MGC QUEST

JOURNAL OF
MURALIDHAR GIRLS' COLLEGE
FOR
EDUCATIONAL RESEARCH

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Editor's Note

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We are delighted to bring forth the second issue of Muralidhar Girls' College's journal, **MGC Quest,** a multidisciplinary-bilingual journal which aims to work at the intersection of humanities and scientific studies. The journal provides an exciting prospect of considering the interdisciplinary nature of research at a time of great change and crossover between various disciplinary boundaries.

The objective of **MGC Quest** is to publish high-quality and original research papers alongside relevant and insightful reviews. As such, the journal aspires to be vibrant, engaging and accessible, and at the same time integrative and challenging. We publish research articles, full-length research papers and review articles. The journal publishes research work in both Bangla and English for greater accessibility to the community of readers and researchers primarily located in Bengal.

We are immensely grateful to our team of sub-editors, committee members, board members and authors for their contribution to the development and success of the journal. In the near future, we hope to strengthen this association and collaborate more meaningfully with the academic community at large to make **MGC Quest** reach greater heights.

Best wishes,

Priya K. Gopal and Rituparna Das

Editors, MGC Quest.

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ARTICLES IN ENGLISH

Understanding the Potential of Rural Tourism in Darjeeling Himalaya Ensuring the Sustainable Development in the Village livelihood: Some Observations

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Abstract

Darjeeling Himalaya is one of the major attractions of tourist throughout the globe. The lofty Mountain range with snow clad peaks, green carpet of forest criss crossed by mighty river gives this place a cinematic charm and is heavenly paradise for tourist to spend a quality time with their family. Therefore, all persons once in their life make a visit to this Himalayan region. The main revenue of this place comes from the Tourism Industry, Plantation areas and Hydel power stations. Every year the month of September –November is the peak tourist season in Darjeeling Hills. Every hotels and lodges are packed with tourist. This provides a good prospect for the urban dwellers to earn handsome money by offering a number of services in and around bazaar and major tourist areas. In recent years it has been observed that the taste of attraction among tourists have shifted to village areas. Because from the hustle and bustle of crowded cities and towns they rather prefer to search for a virgin spot where they can quenched their mental stress and rejuvenate themselves freely in the pure environment. This paves its way for the rural tourism where tourist comes and stays in the house of rural people keeping aside the luxurious amenities of hotels. The rural areas of Darjeeling Himalaya open an avenue for the tourist and at the same time a prospect of employment to the valley youths and people of the study area. The present study covers the Takdah and its adjoining areas. The paper is based on empirical research. Thus this paper is the modest attempt of the author to link ecology with proper human management in the view of sustainable tourism development and environmental balance in the rural areas of the Darjeeling Himalaya.

Keywords- Himalayas, Rural, Tourism and Sustainable developI

Introduction: Defining Tourism & its Aspects

Tourism refers to a movement of people from one place to another. This movement is temporary in nature which is done generally in leisure time for recreation, pleasure, adventure and also for knowledge (Ghulam, 2000). It also implies people's going out for those places which have religious significance. So, tourism involves multi-faceted activities which collectively fulfill various needs of the travelers (Sinha, 2005). In sociological terms, 'tourism' can be defined as the management of social relationships coming out due to interaction among the travelers and the local people of a place, where the travelers come and stay temporarily mainly for relaxation or entertainment.

Tourism plays a very important role for the tourists and the local people to understand each other's culture. The social and economic behavior of the tourists has a reflective effect upon the lifestyle, attitude and economic wellbeing of the local people. Similarly tourists also are influenced by local people and their culture. In this way, tourism not only has an economic aspect but also has a socio-cultural meaning (Bhui, 2013). Based on this definition, tourism industry includes all socio-economic activities that are directly involved in providing services to tourists. Tourism turns the largest industry worldwide in generating employment and GDP. The tourism industry has been growing rapidly as well as dynamically changing the regional economy. As more people are interested in spending their holidays in nature, ecotourism as well as Rural tourism has become one of the vital segments of the tourism industry. Local communities may benefit in economic terms as well as create an employment opportunities and commitment to conservation and sustainable development in a holistic way.

Tourism and Sustainable Development

The incredible growth of the tourism industry in recent years has led to develop the concept of Sustainable Tourism. The concept of sustainable rural tourism development is strongly correlated with ecologically responsible tourism (Basak, 2021). The principles of sustainable tourism were envisaged by the World Tourism Organization in 1988 as "leading to management of all resources in such a way that economic, social and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, and biological diversity and life support systems". Sustainable tourism has been defined as development that meets the needs of today's tourists and host regions, while protecting and enhancing opportunity for the future (Bhutia, 2015). In Rural tourism, sustainability refers to the utilization of Local resources in more convenient and friendly manner so to enhance the

satisfaction of tourists in a more organic way and also to preserve the resource base for future generations.

Tourism and Himalayas: A close Connection

Tourism has flourished in its various forms giving the travelers a pursuit of being happy and excited. The Natural landscapes composed of diversity always boost the Tourism. As such, the magnificent and majestic beauty of the Himalayas for centuries has caught the imagination of travelers. The fascinating mountain ranges in the world are known for its scenic and breathtaking natural beauty. These mountain ranges are also the homeland for 210 million people having rich cultural diversity. The myths and mythology associated with Himalayas has always developed a curiosity among scholars from various fields to understand the hidden mysteries of Beyul of the Himalayas and its intricate history. The findings of untold histories led the rise of tourism in these places because of the art and artifacts.

According to Ancient Buddhist texts, the Beyul were preserves of ***Padmasambhava***, also known as ***Guru Rinpoche***, who introduced Buddhism to Tibet and founded the ***Nyingmapa*** tradition in the eighth century. Information on their locations was kept on scrolls hidden under rocks and inside caves, monasteries and stupa (shrines). Some beyul are now inhabited, others are occasionally visited by spiritual seekers and adventurers, and some are still unknown (Sherpa, 2003). Therefore, understanding of the Himalayas from the various religious to social perspectives has opened an avenue for Tourism. Thus, the Tourism in a broader sense has always existed in the Himalayas in the form of Holy Pilgrimage and Shrines to Hindu and Tibetan Devotees that are located high up in the mountains. The Holy pilgrimage site of the Himalayan regions witnessed the presence of hundreds of people yearly. The existences of such holy places have help to boost the income of the villagers through rural tourism in such relative isolated places.

Onset of Tourism in Darjeeling Himalaya: A Home in the Hills

Darjeeling Himalaya looms like a sentinel from the heat shimmering plains of North Bengal. The entire region is considered as one of the most splendid hill resorts in the world. The place offers the natural beauty in the form of serene snow clad peaks, steep undulating terrain crisscrossed by turbulently flowing streams along with the lush-green tea-gardens. Geographically, located at the base of mighty Mt. Kanchenjunga Darjeeling attracts nature lovers from all walks of life. This small frontier zone is also a hotspot of rich species

biodiversity. Since time immemorial Darjeeling Himalaya is also the Home in the Hills for the diverse Himalayan Ethnic communities.

With the arrival of Colonials in the 19th century, the massive forests of Darjeeling were cleared to make it as a Summer Capital of East India Company and Sanatorium for treating the invalid soldiers of Warfare. It was established in 1835 by the colonial British. They established Darjeeling mainly for their habitation during the summer as the cold climate of Darjeeling suited their health. Historically, also Darjeeling occupies an immense importance from its inception of being a British Sanatorium to flourishing Tea Estates. The natural beauty and serene atmosphere of this region continue to mesmerize and attract tourists from various parts of the world. The tourists travelled Darjeeling for adventure, leisure, and special recreation towards the empathy of Nature for rejuvenation and wellbeing. Due to this wonderful attributes of tourism Darjeeling earned its name as the 'Queen of Hills' for its beautiful landscapes and a global tourist destination

II

Significance of the Study: The Essence of Rural Tourism

Rural Tourism involves the active participation of the village folks in beautification of the natural ambience of the rural areas in a very peaceful way. Rural Tourism envisages as a machinery tool for rural planning and sustainable rural development in a holistic approach. Rural Tourism not only emerges as an utmost income generator in the context of tourism potential business. It has also enhanced into a soothing kind of recreational enterprise to the urban dwellers for connecting into realms of Nature, peace and tranquility. Sustainable Rural Tourism encompasses not just environmental protection but also extends to economic development and social equity (Mathew, 2009). Rural tourism is a form of nature based tourism that uncovers the rural life, culture, art and heritage at rural locations, thereby favouring the local communities socially and economically (Nitashree Mili, 2012).

In addition, Rural Tourism also promotes the cultural and heritage attractions such as handicrafts and local amenities. It allows the persons associated with rural tourism to revive intangible cultural heritage as a parameter to attract more guests through food, crafts and cultural heritage. Thus, Rural Tourism plays a pivotal role in providing opportunities for local communities to uplift socially and economically in the core interior of the village environment.

The Area of Study: Aims and Objectives

The present study area covers the Takdah – Teesta valley and its adjoining areas of Rangli Rangliot block which is one the administrative division of Darjeeling district located at 27° 01'46"N to 88° 21'25"E with the total area of 305.83sq/km. The area falls under the Agro climatic region of Eastern Himalayan zone II of the sub region of Northern hilly. Takdah is one of the major tourist destinations in Darjeeling Himalaya. It is located 30 kilometers away from the main town. It is well connected with roads except few remote villages. During colonial period it was a cantonment area therefore it is also known as Takdah Cantonment. The place offers cool and calm charm of natural beauty, forest villages and a wide variety of flora and fauna. The establishment of tourism in recent years has gained some momentum due to the flow of both foreign and domestic tourists.

The present study aims to give an account of the development of tourism in Darjeeling in general and Takdah in particular. But the main objective is to discuss the prospects of village tourism on the socio-economic condition of the study area. The study identifies to explore the possibilities of the growth of rural tourism that could play an important role in sustainable development and better livelihood of rural societies. The paper also tries to throw a light on a few potential rural tourism places of the study area. The approaches and methods followed in the research paper on rural tourism is empirical one as well as comprehensive reports available from secondary sources are also taken into consideration. A case study method was implied in order to show impacts of rural tourism in the Himalayan villages of Rural Darjeeling.

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 Rural Tourism as Promising Innovative Livelihood option

According to recent World Bank development indicators, the majority of the population in the Himalaya lives in poverty between 47% - 83% and between 17% - 30% living in absolute poverty (World Bank Report, 2005). People in the mountainous region are facing frequent natural hazards, degradation of resources because economically utilizable resources and livelihood options for additional income generation at local level are limited, out migration has become a major livelihood strategy for rural hill people. It is believed that rural tourism is one of the most promising adaptation strategies to these changing conditions, generating much needed resources for the adaptation process, building upon the strength of the region. Rural tourism can yield high levels of employment and income for poor, especially in the

study areas where biodiversity and indigenous cultures have not yet significantly eroded. The villages of Darjeeling Himalaya are the important assets for the development of rural tourism industry. The countryside is blessed with scenic, splendor, colourful cultures, romantic, spiritual or adventurous connotations these villages accelerates to tourism potential. Rural tourism focuses primarily on active participation of a tourist in a rural lifestyle. Various rural areas in Darjeeling hills are hosting tourists from different parts of India. The peace and calm environment of village also enhanced the experience of tourists living in a harmony with nature in a rural backdrop. Furthermore in agriculture or other traditional industrial activities rural people often struggle to get their products to the market. Rural tourism now merchandises their product with organic brand delivers to the market easily and efficiently giving hill farmers good incentives.

