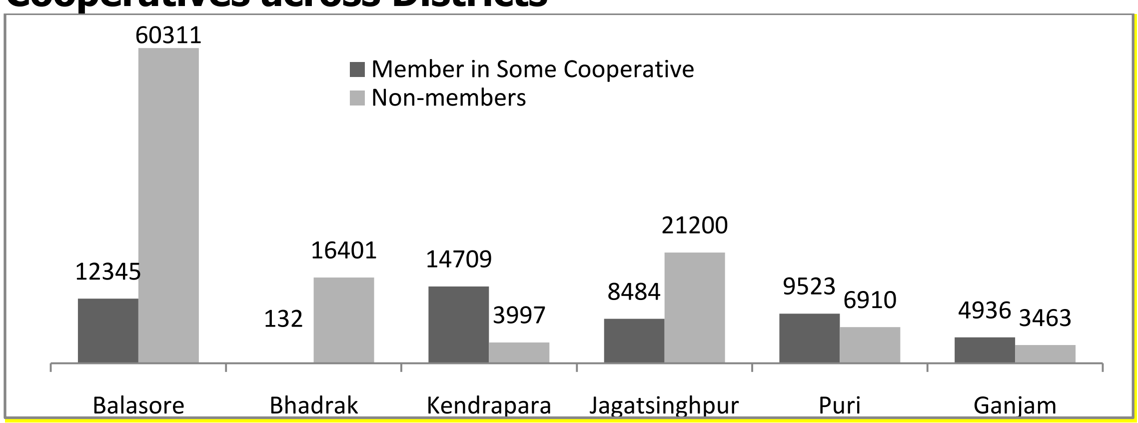
Traditional fishermen mainly take the help of these societies to purchase mechanised fishing boats. As yet, the primary cooperative societies have been primarily involved only in acting as channels for obtaining loans and subsidies for the fisherfolk. A subsidy of 33 percent of capital investment is provided to members of these societies by cooperative banks.

Figure 10: District-wise Membership in Cooperatives by Marine Fishermen



Source: Marine Fisheries Census of CMFRI, 2010

Figure 11: Proportional Participation of Marine Fishermen in Cooperatives across Districts



Source: Marine Fisheries Census of CMFRI, 2010

4.11. Government Policy and Development Plans

Odisha has its own Odisha Marine Fisheries Regulation Act, 1982, applicable over an area of 12 nautical miles from its coastlines, for safeguarding its coastal waters and conservation of endangered species through sustained fishing allowed only to licensed trawlers. The Odisha Government implements various schemes, both its own and those sponsored by the Central Government, to promote the development of marine fisheries. The marine fishery development policy, which aims to boost deep-sea fishing operations, forms part of the state’s agriculture policy.

The Central and State governments jointly share the cost of the Accident Insurance Scheme, which launched in 1983-84. The scheme has a provision of financial help ranging from Rs. 50000 to Rs. 1 lakh in case of partial or permanent disability or death from accidents. In 2013-14, a proposal had been made to bring 10 lakh fishermen under its cover, and Rs. 145 crore had been allocated for the same; 11 lakh fishermen were covered, and a total disbursement of Rs. 54.60 lakh was made. Biometric Identity Cards have been issued to 153000 fishermen, and another 93000 have been enumerated. The Saving-cum-Relief scheme, which is available during the lean fishing season, aims to instill saving habits among fishermen. During 2013-14, 10312 fishermen benefitted from a Rs. 186 lakh government grant.

During the fiscal year 2011-12, the Matsyajibi Unnayan Yojana (MUY) introduced a proposal for the provision of scholarships for 2,940 children of active fishermen and 429 fisherwomen self-help groups (SHGs). Each Self-Help Group received a revolving fund of Rs. 5000 in the fiscal year 2013-14. The initiative facilitated the substitution of 60 traditional country boats with fibreglass-reinforced plastic (FRP) vessels, the motorisation of 658 conventional crafts, the distribution of 960 icebox units alongside cycles, mopeds, or autos, and the creation of employment opportunities for 825 fishermen under the 'Mo Kudia' program. Furthermore, the Group Accident Insurance Scheme (GAIS) provided insurance coverage to a total of 1 million active fishermen, earning Odisha the gold medal for achieving the highest ranking among the States. In 2013–14, a grant of Rs. 239.84 lakh was used to provide 320 low-cost houses with drinking water facilities to fishermen in the form of model fishermen’s villages under the National Welfare Fund for Fishermen (NWFF). Through the Support to Training and Employment Programme (STEP), fisherwomen cooperatives in the Balasore, Bhadrak, Puri, and Ganjam districts train 3000 members from lower-income backgrounds to prepare hygienic dry fish and other value-added fish products.

5. Concluding Observations and Policy Recommendations

Without disturbing deep waters, most fishing activities take place in coastal waters. The advancement of marine fish production in Odisha has exhibited a lack of momentum in recent years, and the exportation of marine products remains nearly static in relation to its potential. Inadequate cold storage, processing, packaging, and transportation facilities force fishers to sell their produce to traders or resort to distress sales lest the fish should become putrid. The fish's ability to add value and generate additional revenue for the fishers also suffers. However, the traders who procure fish and sell them in regional and international markets gain maximum margins. The existing three fishing harbours and seven fishing jetties are not sufficient to accommodate all mechanised boats of the State. To accelerate fishery production on a sustained basis, these productivity and management constraints need to be addressed. For this, there is a need for multifaceted assistance from various external stakeholders, including the government.

6. References

CMFRI. (2005). Marine Fisheries Census, Central Marine Fisheries Research Institute, Cochin, India

CMFRI. (2010). Marine Fisheries Census, Central Marine Fisheries Research Institute, Cochin, India

CMFRI. (2008-09). Annual Report, Central Marine Fisheries Research Institute, Cochin, India

Economic Survey of Odisha (2013-14), Government of Odisha

Economic Survey of Odisha (2020-21), Government of Odisha

Hand Book of Fisheries Statistics. (2011). Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi

Hand Book of Fisheries Statistics (2014), Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India, New Delhi

Fishery Survey of India (2009), Fishery Resources Survey, Assessment and Research Programme, Government of India

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Adaptation of Population: Need of the Hour

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Preface

India is a South Asian country which is full of diversity. People of different castes, religions, languages, looks, colours, food habits, customs, attire etc. live here. Despite all these differences, people here have been living in unity for centuries and today India is the largest democracy in the world. Since ancient times, people from different socio-economic backgrounds of India have been filled with hard work and dedication towards the nation.

The history of India's population is as old as the history of India itself. Over the centuries, India's population has fluctuated, influenced by a variety of social, economic, and political factors. It is clear from the remains of the Indus Valley Civilization that even at that time a large population lived in India. India's population increased during the Mughal period. Its population increased rapidly during British rule and increased continuously since independence.

Due to family planning programs and several other measures, the population growth rate has decreased. Today, India is the second most populous country in the world (with about 17.5 percent of the world's population). This gives an additional specialty to this country, although it is a difficult task to accommodate such a large population in productive work.

India is considered a country of youth

The largest youth population in the world is present in India, which gives a golden opportunity to India and the youth can contribute in making India economically strong. Be it a startup, small business or big business, this will increase exports and India will become independent from imports to a large extent. Even today there are some youth who are unable to join the country's progress due to lack of opportunities or proper guidance, due to which the country is unable to make good use of their potential.

Our ancestors saw a time when there was discrimination among its children, whether it was on the basis of caste or at a lower level like untouchability. But today's youth are rising above this superstition and instilling faith in humanity. In fact, this work can only be done by today's modern youth. The future of India will be like the future of Indian youth because It is said that “Jaisa Khaye Ann Vaisa Hoy Man” means whatever food you consume, your mind will become like that.

Relevance of India's population

Human development is a concept which sees the population as an asset rather than a liability for any economy and through investment in education, training, and health the population turns into human resources (Gurupanch & Sahu, 2014, p. 213-216). In the 21st century, a well-educated population having requisite skills and knowledge is very essential for economic and social development. An educated populace catalyses economic growth through multiple channels (Desai, 2014).

After globalization and the opening up of the economy in the 1990s, India's 'treasure at the bottom of the pyramid' was discovered, which had a huge population and was still untouched by the market. During this time, this population was given the opportunity to benefit. According to UN projections, India's population will grow from its current 1.4 billion to 1.67 billion in 2050, before plateauing at 1.53 billion in 2100 and peaking at 1.7 billion in 2064.

Chanakya's ‘Arthashastra’ also mentions a kind of census being conducted during the reign of Chandragupta Maurya for collecting taxes and implementing the policies of the government. But in modern India, the census was started by the British in 1872, which has been happening every 10 years since 1981. At present, there is a tradition of conducting the census in the first year of any decade. But due to first Corona and then the Lok Sabha elections, the census scheduled for 2021 could not be conducted. It is believed that this census can now be conducted in 2027.

India has one of the largest populations in the world and it has a profound impact on the country's development. After several decades of rapid economic growth, Japan is now stagnating. Only

15.9 percent of the population in Japan is under 20 years of age. Talking about India, even though we have the largest population in the world, the share of the young population is decreasing due to the low birth rate. It is likely to decline further in the future. At present, there is a 20 year old population in India. Youth in India 2022 report projected that the Youth Population aged 15-29 years in India will be 27.9 percent, 27.3 percent and 25.8 percent in the year 2016, 2021 and 2026 respectively. It shows a downline trend and indicates a worrying situation.

Some observations

King (2011) observed that growth, development, and poverty reduction depend on the knowledge and skills that people acquire, not the number of years that they sit in a classroom.

Singh (2021) believes that higher education works as a powerful tool for building knowledge in the competitive world. It imparts in-depth knowledge and understanding so as to expose the students to new frontiers of knowledge in different facets of life. Further it not only broadens the cerebral powers of the individual with specialization but also gives a wider perspective of worldwide conception.

Boohene & Maxwell (2017) found that the presence of educational institutions stimulates employment opportunities in their local regions beyond their core function of teaching and research in the form of business owners, shop assistants, service providers etc. to impact considerably on their local regions’ development.

Woodhall (1989) discussed the aftermath of that condition when education becomes unable to guarantee employment and the repayment is compulsory. In that condition the people of low socio-economic status will be affected severely. It may lead to increased inequalities in participation in education.

Chandrasekhar, Ghosh & Roychowdhury (2006) in the work "The 'Demographic dividend' and young India's economic future", found that the age structure of India's population changed by the declining fertility rates, resulting in a "bulge" in the working age-group. The dependency ratio has improved this "demographic dividend", leading to the hypothesis that the bulge in the working population will lead to acceleration in growth. However, the absorption of the Indian youth into the labor force is not as high as one would expect, as indicated by the recent employment figures.

Kumar (2023) advocates that human resources play a significant role in the process of economic growth, it does not mean that more population means more resources for the development process. What most importantly matters is the quality of the population rather than size of the population. The population is useful only when it can contribute to the process of development. The overpopulation without skills and knowledge if not utilized can lead to several problems.

Maguire, Sue et al. (2018) reveals in their paper that youth unemployment has been on the rise since the beginning of the crisis in 2008. Even more troublesome is the dramatic rise in the number of youth not in employment, education or training, which has led to widespread concerns about the impact on social cohesion and fears of a "lost generation". Through the process A large number of youth run the danger of becoming labour market outsiders.

The term "NEET" emerged in the UK in the late 1980s following changes to unemployment benefit entitlement regulations which essentially removed young people under the age of 18 from the unemployment statistics (Amelie & Ulf; 2013).

Manna, Indanil (Jan, 2019) explains for a knowledge-based society, science is no longer a mere curiosity-driven activity but a societal necessity. Innovation has become synonymous with life development and progress. Education enables people to be active participants and contributors in making the environment better, safer and healthier for us as well as the future generations.

Challenges facing India's population

Employment: Creating employment opportunities for the increasing population is a big challenge. India, as a developing country with one of the largest working populations in the world, faces the challenge of generating better quality employment, especially for its youth. This problem has persisted for decades as economic growth has failed to keep pace with job creation.

Growing ambitions of youth: India's urban landscape is full of ambition. Modern metropolises are considered centers of economic activities and these attract a continuous stream of young graduates to try their luck and find a better place in life. Motivated by years of education and ambition, they come to the city in hope of a better life.

Spread of education: It is essential to ensure quality education for all. Amid the gloomy picture of the employment scenario for educated people, another cause of concern is the continued loss of jobs in the government sector. In the post-liberalization era, as a result of the increasing trend of privatization, government jobs are not expanding.

Universal Access to Healthcare Facilities: Access to health services helps keep populations healthy and active. Access to health services is not adequately available to all communities which is extremely worrying and can obstruct the path of development. To tackle this problem, ensuring access to health services till the last person is an important goal.

Big income gap: Countries like India have areas where the few people are well equipped with modern amenities. On the other hand, the vast majority of the population is poor and deprived of development opportunities. The gap of poverty and inequality is constantly widening in our country. The per capita income of the country is increasing which is a good sign. But if we go into detail, we find that while the income of a particular class is increasing several folds, on the other hand, a particular class still has to struggle a lot to fulfill its basic needs. Reducing this inequality is indeed a big challenge.

Problem of migration: The lack of employment opportunities to the population generally leads to the search for better livelihoods. In February 2023, the country's Foreign Minister told the Parliament that since 2011, more than 16 lakh Indians have given up their Indian citizenship. At the same time, about 18 million people of India were living outside the country in the year 2020.The largest Indian expatriate population’s flock to the United Arab Emirates, the United States, and Saudi Arabia. Economic opportunities across the country shape the aspirations of the working population; as a result, India itself will have limited benefit from a declining population.

Negative impact on the environment: Today, population growth and an unbalanced environment have a global impact. Due to the increase in population, the quality of physical elements like water, air, sound and land has decreased, which has affected the efficiency of the population. The effects of population growth were also seen in the form of malnutrition, overcrowding, unemployment, development of slums, etc. Population and unbalanced environment- As a result, many types of conferences are organized to save the earth, keep nature alive and limit population growth etc.

Contradiction of high-skill but low-employment sectors: The service sector contributes the most to India's gross domestic product (GDP). The country's economic growth has been driven primarily by the service and capital-intensive manufacturing sectors. In such a situation, it is inevitable that employment generation will be less compared to the economic output. The sector boosts economic indicators but is often incapable of generating large-scale employment opportunities, especially for the less-skilled workforce.

To make India a developed Nation, the youth have a special role to play. Workforce will turn into a human resource only when workers are skilled. One of the biggest challenges faced by the country is not the absence of skill, but the lack of proper mechanisms to train and certify the workforce.

About 69% of the country lives in villages. Agriculture is the largest employer (about 48% of its 490 million strong workforce) but results only in 13% share of the GDP (Singh, May, 2017).

Move towards deindustrialization: India is a developing country and it should try to move forward strongly in the manufacturing sector, While it is experiencing premature deindustrialization, a trend partly driven by global competition and automation. This process limits the ability of the manufacturing sector to absorb surplus labour from agriculture, which is a major route of employment creation for developing economies. Due to this, the share of the manufacturing sector in both Gross Domestic Product (GDP) and employment (which was already inadequate) has started declining at the per capita income level as compared to developed countries.

Skill Inconsistency: The rapid pace of technological change has created a significant gap between the skills required by the market and the skills available to the existing workforce. This inconsistency deprives the population from engaging in productive work. As a result, the pace of development is hampered which ultimately slows down the pace of development of the nation. This inconsistency or lack of coordination not only gives rise to unemployment but also creates the problem of underemployment.

Concluding remark and Suggestion

India needs to focus on building a future-ready workforce and adjusting them appropriately. As a result, it will be able to meet the demands of the emerging Indian economy. India should formulate policies keeping in mind its huge working population while focusing on labour based production techniques so that it can be accommodated and benefitted.

According to the latest report 'Future of Jobs 2025' by the World Economic Forum (WEF), one-third of companies in India are now eliminating the requirement of engineering graduates' degree. Their focus is on knowledge-based hiring. By better addressing this challenge, India can ensure that it continues to create growth opportunities for all despite its large population. However, there are some challenges in the country's existing economic and educational systems, which could slow down progress.

While India's economy is strong, investment in research and development is low and the country is far from reaching its environmental policy goals. Higher education institutions need to coordinate research and industry efforts in line with global trends such as sustainable infrastructure and green technologies. Apart from this, there is an emphasis on developing adult education curriculum in the National Education Policy 2020. However, as the economy and innovation grow, students, graduates and workers will need support with relevant skills to keep up with changing needs.

The youth can do a better job of brightening the future of the country because they have the amazing power to bring about change. This power will free India from the shackles of developing countries and give it the status of a developed country. As explained In the Heckscher-Ohlin model of trade; a country abundant in any factor such as labour, produces labour intensive products. in the same way our country would attain specialization with high growth in labour-intensive products using the labour intensively. And then the population would be a blessing for us.

References

Kumar, Sunil. (2023). Role of Education in Socio-economic Development: A Case Study in Bhojpur District. (Thesis), Veer Kunwar Singh University, Ara

Chandrasekhar, C. P., Ghosh, J., & Roychowdhury, A. (2006), The 'demographic dividend' and young India's economic future, Economic and Political Weekly, 5055-5064

Woodhall, M., & University of London (1989), Financial support for students: grants, loans or graduate tax. London: Kogan Page in association with the Institute of Education, University of London.

Boohene, David, & Maxwell, Amita (2017), Growth of Educational Institutions and its Impact on the Development of a Region, International Journal of Research in Business Studies, Vol. 2 (1)

Desai, Mitul. (2014). Why improving education in India is the key to growth, World Economic Forum

https://www.weforum.org/agenda/2014/12/why-improving-education-in-india-is-the-key-to-growth/

Gurupanch, K. S., and Sahu, M. S. (2014), Manav Sansadhan Vikas ke Samajik, Aarthik, Manovaigyanik, Bhaugolik evam Paryavaraniya Aayam, International journal of advances in social sciences, 2(4): October-December, 2014. pp. 213-216

https://www.researchgate.net/publication/318947755

Singh, B. N. (2021). Status of Higher Education in Bihar: Then and Now with Issues and Challenges. In K. K. Singh., N. K. Verma., A. Kishore., & A. B. Pandey (Eds.), Narrativizing Humanity through Social and Life Sciences (5-10). Jaipur: Book Enclave.

King, Elizabeth. (2011). Education is Fundamental to Development and Growth. World Bank blogs, Retrieved from

https://blogs.worldbank.org/education/education-is-fundamental-to-development-and-growth

Amelie, Constant. & Ulf, Rinne. (2013) Labour Market Information for Migrants and Employers: The Case of Germany. IZA Research Report, No. 50

Singh, Swadesh. (May, 2017). Transforming rural India through Skill Development, Kurukshetra, Volume 65, No. 7 pp. 43-45

Manna, Indanil (Jan, 2019), Bharat me Uchcha Shiksha me Navachar ki Mahatwapoorn Pahal, Yojana, Year 63, No. 01, pp. 29-32

Maguire, S., Cockx, B., Dolado, J. J., Felgueroso, F., Jansen, M., Styczyńska, I., & Rinne, U. (2013), Youth unemployment, Intereconomics, 48, 196-235

https://hdl.handle.net/10419/88898

Ministry of Statistics and Programme Implementation (2022), Youth in India, GoI, New Delhi

A study of relation between fear of missing out and resilience among boys and girls adolescents

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Keywords: Fear of missing out; Resilience; Adolescents

Abstract

The present research was purposed to study the effect of gender on the level of fear of missing out and resilience among adolescents. For this, 200 adolescents were selected as the sample. Among them, 100 were boys and 100 were girls. They were in the age group of 13 to 18 years. Fear of missing out scale by Przybylski (2013) and Resilience scale by Lakshmi and Narain were administered on the subjects. Results have shown that girls have more fear of missing out than boys. Also, girls are more resilient as compared to boys. Fear of missing out among the boy and girl students was negatively associated with resilience.