Rural Tourism in Takdah: The Land of Mist

Darjeeling Himalaya nestled on the laps of mountains has number of rural villages having dynamic recreational facilities ensuring fullest tourist satisfaction. Village environment is very clean and therefore can be present in different manner by creating new avenues for tourism and sustainable development of rural livelihood. The villages of Takdah have various aspects to promote itself into potential tourist destination. The author tries to highlight some of the important places adjoining the Takdah and its peripheries promoting the rural tourism in different aspects.

i.   Agro Tourism

Darjeeling apart from being a sensational tourist destination is also an agricultural district of North Bengal. The majority of the rural populations of Darjeeling are engaged in agricultural activities. The terraced green paddy fields, orange orchards, beautiful tea gardens are enough to attract the city dweller to enrich themselves with the authentic lifestyle of village. This not only provides beautiful scenery but also paves for wellness tourism where tourist really attains a peaceful state of mind, body and soul. It not only benefits the tourist but also enhances the local economy and paves a way for sustainable rural development. The agricultural village of *Rampuria busty*, *Poomong busty* and *Hombusty* are ideal location in Takdah block for the development of Agro Tourism.

ii.   Wellness Tourism

Wellness tourism is also one of the attracting packages like religious pilgrimage tourism. The clean and peaceful surrounding of forests really rejuvenates the mental stress of the people. More over the Tibetan medical institution *Chakpoore* in Takdah and *Diwakara Vihara* in Takdah Club forest area can play the pivotal role in the development of village and wellness tourism.

iii.   Colonial Tourism

Darjeeling is a colonial hill stations since its establishment Darjeeling has retained its colonial structure in some places which is of great historical importance. Takdah cantonment is also one of the outcomes of colonial who had made this place as cantonment for their regiments. The forests and calm environment of Takdah attracts them and still some of the remnants of colonial structure are present in Takdah in disastrous condition. With the proper government initiatives and local support these structures can be maintained functioning as colonial tourism.

iv.   Ecotourism

Generally, Ecotourism refers to the travel destination where the natural beauty is the main area of attraction. It means nature-based tourism. It is completely a new and alternative approach to tourism and mainly depends on the idea of sustainability. Many definitions of ecotourism have evolved so far. The term Ecotourism was coined by Hector Ceballos Lascurian in 1983 to describe nature-based travel. The principles of Ecotourism are exactly the opposite of this trend of conventional tourism. Ecotourism opportunities not only help them generate income but also provide training skills to them with which they can move to other areas also. Ecotourism is aimed at minimizing any kind of negative impact on the environment. It also attempts to incentivize conservation by providing financial benefits to the local population. Ecotourism provides people with an opportunity to immerse in the experience of nature in an enjoyable way and also educates us about nature making us more compassionate and responsible towards nature (Rai, 2020).

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Sustainable Home Stay Tourism in Rural Takdah

Far from the madding crowd and congested structures Takdah embraces its visitors with tall canopy of pines, Bungalows retaining colonial architectural legacy and cascading mist all

over the valley. Thus, the offbeat destination tour of rural Takdah in Darjeeling Hills is becoming the tourist first choice of destination. As the place is gaining the momentum, mushrooming of Home stays business are improving the conditions of local villagers.

The Locals are welcoming the tourist as their guest in the Home stays which exhibits the wonderful balance of village life in the natural world. The simplicity of Home stays allows the traveler to experience a new way of lifestyle and unique culture. The principle of sustainable home stay tourism relies on the optimum use of environmental assets, which are critical for tourist development while preserving the ecological processes and contributing to preserving natural heritage and biodiversity (Basak, 2021).

The beginning of rural home stays tourism in Takdah and its adjoining areas reveals the positive side of economic livelihood of the locals. Rural home stay tourism in Takdah is observed as a successful venture as it caters not only creation of local employment opportunities but also helps the region in economic development. Home stays tourism has raised the standard of living of the rural people. Some of the locals got the opportunity to develop themselves as entrepreneurs. The entrepreneurship has been able to capitalize local resources. It has been able to generate some scope for rural unemployed population who are not so skilled workers. Rural home stay tourism in Takdah has acted as a stimulator of economic growth in the entire valley.

There are many tourist destinations scattered in and around Takdah. Out of 75 homestays under Rangli Rangliot Homestays Owner Association, Takdah has 56 homestays and 14 homestays belongs to Lamahatta. Rural tourism at Takdah has become a good alternative livelihood source for local people. Besides homestays, floriculture, forest parks has contributed towards the development of rural tourism at Takdah (Rawat, 2019). As per latest information from the Homestays association the number has increased to 130.

Impact of Rural Tourism

    i.   **Economic and Social Sustainability:** Whenever the tourist visits the village the local revenue of the place is increased enhancing the economic stability and social upliftment. The avenues for new jobs will be increased and to certain extent

glaring rural employment can be checked. Moreover it is a good prospect of side income earning after the agricultural activities.

ii. **Opening of new market:** Tourism promotes to establish a new market for the local entrepreneurs to sell their products which are indigenous and rarely found outside. It also gives an empowerment to the rural women folk to sell their agricultural products, handicrafts and food items to tourists.

iii. **Cultural integration:** The most important impact of tourism is sharing of different cultural ideologies and implementation of new thinking in the very social life.

iv. **Better Infrastructure:** The local decorate the village to make it more attractive for tourists. Repairing of old building and constructions of basic amenities like health, water and others lead to better infrastructure. These infrastructures are not only for tourists but for everyone in the village.

v. **Revival of cultural heritage:** Now-a-days village tourism is promoting local culture, food and customs which attract the tourists. Indeed it revived the cultural heritage of the local ethnic communities which was almost forgotten in the mode of modernization.

vi. **Community Development:** Tourism industry leads to community development of a particular place by providing the better opportunities.

V

Conclusion

Rural tourism acts as a stimulant for socio- economic development in rural areas of Darjeeling Himalaya. The Socio – Economic conditions of the rural people is in not good condition. Rural Tourism is one of the more promising strategies to alleviate their economic condition. The village in rural Darjeeling shows a unique traditional way of life, heritage culture, handicrafts, art etc. that has great prospects. Rural Tourism has channelized these prospects to attract the urban dwellers for experiencing the true core of natural life. In the recent years the drastic pictures of tourists lingering into the village core as offbeat destinations is the power of rural tourism. The serene atmosphere of village with normal foods of high organic value, warm hospitality and gestures of the home stays owners towards the guests during their arrival and departure had made the images of villages as safe and secure too. It is noticed that most of the tourists are again revisiting the areas because of the

people and places. Rural tourism envisages the employment generation to entrepreneurship. It has given the position to rural women folk of study area as stakeholders and thereby assessing the issue of women empowerment too. Rural tourism addresses the unemployment situation in the rural areas of Darjeeling Himalaya. Rural tourism has built the immediate profitable local livelihood opportunities in the study area and had reduced the pressure for rural people to migrate, or resort to unsustainable development options, and had provided the local with necessary resources to reduce their vulnerability to challenges.

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Achene micromorphology of *Scleria* P. J. Bergius and *Rhynchospora* Vahl (Cyperaceae)

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Abstract

Achene macro and micromorphology is an effective tool for identification of members of the family Cyperaceae which are otherwise difficult to identify based on morphological characters only. Among the various Cyperaceous genera *Rhynchospora* Vahl and *Scleria* P. J. Bergius have achene surface ornamentation of taxonomic significance. Achene micromorphology of 5 species of *Rhynchospora* and 11 species and 1 variety of *Scleria*, studied by Scanning Electron Microscope (S.E.M.) is provided here for easy identification of closely related taxa. A key based on achene micromorphological characters is also provided for the genus *Scleria*.

Keywords: Scanning Electron Microscopy, Surface ornamentation, Taxonomy, Identification.

Introduction

Identification of sedges by gross morphological characters often poses difficulties in correct identification as the flowers are small. According to Cyperologists, fruit characters are important in addition to vegetative and floral characters and hence achene macromorphological characters have been used as the basis for framing generic and subgeneric taxonomic parameters. In addition to achene macromorphology, the microscopic

cellular details and cellular arrangement are to be examined as a supportive data. The Scanning Electron Microscopic (SEM) studies are particularly useful as it enables us to examine cellular details in relatively hard, opaque, tissues that are otherwise difficult to observe under a light microscope. In the present work, hard and opaque achenes are selected for study.

Scanning electron microscopic studies of achene surface have been proved beneficial in clarifying certain taxonomic ambiguities below generic level in various Cyperaceae genera. Schuyler (1971), pioneered in SEM studies with *Scirpus* L. achenes. However, SEM of achene surface have been proved particularly beneficial in identification of otherwise poorly differentiated species in the genus *Carex* L. (Walter 1975, Toivonen & Timonen 1976, Tallent & Wujek 1983, Menapace & Wujek, 1985, Menapace & *al*., 1986, Menapace & Wujek, 1987, Rettig 1990). Achene microstructure has also been proved useful in delimitation of species in *Cyperus* L*., Scirpus* L. (Wujek, & *al*., 1992), *Eleocharis* R. Br. (Menapace, F. J. 1993), *Kyllinga* Rottb. (Govindarajalu & Ramani, 1994) *Pycreus* P. Beauv*., Gahnia* J. R. & G. Forster, *Schoenus* L. (Liu, J-Q & Lin, Su-Juan, 1999, Wujek & *al*., 1992), and *Fimbristylis* (Wujek, & *al*., 1992, Menapace & *al*., 2003). Achene micromorphology was also used as a potential tool for the taxonomic recognition of euploid *Cyperus* cytotypes (Wujek & *al*., 1997).

Although achene micromorphology has been studied in quite a good number of Cyperaceae genera, first micromorphological observation of *Scleria* achenes were based on four African Species (Franklin, E. F. 1979). Achene micromorphology of East African sedges and rushes has been studied by (Haines & Lye 1983). (Raju & *al*. 1990) studied achene micromorphology of *Scleria parvula* Nees. Achene micromorphology of Indian *Sclerias* has been discussed in detail by (Wujek & *al*. 1992 & 2001).

Present study deals with achene micromorphology of 5 species of *Rhynchospora* and 11species and 1 variety (out of 28 species and 1 variety represented in India) of *Scleria*. The genus *Rhynchospora* has been divided into 4 sections under 2 subgenera *i.e*. sections Longirostres and Haplostylis under the subgenus *Haplostylis* and section Campylorhachis and Glaucae under the subgenus *Rhynchospora*. The representative achenes of the following species have been studied *i.e.*, *R. corymbosa* and *R. hookeri* of Longirostres, *R. submarginata* and *R. wightiana* of Haplostylis and *R. rugosa* of Glaucae.

The genus *Scleria* has been divided into 8 sections namely Browniae, Carphiformes, Corymbosae, Diplacrum, Hypoporum, Scleria, Sphaeropus and Tessellatae. The representative achenes of the following sections have been studied *i.e. S. neesii* of Carphiformes, *S. lithosperma* var. *linearis* of Corymbosae, *S. pergracilis* of Hypoporum, *S. alta, S. benthamii, S. scrobiculata* and *S. terrestris* of Scleria and *S. biflora, S. mikawana, S. parvula, S. tessellata* and *S. stocksiana* of Tessellatae. However, SEM studies have been restricted to only these 11species and 1 variety because of the following reasons.

- The other members of these sections *i.e.*, *S. lithosperma* and *S. corymbosa* of Corymbosae, *S. levis, S. oblata, S. psilorrhiza* and *S. poaeformis* of Scleria and *S. annularis, S. rugosa* and *S. multilacunosa* of Tessellatae shows smooth nuts and according to (Franklin, E. F. 1979) and (Wujek & *al*. 1992&2001) smooth nuts of *Scleria* are devoid of any ridges or pits and therefore, not useful for SEM characterization, hence, these species can be distinguished by morphological variations.

- *S. purpurascens* and *S. sumatrensis* of section Scleria are characterized by disc characters.

- The members of the section Diplacrum *i.e. S. caricina* and *S. poklii* and only member of the section Sphaeropus *i.e. S. africana* possess small nuts measuring up to 1 mm which are distinguishable by morphological features.

Materials & Methods

Mature achenes used in this study were obtained from fresh collections and duplicate herbarium specimens. Dried achenes were rinsed in distilled water, air dried and mounted on metallic stub using double sided scotch tape, and stereo-scanned at different magnifications at acceleration potential of 12.5 kv in high vaccum mode of Quanta 200 Scanning Electron Microscope.

Diagnostic SEM features

Trichomes: Trichomes are unicellular hairs occurring in interrupted, more or less linear bands, or in groups. In mature achenes, each flattened hair appears to emerge from a pit-like depression in the achene wall.

Papillae: The papillae are sub hemispherical protrusions from the outer surface of the silicified outer tangential wall of the epidermal cell. The papillae are globular or elongate, compactly or distantly arranged.

Asymmetrical bodies: These bodies within the pits of *Scleria stocksiana* are irregular in shape and appear to arise from the bottom of the cell.

"**Tuberculate" form:** This is the characteristic feature of *S. lithosperma* var. *linearis*. According to (Wujek. *& al*.1992), in this form, the cell surface display tuberculate processes. The tubercle is a single reduced cell composed of many costae.

"**Smooth surface" form:** This is the characteristic feature of *S. tessellata*. According to (Wujek. *& al*. 1992) the "smooth surface" form displays little or no surface micro sculpturing (tuberculae).

Achene micromorphology of species belonging to the genera *Rhynchospora* and *Scleria* studied under SEM are provided here.

Species studied with Voucher No.	Observations
Rhynchospora corymbosa (L.) Britton Sangita Dey 9908 (CAL)	Achene obovate with undulate surface **(Plate 1)**.
R. hookeri Boeck. N. L. Bor 22287 (ASSAM)	Achene suborbicular with irregularly hexagonal surface. Unicellular trichomes present near the apex of the achene **(Plate 1)**.
R. rugosa (Vahl) Gale Sangita Dey 9922 (CAL)	Achenes orbicular with rugose surface. Cell lumen irregularly hexagonal **(Plate 2)**.
R. submarginata Kukenth. T. Shaju 57391 (CAL & TBGT)	Achenes oblong and surface almost smooth with scattered, minute protuberances **(Plate 2)**.
R. wightiana (Nees) Steud. Sangita Dey 9926 (CAL).	Achenes oblong, with surface completely covered by flat, obtuse papillae **(Plate 2)**.
Scleria alta Boeck. Griffith *s.n.* (K)	Achenes obscurely lacunose, hairy. Unicellular trichomes occur in groups. Each flattened, acute trichome appears to emerge from a pit like depression in the achene wall. Numerous trichomes

	aggregated at one place **(Plate 3)**.
S. benthamii C.B. Clarke C.B. Clarke 44798 D (CAL)	Achenes rugulose by wavy ridges, no clear formation of lacunae. The erect subulate mucro of the disc lobe can be clearly seen **(Plate 3)**.
S. biflora Roxb. D. Namhata MN 1415 (CAL)	Achenes distinctly tessellate-lacunose, hairy. Unicellular acute trichomes occur in groups mainly on the ridges. Siliceous papillae are seen within the lacunae **(Plate 4)**.
Scleria lithosperma (L.)Sw. var. *linearis* Benth. S. R. Srinivasan 63579 (CAL)	Achenes display tuberculate processes (Wujek, *et al.*, 1992). The basal 3 depressions are densely papillate with globular or elongate papillae **(Plate 5)**.
Scleria mikawana Makino Wight 2916 (CAL)	Achenes lacunose by regular, oblong lacunae arranged in longitudinal rows. Unicellular trichomes occur in groups and are scattered over the nut surface. Cell lumens are filled with less compactly arranged globular papillae **(Plate 6)**.
Scleria neesii Kunth R. D. Taur 484 (CAL)	Achenes tuberculate and the tubercles are covered by a tuft of stellate hairs. The disc is trigonous, columnar **(Plate 7)**.
Scleria parvula Steud. G. K. Deka *s.n.* (ASSAM)	Achenes lacunose by oblong lacunae. The ridges of the lacunae are covered by flat, obtuse unicellular trichomes. Cell lumens are filled with compactly

	arranged globular papillae **(Plate 8)**.
Scleria pergracilis (Nees) Kunth N.C. Nair 69877 (CAL)	Achenes shallowly pitted, with uneven ridges. Numerous compact papillae are present over the surface **(Plate 9)**.
Scleria scrobiculata Nees *et* Meyen N. P. Balakrishnan 5478 (CAL)	Achenes obscurely lacunose, sparsely hairy by flattened acute trichomes, disc notched at apex. Cell lumens are filled with irregular shaped papillae **(Plate 10)**.
Scleria stocksiana Boeck. Sangita Dey 9920 (CAL)	Achene surface pitted, walls of the pits are thickened and contains asymmetrical bodies **(Plate 11)**.
Scleria terrestris (L.) Fass. Sangita Dey 9924 (CAL)	Achene surface lacunose, unicellular acute trichomes occur on the ridges. Cell lumens are filled numerous irregular shaped papillae **(Plate 12)**.
Scleria tessellata Willd. M. A. W. Khan 4568 (CAL)	Achene shows "smooth surface" form (Wujek & *al*. 1992) where cell surface micro sculpturing is absent. Cell lumen shallow, with prominent ridges. **(Plate 11)**.

Result & Discussion

The SEM studies of *Rhynchospora* species are useful in the following cases: According to Gale (1944), achenes of Asiatic specimens of *R. rugosa* differs from American specimens in not having prominent band like corrugations on achene surface. But SEM study reveals that in *R. rugosa*, the nut surface is prominently rugose and further authenticates the

fact that Indian *R. rugosa* is typical *R. rugosa*. The two morphologically alike members of the section Haplostylis, *R. submarginata* and *R. wightiana* have projections on the nut surface, in the former it is in the form of scattered small protuberances and in the latter in the form of well-developed papillae. Between *R. corymbosa* and *R. hookeri*, the two members of the section Longirostres there are no clear correlation. Although, both of them have uneven nut surface, but it is only undulate without any proper formation of cells in the former, whereas well developed hexagonal cells are present in the latter.

The five members of the section Tessellatae *i.e. S. biflora, S. mikawana, S. parvula, S. tessellata* and *S. stocksiana* having more or less reticulate nut surface are difficult to identify on the basis of morphological characters. (C.B. Clarke 1894), combined the characters of *S. mikawana, S. parvula* and *S. tessellata* while describing *S. tessellata* and since then these species have been variously misidentified as *S. tessellata* in Indian herbaria. Although they can be distinguished primarily on the basis of shape and size of the nut and structure of the disc but SEM features further facilitate their identification as indicated in the following key. Similarly, the four species of the section *Scleria*, which are alike morphologically due to the presence of terminal and partial inflorescences and reticulate nut surface has also been keyed out based on SEM studies of achenes.

Key to the species of section Tessellatae (based on SEM studies)

1a. Trichomes present…………………………………………………………………………..3

1b. Trichomes absent…………………………………………………………………………..2

2a. Achene surface obscurely lacunose, cell lumen shallow……………………*S. tessellata*

2b. Achene surface pitted, cell lumen deep…………………………………*S. stocksiana*

3a. Papillae large …………………………………………………………………………4

3b. Papillae small …………………………………………………………………………*S. biflora*

4a. Papillae less compactly arranged; cell surface visible in between papillae…………
…………………………………………………………………………………*S. mikawana*

4b. Cell lumen completely filled with numerous papillae…………………………*S. parvula*

Key to the species of section Scleria

1a. Papillae absent…………………………………………………………*S. benthamii*

1b. Papillae present within cell lacunae……………………………………………….2

2a. Papillae few, numerous trichomes closely arranged to form tufts …………...........*S. alta*

2b. Papillae numerous, trichomes distantly arranged…………………………………3

3a. Trichomes distributed all over nut surface………………………………*S. terrestris*

3b. Trichomes few over nut surface, mainly concentrated on the lower part of the nut, near disc………………………………………………………………*S. scrobiculata*

Wujek, & *al*. (2001) and Menapace & *al*. (1986), tried to correlate the achene micromorphology of *Scleria* and *Fimbristylis* with the sectional classification proposed by Kern (1961) and opined that in both the cases achene micromorphology is of limited systematic significance in delimiting sectional ranks. In the present work, it has been observed that species with trichomes *i.e. S. alta, S. terrestris* and S. *scrobiculata* of the section Scleria are related as all of them have acute trichomes. Similarly, *S. parvula* and *S. mikawana* are closely related as both have globular papillae and flat, ribbon like trichomes.

During the present work, achenes of *Rhynchospora gracillima*, *Scleria laxa* and *Scleria motleyi* could not be studied due to paucity of materials. Achene micromorphology is

one of the vital diagnostic tools for identification. SEM studies of achene surface of all the taxa belonging to *Rhynchospora* and *Scleria* may provide useful information about phylogeny and evolution of taxa.