Introduction

In the contemporary world, the rapid rise of digital platforms and social networking sites (SNS) such as Facebook, Instagram, and Twitter has intensified FOMO to unprecedented levels. Social media, by design, provides users with curated glimpses into the lives of others, often presenting an idealized version of reality. These platforms encourage users to compare their own lives with the seemingly perfect experiences of their peers, which can fuel anxiety, insecurity, and a sense of inadequacy. The constant barrage of updates, notifications, and posts creates a never-ending cycle of comparison, leading individuals to believe they are missing out on valuable opportunities for connection, success, or happiness.

The term Fear of Missing Out is a relatively recent addition to the lexicon of psychology and sociology, having gained widespread recognition with the rise of social media in the early 21st century. However, the underlying psychological roots of FOMO are much older, rooted in human social dynamics and the need for belonging. In evolutionary terms, humans are social creatures whose survival historically depended on group cohesion and collaboration. The fear of being excluded from social groups can be traced back to early human societies, where being left out of a tribe or community could have serious consequences for one's survival. **Franchina, Abeele, van Rooij, Lo Coco & De Marez (2018)** studied relationships between fear of missing out, social media use, problematic social media use (PSMU) and phubbing behaviour among the teenagers. They found that fear of missing out is a strong factor in occurrence of phubbing among the teenagers. Similar results have been found in the study by **Tandon, Dhir, Talwar, Kaur, & Mantymaki (2022)**.

Resilience is a vital aspect of human functioning, influencing mental health, emotional well-being, and overall life satisfaction. The importance of resilience can be observed across various domains, including personal development, mental health, and societal cohesion.In Psychology, resilience is often characterized as a set of adaptive skills and traits that enable individuals to cope with stress, trauma, and other forms of hardship. Similarly, in the context of ecology, resilience refers to the ability of ecosystems to absorb disturbances and maintain their essential functions. In a psychological context, resilience is frequently linked to traits such as optimism, emotional regulation, and social support. It encompasses the ability to maintain a positive outlook despite challenges and to find meaning in difficult experiences. Importantly, resilience is not a fixed trait but a dynamic process that can be cultivated and strengthened over time.Various studies have appeared that females tend to confront more troubles than males (**Albert J Isaacs, 2014**).

Objectives

The present study was carried out with following objectives:

1. To assess the level of fear of missing out and Resilience among adolescents.

2. To explore the effect of gender on the measure offear of missing outamong adolescents.
3. To find out the difference in level of Resilience among boys and girls adolescents.
4. To illustrate the relation between fear of missing out and Resilienceamong adolescents.

Research Variables

- **Dependent Variable:-** Fear of missing out, Resilience
- **Independent Variable**:- Gender

Research Hypothesis

The main hypotheses of the research were as follows-

1. "There would be significant difference between boys and girls in terms of fear of missing out."
2. "There would be significant difference between boys and girls in terms of resilience."
3. "There would be negative and significant influence of fear of missing out on resilience."

Research Methodology

a) Sample of the study- A sample of 400 adolescents was selected as the sample from different schools of Bihar. Among them, 200 were boy students and 200 were girl students.They were in the age group of 13 to 18 years. They were selected randomlywith consideration of some inclusion and exclusion criteria.

Inclusion Criteria:

- School Students
- Age range between thirteen to eighteen years
- Residing in Bihar state

Exclusion Criteria:

- Age below thirteen years and above eighteen years
- Residing outside Bihar
- Psychiatric and psychosomatic disorder

b) Research Variables- The details of the variables of this study are as follows:-

1. Fear of missing out- Fear of missing out is a persistent fear that others are having satisfying experiences that we are missing out on. When people involvement Fear of lost out at that point they check their smartphones routinely to keep upgraded of all the approaching data to diminish the probability of being ostracized and becoming lonely. In the present study fear of missing out has been studied among boys and girls in relationship with loneliness, self-esteem, relationship satisfaction and resilience.

2. Resilience- Resilience is often characterized as a set of adaptive skills and traits that enable individuals to cope with stress, trauma, and other forms of hardship. Similarly, in the context of ecology, resilience refers to the ability of ecosystems to absorb disturbances and maintain their essential functions.

3. Gender- Gender is a person's recognition and identity which means having some characteristics that relate to the categories male, female, or some other. It refers to the social, cultural and psychological meanings that are associated with masculinity and femininity. On the other side, word sex means the biological category of male and female. In Psychology, there have been numerous studies about the effect of gender on different psychological aspects. In this study, two types of gender (male and female) have been selected.

c) Research Tool- There weretwo scales have been used in this study. The details of the scales are as follows:-

1. Fear of Missing out Scale- This scale was developed by Przybylski (2013). It is a one-factor 10-item self-report measurement. The Cronbach alpha coefficient of the original version of the scale is .84. Each item is rated on a 5-point Likert scale (1= Not at all true to 5 = absolutely true). The total scores range between 10 and 50, where higher scores indicate a higher level of fear of missing out.

2. Resilience Scale- This scale was developed by Lakshmi & Narain (2017). It consists of 30 items and has four dimensions - perseverance, composure, self-reliance and faith. Each one followed by the word strongly agrees, agree, neutral, disagree, and strongly disagree. The test-retest reliability was calculated and was found to be 0.87 and split-half reliability was found to be 0.84. The test has Concurrent validity. This scale is meant for 13 years and above of age. Test has 26 positive items and 4 negative items.

d) Research Design- Between group research designs has been used in this study.

e) Data collection Procedure- Each subject was approached individually. Before recording the responses, an attempt was made to develop a good rapport with the subjects. In course of conversation, the subjects were requested to respond honestly and genuinely on the Fear of missing out scale and resilience scale. If the subjects needed any clarification on any question, it has been clarified to them so that she could respond with full understanding.

f) Data Analysis- The obtained data has been analysed by using different statistical techniques like Mean, Standard Deviation, t-test and regression analysis.

Results- Results have been presented through Table-1, 2 and 3.

Table-1: Mean scores of boys and girls students on the measure of Fear of missing out

	Boys (N=200)	Girls (N=200)
Mean	28.32	35.47
SD	5.12	6.24
t-ratio	12.76 P<.001	

df=398

Table-1 depicts the mean scores of boys and girls students on the measure of Fear of missing out. From the table, one can see that the mean of male subjects is 28.32 and mean of female subjects is 35.47. Here, the female subjects have gathered higher mean than the male subjects. This clarifies that the females are having high level of fear of missing out. They are insecure and feel being ignored in social contexts. There is significant difference among thesetwo groups. It confirms the first hypothesis of the study that **"There would be significant difference between boys and girls in terms of fear of missing out."**

This is what triggers individuals with Fear of missing out and nomophobia to effectively utilize their portable phones to fulfill the requirement for data upgrades, and there is a careless state of mind towards the other person (**Strinaricwari, 2023**). Some people have strong urge to have all information regarding outside world at all time. This is only possible through the mobile phones. Because of this, they stick to the phone to get out from the fear of missing out

(**Alt & Boniel-Nissim, 2018**). Phubbing can bring about in an individual, a sense of isolation from the reality and simultaneously brings them into a virtual world. Phubbing may further damage an individual's psychological health when they cannot seem to cope with this phenomenon particularly well.

This fear of missing out makes girls more addicted to smartphones and hence they start neglecting people and this is the reason why their social relations are being deteriorated. High level of fear of missing out leads to high level of internet addiction and high level of internet addiction leads to phubbing. The uses and gratification theory clearly displays that people often check their phones to stay informed about the world, access real-time updates, or retrieve important information. Smartphones offer immediate access to a wide range of information through news apps, search engines, and social media platforms, allowing users to feel knowledgeable and informed. This is the reason why people get fear of missing out. They just want to be informed about anything and stay connected with their phones. The girls have small social circle in society, hence they get interacted more on social media and make friends. But boys have many friends and they have so many engagements in their social lives. That is why girls have more fear of missing out than boys.

Table-2: Mean scores of boys and girls students on the measure of Resilience

	Boys (N=200)	Girls (N=200)
Mean	98.31	110.18
SD	12.56	16.84
t-ratio	8.02 P<.01	

df=398

Table-2 illustrates the mean scores of boys and girls adolescents on the scale of Resilience. From the table, it can be observed that the mean of boys students is 98.31 and the mean of girls student is 110.18. They have average level of resilience. The standard deviations of the two groups are 12.56 and 16.84 respectively. The t-ration between these two groups is 8.02 and is found to be significant. This depicts that both male and female students are different from each other on the scale of resilience. Both groups are having different level of resilience in their lives. It shows that gender is a determining factor in the resilience practices. This result is in the support of second hypothesis of the study that **"There would be significant difference between boys and girls in terms of resilience."**

Studies have shown gender difference in resilience (**Bahadir, 2006; Surucu** and **Bacanlt, 2010**). In the present study, girls have shown higher level of resilience as compared to boys. This is perhaps because girls tend to be psychologically stronger than boys. The societal pressure makes them patient and hence they are mentally powerful and know how to tackle problems and deal with hurdles of life. Some earlier studies have demonstrated that females are more resilient than males (**Hemavathi, 2017**). **Dharshini, Nasreen, & Archana (2017**) have done a study on undergraduate medical students and found that there is difference between male and female students on the measures of resilient and coping strategies.

Table-3: Regression analysis showing influence of fear of missing out on Resilience

Predictor	R	R Square	Beta	F	Sig. of F change
Fear of missing out	.24	.057	-.26	7.19	P<.001

Criterion Variable: Resilience

Table-3 shows the regressions analysis of the fear of missing out and resilience among the adolescents. It is clear from the table that with a total variance of 5.7%, the fear of missing out is a strong negative predictor of resilience among the subjects. This means that fear of missing out obstructs the effective enjoyment of resilience. The significant F denotes that resilience is a criterion variable for fear of missing out. This result is in the line of support of third hypothesis of the study that **"There would be negative and significant influence of fear of missing out on resilience."**

Several studies have shown fear of missing out as a driving factor for negative affectivity such as depression and anxiety which in turn reduces resilience among the adolescents **Beyens, Frison & Eggermont (2016)**. The above table illustrates that fear of missing out has strong negative effect on the level of resilience among the adolescents. The students with high level of fear of missing out are having an intrinsic desire to stay informed of changes in the outside world. This activity of them results into discouragement, demoralization and low self-confidence among themselves. These all can be formed together as low level of resilience among the adolescents. They do not know how to fight with problems and how to overcome these. Persons with high level of fear of missing out have poor coping strategies. The fear makes them aloof from learning the skill of resilience and practices it. Resilience is guide by self-efficacy and optimism which are lacking in the students who are dealing with fear of missing out. This fear of missing out makes them dependent and less valued. This emotional distress can challenge one's resilience. Also, phubbing can lead to conflicts and strain in interpersonal relationships. Resilience can influence how individuals navigate these social challenges.

Major findings of the study

1. Girls have shown more fear of missing out in comparison with boys.
2. Girls have found to be more resilient than boys.
3. Fear of missing out among the boy and girl students was negatively associated withresilience.

Conclusion

Conclusively, it can be stated that gender is a determining factor in development of fear of missing out and resilience among adolescents.

References

Alt, D., & Boniel-Nissim, M. (2018). Using multidimensional scaling and PLS-SEMto assess the relationships between personality traits, problematic internet use, and fear of missing out. Behaviour & Information Technology, 37(12), 1264–1276.https://doi.org/10. 1080/0144929X.2018.1502353

Bahadır E. (2009), Psychological resilience levels of students starting their education in health-related faculties, Master's Thesis, H.U. Institute of Health Sciences.

Beyens I, Frison E, & Eggermont S. (2016)) "I don't want to miss a thing": Adolescents' fear of missing out and its relationship to adolescents' social needs, Facebook use, and Facebook related stress. Computers in Human Behaviour. 2016; 64:1-8.

Dharshini, K, Nasreen, Thaneema & Archana, R. (2017). Cross-sectional study on health-related stress among underweight, obese and overweight undergraduate medical students. International Journal of Research in Ayurveda and Pharmacy.8 (Suppl2):230–233.

Franchina, V., Abeele, M. V., van Rooij, A. J., Lo Coco, G., & De Marez, L. (2018).Fear of missing out as a predictor of problematic social media use and phubbing behaviour among Flemish adolescents. International Journal of Environmental Research & Public Health, 15(10), Article 2319.https://doi.org/10.3390/ijerph15102319

Hemavathi, Archana R. (2017). Prevalence of stress among undergraduate medicalstudents: A cross-sectional study. International Journal of Research in Ayurveda and Pharmacy 8 (Suppl2): 238–240.

Isaacs, A.J. (2014). Gender Differences in Resilience of Academic Deans. Journal of Research in Education, 24, 112-119

Strinaricwari, A. (2023). The Role of Fear of Missing Out on Phubbing in Christian High School Students in Surakarta City. Journal of Psychological Thought and Research 19(1). https://doi.org/ 10. 32528/ins.v19i1.7210

Surucu, M., & Bacanlt, F. (2010). Examination of adherence to university accordingto psychological resilience and demographic variables. Gazi University Journal of Gazi Educational Faculty, 30 (2) .375-396

Tandon, A., Dhir, A., Talwar, S., Kaur, P., & Mantymaki, M. (2022). Social mediainduced fear of missing out (FoMO) and phubbing: Behavioural, relational andpsychological outcomes. Technological Forecasting and Social Change, 174, Article121149. https:// doi.org/10.1016/j.techfore.2021.121149

Entrepreneurship and Innovation: Drivers, Challenges and Socio-economic Impact

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Abstract

Entrepreneurship and Innovation are Key Drivers of Economic Growth and Social Progress Innovation spurs new business ventures, while entrepreneurship speeds up the path toward commercializing transformative ideas. This study investigates the interrelation between these and explains critical drivers of interdependence such as technological development; market demand; access to capital; and enabling policies. While startups have the potential to transform industries, they often encounter obstacles like funding gaps, regulatory hurdles, competition, and talent shortages. Ongoing case studies from organizations such as Tesla, Airbnb, and M-Pesa highlight disruption to the status quo and how innovation can play a role in economic diversification, job creation, and social progress.

Digital transformation, which will open new avenues for growth, will also be examined, as well as sustainability-driven startups and global innovation networks. To ensure we reap the full benefits of entrepreneurship and innovation, however, policymakers should improve intellectual property protections, broaden funding opportunities, and forge stronger university-industry partnerships. Innovation-Focused Ecosystems Economies more resilient,

competitive and inclusive by constructing an ecosystem supporting ventures; ajaX. The implication of this study highlights the urgent need for such interventions to overcome barriers and make it that entrepreneurial innovation can continue to flourish in a moving global environment.

Keywords: Entrepreneurship, Innovation, Economic Growth, Startups, Market Disruption, Technology, Policy Support

1. Introduction

Entrepreneurship and innovation are key drivers of contemporary economies, generating jobs, boosting economic development, and catalyzing societal change [1]. On the one hand, entrepreneurship is about the process of recognizing and pursuing business opportunities, while on the other, innovation refers to the introduction of new ideas, processes or products that challenge the status quo and serve to improve a competitive edge [2]. Collectively, they spur industrial progress, form new markets and solve global challenges. For policymakers, business actors and researchers, it is therefore critically important to understand the dynamics of entrepreneurship and innovation as the fields of technology and economy are increasingly characterized by complex changes [3]. It also evaluates policy interventions and future trajectories that shape innovation-driven entrepreneurial ecosystems.

2.1 Understanding Entrepreneurship and Innovation

Entrepreneurship, on the other hand, is the act of identifying and exploiting opportunities to develop and grow businesses, frequently in uncertain conditions [4]. It consists of risk, resource mobilization, and value creation. Innovation, on the other end of the spectrum, focuses on creating and executing new ideas, technologies, or business models to optimize efficiency, productivity or customer experience [5].Entrepreneurship of both types is very useful for the economic development. Innovative solutions provided by entrepreneurs improve productivity, whereas innovation fosters industry transformation and competitiveness [6]. Employment, diversification, and social advancement are delivered by innovative companies, leading toward an economy with resilience and long-term growth.

2.2 Interdependence of Entrepreneurship and Innovation

Entrepreneurship and Innovation are a dualistic in nature and a cycle that reinforces each other [2]. Entrepreneurs are the catalysts of innovation, bringing new technologies to market and disrupting models of business. On the contrary, innovation drives entrepreneurship through new market opportunities and competitive differentiation [4]

As an illustration, the reassuring use of artificial intelligence, blockchain, and biotechnology has resulted in the emergence of high-growth startups in diverse industries [3]. These innovators have created new markets and formidable competition for their contemporaries at the same time overcoming global challenges like eco-housing, risk-free travel protocols, and alternative cash transfer services [5]. We know from our own research that the symbiosis between entrepreneurship and innovation is crucial for building dynamic economies and fostering sustainable development.

2.3 Objectives of the Study

Prior to that date, data are available until October 2023. It identifies of drivers like technological developments, market needs, and policy assisting, while assessing obstacles like funding gaps, regulatory hurdles, and competition that deter entrepreneurial innovation [13]. The study also explores the socioeconomic implications of entrepreneurship driven by innovation [15], such as job creation, economic diversification, and social advancement. It also evaluates policy recommendations to strengthen startup ecosystems, encourage synergies between universities and industry, and broaden access to capital [12]. Finally, it explores new trends in digital transformation, sustainability and global innovation networks and indicates the future of entrepreneurship in a rapidly changing economy [14].

3. Literature Review

The literature on entrepreneurship and innovation is vast with many theoretical lenses employed to describe the process and outcomes of the phenomena. Our review identifies important theoretical underpinnings like Schumpeter's Creative Destruction, the Resource Based View (RBV) and Effectuation Theory throughout this section. Empirical studies show that startups help to economic growth and innovation clusters show great influence on the development of industry.

3.1 Theoretical Foundations

3.1.1 Creative Destruction by Schumpeter

The German economist Joseph Schumpeter labelled the effect of innovation on the destruction of established industries by substituting old and failed products, services and business models with new ones is known as Creative Destruction [16]. Joseph Schumpeter even claimed that entrepreneurial innovation causes economic development, where productivity increases and allows new companies to create advantages and pressure the existing firms [12] this theory highlights the role of the entrepreneurs as change agents by bringing forth new and disruptive innovations, causing the decline of incumbent firms not able to adapt. One of the biggest examples of creative destruction is the rise of digital photography to supplanted traditional film cameras. The same disruption has happened outside of the restaurant world, with services like Uber and Lyft taking chunks out of traditional taxi and cab services. Creativity is never done, as they say; creative destruction drives growth [20], but that includes large-scale challenges associated with the displacement of jobs, industries, and associated functions, which need to be dealt with with the help of policymakers to manage the transitions for both workers displaced and businesses disrupted [13]

3.1.2 Resource Based View (RBV)

The Resource-Based View (RBV), proposed by Barney asserts that a company achieves sustained competitive advantage through the unique resources and capabilities it possesses, as opposed to just through external environmental factors [4]. According to RBV, resources that are valuable, rare, inimitable and non-substitutable (VRIN) can give rise to a sustainable competitive advantage. Innovation is seen as a strategically valuable asset for the firms, which can use it to explore differentiation and instil long-term success [15]. Using its intellectual capital, proprietary technologies, and organizational competencies, entrepreneurial ventures can create high-growth business models. As an example, tech startups that utilize artificial intelligence (AI) and blockchain technology provide a competitive advantage by creating unique solutions that competitors will find hard to duplicate. Fundamentals of RBV: In terms of resources, the RBV framework is concerned with exploring why some startups succeed quickly and why others fail, and how unique capabilities foster the evolution of entrepreneurship [6].

3.1.3 Effectuation Theory

Starting from this foundation of entrepreneurial perspectives we now advocate approach that has been already previously studied Effectuation Theory to focus on how entrepreneurs decide under conditions of uncertainty [7]. Whereas the rational predictive view dominates traditional strategic planning the theory of effectuation posits that successful entrepreneurs begin with all that they have, utilize contingencies, and respond to dynamics of changing situations. It emphasizes adaptability, cross-learning, and co-creation over fixed targets [8].Much like successful startups iterating their business models based on market feedback. While it began as a local home-sharing service, with significant growth across the globe, Airbnb diversified its product offerings in response to demand and regulation. Effectuation Theory emphasizes on entrepreneurial decision-making method and risk management, especially in dynamic and uncertain settings, where the traditional business modus operandi does not produce good outcomes [9].

3.2 Empirical Studies

3.2.1 The Contribution of Startups to Economic Growth

It is well known that Startups are engines of economic growth, driving job creation, technological advancement and market innovation [10]. Real-world evidence indicates that high-growth startups, especially in technology-oriented industries, are instrumental in driving national GDP and enhancing global competitiveness [11]. Based on the data from OECD (2022) SMEs account for 60–70% of total employment in the majority of economies, where startups are typically leading in job and productivity creation [12]. Silicon Valley, for example, has shown how a robust startup ecosystem can drive continuous economic growth. Google, Facebook, and Tesla started as startups and became global corporate that sustain innovation and economic value. In addition, startups frequently introduce disruptive innovations that can potentially threaten established businesses, which can lead to significant changes across entire industries [13].

3.2.2 Innovative clusters and their effect

Examples [14] like Silicon Valley (United States), Bengaluru (India), and Shenzhen (China) are innovation clusters, a regional company where technology entrepreneurship and innovation. The proximity of talent, research institutions, venture capital, and a collaborative culture contacted each other is one of the reasons behind these clusters being more creative and producing knowledge spillovers [15]. According to Porter's cluster theory: knowledge spillovers, talent mobility, or infrastructure support, lead to increasing productivity and competitive advantage for firms from the same place in innovative hubs [16]. But empirical research shows that areas where entrepreneurs cluster deliver higher rates of patents, startups, and incoming investment dollars than do detached entrepreneurial ventures [17]. Take, for example, the ecosystem of Silicon Valley which is home to rapid technological developments in AI, biotechnology, and fintechtends to attract entrepreneurs and investors from all over the world. Likewise, China's Shenzhen has become perhaps the world's most innovative hub for electronics and hardware startups, backed by both strong government support and a robust supply chain ecosystem [18].

In the backdrop of the eventual evolution of businesses post-COVID-19, the evolution of theoretical frameworks like Schumpeter's Creative Destruction, the Resource-Based View (RBV), and Effectuation Theory can help provide meaning to the dynamics of entrepreneurship and innovation. There is a significant number of empirical studies that confirm the importance of startups for growth and of clusters of innovation for transformation. This study attempts to achieve a dual understanding of entrepreneurship and innovation as drivers of economic growth alongside their role in shaping competitive industries. Table 2.1 illustrates Key Insights from Literature.

Table 2.1 Key Insights from Literature Review

Aspect	Key Insight	Impact on Entrepreneurship	Ref
Creative Destruction	Innovation disrupts industries, replacing old models.	Drives new business opportunities.	[1]
Resource-Based View (RBV)	Competitive edge comes from unique resources.	Startups with proprietary assets thrive.	[4]
Effectuation Theory	Entrepreneurs adapt through flexible decisions.	Encourages agility and innovation.	[5]
Startups & Economic Growth	Startups boost employment and GDP.	Strengthens economies and industries.	[10]
Innovation Clusters	Hubs drive collaboration and investment.	Enhances startup success rates.	[14]
Technology & Innovation	AI, blockchain lower barriers for startups.	Speeds up innovation and scaling.	[11]
Entrepreneurial Challenges	Funding and regulatory barriers hinder growth.	Slows startup success and innovation.	[12]
Policy Support	Incentives and R&D funding aid startups.	Promotes sustainable business growth.	[13]
Market Demand & Innovation	Consumer trends shape startup success.	Drives sustainable and digital startups.	[15]
Corporate-Startup Collaboration	Large firms invest in startups for innovation.	Helps startups scale faster.	[16]
Social Impact of Innovation	Entrepreneurship solves social challenges.	Creates social enterprises.	[17]
Future Trends	Web3, metaverse, and ESG startups emerge.	Defines new business models.	[18]

3. Drivers of Entrepreneurial Innovation

In 2023, there are certain key elements that cause entrepreneurial innovation to take place and impact the economy. Key factors driving development are technological advancements, market demand, and policy support and capital access. Such factors affect the overall ecosystem that surrounds entrepreneurs, influencing which innovative idea paves the road to success and which fails.

3.1 Technological Innovations

One of the most impressive triggers of the entrepreneurial process is the advancement in the technology. The entry barriers for table startups have significantly lessened due to modern technology in the form of artificial intelligence (AI), the Internet of Things (IoT), and automation, enabling newcomers to compete against established players. These technologies facilitate greater efficiencies, scalability, and affordability, paving the way for disruptive solutions from new-age companies. For example, AI-based risk assessment, block chain-based transactions, and automated financial services have tremendously changed the fintech industry. Stripe and all those like them are designing their online payment processing systems to be easy to use, and they've come in often and completely transformed a headache of the industry, little by little. Likewise, health tech startups are harnessing AI to improve diagnostics, predictive analytics, and patient management, thereby making healthcare more accessible.

Table 3.1: Impact of Emerging Technologies on Startups

Technology	Impact on Startups	Example
AI	Enhances automation, decision-making, and personalization.	Chatbots, AI-driven marketing (e.g., HubSpot).
IoT	Enables smart products and connected ecosystems.	Smart homes, wearables (e.g., Fitbit).
Blockchain	Ensures secure, transparent transactions.	Fintech platforms (e.g., Binance, Ripple).
Automation	Reduces costs and increases operational efficiency.	Robotic process automation (RPA) in logistics.

3.2 Market Demand

Entrepreneurial innovation is shaped by market demand. New business models driven by consumer preferences, especially sustainability and ethical consumption Startups that adapt to these changing demands often find themselves ahead of the curve. For example, Beyond Meat, which produces plant-based foods, was born out of increasing consumer awareness of health, climate change, and welfare of animals. Likewise, electric vehicle (EV) startups such as Rivian and NIO are positioned to take advantage of the increasing demand for sustainable travel. Those entrepreneurs who are in sync with new market trends like sustainable packaging, carbon-neutral, and ethically sourced, are poised for success.

Table 3.2: Market Trends Driving Innovation

Market Trend	Impact on Innovation	Example
Sustainability	Drives green entrepreneurship and eco-friendly products.	Beyond Meat, Tesla.
Digital Economy	Boosts demand for online services and automation.	Shopify, Zoom.
Personalization	Increases demand for AI-driven and custom solutions.	Netflix, Spotify.
Health & Wellness	Encourages innovation in biotech, fitness, and mental health.	Peloton, Calm app.

3.3 Policy Support

Entrepreneurship is globally recognized as essential to economic growth and job creation by various governments. Hence, innovation is bolstered by policy support through tax incentives, R&D grants, incubators, and regulatory reforms. Startup India, for instance, is a government initiative bartering tax exoneration, facilitating easy patent filing and providing access to funding. Far leaner, government-backed incubators and accelerator programs in the U.S. Singapore and Germany allow startups to hone their business models and get mentorship.

Governments create an ecosystem where innovation-driven entrepreneurship flourishes by cutting bureaucratic red tape and offering financial benefits. But hurdles such as regulatory compliance, high taxation and legal restrictions that still prevent companies from becoming a household name will remain, demanding continuous policy reforms.

3.4 Access to Capital

Access to capital is one of the most important catalysts for entrepreneurial success. They need capital, in different stages, from when they get when they validate their idea to when they scale their businesses. Funding from diverse financing avenues such as venture capital, crowd funding, cooperation with corporations and government grants offer essential financial aid. Venture capital (VC) firms are a driving force behind the funding of high-growth startups, providing not only capital but also mentorship. This allowed early-stage VC back companies like Airbnb and Uber to scale quickly. At the same time, crowd funding sites like Kickstarter and GoFundMe allow entrepreneurs to source capital directly from consumers. Many startups rely on corporate partnerships to assist them in this growth larger companies invest privately in or acquire disruptive startups to fill gaps in their portfolios. One recent example is that Google absorbed Deep Mind, which supercharged AI research and development, while Facebook absorbed Oculus to hasten virtual reality tech.

Table 3.3: Key Funding Sources for Startups

Funding Source	Benefits	Example
Venture Capital	Provides large-scale funding and strategic guidance.	Sequoia Capital funding Stripe.
Crowd funding	Enables public-backed funding for early-stage ideas.	Kickstarter campaigns for new gadgets.
Corporate Investment	Helps startups scale through partnerships and acquisitions.	Google acquiring DeepMind.
Government Grants	Supports research and innovation without equity loss.	EU's Horizon 2020 program.

Entrepreneurial innovation is driven by a combination of technological advancements, market demand, policy support, and access to capital. Emerging technologies like AI and blockchain empower startups to disrupt industries, while evolving consumer preferences push entrepreneurs to innovate in sustainable and digital solutions. Government policies and funding sources provide essential support, enabling startups to scale and compete. By understanding and leveraging these drivers, entrepreneurs can build resilient and impactful businesses in a rapidly changing global economy.

4. Challenges

There are certain challenges facing entrepreneurial innovation that can limit the growth and sustainability of startups. Challenges including financial hurdles, regulatory intricacies, and talent scarcity among many others severely impede the capacity of entrepreneurs to scale their ventures successfully.

4.1 Funding Gaps

One of the most common challenges encountered by startups is obtaining financing, particularly during the initial stages. Investors tend to play to safe, which prevents a lot of ventures from receiving the funding they need. Although there is some relief with venture capital and crowd funding, attracting investors willing to fund unproven business models remains a problem for many startups.

4.2 Regulatory Barriers

Regulatory environment: Startups need to thrive in complex regulatory environments, such as compliance costs, taxation policies, and IP protection laws. Bureaucratic red tape delays and adds costs to many innovative ventures. Fintech and healthcare are examples of industries that have even more stringent regulations, creating high barriers for new entrants to come into the market.

4.3 Market Competition

Another key challenge for startups is the presence of well-established corporations. Incumbent companies are often large; they have more financial power, name recognition, and market power than smaller firms, making it hard for upstarts to gain a foothold. Disruptive startups are often under siege by aggressive -- established business for whom the revenue streams of more efficient competitors are treasonous acts against their control of the market.

4.4 Talent Shortages

Limited startup growth due to shortage of skilled talent, especially in the high-demand, cutting-edge sectors such as artificial intelligence, blockchain and biotech, As a result of the increased need for tech talent, hiring costs become prohibitively expensive for startups looking to hire and retain professionals with the know-how to build their product. And without the necessary expertise, startups can find it hard to innovate and scale at the pace needed. Addressing these challenges will need a combination of strategic planning, policy reforms and ecosystem support to foster an environment where startups can thrive. A summary of startup challenges, contributing factors and practical examples is highlighted in Table 4.1.

Table 4.1: Key Challenges Faced by Startups

Challenge	Impact	Cause	Example
Funding Gaps	Slows growth and product scaling.	Investors are risk-averse.	Startups struggle for VC.
Regulatory Barriers	Delays market entry and increases costs.	Complex compliance requirements.	Fintech startups face strict laws.
Market Competition	Limits startup expansion.	Large firms dominate industries.	Small retailers vs. Amazon.
Talent Shortages	Hard to innovate and scale.	High demand for tech professionals.	AI firms lack top engineers.

5. Case Studies

Running a business is nothing like what you might be expecting or hoping. As the next section highlights, three such case studies will examine how technology and business model innovation by some of the most successful forms of mobile money—Tesla, Airbnb and M-Pesa—have propelled this industry transformation.

5.1 Tesla: The Leader in Electric Vehicles and Energy

Through its production of electric vehicles (EVs) and advanced battery technology, Tesla has transformed the automotive and renewable energy industries. Unlike traditional automotive companies, Tesla offers AI-based automated driving systems and energy-efficient solutions, thus democratizing environmentally-friendly transportation. Its Gigafactories have revolutionized the production of batteries making it much more cost-effective and scalable. In doing so, Tesla has expedited the worldwide transition to clean energy transportation while also challenging legacy automakers to adopt EV technology.

5.2 Airbnb: A Platform-Based Model that Disrupts Hospitality

Through a peer-to-peer lodging model, Airbnb has transformed the hospitality industry by enabling homeowners to rent out their spaces to travelers directly. Airbnb is one of the leading examples of a sharing economy, as it does not own hotels, but instead allows guests to rent out spaces in other individuals' homes. Its online platform links hosts and guests around the world, providing guests with unique, affordable accommodation. But its success in those few zones has led to regulatory challenges in many other cities because of concerns about zoning laws and taxation. Yet Airbnb is a leader in alternative lodging, showing how digital platforms can remake industries.

5.3 M-Pesa: Pioneering Financial Inclusion in Emerging Economies

The mobile money platform M-Pesa, which was developed in Kenya, has transformed financial services in many economically developing markets. M-Pesa has allowed millions of poor people to access secure, efficient financial services by enabling digital transactions without the need for conventional banking infrastructure. Its success has inspired similar fintech solutions around the world, reinforcing the role of mobile technology in promoting financial inclusion. Here is table 5.1 showing some Key Insights from Case studies

Table 5.1 : Key Insights from Case Studies

Company	Industry	Innovation	Impact
Tesla	Automotive, Energy	EVs, battery innovation, AI driving	Pioneered sustainable mobility, influenced global EV adoption.
Airbnb	Hospitality	Platform-based peer-to-peer model	Disrupted traditional hotels, enabled sharing economy.
M-Pesa	Fintech	Mobile money for financial inclusion	Expanded banking access in emerging markets.

They also underline the role of leveraging new business models and technology-enabled solutions to disrupt industries, improve the accessibility of products and services for customers, and generate new economic value that extends beyond geographical boundaries.

6. Socio-economic Impact

Mastering it helps in forming the society and economy • Entrepreneurial innovation has a tremendous influence on society and economy, they help to initiate economic growth, create jobs, and produce social innovation. The role of startups and small businesses in driving innovation, improving productivity, and solving global problems is essential.

6.1 Economic Growth

Startups help drive GDP growth and economic diversification by bringing new products, services, and business models to market. This, in turn, increases cross-sectoral productivity, bringing in foreign investment and generating a vibrant economic ecosystem. This is the case as emerging fintech startups reinforce financial markets; biotech companies advance healthcare and pharmaceuticals, etc.

6.2 Job Creation

Entrepreneurs are major players in new job creation, especially in developing countries. Small and Medium Enterprises (SMEs) represents 60–70% of employment in OECD economies and are driving the expansion of the labour market. Startups are also boosting demand in high-growth sectors, like artificial intelligence, clean energy and e-commerce, where the need for specialized skills is on the rise.

6.3 Social Innovation

More than just economics, entrepreneurship moves the needle on social innovation, delivering cost-effective solutions to essential problems, from health care to education to climate change. Solar startups in Africa, for instance, are enabling off-grid energy access and enhancing electricity availability in rural areas. Education Technology (EdTech): With the same effect, edtech startups are disrupting education by making learning more easily accessible through technology. And entrepreneurship is a powerful force in the structure of a sustainable and inclusive future as it is by spurring economic development, generating job opportunities and pro-social change.

7. Future Trends

Entrepreneurship and innovation are ever-evolving fields, and new trends indicate what the future of industries will hold. Trends like digital transformation, sustainability and global community collaboration will drive the next wave of business innovation and economic growth.

7.1 Digital Transformation

The decentralized technologies provided by Metaverse, Web3 and many others are reshaping the interactions of businesses and consumers with one another. The Metaverse opens up immersive digital landscapes as virtual commerce, real estate, and socialization become commonplace. Through blockchain, Web3 technologies are encouraging decentralized finance (DeFi) and allowing users to grant them more ownership of the data. AI, machine learning, and automation-driven startups will further accelerate digital business models across a plethora of industries including finance, healthcare, and entertainment.

7.2 Sustainability

And as the world becomes more focused on climate change and environmental responsibility, circular economy startups and ESG-oriented companies (Environmental, Social, and Governance) are on the rise. Enterprises are adopting green technologies, carbon-neutral solutions, and sustainable supply chains to limit their effect on the environment. Whether it’s biodegradable packaging or new startups in renewable energy, innovation driven by the need for sustainability is becoming a major force in entrepreneurship.

7.3 Global Collaboration

Cross-border innovation networks between startups and enterprises have leveraged global talent, funding and markets. Governments and international organizations are catalyzing partnerships through accelerator programs, R&D partnerships, and policy collaborations. Rising technologies are embedding themselves into the world's insatiable quest for economic development, and to the derivative, prosperity. As we move forward, these trends will only continue to shape the entrepreneurial ecosystem, fueling innovation and economic resilience and sustainable development on a global scale. Table 7.1 summarizes the great trends of the future, which are the revolutionary movements for any entrepreneur.

Table 7.1: Key Future Trends in Entrepreneurship

Trend	Key Impact	Driving Factors	Example
Digital Transformation	Enhances virtual experiences, decentralization, and automation.	Advances in AI, blockchain, and Web3.	Metaverse businesses, Web3 startups.
Sustainability	Promotes eco-friendly solutions and ethical business models.	Climate change policies, ESG investment.	Circular economy startups, renewable energy ventures.
Global Collaboration	Strengthens cross-border innovation and market expansion.	International trade, startup ecosystems.	Global R&D partnerships, international accelerators.

8. Policy Recommendations

Policy makers enter here, for building a supporting ecosystem where innovation thrives: bringing down barriers but at the same time supporting startups scale their businesses on a structural level. In this spirit, the following recommendations will help create an inclusive, efficient, and sustainable environment for entrepreneurial growth.

8.1 Exercise Stronger IP Laws

Having strong IP laws is essential in protecting innovators and offering incentive for investment in research and development. Enforcement of patent, copyright, and expedited trademark applications ensures that entrepreneurs can commercialize their innovations without being in danger of infringing on the rights of others. Governments need to offer IP support services for navigating complex legal frameworks.

8.2 Broaden Access to Seed Funding and Mentoring

Funding gaps are a pain for early-stage startups. Governments can create seed funding programs, tax incentives for investors, and public-private partnerships to ensure access to capital. Structured mentorship programs that pair entrepreneurs with industry experts and venture capitalists can also improve startup success rates.

8.3 Promoting University-Industry R&D Collaboration

Drives innovation through collaboration between universities and industries Strengthening educational-business ties through joint R & D projects, innovation hubs, and technology transfer programs should, therefore, be fostered — both for direct benefits to the firms involved and for societal benefits from innovation.

8.4 Relieve Bureaucratic Barriers

New businesses are often delayed by excessive regulatory requirements. Simplifying business registration and tax filing and compliance processes would reduce barriers to entry for startups. This can be further complemented with digital government platforms and one-stop regulatory services, which can reduce the administrative burden on entrepreneurs. By adopting these policy recommendations, we can build an environment where innovation thrives, entrepreneurs flourish, and economies prosper. This table 8.1 note essential plunge measures, the ailing form, relay policy thereupon to engender the entrepreneurial growth.

Table 8.1: Key Policy Recommendations for Entrepreneurship

Policy Area	Key Impact	Implementation Strategy	Example
IP Protection	Encourages innovation by safeguarding ideas.	Strengthen patent laws, offer legal support.	Fast-track patent approval systems.
Seed Funding & Mentorship	Supports early-stage startups with capital.	Grants, tax incentives, investor networks.	Government-backed startup funds.
University-Industry R&D	Bridges academic research and market needs.	Joint research programs, innovation hubs.	Tech transfer offices in universities.
Regulatory Simplification	Reduces barriers to new business creation.	Digital registration, streamlined compliance.	One-stop business registration portals.