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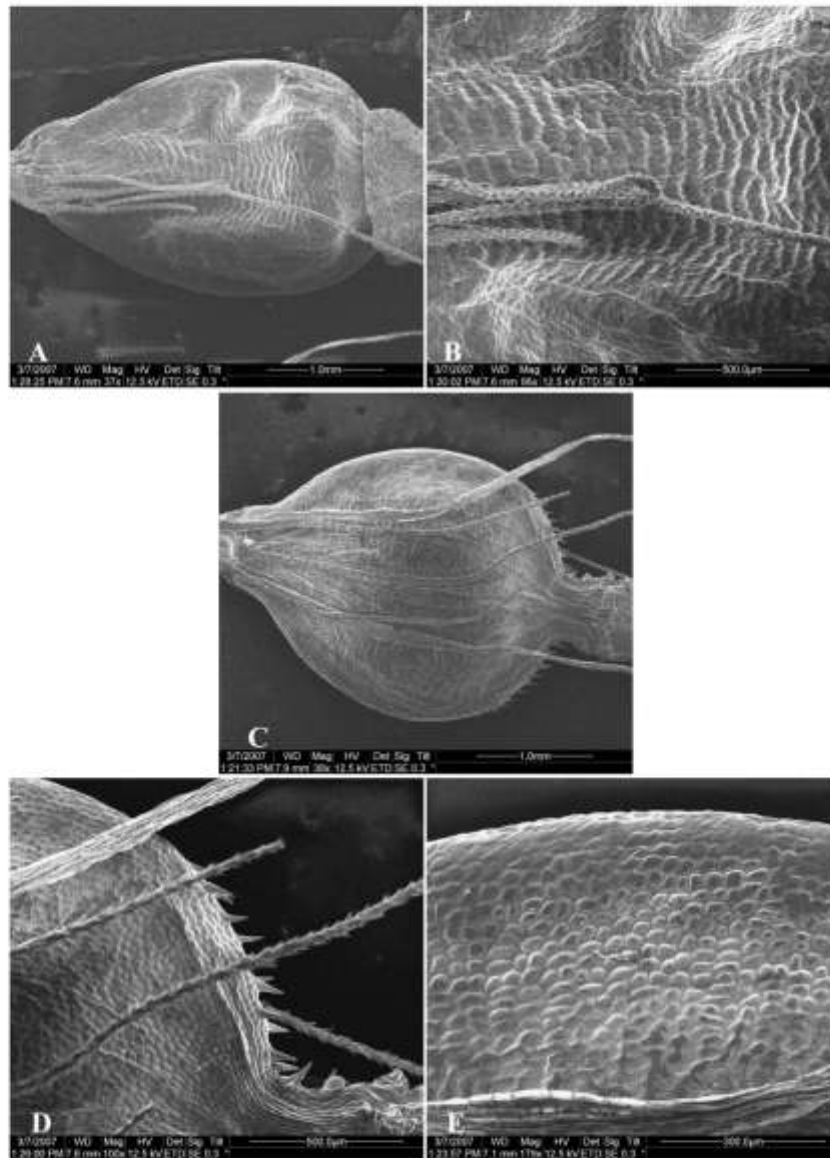
Plate 1. A-B. *Rhynchospora corymbosa* (L.) Britton；
C-E. *Rhynchospora hookeri* (Boeck.)
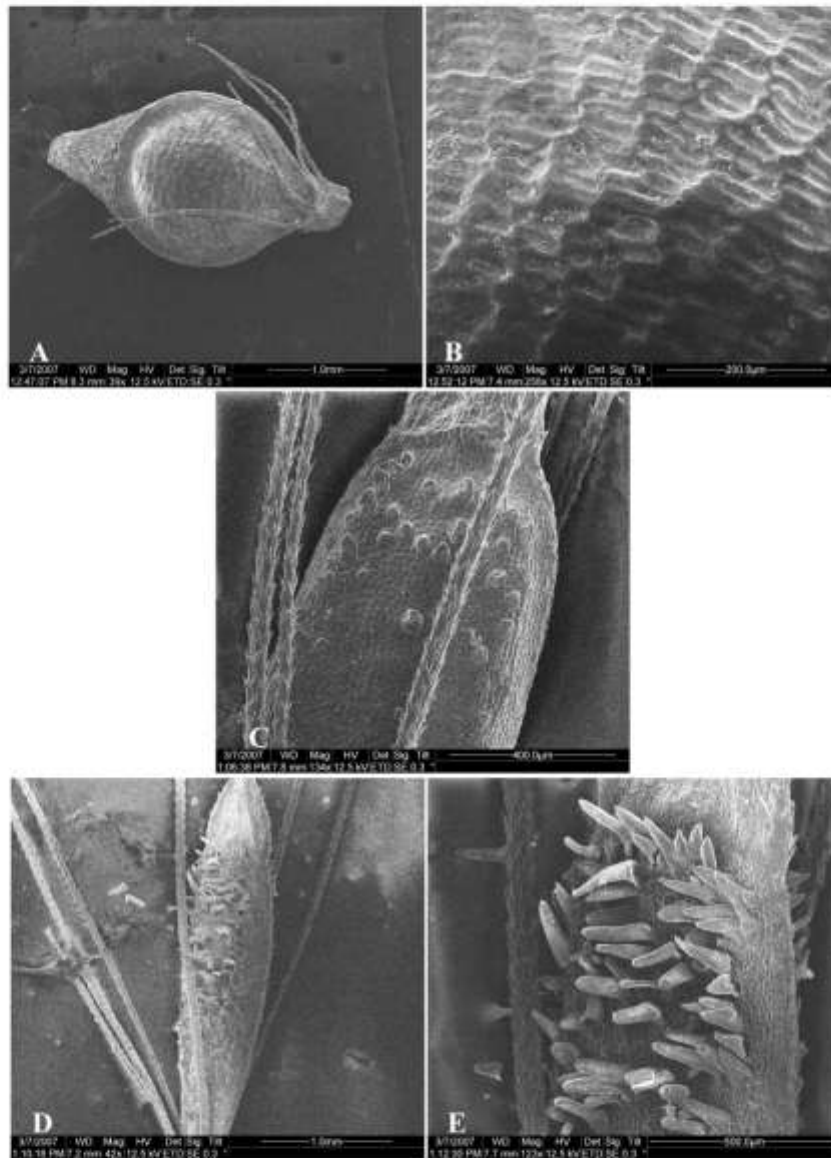
Plate 2. A-B. *Rhynchospora rugosa* (Vahl) Gale;
C. *Rhynchospora submarginata* Kukenth,;
D-E. *Rhynchospora wightiana* (Nees) Steud.
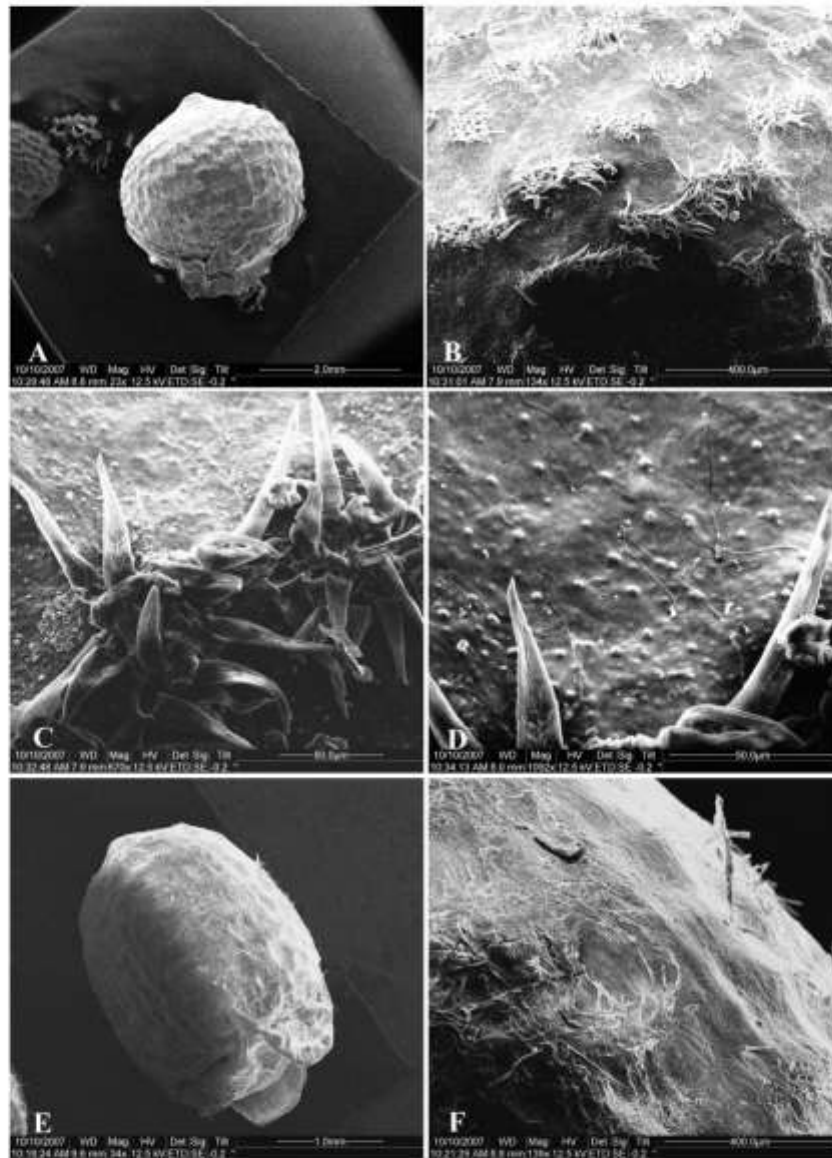
Plate 3. A-D. *Scleria alta* (Boeck.); E-F. *Scleria benthamii* C.B.Clarke
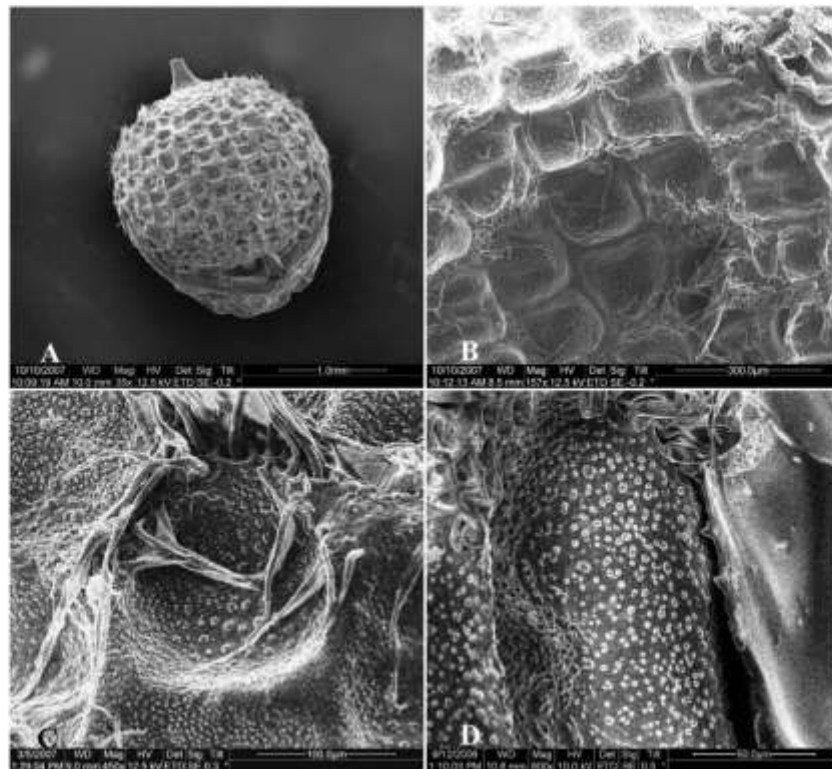
Plate 4. A-D. *Scleria biflora* Roxb.
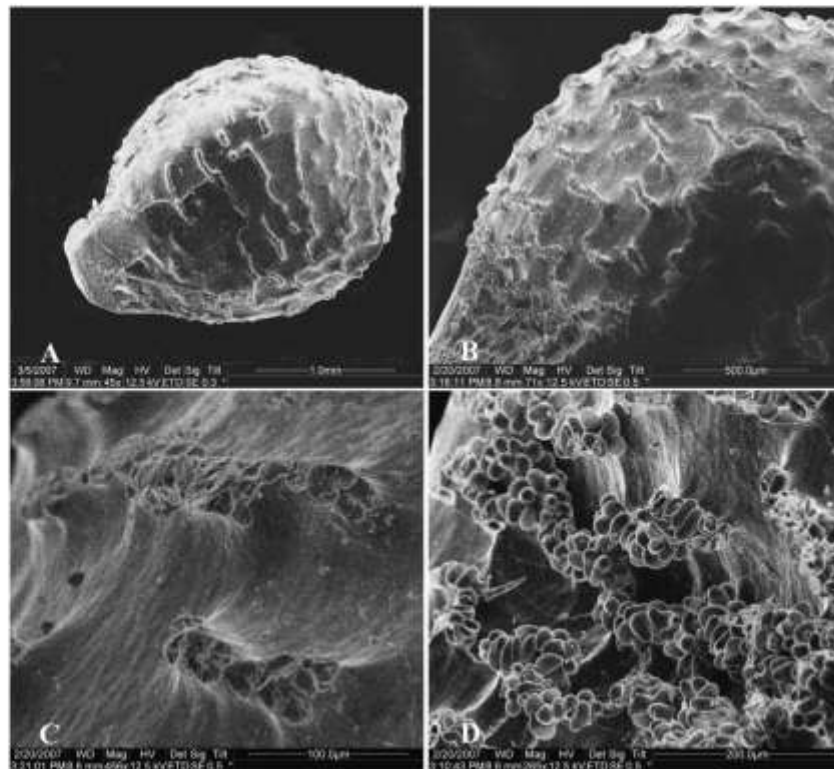
Plate 5. A-D. *Scleria lithosperma* var. *linearis* Benth.
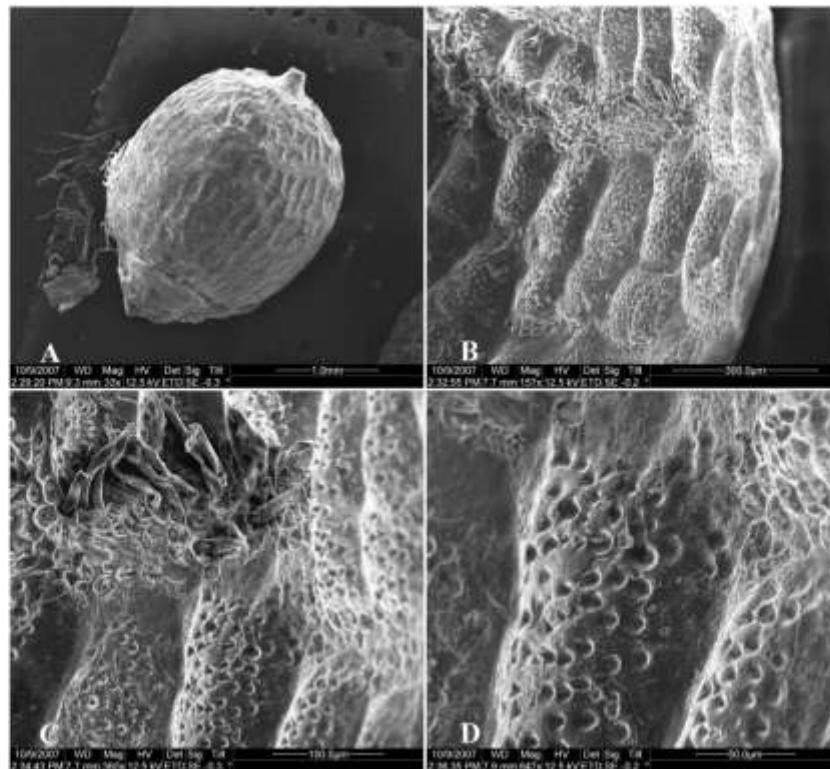
Plate 6. A-D. *Scleria mikawana* Makino
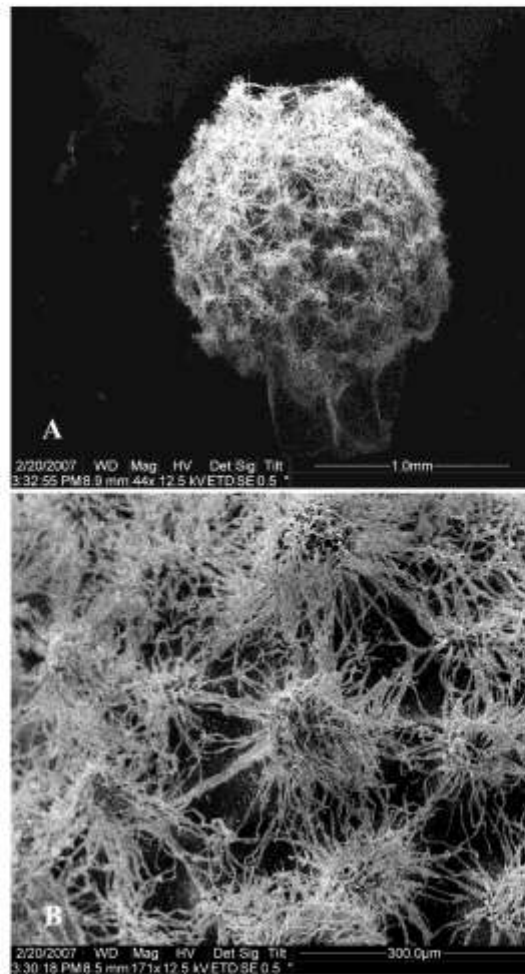
Plate 7. A-B. *Scleria neesii* Kunth
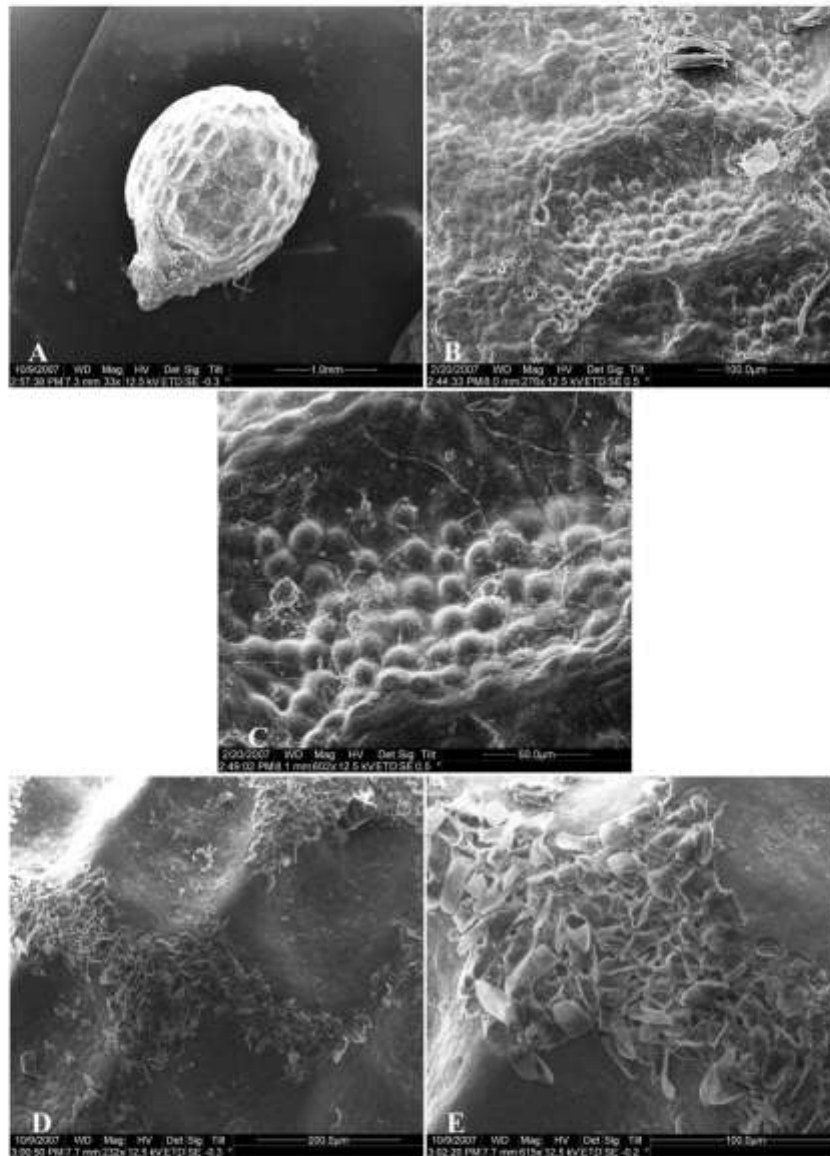
Plate 8. A-E. *Scleria parvula* Steud.
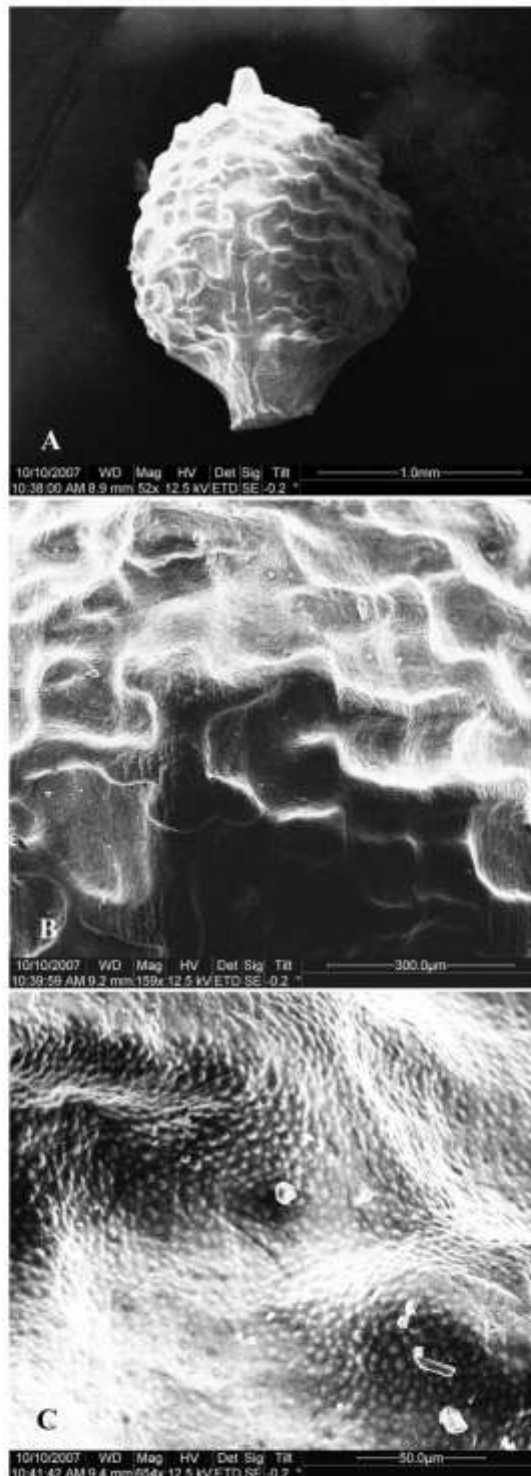
Plate 9. A-C. *Scleria pergracilis* (Nees) Kunth
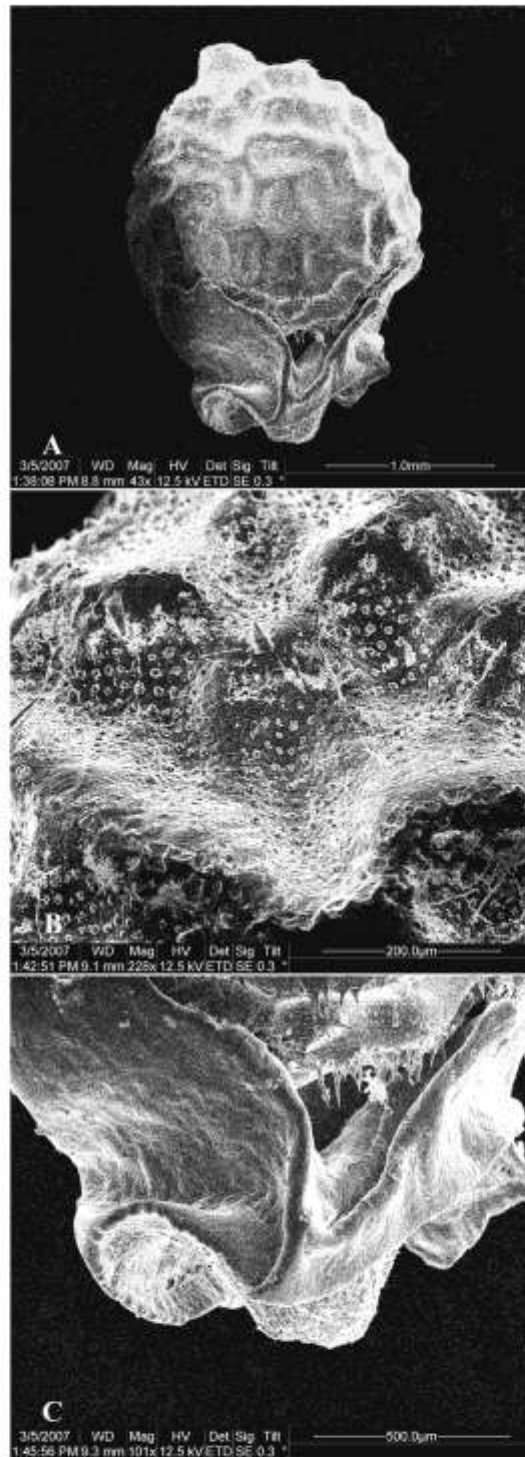
Plate 10. A-C. *Scleria scrobiculata* Nees & Mey ex Nees
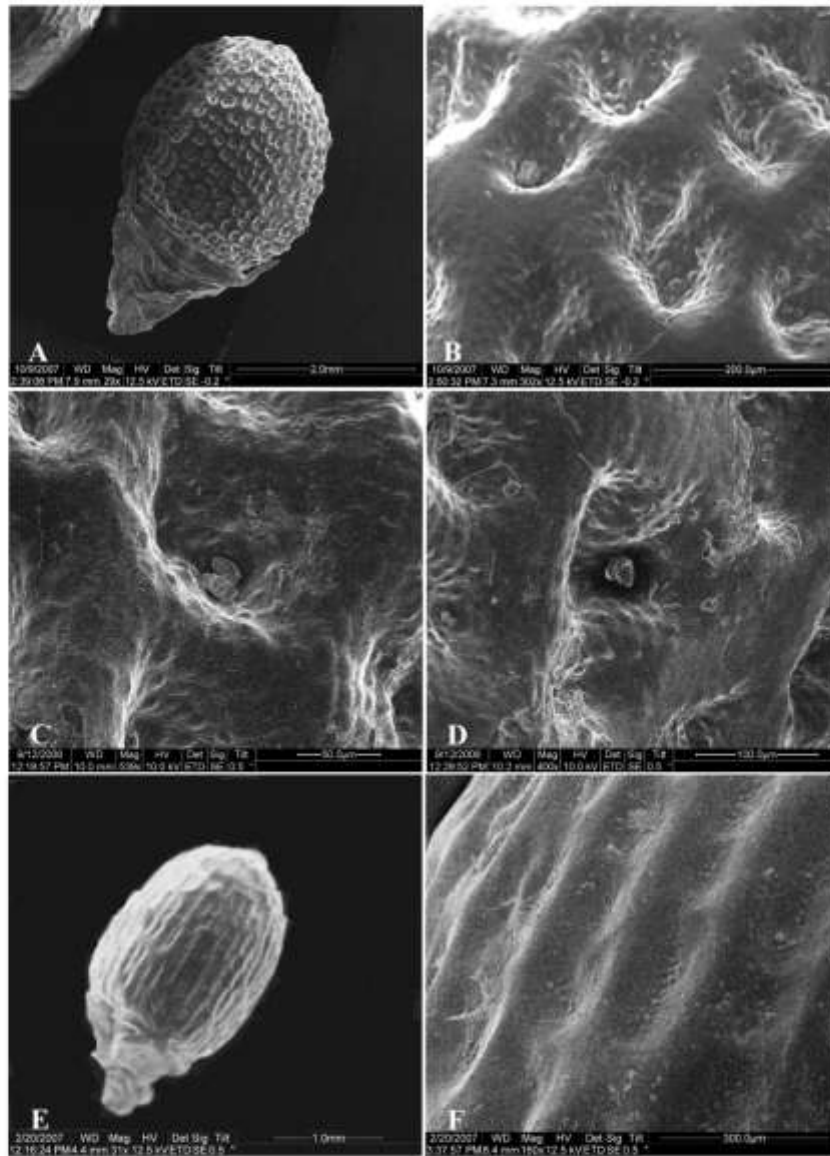
Plate 11. A-D. *Scleria stocksiana* Boeck. E-F. *Scleria tessellata* (Willd.) Roxb.
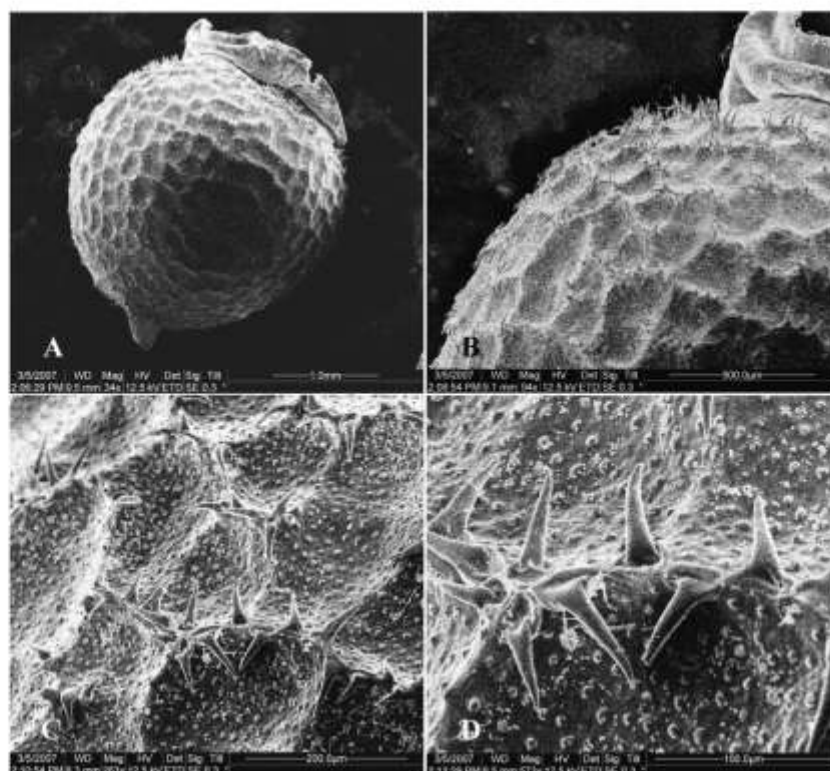
Plate 12. A-D. *Scleria terrestris* (L.) Fass.