9. Conclusion

Entrepreneurship and innovation are interdependent forces that drive economic growth, technological progress, and industry transformation. By fostering new business models, job creation, and market competitiveness, they contribute significantly to global development. However, startups and innovators face persistent challenges, including funding constraints, regulatory barriers, and intense market competition. Addressing these challenges requires comprehensive policy support, access to capital, and ecosystem-driven initiatives. Governments and stakeholders must implement strong intellectual property protections, seed funding programs, university-industry collaborations, and simplified regulatory processes to enable entrepreneurial success. Additionally, fostering cross-border innovation networks and digital transformation will further accelerate progress. Future research should explore sector-specific entrepreneurial trends, particularly in fintech, renewable energy, and AI-driven industries, while also analyzing regional and cultural influences on innovation. With strategic interventions and ecosystem support, entrepreneurship will continue to be a catalyst for economic resilience, sustainability, and global innovation.

References

1. C. Busch, "Towards a Theory of Serendipity: A Systematic Review and Conceptualization," J. Manage. Stud., vol. 61, no. 3, pp. 1110–1151, May 2024.
2. R. Mudida and C. Busch "Asserting and Transcending Ethnic Homophily: How Entrepreneurs Develop Social Ties in Socially Contested Environments to Access Resources and Opportunities," Strategic Entrepreneurship J., vol. 18, pp. 229–257, 2024.
3. H. G. Barkema and C. Busch, "Planned Luck: How Incubators Can Facilitate Serendipity for Nascent Entrepreneurs Through Fostering Network Embeddedness," Entrepreneurship Theory Pract., vol. 46, no. 4, pp. 884–919, 2022.
4. C. Busch and H. G. Barkema, "From Necessity to Opportunity: Scaling Bricolage in Resource-Constrained Environments," Strategic Manage. J., vol. 42, pp. 741–773, 2021.
5. Galvao, C. Mascarenhas, C. Marques, J. Ferreira, and V. Ratten, "Triple Helix and Its Evolution: A Systematic Literature Review," J. Sci. Technol. Policy Manage., vol. 10, no. 3, pp. 812–833, 2019.
6. C. Busch and L. Hehenberger, "How to Evaluate the Impact of Corporate Purpose," MIT Sloan Manage. Rev., Fall Issue, 2022.

7. E. G. Carayannis and D. F. J. Campbell, "Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth," European Union Committee of the Regions, 2016.
8. S. Cavallini, "Using the Quadruple Helix Approach to Accelerate the Transfer of Research and Innovation Results to Regional Growth," European Union Committee of the Regions, 2016.
9. C. Busch and M. Grimes, "Serendipity in Entrepreneurship, Strategy, and Innovation," in Serendipity Science, S. Copeland, W. Ross, and M. Sand, Eds. London: Springer Nature, 2023, pp. 69–100.
10. E. G. Carayannis and D. F. J. Campbell, "'Mode 3' and 'Quadruple Helix': Toward a 21st Century Fractal Innovation Ecosystem," Int. J. Technol. Manage., vol. 46, no. 3/4, pp. 201–234, 2009.
11. E. G. Carayannis, T. D. Barth, and D. F. J. Campbell, "The Quintuple Helix Innovation Model: Global Warming as a Challenge and Driver for Innovation," J. Innov. Entrepreneurship, vol. 1, no. 2, pp. 1–12, 2012.
12. M. Peris-Ortiz, J. Ferreira, L. Farinha, and N. Fernandes, "Multiple Helix Ecosystems for Sustainable Competitiveness," Springer, 2016.
13. L. Leydesdorff, "The Triple Helix, Quadruple Helix, ..., and an N-Tuple of Helices: Explanatory Models for Analyzing the Knowledge-Based Economy?," J. Knowl. Econ., vol. 3, pp. 25–35, 2012.
14. R. Arnkil, A. Järvensivu, P. Koski, and T. Piirainen, "Exploring Quadruple Helix: Outlining User-Oriented Innovation Models," Univ. Tampere, 2010.
15. K. Rönkä and J. Orava, "Kehitysalustoilla Neloskierteeseen: Käyttäjälähtöiset Living Lab- ja Testbed-Innovaatioympäristöt," MovenseOy & The Center for Knowledge and Innovation Research, HSE, 2010.
16. S. P. MacGregor, "CLIQboost: Baseline Research for CLIQ INTERREGIVC (Creating Local Innovations for SMEs Through a Quadruple Helix)," Documenta Universitaria, 2010.
17. F. Plasser, "Politische Kommunikation in Österreich: Ein Praxisnahes Handbuch," WUV, 2004.
18. E. G. Carayannis, T. D. Barth, and D. F. J. Campbell, "The Quintuple Helix Innovation Model: Global Warming as a Challenge and Driver for Innovation," J. Innov. Entrepreneurship, vol. 1, no. 2, pp. 1–12, 2012.
19. L. Höglund and G. Linton, "Smart Specialization in Regional Innovation Systems: A Quadruple Helix Perspective," R&D Manage., vol. 48, no. 1, pp. 60–72, 2017.
20. E. G. Carayannis and D. F. J. Campbell, "'Mode 3' and 'Quadruple Helix': Toward a 21st Century Fractal Innovation Ecosystem," Int. J. Technol. Manage., vol. 46, no. 3/4, pp. 201–234, 2009.

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Exploring the Endangered Kusunda Community's Indigenous Culture, Language and Education

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Abstract

The primary objective of this study is to explore the indigenous culture, language and education of the endangered Kusunda community. This study also identifies the causes behind the decline of the Kusunda language and culture. This study is primarily conducted using a qualitative research approach. Despite having a unique language, culture, values, and traditions, the Kusunda community faces the threat of extinction. Since the Kusunda community is endangered, two Kusunda families—one from Tiram, Pyuthan, and the other from Ambapur, Dang—were selected as the study sample. Data were collected mainly using surveys, participatory observations and in-depth interviews. The Kusundas are undoubtedly forest-dwelling people, but they are found to be honest forest inhabitants who have undergone processes of acculturation, stratification, and socialization. They are known for their unique traits such as begging, hunting birds, avoiding arguments, not consuming cloven-hoofed animal meat, and avoiding contact with cow dung. The Kusunda tribe, which represents early human societal traits, is gradually losing its uniqueness and integrating into mainstream society. However, they have also lost their ethnic identity to some extent. Factors contributing to this include modernization, societal changes, deforestation, challenges in livelihood, inter-ethnic marriages, lack of organization, and the Kusunda people's own perceptions and pace of development. Additionally, this group, one of Nepal's earliest inhabitants, has been neglected in research, further accelerating its loss of identity. Their language and culture are not *entirely extinct, but further research is needed to preserve and document them. It is suggested that the valuable aspects of their indigenous culture should be integrated into modern education systems.*

Keywords: Kusunda, endangered, Kusha, indigenous culture, language, education

Background

Nepal's cultural diversity is a feature of Nepali life and an invaluable national wealth. This wealth encompasses language, script, literature, art, and culture. The state has adopted policies to promote and preserve this heritage, strengthen unity, and uplift marginalized and endangered ethnic groups and communities (Constitution of Nepal, 2072). While Nepal is a multilingual nation, with over 123 languages spoken as mother tongues by 125 ethnic groups (CBS, 2012), many of these languages are listed as endangered. These languages have been disappearing over the last few decades as the field of linguistics is losing the languages of the world (Baez, 2018). As a result, this trend is endangering linguistic variety globally, and Nepal's indigenous people are particularly affected. Many of the languages spoken by these groups in Nepal, especially those belonging to the Tibeto-Burman language families, are in danger of going extinct (Yadava, 2014). It is widely accepted among linguists that languages can be classified as safe, endangered, at risk, or extinct (Crystal, 2000). The majority of Nepal's native languages are classified as endangered. Numerous linguists have also concurred that the number of children learning a language, rather than the number of speakers, is a better indicator of that language's proficiency. Wigglesworth and Simpson (2018), for example, contend that indigenous children face an additional educational barrier when they transition into the school system and begin studying languages other than their mother tongue.

Globally, at least 200 million people still live in primitive conditions (Bodley, 1988). Whether referred to as tribes, races, or indigenous groups, these human societies primarily rely on hunting and gathering for their livelihood, sustaining themselves by collecting forest resources. They follow a nomadic lifestyle, roaming from jungle to jungle. Such societies, which resist being molded into a uniform pattern of change, are often categorized as "modern hunter-gatherer societies." These societies are also composed of various ethnic groups. Ethnicity refers to the stratified internal divisions of a society, with members having a permanent and hereditary identity (Berman, 1972).

These so-called "barbaric" and "uncivilized" ethnic groups still exist, although their way of life has evolved. They are no longer pure ancient hunter-gatherers (Luitel, 2055). The Kusunda community exists in this context. According to Luitel, this community has been oppressed by colonial effect, burdened by population expansion, pressured by increasing external demands on natural resources, and displaced by parks and reserves established in the name of forest conservation.

The Kusunda, who wander through forests in the western hilly regions of Nepal and the eastern Himalayas, raise many questions: What kind of community are they? What is their education and natural way of life? How did they manage their traditional knowledge and lifestyle? Why they are still referenced in derogatory terms during disputes in villages? Why has the government failed to preserve the language and culture of endangered groups like the Kusunda? These questions motivated my desire to undertake this study.

The Kusunda are Nepali-speaking Hindus (Bhattarai, 2055). Anthropologists and researchers have described the Kusunda and Rautes of Nepal as the last hunter-gatherer tribes of South Asia (Reinhard, 1974), Nepal's only nomadic hunters (Bista, 2000), and endangered communities (Singh, 1997). The Kusunda trace their origins to the descendants of Kush, one of the sons of Sita and Ram from the epic 'Ramayana'. Anthropologists and researchers have described the Kusunda as one of South Asia's last nomadic hunter-gatherer tribes. Despite their historical and cultural significance, they are on the margin of extinction due to neglect and lack of prioritization in research. These descriptions show the Kusunda as a remnant of "primitive human society" on the verge of extinction. Against this backdrop, the primary objective of this study is to explore the indigenous culture, language and education of the endangered Kusunda community. Similarly, this study also identifies the causes behind the decline of the Kusunda language and culture.

Numerous paper, documents and reports concluded that the Kusunda are among the oldest inhabitants of Nepal. However, to date, no integrated outcome of research conducted on this community has been achieved. Culture is a powerful foundation that defines any society, but the Kusunda's foundation is deteriorating and nearing extinction. Identifying and preserving the educational heritage tied to their indigenous traditions and culture is everyone's responsibility.

Exploring the identity and existence of the Kusunda community could help identify ways to integrate modern education into their language and culture, bridging traditional and modern educational practices. This realization prompted us to select this subject to study the Kusunda people, their culture, and the education embedded within it. Furthermore, the detailed study of the Kusunda community has not been a priority for researchers. Ancient scriptures in Sanskrit, Pali, and Prakrit are already rare in Nepal compared to India, and Nepal also houses ancient texts in Newari and Maithili languages. If efforts are made to compile the Kusunda language and culture, it could become a globally significant contribution to linguistic studies (Dahal, 2057). Based on this understanding, it has become imperative to study the Kusunda community today.

The Kusunda are one of the most endangered and vulnerable ethnic groups, whose existence is at risk. Despite this, little research has been conducted on them. Historical accounts from 2037/2038 BS suggest that the Kusunda led a highly nomadic lifestyle. However, their transition to permanent settlement and adjustment to a inactive life became an area of interest for this research. This study seeks to explore significant changes within Kusunda culture and the factors driving those changes. Future researchers can use this study as a foundational reference. The findings and insights from this research could help design policies to preserve and develop endangered communities and guide educational institutions in creating constructive educational programs based on modern pedagogy.

Objectives of Study

The primary objective of this study is to explore the indigenous culture, language and education of the endangered Kusunda community. Similarly, the objective of this study is to investigate the factors responsible for the decline of the Kusunda language and culture. To achieve these objectives, the following research questions have been constructed:

1. What beliefs and folklore exist regarding the origin and settlement of the Kusunda people?
2. What is their indigenous culture?
3. What are the major changes observed in their culture, and
4. What are the educational implications of Kusunda's indigenous culture in modern education?

Review of Literature

It is widely acknowledged by linguists and education planners that a country's educational system determines its future. The quality of education is influenced by the languages that are utilized for learning and instruction in schools and universities (Kadel, 2017). In order to address this issue, Kadel (2017) examined the history of Nepal's education laws pertaining to the use of minority languages in basic education and made the case that every Nepali community in the country has the right to protect and advance its mother tongue, script, cultural civilization, and legacy. A related study was conducted in 2011 by the Department of English Education, which examined the realities of multilingual education programs implemented in seven schools across six districts. The results indicated the initiative may not be sustainable because of the impractical way multilingual education is being implemented. According to the findings, the state government's assistance was insufficient to enable the teachers to manage the program efficiently.

Understanding the reality of the Kusunda community requires a multidisciplinary approach. Thus, we have synthesized various studies and reflections to gain insights into the Kusunda people. Social change, as a topic, falls within the realm of social sciences. The transition from simplicity to complexity brings social, cultural, and educational transformations. Darwin's theory of struggle for existence (1859) suggests that distinctive traits inherited by descendants can lead to the emergence of new species with refined characteristics over generations. Based on this principle, the Kusunda initially led a hunter-gatherer lifestyle. When hunting became insufficient for survival, they turned to collecting food from villagers. Gradually, they adapted to agriculture and animal husbandry, aligning their activities and lifestyle with the changing circumstances.

Globalization and marginalization cause cultural deterioration for indigenous groups (Smith, 2021). Nearly 40% of the 7,000 languages spoken worldwide are endangered, making language loss a crucial sign of cultural degradation (UNESCO, 2023). According to academics, culturally responsive education fosters academic achievement as well as identity (McCarty & Lee, 2014). Language engagement schools and other revitalization initiatives have demonstrated promise (Hinton et al., 2018). Nonetheless, regional disparities in financial and policy support persist (Wilson & Hughes, 2022).

Indigenous voices in education are empowered through community-driven curriculum creation (Kirkness & Barnhardt, 2001). The use of technology to maintain language and oral traditions is growing (Perley, 2020). However, equal access to these technologies is restricted by digital divides (Resta & Laferriere, 2021). Transmission of information between generations is essential to maintaining culture (Cajete, 2016). There is possibility for revolutionary change through cooperative relationships between indigenous institutions and communities (Simpson, 2017).

Protecting indigenous rights and cultural heritage requires ongoing lobbying and legal acknowledgment (Anaya, 2022). By giving preference to dominant languages and disregarding indigenous epistemologies, educational systems frequently contribute to this loss (Smith, 2021). However, there is potential for reviving indigenous identity and knowledge through culturally responsive educational methods (McCarty & Lee, 2019). Intergenerational knowledge transfer is greatly aided by community-based language initiatives, particularly those that involve elders (Zepeda & Hill, 2022). Regional differences persist in legal safeguards and political recognition (Battiste, 2013). Holistic methods that combine land-based learning, language, and culture are becoming more popular (Coulthard, 2014). For true representation in curriculum creation, indigenous leadership is essential (Brayboy, 2022). To guarantee sustainability and relevance, indigenous communities themselves must ultimately spearhead preservation initiatives (Wilson, 2008).

Marx's materialistic interpretation of history (1846) posits that all historical changes result from shifts in production systems driven by conflicts between the bourgeoisie and the working class. Applying Marx's theory to the Kusunda shows that they were not originally slaves but independent nomadic hunter-gatherers. They had no internal conflicts and led a communal lifestyle with no direct engagement with economic systems. However, modern sedentary Kusunda families exhibit signs of change.

Durkheim's structural functionalism (1951) emphasizes the primacy of social existence over individual existence in social organization. He argues that individuals' activities are directed to fulfill social needs. The Kusunda's transformation can be attributed to this functionalist perspective. Crisis, inadequacy, adaptability, and imitation have led them to abandon their indigenous ideals and adopt new social values, norms, and cultures, resulting in "culturalization."

Luitel (2055) states that Raute culture as a culture of continuity, but he acknowledges that communities like the Chepang and Kusunda were compelled to embrace change, which could also happen to the Raute. Reinhard (1976) and Gurung (1995) note that the Kusunda's decline was influenced by their inability to sustain regular meat supplies through bow-and-arrow hunting. Like the Chepang, who were forced to adopt farming, and the Raute, who now face challenges in sustaining their population without crop production, the Kusunda adapted by embracing new survival strategies?

Method and Process

This study does not provide a comprehensive representation of all Kusunda people scattered across Nepal who are on the verge of extinction. Instead, it focuses on two Kusunda families: one from Mandavi, Tiram, Pyuthan, and the other from Ambapur, Ghorahi, Dang. The study primarily examines the indigenous culture of the Kusunda, the significant changes observed within the community and their natural education system. This study employs a qualitative research approach. As the Kusunda are an endangered and minority community, elderly men and women from both families were selected as the primary subjects of the study. Additionally, elderly non-Kusunda individuals, teachers, and knowledgeable locals from both locations were included in the sample. Data collection tools included participatory observation form and in-depth interview guidelines. Literate individuals completed the questionnaires themselves, while illiterate individuals were asked open-ended questions, and their responses were recorded. Participatory observation, field surveys, interviews, and discussions with both Kusunda and non-Kusunda elders were conducted to gather data. Both primary and secondary data sources were utilized in this study.

Results and Discussion

This section attempts to analyze the data obtained in relation to the objectives. Various headings and subheadings have been used to sequentially advance the study in line with the objectives.

Origin and Homeland of the Kusunda Community

While traditional scholars have various theories about the origins of the Kusunda, the community has its own narrative. According to them, humanity is divided into four groups: i) Brahmins (descendants of Brahma) ii) Rulers (descendants of Vishnu, including Thakuris and Chhetris) iii) Magars or Mongols (descendants of Maheshwara), and iv) Artisans like Lohars (descendants of Vishwakarma). The Kusundas claim their root originates from the descendants of Vishnu. Based on accounts from individuals like Lil Bahadur Kusunda (Pyuthan) and Prem Bahadur Ban Raja (Dang), they assert that their ancestors are connected to stories mentioned in the Ramayana.

According to Kusunda oral history, Sita gave birth to a son, Lav, while in exile. One day, while she was bathing, a monkey played with the baby she had left in a sling. Fearing for her child, she took him back, and the sage (unaware of the incident) created another baby using a piece of Kusha grass. The baby cried when Sita returned, and the sage claimed the second child was hers, naming him "Kusha." The Kusundas believe their lineage stems from Kusha, while Lav inherited Ram's kingdom. Kusha, denied his father's kingdom, moved to the forest, becoming a forest king. His descendants, too, ruled the woods, collecting taxes from groups like the Raute.

Cultural Heritage of the Kusunda

The Kusunda community claims a unique culture rooted in their identity as forest rulers. However, over time, their traditions have evolved through interaction with local communities. While the Kusunda and Raute share a nomadic lifestyle, dwelling in temporary shelters and relying on hunting, key differences exist: i) Rautes predominantly hunt monkeys, while Kusundas do not eat hoofed animals. Instead, they hunt birds like pheasants and porcupines ii) Raute women avoid visiting villages alone due to fears of exploitation, but Kusunda women had no such reservations, even singing folk songs while begging in villages. Kusunda has won unique traditional practices such as: Avoiding hoofed animal meat and cow dung, which they believe are impure, performing purification rituals using cow urine and worshiping nature and forest deities, indicating a blend of Hindu and animistic beliefs. Modern influences have gradually eroded Kusunda traditions. These changes are as: Interactions with local Hindu communities introduced changes, such as adopting agricultural practices and Hindu customs and the phrase "Kusunda-like" became a derogatory term due to their distinct practices, reflecting societal attitudes.

Decline and Preservation Efforts

The decline in Kusunda traditions is evident as their community integrates into mainstream society. However, cultural elements such as their unique language, hunting skills, and dance performances still hold significance. Efforts to preserve their language and heritage continue, with workshops and studies highlighting their importance. This analysis underscores the need to document and safeguard the Kusunda community's heritage to ensure its survival amidst societal changes.

Kusunda Education and Culture

During a school survey, no Kusunda children were found attending school. Household surveys revealed that no members of the Kusunda families were literate. Although five Kusunda children were enrolled in school through counseling in 2045 BS, they left school without achieving literacy. Analysis of interviews with local educators, school staff, and the Kusunda community highlighted several barriers to education: i) nomadic lifestyle and lack of ancestral property ii) lack of awareness among parents about the importance of education iii) children being used as labor for household livelihoods iv) neglect of their mother tongue and experiences of caste-based discrimination in schools. Teachers' perception of Kusundas as a "wild tribe" reflects a lingering bias, further alienating the community from formal education.

The Kusunda community's emphasis on preserving their traditional nomadic lifestyle and cultural values has contributed to their disinterest in formal education. Despite lacking access to formal education, Kusundas have a natural and informal system of learning. For example: Teaching children to respect others, master practical skills, and preserve traditional arts, instilling moral values, such as viewing disrespect, teasing, or arguments as sinful, and transfer of skills like hunting, crafting weapons, and adapting to natural laws through observation and practice. Their collective spirit is reflected in cultural practices such as communal hunting, dancing, and singing. The Kusunda community considers nature their teacher and values its principles as a guide for life. Therefore, it is found that cultural influence on Kusunda education or life style.

Kusunda Language

The Kusunda language, once a marker of their identity, is now nearly extinct. This study found that even elder Kusunda members have forgotten much of their native tongue. However, a few remaining words were documented in this study. Linguistic analysis suggests that the Kusunda language belongs to the Tibeto-Burman family, sharing similarities with Himalayan languages like Magar and Tamang. For instance, the word for "banana" in Kusunda is 'mucha', which resembles 'mocha' in Magar and 'moje' in Tamang. Early linguistic studies, such as those by Hodgson (1857), suggested Kusunda is distinct yet related to languages spoken in southern Himalayan regions. Researchers like Reinhard and Toba (1970) also contributed to documenting Kusunda vocabulary and grammar. However, inaccuracies and lack of detailed records have limited the study of this language.

The key findings of this study are: Kusunda exhibits significant phonetic and lexical similarities with Tibeto-Burman languages, although it retains unique features such as the dominance of the nasal consonant. The Kusunda community's transition from a nomadic hunter-gatherer lifestyle to settled farming has contributed to the erosion of their cultural identity. Despite its anthropological significance, the Kusunda language has been poorly documented, and the tribe has not been prioritized in linguistic or cultural studies. The primary concern is not the classification or origin of the Kusunda language but its preservation and revitalization. Immediate measures must be taken to document and safeguard the remaining linguistic and cultural heritage of the Kusunda tribe. Further research and support are essential to ensure that this endangered community and its unique identity are not lost to time.

Reasons for the Decline of Kusunda Language and Culture

The disintegration of a community's unique language and culture questions the essence of a nation's identity. It symbolizes the potential extinction of the group or community itself. This has been observed in the Kusunda people. Linguistically, the loss of originality, culture, or language within a community is termed as the "death of language". Researchers have examined why Kusunda language and culture faced extinction. Drawing from Darwin's evolutionary theory (1859), linguistic and anthropological perspectives, and field surveys of the Kusunda community, studies suggest that the nomadic hunter-gatherer lifestyle of the Kusunda people could not sustain, pushing them toward decline. Their inability to maintain a sustainable reproduction rate further weakened their survival.

Darwin's theory of evolution is related to Kusunda community. According to Darwin the population of every species would increase if all of its progeny survived to reproduce. The size of populations is constant, notwithstanding irregular variations. Food and other resources are scarce and largely constant across time. A population's members differ greatly from one another. This variation is largely inherited. Natural selection is the process by which individuals who are more suited to their surroundings are more likely to survive, reproduce, and pass on their heritable traits to future generations. Additionally, Darwin's principle of hereditary traits indicates that differences among individuals and intermarriages led to the emergence of distinct characteristics, causing the loss of Kusunda's original cultural identity.

In addition to these theoretical causes, the following causes have been identified for the decline of Kusunda language and culture:

Natural Disasters: Kusunda populations may have been affected by landslides, floods, earthquakes, volcanic eruptions, or attacks by wild animals, as per Lil Bahadur Kusunda. He emphasizes that their extinction was not due to enemy attacks.

Mixed Settlements: Kusunda people resided with non-Kusunda communities, leading to the gradual disappearance of their language and customs.

Abandonment of Group Traditions: Integration into modern society caused the Kusunda to abandon their traditional practices, resulting in the decline of their language and culture during the process of socialization.

Migration for Livelihoods: Their tradition of joining foreign armies for a livelihood introduced external influences, leading to the abandonment of their cultural practices.

Social Stigma: The societal perception of the Kusunda as inferior discouraged individuals from identifying themselves as Kusunda.

Deforestation and Development: Habitat destruction, disease outbreaks, migration, and rapid development activities contributed to the disappearance of Kusunda language and culture.

The challenges faced by Kusunda children are deeply linked to poverty and social marginalization. Suggested solutions include: i) awareness campaigns to encourage Kusunda families to educate their children while preserving their cultural heritage ii) informal education programs incorporating their traditional knowledge and skills (e.g., hunting arts, collective living practices) iii) eliminating societal prejudices and promoting positive attitudes toward the Kusunda community. Similarly, the integration of traditional skills, such as archery and crafting weapons, into modern sports (e.g., shooting, javelin throw), and the incorporation of their musical traditions into school curriculums can bridge the gap between their heritage and formal education. Merely enrolling Kusunda children in schools is insufficient. A more holistic approach is necessary, focusing on: Creating an inclusive school environment, and supporting students to adapt to the school system while respecting their cultural and natural surroundings.

Conclusion

The study concludes that Kusunda culture, language, and art are unique and invaluable but are at risk of extinction. The transition from a hunter-gatherer lifestyle to a more settled one, coupled with neglect and lack of societal coordination, has led to the erosion of their language and culture. Efforts to preserve their language and culture require coordinated research, documentation, and community-centered policies. The study also highlights the Kusunda origin myth linking them to the descendants of Kush, one of the sons of Goddess Sita, suggesting the need for further investigation into their history and heritage. Language and culture are dynamic entities. The necessity to adapt to modern societal norms can lead to their extinction, as seen in the case of the Kusunda. Overall, factors such as intermarriage, social integration, and Darwin's evolutionary theory emerge as the primary reasons behind the decline of Kusunda language and culture.

References

Acharya, B. (2067 BS). *Theoretical perspectives of sociology.* Kirtipur: Sunlight Publications.

Adhikari, N. P. (2057 BS). *Modern education in the culture of the Kusunda people.* Unpublished research paper. Tribhuvan University, Kirtipur.

Anaya, J. (2022). *Indigenous peoples in international law*. Oxford University Press.

Baez, G.P. (2018). Linguistic diversity, language vitality and the advancement of linguistics as a science. *ACTA Linguistica Hafniensia,* 50(2), 1-28.

Bista, D. R. (2000). *People of Nepal.* Kathmandu: Ratna Pustak Bhandar.

Brayboy, B. M. J. (2022). *Indigenizing the academy*. Harvard Educational Review.

Cajete, G. (2016). *Native science: Natural laws of interdependence*. Clear Light Publishers.

Central Bureau of Statistics (CBS). (2012). *National population and housing census 2011, National report.* Kathmandu: Central Bureau of Statistics.

Coulthard, G. S. (2014). *Red skin, white masks: Rejecting the colonial politics of recognition*. University of Minnesota Press.

Darwin, Charles (1958), Barlow, Nora (Eds.). *The autobiography of Charles Darwin 1809–1882. With the Original Omissions Restored. Edited and with Appendix and Notes by his Granddaughter Nora Barlow*, London: Collins.

Department of English Education, Faculty of Education, TU. (2011 BS). Multilingual education in Nepal: Hearsay and reality? UNESCO. https://unesdoc.unesco.org/ark:/48223/pf00002148

Durkheim, E. (1897). Suicide, a study in sociology (1951 Edition, J. A. Spaulding, & G. Simpson, Trans.). London: Routledge.

Government Information Department (2031 BS), From Mechi to Mahakali (Vol. 2, 3, 4), Kathmandu: Author.

Gurung, H. (2057 BS). *Nepalese linguistic. Journal of Nationalities of Nepal.* Kathmandu: SENAS.

Hinton, L., Huss, L., & Roche, G. (2018). *The Routledge Handbook of Language Revitalization*. Routledge.

Kadel, P. (2017). Reviewing multilingual education in Nepal. In H. Coleman (Eds.), *Multilingualisms and development* (pp. 189-204). British Council.

Khatri, P. K. & Dahal, P. (2044 BS). *Nepali culture and civilization.* Kathmandu: Kaladevi Dahal.

Kirkness, V., & Barnhardt, R. (2001). First Nations and higher education: The four R's—Respect, relevance, reciprocity, responsibility. *Journal of American Indian Education*.

Koirala, B. (2054 BS). *A study on dalits and their education in Nepal*. Kathmandu: Samanta.

Luintel, Y. (2057 BS). *A sociological study on nomadic raute.* Kathmandu: Nepal Academy.

McCarty, T. L., & Lee, T. S. (2014). Critical culturally sustaining/revitalizing pedagogy. *Harvard Educational Review*.

McCarty, T. L., & Lee, T. S. (2019). Critical culturally sustaining/revitalizing pedagogy and Indigenous education sovereignty. *Harvard Educational Review*, 89(3), 409–429.

Nepal Asian Research Centre (2056 BS). *Socio-economic study of marginalized groups in Nepal.* Kirtipur: Tribhuvan University.

Perley, B. C. (2020). *Defying Maliseet Language Death: Emergent Vitalities of Language, Culture, & Identity in Eastern Canada*. UBC Press.

Rana, B. K. (2000*).* Dead language. *The Kathmandu Post.* April 16, 2000.

Reinhard, Johan and Toba, Tim (1970). A Preliminary linguistic analysis and vocabulary of the Kusunda language. Nepal: Summer Institute of Linguistics and Tribhuvan University, Nepal.

Report on the Two-day workshop on endangered Kusunda language and culture, Jestha 6 & 7, 2057 BS, Kathmandu.

Resta, P., & Laferrière, T. (2021). Digital equity and indigenous education. *Educational Technology Research and Development*.

Simpson, L. B. (2017). *As We Have Always Done: Indigenous Freedom through Radical Resistance*. University of Minnesota Press.

Smith, L. T. (2021). *Decolonizing Methodologies: Research and Indigenous Peoples*. Zed Books.

UNESCO. (2023). *International Decade of Indigenous Languages (2022–2032)*. Retrieved from https://en.unesco.org

Wilson, J., & Hughes, M. (2022). Indigenous education policy and practice. *Global Education Review*

Wilson, S. (2008). *Research is Ceremony: Indigenous Research Methods*. Fernwood Publishing.

Yadava, Y. P. (2014). Language use in Nepal. *Population monograph of Nepal* (Vol. 2, pp. 51-72). Central Bureau of Statistics.

Zepeda, O., & Hill, J. H. (2022). *The Condition of Native American Languages in the United States*. Language in Society, 51(1), 1–19.

Cost-Effective upgrade in Post-Gorkha Earthquake Housing Prototypes for Improved Thermal Performance and Occupant Comfort

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Abstract

Following the 2015 Gorkha Earthquake, large-scale reconstruction in Nepal prioritized structural strength over thermal performance and occupant comfort. This study evaluates government-regulated post-earthquake house prototypes that are commonly constructed, highlighting their inadequacies in ensuring adequate year-round thermal comfort. Based on simulation-based analysis and field observation, this work proposes low-cost and readily viable upgrade —like cavity wall design and fiber cement board layers under CGI roofs. Three house prototypes were simulated in Ecotect for the assessment of thermal discomfort loads. As can be discerned from the results, minor adjustments in the wall and roof assemblies can reduce the discomfort load by over 60-70%, significantly improving indoor thermal conditions and energy efficiency. The study emphasizes people-centered, climate-sensitive reconstruction approaches that uphold livability without altering the basic structural design.

Keywords: Post-earthquake housing, thermal comfort, cost-effective upgrade, cavity wall, roof insulation,occupant satisfaction

Introduction

In 2015, a devastating earthquake hit the Gorkha District of Nepal, resulting in significant casualties and property damage, while also having a profound impact on the country's infrastructure, housing, and cultural heritage. The disaster caused substantial harm to Nepal's building sector, with many temples and monuments either completely or partially destroyed. The destruction of these heritage landmarks signified more than just physical loss. [1] After the 2015 Gorkha Earthquake, the Government of Nepal launched a mass reconstruction program focused on structural resilience. [2] But the occupants thermal comfort is completely shaded under structural prespective. Thermal comfort issues in reconstructed houses in Nepal, is poor insulation and high energy demand. [3] Government has also made many rapid reconstruction pograms of the physical damages caused by the massive earthquakes of April 25 and May 12, 2015 and their aftershocks safety. [2] Despite this, any habbitable building always should have recident satisfaction. It refers to individuals' appraisal of the conditions of their residential environment, in relation to their needs, expectations and achievements.[4] But many reconstructed homes failed to ensure year-round thermal comfort, resulting in discomfort, additional energy needs, and lower user satisfaction. This paper emphasizes people-centric approaches that integrate cavity wall construction and roof insulation improving user comfort through minimal and cost-effectiveness upgrade in housing reconstruction.

Objective

The major objective of this paper is to evaluate the performance of standard reconstruction prototypes that has been constructed by using the manual of reconstruction authority and to propose low-cost interventions in wall and roof assemblies. The major intension of calculating the load performance is to find out the impact of small and effective changes during construction without intervention on actual design of house itself. This will assess user comfort using zone-based thermal parameters.

Methodology

This research uses Pragmatic paradigm: implies the mixing of data collection methods and data analysis procedures within the research process. The obtained quantitative data were through structured questionnaire and Energy consumption pattern is studied using correlational research. Energy performance of a building was observed in a simulation with strictly objectified quantitative data. The process here we have followed the research site is visited and many houses were sampled and questions were asked to ensure the necessity of research itself. After ensuring that the comfort level was low in comparison to tradition houses to the prototype houses the research is moved to climatic data analysis and interpretation of possible scenarios. Upon many simulation and quantified options few interventions like changing the construction system of wall form sold to cavity is tasted. These results lowering the energy demand leading to increased comfort level of occupants.

climatic analyis

The major part of any energy performance is climate study. The site climate is strategically chosen inside the valley, Dhulikehl, which have moderate climate but slightly cooling dominated. However, site experience both summer and winter in a year. In figure1, the data presents a comparative analysis of temperature and relative humidity (RH) trends using historical records and forecasted predictions. It includes 18 years of observed data from the Department of Hydrology and Meteorology (DHM), with a baseline average for 2000-2009, alongside 10 years of forecasted data for 2010-2017 that was later compared with actual DHM measurements from the same period. The parameters tracked consist of temperature (°C) recorded at two time points, along with RH measurements taken at 8:45 (morning) and 17:45 (evening). This comparison serves to evaluate the accuracy of climate prediction models and detect potential shifts in microclimatic conditions over time, particularly useful for assessing how environmental factors might impact building performance in post-disaster reconstruction projects like those implemented after the Gorkha earthquake. The average maximum temperature reaches up to 26.7 degree in midsummer where as it falls below 5 degrees Celsius in winter. The humidity is comparatively high, which is above 95 % during summer and falls under comparatively comfort level for few months like April.

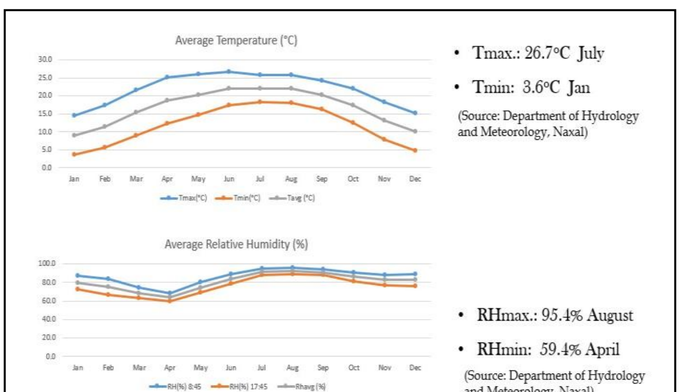

Figure 1 Yearly climatic data - Dhulikhel

Research setting and paramaters

The simple two-room prototype has been suggested all over Nepal as an emergency dwelling against Gorkha earthquake 2015. These houses are made of simple arrangement with two plain rooms as multi-usable space according to requirement. This base prototype as suggested by government of Nepal is one of the categories which has been used most widely along hilly region of Nepal. The common size was suggested as mandatory size and shape over most of the municipalities and rural villages of Nepal. The most common size found the study site is 6m in length and 4.28m in width having a partition wall dividing the room in two equal half. The house is provided with one opening at approximately middle as door and two windows at front. The construction system may have been slight modified over time and as per location with availability of material but the exact model for performance analysis chosen is shown in figure 2.

Figure 2 Prototype -1 Base prototype

Prototype- 1 Base model zonal setting and house description

The building has 9-inch-thick brickwork walls with plaster for structural stability and thermal mass. The openings have timber-paneled doors and windows. Substructure is a plain cement concrete (PCC) stone plinth for stability, and the superstructure incorporates corrugated galvanized iron (CGI) sheets—a low-cost, light-weight roofing material most commonly used in post-disaster reconstruction. The selection of materials is cost-effective, locally sourced, and functionally efficient but the climatic consideration and comfort is lacking. For simulation the following zonal parameters has been used. Zone parameters are adjusted such that occupant comfort is at its peak with clothing value 1 (characteristic of indoor light clothes), average humidity level at 50% (within the optimal range of 40–60%) and lighting level at 200 lux (suitable for plain tasks). A mean air speed of 0.3 m/s is comfortable ventilation with no drafting, but the mixed-mode system involves a combination of natural and mechanical conditioning to maintain temperatures in the comfort band of 18–27°C—the optimum for the attainment of thermal neutrality in temperate climates.

Prototype- 2 Base models with flat RCC roof - zonal setting and house description

The building has same construction for wall as structural stability and thermal mass. The size of openings is as same per prototype 1 base model but the number of windows has been increased to make air change better inside the rooms. There is same construction setting for substructure. The change has been constructed with RCC slab instead of corrugated galvanized iron (CGI) sheets. The selection of materials is slightly costly than prototype 1. For simulation the following zonal parameters has been used. Zone parameters are adjusted as in prototype-1to make it comparable. This prototype is also found in some of the place the site. But most of them are not in use for habitable purpose. The brief dimension, plan and elevation is shown in figure 3.

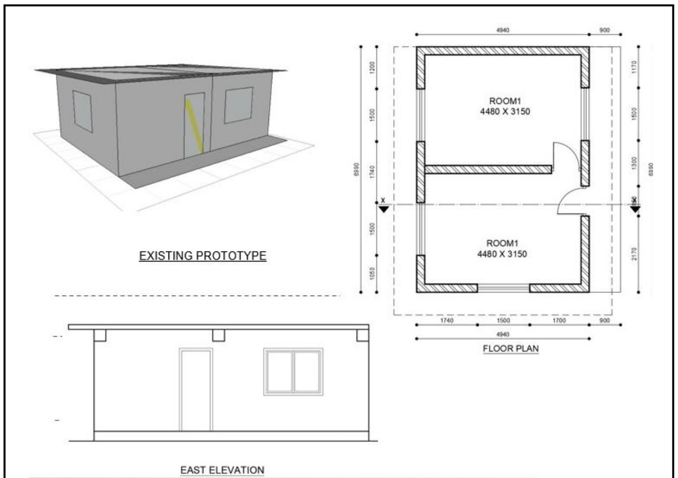

Figure 1 Prototype - 2. with RCC roof.

Prototype- 3 Modified case- zonal setting and house description

The building size remains same as in prototype 1 and 2 but there has been major modification on wall and roof. The modification is done as suggested form psychrometric chart analysis which is outcome of climatic study. The major change done in prototype 3 are: the roof is shifted to slope roof with CGI as per in prototype 1 but insulation is added below the CGI roof. The insulation is not standard insulation because standard insulation material like EPS, XPS, rock wool and other industrial product are hard to find and expensive. So, instead of that simple fiver cement board layer is added which is water resistant. The wall is changed to cavity wall but the thickness remains same as in previous prototype. Just layer of 50 mm cavity is added as an insulation layer. No standard insulation material is filled inside in between. The placement of window is done as in prototype 2 which seems logical and effective form the structural and functional perspective. Zone parameters are adjusted as in prototype-1to make it comparable. The brief dimension, plan and elevation is shown in figure 4.