CAA and NRC: Constitutionality and Implications

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Abstract

CAA and NRC are to be viewed in a continuum which has grievous consequences for the democratic ethos of the state. Prima facie, CAA applies to foreigners, whereas NRC is concerned with citizens. However, under NRC any resident of India is liable to be declared an illegal migrant unless he proves otherwise. Thus, CAA, when applied in conjunction with NRC, concerns the existing citizens where mere technicalities can be used to dispossess citizens of their legitimate rights. The chapter seeks to address three issues - the disputes associated with the introduction of CAA and NRC, the contesting claims over constitutionality of CAA-NRC, and the impact of CAA-NRC nexus on the democratic character of India.CAAinstitutionalizes a non-secular and exclusionary criteria for citizenship which fails to meet the 'classificatory nexus test' as well as the 'arbitrariness test' under Art 14 of the Constitution. NRC seeks to identify illegal migrants for deportation. However, marginalized and dispossessed Indians, without proper documentation, are classified as illegal migrants. They cannot take benefit of the CAA as they are not eligible under it. Thus, the CAA-NRC nexus is not merely anti Muslim but anti Indian at large. Notwithstanding the constitutionality of CAA in isolation, CAA read with the provisions relating to NRC, defeats the basic structure of the Indian Constitution.

Keywords – Citizenship, CAA, NRC, Constitution, Muslim, Article 14.

Introduction

The introduction and the proposed implementation of the Citizenship (Amendment) Act 2019("CAA")[1] and the National Register of Citizens ("NRC")[2] respectively, has the potential to institutionalize a regime of discriminatory citizenship in India. The CAA and the NRC are a coupled exercise, which is preferential, and can pave way for statelessness and disenfranchisement for millions. A national register of citizens does not appear be a dubious idea at least on paper. But the arbitrariness in its implementation in Assam has led to mass exclusion of people from various backgrounds. Thus CAA, read with NRC, has not only targeted minorities especially Muslims, but also millions of dispossessed and disempowered people who lack the documents to prove or apply for citizenship (Bhattacharjee,2019). It erodes the secular character of the state and violates the basic structure of the Constitution of India. Though apparently disparate in their objectives, modalities and application, the Citizenship (Amendment) Act 2019 and the National Register of Citizens should be viewed in a continuum. Prima facie, CAA applies to foreigners, whereas NRC is concerned with the citizens of India. However, under NRC any resident of India is liable to be declared an illegal migrant unless he proves otherwise. Thus, CAA, when applied in conjunction with NRC, concerns the existing citizens where mere technicalities can be used to dispossess citizens of their legitimate rights.

The Citizenship (Amendment Act), 2019 amends the Citizenship Act, 1955 by providing that person belonging to minority groups namely Hindu, Sikh, Jain, Parsi, Buddhist, Christian from the neighboring countries of Afghanistan, Bangladesh, Pakistan, who fled religious persecution or fear of such religious persecution would not be treated as "illegal migrant" and be made eligible for citizenship by naturalization or registration[3]. Such person must have entered India on or before 31st December 2014. Further, this act provides for fast-track citizenship by reducing the aggregate period of residence or service of Government to five years from eleven years[4]

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[1]An amendment to the Citizenship Act 1955.
[2]The creation of NRC is mandated by the Citizenship (Amendment) Act 2003.
[3]Section 2(1)(b) of Citizenship Act 1955, as amended by the Citizenship (Amendment) Act 2019.
[4]Clause (d), Third Schedule of Citizenship Act 1955 as amended by the Citizenship (Amendment) Act 2019

However, CAA is restricted in its application, for it would not apply to the areas under the Sixth Schedule of the Constitution, which includes tribal areas of Assam, Meghalaya, Mizoram, and Tripura, as well as the Inner Line Permit areas[5]. The Act allows the cancellation of registration of Overseas Citizen of India cardholders, provided such persons have violated any provisions of the Act, or any law of the Central Government[6].

Literature Review

According to Stanford Encyclopedia of Philosophy (2006), citizenship consists of three main dimensions – legal status, political agency and membership of a political community. As a legal status, citizenship implies equality before law. Citizens have a distinct identity stemming from membership of a political community, and are endowed with certain rights and certain obligations accruing from such membership. For Arendt (1973) citizenship was "the right to have rights"

The concept of citizenship has undergone considerable development over the course of history. In ancient times, citizenship was restrictive and defined more in terms of duties than rights. In Greece, citizenship was not extended to slaves, women and the alien. In Rome, citizenship was initially restricted to the power holders, but was later extended.
to common people. Rome had in place a model of differentiated citizenship, where different groups of citizens enjoyed different rights.

Even the ambit of rights underwent evolution. Marshall (1950) identified the development of rights in Britain across centuries. Consolidation of civil rights like equality before law, freedom of speech and expression, and right to private property was followed by evolution of political rights and social rights respectively. Political rights ensured political participation while the purpose of social rights was to mitigate inequality The modern conception of citizenship has ceased to be restrictive and has widened its scope to include hitherto excluded groups. However, the Marxist, subaltern and feminist critics state how some citizens are more

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[5]Inner Line Permit Area is a concept of colonial India initially introduced by the Bengal Eastern Frontier Regulation Act 1873, which applies to Arunachal Pradesh, Nagpur, Manipur, and Mizoram. Its objective was to prevent outsiders from settling in these areas so as to preserve the indigenous culture.

[6]Section 7D of the Citizenship Act 1955, as amended by the Citizenship (Amendment) Act 2019.

equal than others due to presence of a patriarchal structure, class power and systemic prejudices.

In case of India, CAA and NRC would radically alter the conception of citizenship in India, where the dispossessed, disempowered and undocumented lot would be stripped of their citizenship status. Such policy initiative reveals the deep-seated systemic bias where the majority Hindus (at the most including Sikhs, Jains and Buddhists[7]) are treated as natural citizens and minorities like Muslims are denied citizenship on ground of their faith.

The debates surrounding the introduction of CAA and NRC are not novel, but dates back to Constituent Assembly days. An important question was whether citizenship should be granted on basis of *jus soli*, that is birth on the soil of the country, or *jussanguinis*, that is citizenship based on blood-based descent.

P.S Deshmukh(1949) argued that the universalist conception of citizenship based on *jus soli* would make Indian citizenship cheapest of all. One could acquire citizenship by virtue of certain number of years of residence, namely five years. No importance was attributed to nationality, parentage or even the purpose of residence. In a similar vein, Prof. Shibban Lal Saksena(1949), repudiating secular criteria of citizenship, identified India as the only home for Hindus and Sikhs. Therefore, he inferred that every Hindu or Sikh, should be eligible for acquiring Indian citizenship provided he was not a citizen of any other state. This same argument is reiterated in the Hindutva narrative underlying the CAA, which portrays India as the Hindu rastra, and Hindus as the natural citizens of India, debarring Muslims from applying for citizenship under CAA.

The Constituent Assembly debated the rights of refugees who migrated to Pakistan during pre-partition riots and returned to India after partition. While Hindu refugees were considered victims of religious persecution and their claims to citizenship considered sympathetically, Muslims who returned were looked upon suspiciously, their intentions questioned and their claims to citizenship contested.
However, some members strongly rejected religion as criteria for citizenship. For example, Mahboob Ali Baig Sahib Bahadur (1949) opined that those who migrated between the

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[7]It is interesting to note that the Hindu personal laws, like the Hindu Marriage Act 1955, Hindu Succession Act 1956, etc. are also applicable to persons from Sikh, Jain and Buddhist background.

dominions of Pakistan and India were compelled by tragic circumstances. Thus, no distinction of treatment can be justified.

The Constituent Assembly eventually accepted the secular conception of citizenship. India's choice of *jus soli* as basis of citizenship was not unsurprising for it was inherited from Britain and an implausible principle in multi-ethnic society. In late colonial period, Indians was constantly reminded that they did not qualify the preliminary condition to constitute a nation. At independence, India affirmed the possibility of citizenship as a political identity without an anchorage in culture(Jayal, 2013)

The Article 5 to Article 11 of the Constitution laid down the basis for Indian Citizenship. At the inception of the Constitution, anyone born in the territory of India was a citizen of India. Apart from it, one would be regarded a citizen of India, if either of his/her parents were born in India or if he/she had resided in India for a minimum of five years immediately prior to the inception of the Constitution.

According to the Citizenship Act 1955, one would be Indian citizen by birth if he/she was born on the day or after the day the Constitution came into effect. However, consequent amendments to the Citizenship Act 1955 highlights the gradual prioritisation of the principle of *jus sanguinis* over *jus soli* in the Indian conception of citizenship. The Citizenship (Amendment) Act 1986 underlined the importance of parentage criteria for citizenship. For acquiring citizenship, it was not sufficient to be born in India. It was necessary to prove that either of his/ her parents must have been Indian citizen at the time of his/her birth. The Citizenship (Amendment) Act 2003 retained the provision of citizenship by birth but made the provision for descent more stringent. Both or either of parents had to be citizen of India at the time of his/her birth. However, under no circumstances can either of the parents be an illegal migrant. According to the act a foreigner was to be regarded as an illegal migrant if he had come to India without a passport that was valid or travel documents which were legally permissible. Also, a foreigner whose duration of stay in India had exceeded the legally authorised period of time was defined as an illegal migrant.

This gradual shift from *jus soli* to *jus sanguinis* conception of citizenship was decisively consolidated in the Citizenship (Amendment) Act 2019, for it diluted secular conception of citizenship by paving way for faith-based citizenship(Jayal,2019)

Research Methodology.

The article has made use of content analysis and doctrinal methodology to juxtapose jurisprudential and philosophical concepts. In doing so it has made use of historical, analytical and descriptive methods. It has mainly relied on secondary sources like views of prominent scholars as reflected in books and articles, constitutional assembly debates , relevant statues and policies, reports of various organisations and judgement of courts.

Discussion

The Citizenship (Amendment) Act 2019 seeks to provide a fast-track route to citizenship to people belonging to specific communities namely Sikhs, Hindus, Christians, Buddhists, Christians, Parsis and Jains from neighbouring countries of Pakistan, Afghanistan and Bangladesh, who were subjected to religious persecution or has fear of religious persecution. They will not be treated as illegal migrants and thereby not detained or deported. In India, illegal migrants are not eligible to become citizens of India. Section 3 of Citizenship Act 1955 states that even children born to illegal migrant on or after 3 December 2004 are ineligible to acquire citizenship by birth alone. Illegal migrants are liable to be deported and detained under provisions of Foreigner's Act 1946 and Passport (Entry into India) Act 1920.

Providing citizenship to persecuted minorities is a benevolent act. However, CAA is criticised to be discriminatory, divisive and unconstitutional, in violation of Article 14 of the Indian Constitution. Article 14 states that equality before law or equal protection of law shall not be denied to anyone by the state. Article 14 is not confined to citizens of India but extends to everyone living in the territory of India, including foreigners and aliens.

The vital legal question to be addressed is how far the classification made by CAA is permissible under Article 14 of the Constitution?