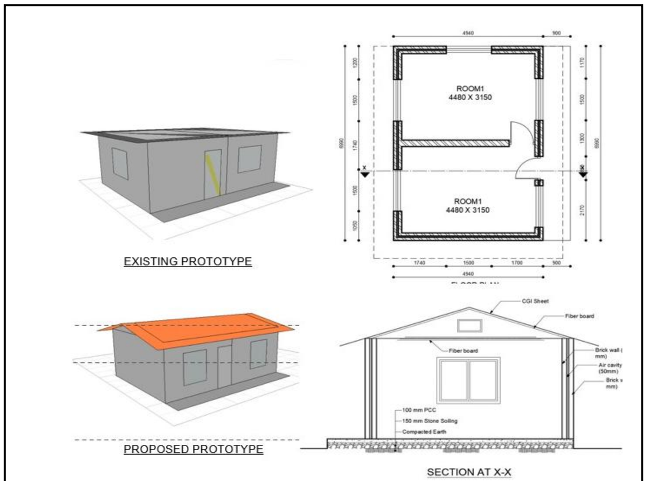

Figure 2. prototype -3 Modified case

Simulation and limitations

In order to study the thermal performance of Nepal's rebuilt housing prototypes at Khasthali, Dhulikhel Ecotect Analysis—a building performance simulation tool—was used. The tool allowed simulation of solar exposure, heat gain, daylight levels, and internal thermal conditions throughout the year. After inputting the local climatic data (Kathmandu Valley climate file) as well as material properties, typical masonry houses with CGI sheet roofs and RCC roof is simulated. The climatic files were uploaded in WEA, Format which has been slightly calibrated as per local climatic condition.

The simulations revealed considerable thermal fluctuations between day and night, particularly in winter, when the indoor temperature dipped below human tolerance levels. Roofs and uninsulated walls were identified as key contributors to heat loss. The findings highlight the need to integrate passive solar design strategies—such as increased insulation, optimized thermal massing, and well-shaded windows—into reconstruction models.

The simulation outcomes from Ecotect provided not only quantitative foundations for the design recommendations but also supported the argument for human-scale, climate-responsiveness dwelling approaches that optimize year-round thermal comfort and reduce energy dependency.

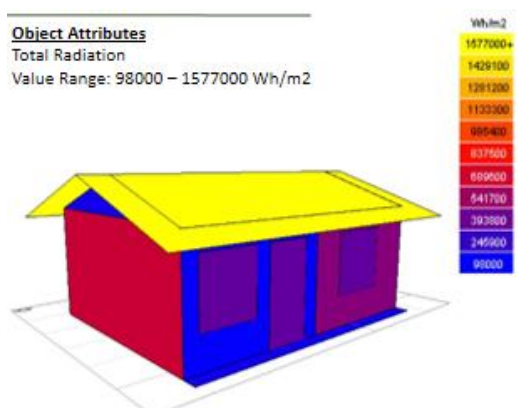

Figure 3 Effect of radiation is higher than the vertical surfaces

findings

The comparative analysis of three building prototypes reveals significant variations in thermal discomfort loads.

Prototype 1 is the control test, consisting of uninsulated brick work walls and a corrugated galvanized iron (CGI) roof. From Figure

6, prototype 1 experienced the highest annual discomfort load of 2,544 kWh, its poor thermal efficiency evident, particularly on cold winter nights and morning times (November to March). Heat loss by fabric in this stage superseded gains, as experienced in the respective heatmap, indicating high thermal inefficiency.

Prototype 2 replaced the CGI roof with a reinforced concrete slab, contributing additional improved thermal mass and temperature stability. The discomfort load came down to 1,919.22 kWh, a 24.5% improvement on the base case. Nevertheless, as this reduction was not matched with key passive qualities such as optimized orientation, insulation, and solar gain control, the design remained inadequate. As one can observe from the heatmap, even though summer daytime performance marginally increased, nighttime losses were substantial.

Prototype 3 employed a climatically responsive solution, where thermal insulation in the roof, improved wall materials, strategic orientation, and better fenestration location were used. These improvement in the design greatly reduced discomfort load to 720.85 kWh, a 71.7% reduction from Prototype 1. The heatmap of thermal gain indicates well-balanced performance for summer and winter, where day heat gains are optimized from April to October and losses considerably reduced in the instance of winter nights.

Interpretation of Fabric Gains

Maximum gains were observed in the daytime during the summer season (April to October), especially between 10:00–16:00 hours. Maximum losses were incurred during early morning and night during the winter season (November to March), especially between 00:00–08:00 and 18:00–22:00 hours.

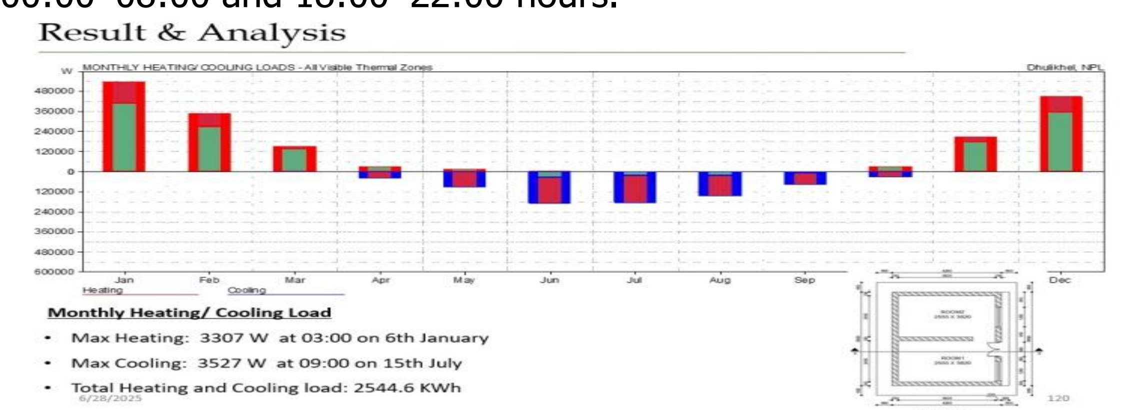

Figure 4 Annual load analysis of prototype 1

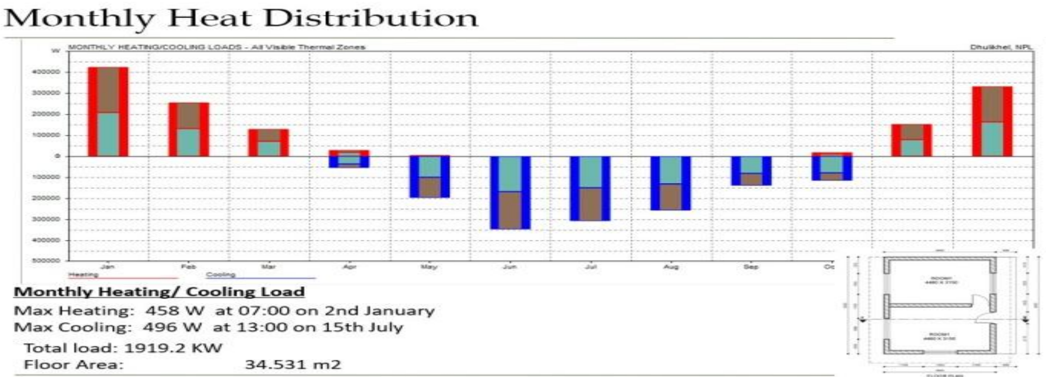

Figure 5 Annual load analysis of prototype 2

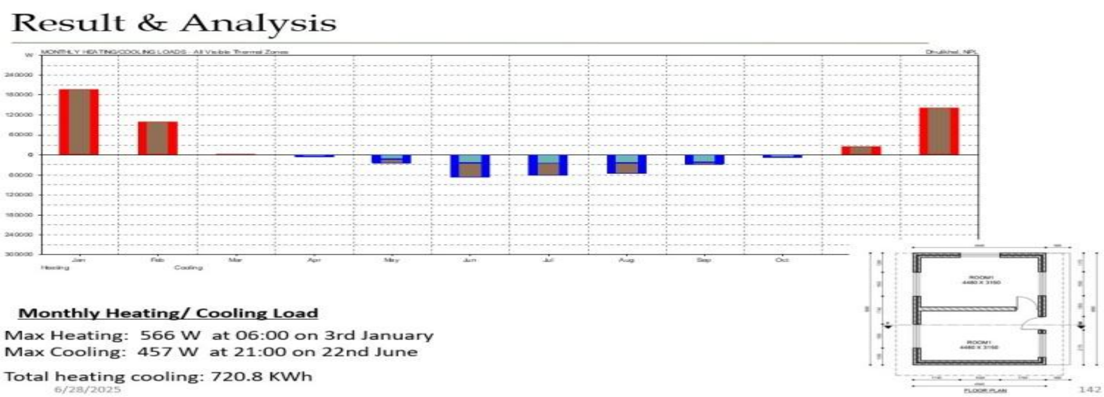

Figure 6 Annual load analysis of prototype 3

Conclusion

These results clearly demonstrate that strategic modifications to roof design , wall systems, and fenestrations can dramatically improve thermal performance in building envelopes. The data suggests that comprehensive design interventions (as implemented in Prototype 3) are significantly more effective than isolated roof modifications alone. The design objective in the upgraded prototypes was to reduce significant amount of energy which is a clear indication of increased comfort level of occupants. Therefore, simple and cost-effective modification in wall and roof have positive effect on thermal comfort. The comparison of discomfort load is shown in table 1.

Table 1 comparison of discomfort load

Case	Building Envelop	Total Discomfort Load (KWh)
Prototype 1	Brick Masonry with CGI slopped roof	2544
Prototype 2	Brick Masonry with flat slab roof	1919.22
Prototype 3: modified	Modification in roof, orientation, wall and fenestrations	720.85

References

1. N. Parajuli, "Review of Status of Post-Earthquake Reconstruction In Nepal," *ournal of Advanced College of Engineering and Management, ,* Vols. Vol. 10, , 2025,.
2. N. r. authority, "Nepal reconstruction authority," [Online]. Available: https://portal.nra.gov.np/.
3. U. Maharjan, "Thermal performance of reconstructed in Nepal after the 2015 earthquake.," *Proceedings of the International Conference on Passive and Low Energy Architecture ,* 2018.
4. J. I. A. María Amérigo, "A Theoretical and Methodological Approach to The Study of Residential Satisfaction," *Journal of Environmental Psychology,* vol. Volume 17, no. Issue 1, pp. Pages 47-57, March 1997.

Muslim Women Employment: A Case Study of Bihar

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Abstract

This paper examines the status of women employment among minority communities with a special focus on Muslim women of Bihar. Through a comprehensive review of existing literature and analysis of survey report (2022) of socio – economic and educational status of Muslim in Bihar which was conducted by then Hon'ble Chief Minister Nitish Kumar which show the actual status of Muslims. This study explores the intersection of gender, religion, and regional factors that influence employment outcomes. The study used both qualitative and quantitative methods. The paper concludes with policy recommendations and identifies areas for future research to advance the employment agenda for minority women in similar socio-cultural contexts.

Keywords: Women Employment, Rural, Education, Minority, Socio – Economic, Literature

Introduction

There are 50 million Muslim women in India. Only 15% of them are employed, versus 26% of Hindu women, according to 2021 – 2022 labour force data. Of this, around nine of ten Muslim workers get by through the informal economy, as crafts persons, tailors, weavers, domestic workers, hawkers, etc.

The work participation rate of Muslim women in Bihar is only 15.1%. the statistics above indicate that Muslim women have not been able to take the full advantage in the society. It has been recognized that education and employment are the two basic factors in the development of any social community. In Bihar, women's employment rates have seen a mixed bag of trends. While overall female labor force participation has increased, particularly in rural areas, a significant portion of this increase. Regular salaried jobs for women, particularly in urban areas, have decreased, even with job reservations in place. Bihar has seen a rise in women's participation in the workforce, with the female worker Population Ratio jumping from 4% in 2017-18 to nearly 30% in 2023-24, according to the Periodic Labour Force Survey (PLFS).

According to the 2011 Census, 67.6% of Muslims are literate as against the national average of 74.04%. There are some state in which Muslims have high literacy which are Kerala, Tamil Nadu, Chhattisgarh, Maharashtra and Gujarat. The situation in Bihar is not different. However the situation is slightly changing because the proportions of school going children (6 – 14 Years) among Muslims communities are rising.

The Muslims are relatively educationally deprived community of Bihar. They do not access to all the educational facilities in their locality; even they lack local Maktab and Madarsa (religious school). The Muslims have only 42% literacy rate which is below the Hindus literacy rate (47.9%) and Bihar average literacy is 63.83%. The male literacy rate of Muslims is 51.8% and female literacy rate of Muslims is 31.5% which is far below the state average for male (73.32%) and for female (53.33%). The rural literacy rate of Muslims is 38.68% and urban literacy rate of Muslims is 64.34% which is below the state average for rural (53.9%) and urban (81.93%). Sex ratios 936 among Muslims in Bihar. It is also found that Patna has highest literacy rate of 63.82% followed by Rohtas 62.36% and Munger 60.11%. Kishanganj, Araria and Katihar has lowest literacy rate in Bihar ie. 31.2%, 34.94% and 35.29%. It is found that the more than 1000 Muslim-concentration villages in Bihar do not have any educational institution. The situation is worse in small villages in the state. The proportion of Muslim concentration villages in all three size classes with educational facilities is lower than the total proportion of villages that have such facilities. This is particularly so in the case of smaller villages where the differential is alarmingly high. This would indicate that Muslim concentration villages, especially smaller ones, lack access to educational institutions (GOI, 2006. 143-144).

Muslim women's employment downgrade is influenced by several interconnected factors, including societal discrimination, limited access to education and resources, and cultural norms that may restrict their participation in the workforce. These factors create a "triple marginalization" based on gender, social class, and religious identity, leading to significant disadvantages in the job market.

Here's a more detailed breakdown are as follows:

1. **Societal Discrimination and Bias**

(i) **Stereotypes and Prejudice:** Muslim women often face negative stereotypes and prejudice, which can lead to discrimination in hiring and promotion processes. Studies show that Muslim women may receive fewer job callbacks than their non-Muslim counterparts with similar qualifications.

(ii) **Lack of Familiarity:** Some employers may lack familiarity with Muslim culture and traditions, leading to discomfort or bias in their hiring practices.

(iii) **Visibility and Representation:** Muslim women who wear hijab may be more visible and potentially face discrimination or assumptions about their abilities or commitment to work.

2. **Limited Access to Education and Resources**

(i) **Lower Literacy Rates:** Muslim women often have lower literacy rates compared to other groups, which can limit their access to various job opportunities.

(ii) **Economic Disadvantage:** Many Muslim women come from economically disadvantaged backgrounds, which can affect their ability to pursue higher education or specialized training needed for certain jobs.

(iii) **Lack of Access to Networks:** Muslim women may have limited access to professional networks and mentorship opportunities that can help them find jobs and advance in their careers.

3. **Cultural and Social Factors**

(i) **Family Responsibilities:** Traditional gender roles and expectations within some Muslim communities may place a greater emphasis on women's roles within the household, potentially discouraging or limiting their participation in the workforce.

(ii) **Religious Practices:** Some religious interpretations or practices may restrict women's mobility or types of work they can engage in, further limiting their employment options.

(iii) **Work-Family Conflict:** Muslim women may experience greater work-family conflict due to traditional gender roles and expectations, which can affect their ability to balance work and family responsibilities.

4. Impact of Marginalization

(i) **Lower Wages and Fewer Opportunities:** Discrimination and limited access to opportunities can lead to lower wages, fewer promotions, and less job security for Muslim women.

(ii) **Social and Economic Disadvantage:** The combination of these factors can perpetuate a cycle of social and economic disadvantage for Muslim women, affecting their overall well-being and social mobility.

Addressing these challenges requires a multi-pronged approach that includes promoting education and skill development, challenging stereotypes and biases, and creating more inclusive and equitable workplaces. Organizations and individuals must actively work to create environments where Muslim women can thrive and reach their full potential.

Objective of the Study

The general objective of this study is to identify the reason for deprive of Muslim women's employment in our society of Bihar. The present research intended to examine the effects of three social psychological factors i.e. socio-economic class, cast and family structure on the educational orientation and employment orientation in Muslim women. Socio – economic class, caste and family structure have been treated as independent variables. Educational orientation and employment orientation in Muslim women have been treated as dependent variables.

Hypothesis

The main hypothesis of the present research is that the development of Muslim women education and employment in Bihar. The development of education of Muslim women and employment is the way to prosperity in Indian economy.

The main hypothesis of the present research are as follow :

(i) The Muslim women of Bihar from different socio – economic classes will be differ on educational orientation and employment orientation.

(ii) The Muslim women of Bihar from different castes will be differing on educational orientation and employment orientation.

(iii) The Muslim women of Bihar from different family structures will be differ on educational orientation and employment orientation.

Methodology

The study is based on two main types of data. Firstly, previous literatures were reviewed to provide a general picture and the state of literature on the issue of the Muslim women's employment in Bihar. Secondly, the study also provided a case study based on primary data collected in selected study areas in Bihar. The methods of the study will be analytical and critical supplemented by statistical surveys. The study required data related to women education and employment sector thus the facts and figures must be related. Potentiality of their economic development and figures related to the educated women employment, so far the analysis of data is concerned according to the nature of data and requirement of study different statistical tools would be used.

Conclusion

The main findings derived from the present study are as follows:

(i) Socio – economic status may be a potential factor in the educational and employment orientation among young educated Muslim women. The middle class Muslim girls seem to have demonstrated a stronger orientation towards education and employment as compared to Muslim girls from either the higher or the low socio economic classes.

(ii) Cast could also be a factor in the educational or employment orientation among educated Muslim girls. The Muslim girls from general cast may have stronger orientation towards education and employment than those belonging to backward cast in Muslims.

(iii) The family structure may have strong effect on the educational and employment orientations among educated Muslim girls. The Muslim girls from nuclear families are likely to have stronger orientation towards education and employment as compared to those of the joint families. This may be, perhaps because of the possibility of greater family support in nuclear families than in the joint family.

References

1. Survey Report Socio – economic and educational status of Muslim in Bihar by Government of Bihar (2022).
2. Socio, Economic and educational status of Muslim community in India (Nov 2006).
3. Nahid Sarikhani (2008), Muslim women's work participation in India, J. Soc. 17 (3) : Page 219 – 222.
4. Census of India (2001) the first report on religion data. New Delhi;
5. District information system for education (2019-20), educational statistics for Gaya District. Ministry of Education, Gov. of India.
6. Gupta. A. & Sharma. R (2019) financial inclusion through self help group: challenges in minority concentrated areas of Bihar. Journal of Development studies, 27 (3), Page 112 – 126
7. Hussain, S. (2010), educational development of Minorities: an analysis of educational policies economic and political weekly, 45 (26-27), Page 288-295.
8. Kainat Mohammadi, (2025), Women empowerment among Muslim Minority women of Gaya: A Reviews, vol. 19, Page 235-243.
9. Jeffery, P. (2001). A uniform customary code? Marital breakdown and women's economic entitlement in rural Bijnor, contributions to Indian Sociology, 35 (1), Page 1-32.

Family support as a buffer against anxiety and maternal stress during pregnancy

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Abstract

Pregnancy is a unique phase filled with emotional and physiological changes that can predispose women to anxiety. Family support has been widely recognized as a crucial factor that can buffer stress and reduce anxiety symptoms during pregnancy. Family support, in its varied forms—emotional comfort, practical assistance, and guidance—acts as a cornerstone for stabilizing maternal mental health. This article examines how family support influences anxiety levels in pregnant women. Drawing upon recent research studies and empirical data, the article highlights the types and sources of family support, their protective effects, and recommendations for strengthening these support systems to enhance maternal mental health.

Keywords: family support, maternal mental health, emotional support, psychological well-being, pregnancy stress and anxiety

Introduction

Anxiety during pregnancy is a common concern with substantial implications for both maternal and foetal outcomes. if persistent, may lead to sleep disturbances, irritability, impaired functioning, and in extreme cases, clinical disorders that require intervention. The presence of a supportive family environment can significantly alleviate anxiety symptoms by providing emotional stability, practical assistance, and a sense of security. In middle-income populations, where women often juggle multiple roles and responsibilities, family support assumes an even more vital role. Research underscores the inverse relationship between family support and anxiety levels during pregnancy. The study explores this essential dynamic, seeking to highlight how nurturing family relationships can transform the pregnancy experience and promote mental equilibrium in expectant mothers. he researches also seeks to compare the effectiveness of support from different family members, including parents, in-laws, and siblings, in alleviating pregnancy-related stress. This study specifically focuses on the Giridih District, where many families are engaged in farming and related activities. This often results in busy daily routines and limited time or practical support available for working pregnant women. The significance of family support in such socio-economic settings becomes even more critical for reducing pregnancy-related anxiety.

Objectives

- To examine the relationship between perceived family support and levels of anxiety among pregnant women.
- To compare the effectiveness of support from different family members (e.g., parents, in-laws, siblings) in alleviating maternal stress.

Hypotheses

- H0: Family support has no significant effect on stress and anxiety levels among working pregnant women in the Giridih District.
- H1: Lack of family support significantly increase stress and anxiety levels among working pregnant women in the Giridih District.

Methodology

A mixed-methods research design was used to assess the role of family support in managing pregnancy-related anxiety. The study included a sample of 100 pregnant women recruited from both government and Angan Badi centre of urban and peri-urban areas.

Research Design: A cross-sectional descriptive study and semi-structured interview was adopted.

Sampling

- Sample size: 100 pregnant women
- Sampling technique: Purposive Sampling

- Location:Giridih District

Formulas Used for Calculations

- Mean Family Support = (Sum of all family support scores) ÷ (Total number of participants, N)
- Mean Anxiety = (Sum of all anxiety scores) ÷ (Total number of participants, N)
- Percentage Low Support = (Number reporting low support ÷ N) × 100
- Percentage Moderate/High Anxiety = (Number with moderate/ high anxiety ÷ N) × 100

Data on Family Support and Anxiety: Key Statistics

Quantitative analyses illustrate the buffering role of family support: Overall, 36% of women experienced moderate to high anxiety levels, indicating a substantial proportion of the population requiring targeted interventions to enhance family involvement and emotional care.

Table 1: Summary Statistics on Family Support and Anxiety Among Pregnant Women

Mean Family Support Score	Mean Anxiety Score	Number Reporting Low Family Support	Percentage Low Family Support	Number with Moderate/ High Anxiety	Percentage Moderate/ High Anxiety
83.7	9.2	9	9.3%	36	36.0%

Example:

- N = 100
- Percentage Low Support = (9 ÷ 100) × 100 = 9%
- Percentage Moderate/High Anxiety = (36 ÷ 100) × 100 = 36%

In a sample of 100 pregnant women, the mean family support score (scale 0–100) was 83.7. The mean anxiety score, was 9.2, representing mild to moderate anxiety on average. 9 women (9.3%) reported low levels of family support. Approximately 36 women (36.0%) experienced moderate to high anxiety.

These results further reinforce that robust family support is associated with lower anxiety, while insufficient support corresponds to higher distress during pregnancy.

Relationship Between Family Support and Anxiety in Pregnancy

The strength of family support strongly correlates with anxiety levels:

Table 2: Effects of Family Support Levels on Anxiety During Pregnancy

Family Support Level	Anxiety Level	Odds of Anxiety (95% CI)
High	Low	Reference
Moderate	Moderate	1.5 (1.1–2.1)
Low	High	2.8 (1.9–4.3)

- Women with low family support are nearly three times more likely to experience high anxiety compared to those with strong family support.
- Moderate support also poses an elevated risk compared to high support but to a lesser extent.

Types and Sources of Family Support

Table 3: Components and Sources of Family Support Relevant to Pregnancy

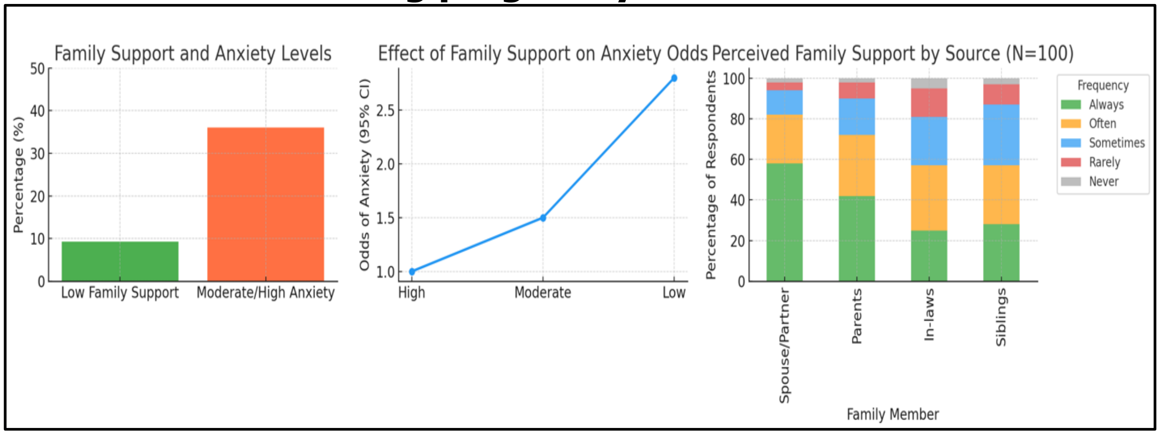
Type of Support	Description	Family Sources
Emotional Support	Empathy, reassurance, listening	Partner, parents, siblings
Instrumental Help	Practical assistance with household/ work tasks	Partner, in-laws, elders
Informational Aid	Advice related to pregnancy and childcare	Experienced family members
Appraisal	Positive encouragement and affirmation	Partner, extended family

Table 4: Source-wise Distribution of Perceived Support (N = 100)

Family Member	Always	Often	Sometimes	Rarely	Never
Spouse/Partner	58	24	12	4	2
Parents	42	30	18	8	2
In-laws	25	32	24	14	5
Siblings	28	29	30	10	3

Among the 100 pregnant women surveyed, spouse/partner support was the most consistent, with 58% reporting “always” and 24% reporting “often” receiving support from their partners. Parental support was also strong, with 42% “always” and 30% “often” receiving help from their parents.

Figure 7: Family support as a buffer against anxiety and maternal stress during pregnancy



In-laws' support showed more variation. Only 25% "always" received support, while 14% reported "rarely" and 5% "never" receiving support from in-laws. Siblings provided moderate support, with almost equal distribution: 28% "always", 29% "often", and 30% "sometimes".

These findings suggest that spouses and parents are the primary sources of consistent support during pregnancy, while in-laws and siblings contribute to varying degrees, depending on individual family dynamics and relationships.

Discussion

Both emotional and practical forms of family support are vital in helping to lower anxiety during pregnancy. Analysis of the study data revealed a clear link between the extent of family involvement and the level of anxiety experienced by expectant mothers. The findings supported the assumption that stronger family support is associated with reduced anxiety, with women lacking adequate support being nearly three times more likely to experience heightened anxiety than those with robust support systems. Among all sources of help, a supportive spouse or partner proved to be the most influential protective factor, offering reassurance, sharing responsibilities, and providing emotional comfort throughout the pregnancy journey. When family members take part in pregnancy-related decisions and activities, they create a sense of safety, help ease stress, and strengthen the emotional bond with the expectant mother.

For women from middle-income households, the added pressure of balancing job responsibilities with family life can magnify stress levels, making reliable family support even more critical. Active involvement from family members can ease both the professional and personal challenges that come with pregnancy, allowing women to navigate this period more smoothly. Cultural traditions and expectations also play an important role in shaping how family members engage during pregnancy, influencing both the type and extent of support provided. Any program or intervention designed to strengthen family support should therefore take these cultural nuances into account, ensuring that the approach is relevant, respectful, and effective in meeting the distinct needs of pregnant women.

Hypothesis Status

The hypothesis (H1) was proved, as statistical analysis showed that low family support significantly increases anxiety levels among pregnant women in the Giridih District.

Conclusion

Family support emerges as a crucial determinant of psychological well-being during pregnancy. This study reaffirms that women who perceive high levels of support from their spouses, parents, siblings, and in-laws report lower levels of anxiety and exhibit better emotional resilience throughout their pregnancy journey. Spousal involvement, characterized by empathy, shared responsibilities, and emotional validation, significantly reduces psychological distress and promotes a sense of safety and preparedness in expectant mothers.

Conversely, women lacking adequate support, or facing familial conflict and neglect, were more susceptible to moderate or severe anxiety symptoms. This emphasizes that emotional and instrumental support from family members is not just helpful—it is essential. It directly impacts maternal mental health, influencing outcomes such as sleep quality, decision-making confidence, and overall pregnancy satisfaction.

Recommendations

- Healthcare providers should routinely assess family support levels during antenatal visits.During regular check-ups, doctors, nurses, and midwives should evaluate both the emotional and practical support systems available to the expectant mother. This assessment can help identify women at risk of low family support early and allow for timely interventions or referrals to counselling and support services.

- Family-inclusive prenatal education classes can enhance knowledge and encourage positive involvement.Prenatal classes should be designed to include partners and other key family members. These sessions can provide information about pregnancy health, emotional well-being, and ways to assist the mother, helping families become active and confident participants in the pregnancy process.
- Community programs can provide resources for families to understand and actively support pregnant members.Local health centres and community groups can organize workshops, information sessions, and peer-support networks that teach families about the needs of pregnant women. Such initiatives can also help break myths, share practical caregiving tips, and build stronger community-based support systems.

References

Denissen, J. J. A., et al. (2020). Family support and anxiety trajectories across pregnancy. Journal of Affective Disorders, 266, 277-284.

Lee, E. H., & Chae, S. (2017). The Impact of Family Support on Anxiety during Pregnancy: A Systematic Review. International Journal of Women's Health, 9, 573–580.

Alhusen, J. L., et al. (2015). The influence of social support on maternal prenatal anxiety and depression. Journal of Women's Health, 24(7), 576-584.

Cankorur, V., et al. (2021). Role of family support in pregnancy anxiety and depression: A prospective cohort study. Psychological Medicine, 51(2), 281-290.

Khan, S., & Rizvi, N. (2021). Family involvement and maternal health outcomes in rural India. Journal of Health Psychology, 26(3), 321–335.

Patel, R., & Sharma, P. (2020). Emotional and practical support during pregnancy: Cultural perspectives from India. Maternal and Child Health Journal, 24(5), 589–597.

Effect of soil pollutants, Raw-sewage on disease development of Brinjal (Solanummelongena (Linn) wilt caused by Sclerotiumrolfsii (Sacc)

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Introduction

Vegetable as a major component play significant role in human diet by fulfilling the need of Minerals, Vitamins, Carbohydrate and Protein. They neutralize the acidity by producing substances during the digestion in alimentary canal and help to prevent the Constipation. Brinjal (Solanummelongena Linn) parallel to tomato is popular common and economically important vegetable crop. The Brinjal due to its medicinal properties is helpful to the patients suffering from Diabetes and liver ailments. Rolfs (1892) found a new Sclerotial fungus causing tomato blight at Florida Agriculture Experimental Station U.S.A. Later in (1911) Saccardo name this fungus Sclerotiumrolfsii is recognition of Rolfs Pioneer work in the discovery of this fungus, Since then this fungus has been reported to cause root-rot and wilt in many plants cultivated and wilds Wilt of Brinjal caused by S. Rolfsiiis a new record. This disease has been observed in many cultivated agro field in Chotanagpur areas of Jharkhand, Bihar and some parts of Uttar Pradesh also.

Environmental pollution is perhaps the biggest means of industrialization and urbanization. The pollutant has direct or indirect effect on the microbial community and plant susceptibility. The Pollutant i.e. Ammonium hydroxide raw sewage and metal industrial effluents have controlling effect on the wilt of Brinjal caused by the S. Rolfsii. The raw sewage treatment in various concentrations has got maximum controlling effect on wilt in the peak vegetative phase of the Brinjal. The incidence of wilt at its maximum level was 20.80% in Pant Samrat variety of Brinjal but disease incidence was0.00 %in raw sewage treated soil in the month of December.

Materials and methods

Brinjal (Solanummelongena Linn) is an important oleri-culture plant is widely grown in India. It suffers greatly due to wilt disease caused by Sclerotiumrolfsii (Sacc) causing considerable loss in yields, Municipal raw sewage was collected from big drains of cities. The un-polluted soil sample was collected from the Agro-experimental field of kanhaipur, Jaunpur. The Brinjal seeds were sown in experimental field as well as in the earthen pots in October and harvested in the last of their season of the following year.

Physio-chemical analysis of soil and isolation of micro flora is carried out by following parameter such as soil texture, total organic carbon, total organic matter, soil pH, soil moisture, mechanical composition, conductivity & total composition conductivity by phosphorus potassium sodium nitrate, nitrogen and ammonium contents.

Isolation and purification of the pathogen S. Rolfsii associated with the wilted Brinjal plants were collected from various vegetables fields of Jharkhand, Bihar and Uttar Pradesh. The Sclerotia were washed thoroughly in water to remove dust particle and sterilizeit with 0.1% acqous solution of $Hgcl_2$ for one minute. All together 15 isolates from different localities were collected and their pathogenicity on fresh Brinjal plants was established by inoculation healthy plants with maturesclerotia, cultural experiment is carried out upon PDA medium at $25^oC + 2\ ^oC$ for a week.

Raw sludge treatment

Raw sludge was mixed in Czapeks Dox+yeast extract medium/ PDA medium at the concentration of 1000 µg/ml, 1500 µg/ml,2000 µg/ml and 2500 µg/ml separately and their after the medium was autoclaved extract medium without raw sludge served as the control. The radial growth was recorded by the method as described above under sewage pollutant the germination of the inhabitation of sclerotia was calculated under the use of following formula:

$$\text{\% inhibition of Sclerotial germination} = \frac{\text{No. of Sclerotia germinated in control} - \text{No. of Sclerotia germinated in treatment}}{\text{No. of Sclerotia germinated in control}} \times 100$$

Observation

The experimental findings have been presented as follows:

Symptom of the disease

Symptoms occur at any stage of plant growth. First of all, due to infection the chlorophyll content vigour and turgidity of the host tissue gradually decreases and making leaves yellow after epidemic infection. The host get wilted and dies. The collar region of the diseased plant is covered with thick white mycelial strands measured under 60µm-350µm in the length and 2-8 µm in breadth. The colour of mycelium is grey at maturity. Sclerotial development recorded from PDA at 30^oC after 5 days of the mycelial growth. Sclerotia appear at small stuffs of loosely interwined- hyphal bodies as a result of aggregation of hyphal branches at maturity, it became compact and give rounded pale yellow in colour. Mature Sclerotia are globose and hard Germination of Sclerotia is influenced by environmental factors especially moisture and temperature. Optimum soil moisture 10% and optimum temperature 25^{o}C-30^{o} C.

Effect of soil pollutants on plant disease

Physio-chemical properties of polluted and unpolluted soil samples are carried out for observation. Percent incidence of wilting in some varieties of brinjal plants under different inoculums soil concentration in raw sewage polluted soil.

Observation Table

Percent incidence of wilting in some varieties of Brinjal plants under different inoculums soil concentration in raw sewage polluted soils.

S. No.	Name of Varieties	Months	% of utilizing in brinjal plants with inoculums soil concentration		
			100:00	50:00	00:100
1.	Pant Samrat	October	12.48	8.32	4.16
		November	12.48	8.32	4.16
		December	20.80	12.48	00.00
		January	20.80	12.48	00.00
2.	Pusa Kranti	October	8.32	4.16	00.00
		November	8.32	4.16	00.00
		December	12.48	8.32	00.00
		January	12.48	8.32	00.00
3.	Pusa Bhairab	October	4.16	00.00	00.00
		November	4.16	00.00	00.00
		December	8.32	00.00	00.00
		January	8.32	00.00	00.00

Average** of 6 replicates

F= 17.9 **

** -- Highly Significant at 0.001 p level

Results and Discussion

Incidence of wilting in raw sewage treated soil with inoculums variation

Raw sewage has some controlling effect on the incidence of wilt disease in Pusa Bhairab variety of brinjal, the incidence of wilt was minimum of 4.16% in October and 8.32% in January at 100% inoculums level which has fully controlled in 50% and 0% inoculums level. The values were highest of 12.48% in October, 20.8% in January at 100% in inoculums level in pant-Samrat variety of Brinjal. The controlling trend was medium in Pusa Kranti variety of Brinjal in all the months at 100% inoculums level mentioned in table. Bivariate analysis of variance for the inoculums level and the month variation, the values of f = 17.9 is mentioned in table. Highly significant for controlling effect of sewage treatment in soil. Thus, it can be concluded that the raw sewage has maximum controlling effect for the incidence of wilting in different varieties of Brinjal caused by S. Rolfsii (Sacc).

In view of the above finding and discussion it is concluded that no single method is likely to eliminate Sclerotiumwilt of brinjal. But it can be greatly reduced if a concerted effort is made i.e. summer ploughing of the field in the months of May and June in order to expose the Sclerotia of S. Rolfsii at high temperature under the maintenance of adequate soil moisture in the field. Instead this addition to nitrogen, phosphate, potash and Zinc fertilizer along with green and organic manure in the field at least 15 days before growing of Brinjal plants in suitable under the reduction of diseases.

Statistical analysis

Bivariate analysis of variance 'F' test

Bivariate Annova for the variation in percentage of wilting under different varieties of Brinjal due to different concentration of raw-sewage polluted soil in pots.

Sources of Variation	S.O.S.	df	M.S.
Between the treatment	620.21	2	310.11
Within the treatments	571.01	35	17.30

F= 17.9 **

** -- Highly Significant at 0.001 p level

References

Abeyguna Wardena D. V. W. and R. K. S. wood (1957), Factors affecting the germination for Sclerotia and mycelial growth of Sclerotiumrolfsii (Sacc). Trans.Brit.Myco.Soci. 40: 221-231

Abdul Mallik, A. Y. Moharran: A. M. and Bagy M. M. K. (1988), Effect of soil treatment with Sewage and Sludge on Fungul Population, J.Basic.Microbiol. 28(9/10): 565-570

Baker, R. (1968), Mechanism of Biological Control of soil born plant pathogen: Ann. Rev. Phytopathol, 6: 263-294

Dhanbir Singh, Dhancholia S. (1991), A noteworthy disease of Brinjal caused by S. Rolfsii. Himan. J. of Agri.Res 17(1-2):119-120

Garrett, S. D. (1970), Pathogenic root infecting Fungi, Cambridge Univ. Press London

Kodanda Pang, V and Abbarao (1963), Studies on the nutritional physiology of S. Rolfsii. Ind. Acad. Sci. 57B; 326-328

Liv: D. (1982), The effect of sewage sludge land disposal on the microbiological quality of groundwater, J. of Agri.Res. 16: 957-961

Robin G. O. Goi, Phookan, A. k. (1993), Survival of S. Rolfsii under humid condition of North East India. Ind.J.mycol. Plant, path. 23(2): 153-156

Stanley R. F., Berger, D. A. (1996), First report of S. Rolfsii on perennial Peanut in Florida: Plant diseases 80(1): 105

Study of Josephson Effect between Bose Condesate

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Abstract

Since its theoretical prediction in 1962,[1] the Josephson effect has played a major role in the physics and technology of superconductor.[2]

Key Words: *B.E. Condensate, superfluid, Josephson effect, Cooper pair, plasma frequency*

Introduction

The physics of the Josephson Effect becomes manifest when a weak link is created (e.g by tunneling or through a point contact) between two systems which have undergone some type of gauge symmetry breaking. In fact, the Josephson effect has also been observed in superfluid,[3] and because of the profound analogies, its observation in the recently achieved[4-7] Bose condensed atomic gases is generally expected. A system whose gauge symmetry has been spontaneously broken can be described by an order parameter that behaves in many respects like a macroscopic wave function Ψ (r). In system whose gauge symmetry has been spontaneously broken can be described by an order parameter that behaves in many respects like a macroscopic wave function Ψ (r). In the simplest cases, the order parameter reduces to a complex scalar, $\Psi = \sqrt{\rho e^{i\phi}}$ where $\rho(r)$is the 'superfluid density' $\phi(r)$and is the phase. For Bose-Einstein condensates of dilute alkali gases, $\phi(r)$is wave function of the macroscopically occupied one-atom state.