Firstly, CAA creates a class of citizens who are perceived to be victims of religious persecution. However, the selection of persecuted communities is underinclusive and excludes certain Muslim communities like Rohingyas in Myanmar or Shia, Sufis and Ahmadiyya Muslims facing persecution in Pakistan. Though the Act recognises religious

persecution towards non-Muslim minorities, it fails to recognise Muslim minorities who are similarly placed. An amendment to the Constitution of Pakistan (1974) declared Ahmadis as non-Muslims. The Ahmadis continue to face socio-legal discrimination including attacks on their lives and denigration of places of worship (Rathore,2018). The Rohingyas who have been persecuted systematically by the Buddhist majority in Myanmar have not been included. The UNHR(2017) has referred to the Rohingyas as the most persecuted community in the world. And yet, CAA fails to take into account persecuted groups such as Ahmadis and Rohingyas.

Secondly, CAA takes into account only three states leaving out Bhutan, Nepal, China, Sri Lanka, and Myanmar. But the presence of persecution in in all these states is a matter of record. China has persecuted Ughyurs who had embraced Islam, subjected them to re-education programs and surveillance (Hughes,2018). In Nepal, the anti-conversion law has been used to oversee persecution against Christians by the Hindus (World Watch Monitor,2018) Even Muslims in Nepal have remained poor, underrepresented in politics, and invisible concepts of national identity (Gill,2018). In Bhutan, where Mahayana Buddhism is practised, other religions are barely tolerated. Proselytism and incitement to convert is considered illegal. Non-Buddhists do not enjoy benefits like free education (World Watch Monitor,2018). Sri Lanka has witnessed a rise of violence against Muslims opposing Sinhalese majoritarianism (Mahal and Bastians,2018).

CAA takes into account a skewed pre-partition history. It allegedly addresses the unfinished tasks of partition. But it fails to cover Bhutan which was a part of pre-independence British India whereas Afghanistan which was not a part of undivided India has been included in the Act.

CAA is also arbitrary in the sense that it takes into account the plight of minorities in states where Islam is the state religion. Thus, it is blind to religious persecution practised in secular states like Nepal or non-Islamic countries like Bhutan where Buddhism is the religion of the majority. Even the list of Islamic neighbouring states is not exhaustive, as is apparent by the omission of Maldives. A dominant argument in support of the choice of states and communities in CAA is that the earlier Nepal was a Hindu nation but Hindus have nowhere to go to in order to flee persecution, unlike the Muslims who can find refuge in many Islamic

states. Thus, it contributes to the narrative that Muslims are persecutors, leading to the othering of the Muslims in India (Seshadri,2020).

Thirdly, CAA arbitrarily puts forward the cut-off date to 31 December 2014 for acquiring citizenship. No reasonable justification has been provided for the cut-off date. Also, this fails to address the Rohingya crisis among others, which gained momentum in 2017.

Fourthly, CAA emphasizes on one form of persecution, namely religious persecution, ignoring other forms of persecution - racial, social or political.

Before analysing CAA in the light of the Constitution, it needs to be noted that the scope of Article 14 has considerably expanded and includes the old doctrine of classification nexus test and new doctrine of arbitrariness test. While the old doctrine interrogates into unreasonable comparison, the new doctrine is a test of unreasonableness which does not include comparison(Khaitan,2016).

In *State of West Bengal vs Anwar Ali Sarkar* (AIR 1952 Cal 150), Supreme Court held that laws need not be of universal application. Laws can classify for the purpose of legislation, but the classification must be rational. It laid down the nexus test of reasonable classification that - (i) in order to distinguish one group from another, classification had to established on the premises of intelligible differentia (ii) a rational relation must exist between the differentia and the objective of the Act.

However, the Department of Legal Affairs while putting forward their observation before Joint Parliamentary Committee on Citizenship (Amendment) Act 2019 has held that the classification is based on intelligible differentia, citing certain judicial precedents (Agarwal,2019). In *Ram Krishna Dalmiya vs Justice SR Tendulkar* (AIR 1958 SC 538), it was held that the classification can be based on different bases, like geographical or according to occupations, and like. The legislature is free to recognise the degree of harm. Further factors like history, knowledge and report which were common and existent at the time of enactment of the law, had to be taken into account by the court.

However, the objective to be sought had to be just and lawful as the Supreme Court ruled in *Nagpur Improvement Trust vs Vithal Rao* (1973 AIR 689). Interestingly, the objective of act is ambiguous. A reference to persecution of religious communities is made only in the Objects and Reasons of the Act, as against the Act itself. CAA introduces religion as a criterion for citizenship opposing secularism which forms a part of basic structure doctrine as laid down in the *Kesavananda Bharati* case and *S.R. Bommai* case.

Espousing the doctrine of arbitrariness in the *Royappa* case, Justice Bhagwati noted, that equality and arbitrariness are sworn enemies where one belongs to the rule of law in a republic while the other, to the whim and caprice of an absolute monarch. If an arbitrary act was analysed by the yardstick of constitutional law and political rationale, its implied unequal nature would lead to an assault on the spirit of Article 14.

In India the concept of equality as antithetical to arbitrariness has evolved through subsequent judgments. In *NavtejJohar* and *Joseph Shine* case, the court emphasized on the dynamic nature of equality and the role of transformative constitutionalism in dismantling hierarchies based on caste, gender religion etc. Moving further in *Navtej Singh Johar case* (2018)Indu Malhotra, J. observed that differentiation on the grounds of attributes which are core and intrinsic, is discriminatory and cannot be considered asa reasonable classification based on intelligible criteria. In case of CAA, the country of one's birth, one's religion is an intrinsic trait which a person has little control over and cannot change easily. Hence any classification based on them cannot be regarded as reasonable.

In the *S.R. Bommai* (1994) case, the Supreme Court emphasized on secularism as a constitutional policy in building fraternity and strengthening unity across religions. CAA is opposed to the very idea of secularism because it discriminates between the people based on their religious belief. Justice Sikri *Puttuswamy* (2017) case had outlined the essential principles of dignity: intrinsic worth of each person, community and autonomy. It is also argued that CAA not only specifically violates both the principles of intrinsic value of every person and community, but also the principle of autonomy by denying human rights.

Roy (2019) holds that Citizenship (Amendment) Act 2003 may be seen as a hinge point from which two mutually contradictory tendencies emerged in form of CAA and NRC. The genesis of NRC traces back to the ethno linguistic movement in Assam which was committed to safeguard the Assamese identity at the face of influx of refugees in Assam particularly from Bangladesh. The commitment to detect the infiltrators led to the Assam Accord which held that anyone who came to Assam before 25 March 1971 (the date of creation of Bangladesh) would be deemed to be an Indian, while others were to be identified and

deported. The Illegal Migrants (Determination by Tribunal) Act which was enacted ,with the objective of detecting illegal migrants in the state of Assam while putting the burden of proof on the authorities ,was held to be unconstitutional by the Supreme Court in the Sonowal case(2005). The Assam Accord and Sonowal Case paved the way for NRC in Assam. The Assam experiment could lead to a nationwide NRC in India (Hindu,2019).

The Citizenship (Amendment) Act 2003 inserted Section 14A which called for compulsory registration of every citizen of India and issuing identity cards by the Central government. The purpose of NRC was to document the legal citizens of India and sieve out citizens from non-citizens. It is apprehended that the creation of National Population Register (NPR) is the first step towards NRC. The Citizenship Act 1955 and the Citizenship (Registration of Citizens and issue of National Identity Cards) Rules 2003 provided the legal basis for NRC and NPR. The data for NPR will be gathered through door-to-door survey at house listing phase of the census. NPR would create a list of residents in India, and then by identifying the doubtful cases of citizenship, NRC would come about. Compared to the last NPR conducted in 2010, NPR in 2020 asks for additional data from the respondents including the controversial questions regarding date and place of birth of parents, which can be used to claim citizenship. While the government has provided contradictory response to the question whether NPR and NRC are linked (Tiwary,2019) on a critical analysis of the legal provisions and based on the past experience with NRC, it can be reasonably apprehended NRC and NPR would be linked.

NRC is a dubious idea for various reasons. Asking a society of pauperised, illiterate, undocumented people, who are subjected to migration due to ethnic conflicts and calamities, in addition to economic imperatives, to produce papers to prove their citizenship is problematic.
Sharma (2019) argues that NRC does not take into consideration those who are outside the heteronormative family structure and fail to establish citizenship through lineage. The fact that two thousand transgenders have been left out from the NRC in Assam leaves little room for surprise(India Today,2019).NRC has also been discriminatory towards women. Many women in India do not own land or inherit property. They get married off before attaining the legal age of marriage, migrate to other villages, change their names, do not complete school. Thus, their name do not find mention in voters' list or board educational certificates.

Desai (2020), harping on the redundancy of the NRC exercise, argues that the need for a separate register of citizen and documented citizenship was complete otiose. If the state suspected one to be an illegal migrant then he could be prosecuted and extradited under the provisions of the Foreigners Act already in effect.

Certain permissible documents for establishing citizenship claims under NRC are likely to include passports, birth certificates, Aadhar, board certificates NRC. However, not many in India are in possession of such documents. A data of Ministry of External Affairs state that out of 138 crores only 6.8 crore that is 5.5 percent of the entire population have passports in India (Business Today,2017)

Birth certificate is an important proof of date and place of birth in India. However, registration of birth was made mandatory only with the Registration of the Births and Deaths Act 1969. Additionally, the lack of proper implementation and lack of awareness means the rate of registration has historically been poor even after theenactment. According to NFHS-4(2015-16), three in every five children had their birth registered and possessed a birth certificate in 2015-16.

Procedurally, the exercise to implement NRC is bureaucratic and administrative lapses can lead to exclusion from the list. For illiterate people, those without documents can rely on community verification and witnesses. In a caste ridden society plagued with social prejudices like India, community verification might not be very reliable. Those whose name do not appear in the NRC can approach the Foreigner Tribunal within 120 days of the issue of rejection order. The constitution and functioning of the tribunals leave much to be desired. The members of the tribunals had very little experience and were appointed on a contractual basis without security of tenure(Mustafa,2019). Amnesty International(2019) has analysed how the tribunals have functioned arbitrarily, and excluded people for minor spelling mistakes or failing to recall minute ancestral details dating back to 50 years or more.
The verification of entries at local level are undertaken by a local registrar who has wide discretionary powers to determine who is a "doubtful citizen". This could unleash a regime of corruption and bribery, and rent seeking. Moreover, anyone can oppose an entry on the draft of Local Register of Citizens within 30 days of publishing the draft. If such objection is

sustained, then the entry will not make to the population register at higher level and the NRC (Venkatramanan,2019)

The NRC will involve huge costs-social, human and financial. NRC in Assam cost the government Rs. 1600 crore and employed 50,000 people (Jayal.2019). Given the population of Assam is 3 crores, a nationwide NRC involving 130 crore people, will cost the governmentat least Rs 64,000 crore. The social costs involve huge amount of time involved in gathering documents, bureaucratic delays and harassment suffered.

Conclusion

CAA and NRC work in tandem, unified by their objective of institutionalising a regime of exclusionary majoritarian citizenship. NRC casts suspicion of alienage on Indian citizens, who have to resort to documentary proof to establish their claim to citizenship. Those failing to do so, would stripped off their citizenship status and reduced to rightless entities in detention centres. The CAA provides a safety for fast track citizenship, to but a favoured few. In order to obtain citizenship under CAA one has to prove his country of origin, his practising religion, date of entry into India and establish

the fear or fact of persecution. For dispossessed, pauperised Indians living for decades in India, claiming to be citizens of other states who have suffered persecution or fear of persecution is not only a difficult proposition but also impermissible legally and ethically. Thus, it would be wrong to infer that CAA is opposed to certain communities from certain states alone. When CAA is combined with NRC, it is antithetic to the interest of the entire milieu who are undocumented in India namely the tribes, backward classes, migrant labourers, LGBT community, orphans, women, disabled. CAA, combined with NRC, grants legitimacy to the nationalism of exclusion, divisiveness and discrimination. While CAA traces its origin to the majoritarian Hindu nationalism in India, NRC owes its genesis to the ethno-linguistic nationalism in Assam. CAA and NRC in conjunction transforms the conception of citizenship from *jus soli* to *jus sanguinis*. They institutionalise a regime of qualified citizenship, where religion acts as a criterion for citizenship in case of CAA, whereas descent functions as a condition for citizenship under NRC. CAA and NRC violate the basic structure of the Constitution opposing the tenets of secularism, equality and non-

discrimination. CAA and NRC oppose the idea of inclusive and democratic state of India as envisioned in the Constitution. Thus, CAA and NRC provide a classic example of how the letter of law can be misused to destroy the spirit of law.