In his epoch-making,[1] Josephson predicted that, between two weakly connected superconductors of phase $\varphi_1 \varphi_2$, and a nondissipative particle (Cooper pair) current flows between them whose value is

$$I(\varphi)I_c \sin\varphi \tag{1}$$

where I_C is the critical current and is the relative $(\phi(r)$is assumed to be approximately uniform within each superconductor). He also predicted that, in the presence of a nonzero chemical potential difference $\mu = \mu_2 - \mu_1$, the relative phase rotates as

$$\varphi = -\mu / \hbar \tag{2}$$

The Josephson relations can be obtained from very general considerations and apply to any pair of weakly linked systems that can be described by macroscopic wave function.[8] They can be obtained as the equations of motion of the 'pendulum Hamiltonia'

$$H(\varphi, N) = E_J(1-\cos\varphi) + \frac{1}{2}E_C N^2 \quad (3)$$

where $E_J = \hbar 1_c$ is the Josephson coupling, $N = (N_2 - N_2)/2$ is the number of transferred particles and $E_C = \partial\mu/\partial N$ is the capacitive energy due to interactions. In the absence of external constraints, $\mu = E_C N$. In a superconducing link, the critical electric current is $2eI_C$ and the capacitive (or 'charging') energy is $E_C = (2e)^2/2C$, where C is the electrostatic capacitance. For trapped BECs, E_C can be obtained to a good accuracy from the Thomas-Fermi (TF) calculation[9] of the chemical potential.

When both E_C and $k_BT<<E_J$ and system is near equilibrium, the Josephson pendulum Hamiltonian can be approximated as a harmonic osciallator.

$$H(\varphi, N) \cong E_J \frac{1}{2}\varphi^2 + \frac{1}{2}E_C N^2 \quad (4)$$

whose frequency

$$\omega_{JP} = \sqrt{E_J E_C}/\hbar \quad (5)$$

is called the Josephson plasma frequency.

Given the intimate relationship between eqs. (1), (2) and (3), a derivative of the pendulum Hamiltonian (in particular of the $\cos\varphi$ dependence of the energy on the relative phase) may be regarded as equivalent to a derivation of the Josephson effect. At low temperatures, the collective dynamics of an inhomogeneous BEC is well described by the Gross-Pitaevskii (GP) Hamiltonian[10]

$$H[\psi, \psi^*] = \int dr \left(\frac{\hbar^2}{2m}\left|\nabla\psi(r)^2\right| + V_{ext}(r)\left|\psi(r)^2\right| + \frac{g}{2}\left|\psi(r)^4\right| \right) \quad (6)$$

where $g = 4\pi\hbar^2/m$ (a is the s-wave scattering length). Neglecting depletion,[11] the normalization can be taken as $\int dr\rho = N_T$, N_T being the total number of atoms. The extremum condition $\delta(H - \mu_0 N_T)/\delta\psi^* = 0$ (where μ_0 is the equilibrium chemical potential) leads to the well-known GP equation.[10]

Phase rigidity and broken gauge symmetry

The assumption of a uniform within each Bose condensate is implicit in most discussion of the Josephson effect. It seems therefore convenient to check explicity that this is a physically meaningful approximation. To prove it, let us estimate the energy of a one-radian fluctuation of the phase across the condensate near equilibrium in a single spherical harmonic well [eq.(1)],

$$\frac{\hbar}{2m} = \int dr\rho|\nabla\phi|^2 \cong \frac{\hbar}{2m}\frac{N_T}{4R^2} \cong 0.7N_T^3\frac{\hbar\omega_2}{2} \qquad (7)$$

where R=$a_0(15aN_T/a_0)^{1/3}$ is the cloud radius estimated within the TF approximation.[9] $a_0 = (\hbar / m\omega_0)^{1/2}$ is the harmonic oscillator length. For the last approximate equality one has typical parameter a=5nm and $a_0=10^{-4}$ cm. The characteristic temperature of such an oscillation can be as big as $10\mu k$.[7] Since temperature as low as 100nK can be reached in current BEC setups, it is acceptable to view the phase of a condensate within one well as internally frozen and rigid. It is clear from eq. (7) that spatial fluctuations of the phase are energetically more costly the higher the value of the condensate density ρ. For this same reason, in the interstitial region between two wells, where $\rho(r)$ decreases appreciably, spatial phase variations require less energy and are thus easier to activate at low temperatures. Here lies the essence of low-energy Josephson dynamics. At low temperatures, the picture emerges of two wells, each with an internally uniform phase, whose relative phase

$$\phi = \int_1^2 dl.\nabla\phi \qquad (8)$$

induced by local variation $\phi = (r)$ in the interstitial region, is the only active dynamical variable.

From the theory of phase transitions, one knows that some type of 'rigidity' is generally exhibited in the ordered phase below the critical temperature.[12] In the case of superconductors, superfluids and Bose-Einstein condensates (BECs), one may speak of 'phase-rigidity' because, given an electromagnetic gauge (or its equivalent for superfluids and BECs). The phase is determined everywhere once it has been fixed at a given point. Alternatively, since gauge and phase are intimately connected in quantum mechanics, one can say that, given a choice of phase, one has lost the freedom to choose the gauge, hence the term 'gauge symmetry breaking'.

Long range phase coherence can be destroyed by thermal or quantum fluctuations. Simple pictures of how this occurs can be developed by analyzing the Josephson Hamiltonia (3), which may be viewed as a two-site reduction of the more general energy function (6). In equilibrium, good phase coherence between sites 1 and 2 is obtained in the harmonic limit (4). Then it is appropriate to speak of global phase coherence or rigidity in the combined double BEC system. Thermal fluctuations randomize the phase for $k_B T \geq E_J$. To see how quantum fluctuations can destroy the two site phase coherence, one notes that, since N and φ are canonically conjugate variables, N can be represented as $N = i\partial / \partial\varphi$ in a quantum description. As a consequence, the capacitive term in eq. (3) plays the role of the kinetic energy for the phase variable. At zero temperature, quantum fluctuations can destroy phase rigidity between sites 1 and 2 if the interactions are sufficiently strong $(E_C \geq E_J)$. In this limit, the relative particle number becomes a good quantum number eq. (3) and the two condensates behave as essentially independent. Because of the weak connection, it is much easier to destroy the relative phase coherence between condensate. One has already proved that internal coherence cannot be destroyed by thermal fluctuations at the experimental temperatures. On the other hand, long range coherence within each condensate is preserved from destruction by quantum fluctuations thanks to the three-dimensional character of the problem, for which the Mermin-Wagner theorem does not apply.

External Josephson Effect
Semi-classical description

Let us assume that $V_{ext}(r)$ is such that our system has the structure of two weakly connected condensates 1 and 2. One assumes that the condensates are confined within spherical harmonic wells of the same frequency ω_0. First one wishes to analyze the semi-classical dynamics. Then, N and φ can be treated as simultaneously well defined and one may writes for the wave function the ansatz.[13]

$$\tilde{\Psi}(r,t) \sim \Psi_1(r; N_T/2 - N(t)) + e^{i\varphi}\Psi_2(r; N_T/2 + N(t)) \qquad (9)$$

where $\Psi_1(r;n)$ is the (real) equilibrium wave function for the isolated well *i* containing *n* basons. It is straightforward to show that, to lowest order in the overlap integrals $\int \Psi_1\Psi_2$, the energy functional for $\tilde{\Psi}$ takes the from

$$H(\varphi, N) \cong E_B(N) + E_J(N)(1 - \cos\varphi) \qquad (10)$$

where $E_B(N)$ is the bulk energy of the two isolated wells with N transferred atoms, and $E_J(N)$ is the Josephson coupling energy.

In the TF limit (9), the bulk energy $E_B(N)$ is mostly due to interactions, and it may be expanded as

$$E_B(N) \cong E_B(0) + \mu_0^{'}\left(\frac{N_T}{2}\right)N^2 + \frac{1}{2}\mu_0^{m}\left(\frac{N_T}{2}\right)N^4 \qquad (11)$$

since $\mu_0 \sim N_T^{2/5}$, the ratio between the third and second terms in the expansion is 0.32 N^2/N_T^2, which means that the last term can be neglected in a wide range of situations.[9] To avoid complications stemming from possible resonance between Josephson oscillations and intrawell excitations, one requires, $\mu_0(N_T/2 + N) - \mu_0(N_T/2 - N) << \hbar\omega_0$ where one uses the result that the first normal mode of a spherical well lies approximately at $\hbar\omega_0$ above the ground state.[14,15] This condition is realized when $N/N_T << 4.6N_T^{-2/5}$ for typical parameters. This upper bound is of order 2-10% for N_T ~ 10^4-10^6.

Josephson coupling energy in one dimension

The expression for the coupling energy $E_J(N)$ in terms of ψ_1 and ψ_2 implicit in eq. (10) is rather complicated and difficult to handle, so it is desirable to find a simpler expression. Let us assume that the $(1-\cos\varphi)$ dependence for the energy of a Josephson link has already ben proved by e.g., the arguments and focus on the particular $\cos\varphi << 1$ where $\psi(r)$ is very close to ground-state wave function $\psi_0(r)$ with $\varphi = 0$. In such case, the integrand $|\nabla\psi|^2$ in eq. (6) is mostly due to phase variation. In one dimension, one can then writers.

$$E[\phi] = \frac{\hbar}{2m}\int_1^2 dx\rho(x)\left|o'(x)^2\right| \cong \frac{1}{2}E_J\varphi^2 \qquad (12)$$

where the phase term in eq. (3) has been approximated quadratically, and where the integration extends between two points beyond which the phase is practically uniform.

From eq. (1), one knows that a super current must flow between the two condensate whose value is

$$I \cong (E_J/\hbar)\varphi \qquad (13)$$

On the other hand, particle number conservation requires

$$I = (\hbar/m)\rho(x)|\phi'(x) = \text{const} \qquad (14)$$

Inserting the resulting expression for $\phi'(x)$ into eq. (13), one obtains a functional expression for the Josephson coupling energy in terms of the ground-state superfluid density

$$E_J = \frac{\hbar^2}{2m}\left[\int_1^2 \frac{dx}{\rho_0(x)}\right]^{-1} \qquad (15)$$

where one has used the fact that, $\varphi << 1, \rho \cong \rho \equiv |\psi_0|^2$

Three dimensions: electrostatic analogy

One assumes again that the $(1-\cos\varphi)$ dependence has already been proved and consider the case $\varphi << 1$. Analogously to eq. (12), one can write

$$E[\phi] = \frac{\hbar}{2m}\int_{ext} dr\rho(x)|\nabla_0(r)|^2 \cong \frac{1}{2}E_J\varphi^2 \qquad (16)$$

where the integration extends over the region exteriors to the condensates (the results are quite independent of the precise location of the condensate borders). The phase within the condensates is assumed to be uniform. The only way for eq. (16) to have dependence on the total phase difference φ and not on the details of $\nabla\phi$ is that the condition $\delta E(\phi)/\delta\phi(r) = (\hbar^2/2m)\nabla.(\rho\nabla\phi) = 0$ is satisfied, something which is guaranteed by current conservation $(\hbar/m)\rho\nabla\phi$ is the particle current density). One may have noted that, except for trivial factors, this is the electrostatic equation for the electric displacement vector $D = \rho\nabla\phi$ in a medium with a non-uniform dielectric constant $\rho(r)$. Boundary conditions for $\phi(r)$ are given by its value at the borders of each condensation $(\varphi_1 \text{ and } \varphi_2)$, which act as conductors in this analogy. One has a system of two conductors held at a potential difference φ and a dielectric medium surrounding the. The $E[\phi]$ is essential the energy of this capacitor. Potential theory tells us that $E[\phi] \sim \varphi^2$, with E_J in eq. (16) playing the role of the mutual capacitance of the two conductors in the presence of such a dielectric.

Standard variational arguments can be invoked to prove that, for parallel plate boundary condition, 13

$$\int \frac{dxdy}{\int_1^2 dz\rho(x,y,z)^{-1}} \le \frac{mE_J}{\hbar^2}\left[\int_1^2 \frac{dz}{\int dxdy\rho(x,y,z)}\right]^{-1} \tag{17}$$

(here z is the longitudinal coordinate connecting the centers of the two wells, and *x*, *y* are the transverse coordinates). The lower bound is obtained by removing the positive term $(\partial\phi/\partial x)^2 + (\partial\phi/\partial y)^2$ from the energy functional (16), while the upper bound is derived by taking ϕ independent of *x*,*y*. If the equilibrium density can be factorized in the region controlling (a not very restrictive condition in practice), one can writes $\rho_0(r) = f(x,y)g(z)$ and the two bounds become identical. Taking r=0 at the middle point of the double-well configuration and choosing x=y=0 to be the line connecting the two well centres, one can finally writes[13]

$$E_J = A\frac{\hbar^2}{m}\left[\int_1^2 \frac{dz}{\rho_0(0,0,z)}\right]^{-1} \tag{18}$$

$A = f(0,0)^{-1}\int dxdyf(x,y)$ being an effective area. The factorization condition is much more general that it might appear at first sight, since it only has to be satisfied in the interstitial region near the top of the barrier giving the dominant contribution E_J. There $V_{etx}(r)$ has a saddle point and thus it can be decoupled in longitudinal and transverse coordinates. Since interactions are negligible in the bottleneck region connecting the two wells, one concludes that the wave function must be factorizable.

WKB calculations

In order to proceed, one needs an estimate $\rho_0|\psi_0|^2$ in the region of interest. Here on reproduces sketchily the WKB calculation of ref. [13]. For two identical wells in equilibrium, the ground state wave function is symmetric in z. Focusing on the x=y=0 line giving the dominant contribution, one writes

$$\psi_0(z) = \frac{B}{\sqrt{p(z)}} \cosh\left[\frac{1}{h}\int_1^2 dz' p(z')\right] \tag{19}$$

where $p(z) = [2m(V_{ext}(0,0,z) - \mu_0)]^{1/2}$ and B is a constant to be determined from the work of ref. [16]. Introducing eq. (19) into eq. (18) one obtains

$$E_J \cong \frac{\hbar A|B|^2}{m}\left[2\tanh\left(\frac{S}{2}\right)\right]^{-1} \tag{20}$$

where $S = \int_1^2 p(z)dz/\hbar$ is the dimensionless instant on action. One finally gets [13]

$$E_J \cong \frac{e^{-s}}{\tanh(S/2)}\left(\frac{N_T}{2}\right)^{1/3}\left(\frac{15a}{a_0}\right)^{-2/3}\frac{\hbar\omega_0}{2} \tag{21}$$

The $N_T^{1/3}$ dependence can be understood qualitatively by noting[14-16] that $A \sim R^{2/3}$ and $B \sim R^{1/2}$. Since in the TF approximation.[9] , $R \sim N_T^{1/5}$ one obtains $E_J \sim N_T^{1/3}$. Knowing that the critical temperature satisfies $k_B T_C \cong N_T^{1/3}\hbar\omega_0$ [17] one may rewrites eq. (21) as (for large S and typical parameters)

$$E_J \cong k_B T_c e^{-s} \tag{22}$$

which is reminiscent of the Ambegaokar- Baratoff formula for superconductors[2] if one notes that e^{-S} is the probability amplitude for a particle to traverse the barrier.

Conclusion

We have presented an overview of the physics of the Josephson Effect between Bose condensed systems, with emphasis on the recently achieved BECs in trapped alkali gases. We have mostly focused on those physical phenomena that are likely to be observed only (or more easily) in these novel systems. Thus, we have omitted the discussion of problems (such as, *e.g*., steady particle flow under the action an alternating chemical potential) which may be viewed as straightforward applications of well known Josephson physics.[2] We have tried to underline the potential richness of the physics displayed by weakly connected BECs. One may have an external (spatial) and internal (hyperfine) Josephson effect. It seems possible to explore the crossover between collective Josephson behavior and independent boson Rabi dynamics. Finally, the observation of fascinating phenomena such as quantum self-trapping and macroscopic interference between separate Bose condensates seem also within reach of the emerging BEC technology. Everything indicates that the experimental and theoretical study of the Josephson Effect between Bose-Einstein condensates will leads us to the exploration of most exciting new physics.

References

1. B.D. Josephson, *Phys. Rev.* 1, 251 (1962)
2. A. Barone and B. Paterno, *Physics and Applications of the Josephson Effect* (John Wiley & Sons, New York), 1982
3. O. Avenel and E. Varoquaux, *Phys. Rev. Lett.* 55, 2704 (1985)
4. M.H. Anderson, J.R. Ensher, M.R. Matthews, C.E. Wieman and E.A. Cornell, *Science* 269, 198 (1998)
5. C.C. Bradley, C.A. Sackett, J.J. Tollett and R.G. Hulet, *Phys. Rev. Lett.* 75, 1687 (1995)
6. K.B. Davis, M.O. Mewes, M.R. Andres, N.J. van Druten, D.S. Durfee, C.G. Townsend and W. Ketterle, *Phys. Rev. Lett.* 75, 3969; 988 (1995)
7. M.O. Mewes, M.R. Andrews, N.J. van Druten, D.M. Kurn, D.S. Durfee, C.G. Townsend and W. Ketterle, *Phys. Rev. Lett.* 77, 416; 988 (1996)
8. R.P. Feynman, R.B. Leighton and M. Sands: *The Feynman Lectures on Physics* (Addison-Wesley Publ. Co, Reading) (1963)
9. G. Baym and C.J. Pethick, *Phys. Rev. Lett.* 76, 6 (1996)
10. L.P Pitaevskii, *Zh. Eksp. Teor. Fiz,* 40, 646 (1961) (*Sov. Phys. JETP* 13, 451 (1961); E.P. Gross, *Nuovo Cimento,* 20, 454 (1961), *J. Math. Phys.* 4, 195 (1963)
11. S. Giorgini, L.P. Pitaevskii and S. Sringari, *Phys. Rev. Lett.* 78, 3987 (1997)
12. P.W. Anderson, *asic Nations of Condensed Matter Physics* (Benjamin-Cummings, Menlo Park), (1984)
13. I. Zapata, F. Sols and A.J. Leggett, *Phys. Rev.* A 57, R28 (1998)
14. S. Stringari, *Phys. Rev. Lett.* (PRL) 77, 2360 (1996)
15. M. Edwards, P.A. Ruprecht, K. Burnett, R.J. Dodd and C.W. Clark, *Phys. Rev. Lett.* (PRL) 77, 1671 (1996)
16. F. Dalfovo, L.P. Pitaeviskii and S. Stringari, *Phys. Rev.* A 54, 4213 (1996)
17. S. Giorgini, L.P. Pitaeviskii and S. Stringari, *Phys. Rev.* A 54, R4633 (1996)
18. D.S Hall, MR. Matthews, C.E. Wieman and E.A. Cornell, *Phys. Rev. Lett.* (PRL) 81, 1543 (1998)
19. A.J. Leggett, *Proc. ICAP XVI,* edited by W.B. Baaylis and G.W.F. Drake (AIP Press, Woodbury, New York), (1999)

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