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Theatre Censorship in Mauryan Times: An Offshoot of the Benevolent Despotic Ideology of the Mauryan State

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Abstract

An attempt will be made in this paper to address the issue whether theatre censorship did appear in ancient India during the universal monarchy of Magadha, under the guidance of emperor Ashoka. While doing so it will survey the sources that deal with this subject, more so the rock edicts of emperor Ashoka relating to this subject. The paper will also try to understand the policies of the Mauryan state, vis-à-vis, the notion of censorship and try to contextualize them according to the needs of the age and the requirements of the centralised state structure, that was present under the Mauryas. Theatre censorship appeared in India during the time of the universal monarchies of Magadha under the guidance of Ashoka. The great Mauryan monarch had been unrivalled in Indian history as regards his works of public utility. The pious but astute king had made numerous provisions for the wellbeing of his subjects but had tried to censor and even ban dramatic productions from his realm. However,Arthashastra the most valuable and authentic work on governance and statecraftof Mauryan times, had recorded the importance of this artform.

Key words: - benevolent, despotism, imperialism, public, performance, censorship

Introduction

For a very brief period in ancient India, of less than two centuries, the Indian subcontinent witnessed a type of imperialism, which was hitherto not seen earlier or for a long time in the future. The Mauryan empire for less than two centuries i.e., from the early 4th to the late 2nd century BCE held sway over more than three quarters of the Indian subcontinent. Established by Chandragupta Maurya in 324/322 BCE and continued by his son Bindusara (c. 293-268 BCE) and grandson Ashoka (c. 268-232 BCE), the Mauryan empire, was and still is one of the astonishing facts of ancient Indian history. With a population of about 50 million people, and extending from Afghanistan to Bengal, it was larger than the Mughal empire, which came 2000 years later and even larger than the British empire in India in its heydays. From their central state in Magadha, the first three Mauryan emperors envisaged an empire, never before witnessed in Indian history, where they mustered extraordinarily large materials to maintain an imperial hegemony in the Indian subcontinent. This hegemonizing influence was exerted over the general population by two paradoxically contradictory ideals, which was absolutely necessary to weld together different types of people, residing in such a huge landmass. On one hand under the aegis of the ideal of the universal monarchy, the Mauryan government relied heavily on the bureaucratic institutions and administrative diktats, which gave the people a sense of security and belonging, but also demanded strict obedience to the emperor at all times. Though, this remained the major style of Mauryan governance, a new element was introduced by the third monarch, Ashoka. Under him, a unique form of cultural coherence based on the moral values of Buddhism was bestowed upon the empire, in the shape of moral exhortations as inscribed on the stone tablets/monuments which were erected all over the subcontinent. These messages constituted an ideal norm of benignity, civility and humanity in the matters of governance. Censorship of the theatre or censorship of any kind of public enactments to be more precise, by Ashoka has to be understood in this broad context.

Methodology

Since the paper is based on the survey of secondary source material it is to be mentioned here that the methodology that has been followed here is the analysis of historical content and archival records, from which inference has been drawn.

Discussion

The rise of the universal monarchy of Magadha had ushered in a period of rapid urbanization in ancient India. Urbanisation brought in its wake a kind of material culture in the Gangetic plains which was complex yet cosmopolitan in nature. This cosmopolitan culturewas best exemplified by Sanskrit drama. With the growth of urban culture, the growing importance of the city was noticed in the socio-political, economic, religious as well as artistic life of the times. The growing urban life contributed to the growth of the theatre, which in turn became an important element of urban life. Drama being the imitation of life (lokanukṛiti) as mentioned by Bharata in his Natyashastra[1] (Ghosh Manmohan, 1967) (Rangacharya Adya, 1996), the ancient Indian treatise on drama and dramaturgy, it was quite natural that social changes were reflected in the structural changes of drama and urbanization itself was bound to transform the basic concept of dramaturgy.[2] (Pande Anupa, 1993)

According to the Cambridge dictionary, censorship means the action of preventing part or whole of a book, film, work of art, document, or other kind of communication from being seen or made available to the public, because it is considered to be offensive or harmful, or because it contains information that someone wishes to keep secret, often for political reasons. Or it means a system in which an authority limits the ideas that people are allowed to express and prevents books, films, works of art, documents, or other kinds of communications from being seen or made available to the public.[3]Theatre censorship appeared in India during the time of the universal monarchies of Magadha under the guidance of Ashoka. The great Mauryan monarch Ashoka, who was one of the greatest figures of world history had been unrivalled in Indian history, as regards his works of public utility. The pious but astute king had no doubt made numerous provisions for the wellbeing of his subjects but had tried to censor and even ban dramatic productions from his realm, as is evident from his Rock Eddict No. I.(Murti &Aiyangar, 1951) (Ahir D.C, 2010). [4] Here he mentions banning animal slaughter and festive gatherings of all kinds. The Maurays had always supported the heterodox sects, be it Chandragupta Maurya who was a devout Jain or Ashoka, under whose patronage Buddhism became a world religion. They had also fought against brahmanical orthodoxy in every step of their career. Their vision of a universal monarchy ruled by the total despot and controlling every aspect of their subjects' lives had undoubtedly clashed with the brahmanicalclass' control over society enjoyed by them, since their inception. This can be corroborated by the fact that brahmanical reaction was considered

to be one of the most significant causes of the downfall of the Mauryan empire. [5] (Majumder and Roy Chowdhury, 1960) The dramatic art so long had propagated the age-old customs and beliefs of society. The need to control these ideas was felt by Ashoka, who however tried to propagate his own ideology of Dhamma, piety and obedience to king and country, which was foremost, through the medium of performing arts. The great emperor was a follower of Buddhism and might have been influenced by Buddha's earlier attitude towards performing arts and artists, as seen in the Vinaya texts (Max Muller, 1969) which was not at all complimentary towards the performing artists in general and the female performers in particular.[6] (Max Muller, 1969) He extended little patronage to the performing artists, but accepted them as tax payers as is evident from the Arthashastra, the treatise written on Mauryan state craft (Shamashastry, 1960) (Rangarajan L.N, 1992).[7] However in pursuance of his policy of Dhamma Vijaya or moral conquest, Ashoka had launched a concerted campaign to mitigate the sufferings of his subject people, rather all living beings in his empire. He was probably the only king who had undertaken such huge works on public utility. Ashoka had ordered and banned the sacrificial killing of animals together with the samajas, or merry making, feasting and similar other amusements in his Rock Edit No. 1. (Murti &Aiyangar, 1951) (Ahir D.C, 2010). [8]

Ashoka's prohibition of festive gatherings (RE No. 1) was almost contrary to his image of a benevolent and tolerant king. Samajas, during those times signified festive gatherings of a non-religious nature. He however made distinctions between good and bad samajas, good here probably meant state sponsored gatherings (Thapar Romila, 1961).[9] In the time of the universal monarchies, because of the absolute power of the king the Mauryan centralized beauracracy had become a paternal despotism under Ashoka. He had complete control over all spheres of social and political lives of his subject people. His concern for the wellbeing of his subjects even made him dictate their course of action, which would be morally suitable. Thus, the prohibition of samajas might have been a puritanical step on part of a pious king, who thought of economic waste and immorality associated with these festivities as evil. The suppression of these popular festivals was also in strict conformity with Ashoka's ideas of centralisation. The continuance of the old traditional festivals would have kept alive the earlier customs and beliefs of society, which Ashoka was trying to supplant by a new ideology of centralized monarchy and benevolent but despotic autocracy. The samajas were seen as occasions for attacks on the king's new ideas. Thus, the demarcation between good and bad samajas, where the good samajas or state sponsored or organized festivals would

have acted as propaganda vehicles of the astute king (Thapar Romila, 1961).[10] Ashoka thus tried to discipline even the artistic and cultural practices of his subjects.

Though the scholarly debate over the time-frame of the Arthashastra remains unresolved it is generally accepted that it was composed atleast substantially in the early Mauryan age (Mukherjee B.N, 2000).[11]Arthashastra the most famous treatise on state craft was composed by the prime minister of Chandragupta Maurya, Kauṭilya or Chanakya also called Viṣhnugupta. His elaborate work dealt with all aspects of Mauryan administration and was an extremely authentic guide on prevalent customs and conditions of ancient Indian society. The Arthashastra listed a number of performers like nata (actor), nartaka (dancer), vadhyaka (musician), gayeka (singer), puranika (recite of puranic stories), kathaka (story tellers), mimics acrobats, jugglers and conjurors, wandering ministrel, people who dealt in women to be supervised by a state department headed by the ganikadhyaksha. Kauṭilya thus clubbed the performers with the prostitutes and made the same rules suffice for them also. He thus maintained that the performers should pay half of their earning to the king as tax. Tax was also levied on troupes coming from other countries or foreign troupes of 5 panas license fee or prekshavetana (Shamashastry, 1960) (Rangarajan L.N, 1992).[12] The cost of putting on shows was to be shared by the people of a village and shows could be held both in day and night. The Arthashastra made provisions that the king had to undertake the task of arranging teachers for the courtesans, prostitutes and actresses. The sons of the courtesans were to be trained to become rangopajivi or those who lived on dancing and entertainment also by the teachers appointed by the state.[13]

The Arthashastra in fact also admitted the usefulness of this group of performers. Kautilya mentioned that the king often employed the dramatic personnel as spies who would try to reach the enemy king. The artistes who were well versed in sign languages and signals could be employed as spies and secret agents, who using the profession of their relatives as cover, was useful in detecting the wicked and deluding and murdering foreign spies (Shamashastry, 1960) (Madhu M.K, 1992) (Rangarajan L.N, 1992).[14] The agents and spies of the king could also disguise themselves as entertainers, who worked clandestinely to ascertain the wrong doings of the villagers, the superintendents and others and reported them to the king. In other instances when people's attention was diverted the shows performed by entertainers often afforded opportunities to draw out the enemy from the safety of the fort or for storming it (Shamashastry, 1960) (Rangarajan L.N, 1992).[15] Thus it appears that there was a huge gap between the normative principles of state policy and the objective reality of the age.To be

more precise though the general law of the Mauryan state policy, as envisaged by the Maurayan monarch was one in favour of censoring public enactments of any kind in general and drama or theatre in particular, the objective reality was quite different. The Arthashastra, which was more descriptive than prescriptive, realized the importance of these people as a social group and sought to utilize them for the benefit of the state and society. This ambivalence was one of the characteristic features of the Mauryan age, which made it into such an unique period in world history.

Conclusion

With the gradual stratification of the brahmanical society, a lot of stigmas were attached to the persons following unconventional profession and menial jobs. Acting being somewhat unconventional, elicited the red eyes of the moral police of the ancient period. Drama was, however, an integral part of ancient Indian urban life. And in reality, the dramatic performers enjoyed a lot of affluence and influence in ancient Indian society. This probably made Kautilya accept them as tax payers and urged him to make laws to control them accordingly. The centralized monarchy of the Mauryas, under the guise of benevolence had set out to control all aspects of the life of the subject people. The benevolent despot, that he was made Ashoka try to control the joys and sorrows of the common people.

The banning of secular festivals like samajas in R.E. No1 by him was probably a pointer to the ambivalence present in Ashoka's nature of politics. Recognized as one of the most tolerant and enlightened rulers of ancient India, Ashoka's despotic zeal was well known. He was also probably influenced by the early views of the Buddhists towards the performing artists. The evangelical monarch thus probably viewed the samajas, or secular festivals as a moral and economic waste of the society's resources. The despotic and totalitarian monarch's quest for total centralization had also probably clashed with the brahmanical class's control over society, and drama was very much seen as a medium of instruction of the brahmanical class for the society. Hence the need to censor and regulate drama and other performing arts was felt by the great Mauryan monarch.

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'A Girl and Her Education': Octavia Butler's Kindred

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ABSTRACT:

There has been great scholarly debate over the genre categorization of *Kindred*, yet there is a lot of missing scholarship regarding the situation of *Kindred* within the Black Power Movement of the 1970s. The women's education aspect and the impact of gaining knowledge is immensely overlooked in scholarly articles of neo-slave narratives. A key understanding *Kindred* involves the background that is involved with creating the piece of literature . The education piece , and its connection to the Black Power Movement and slavery in antebellum south is where I am placing the argument of this paper. Dana, the protagonist of the novel uses all the power she possesses, through experience and formal education, to emphasize female strength and the impact of literacy through the novel. This article , thus , endeavours to add criticalanalysis of education within *Kindred* through the lens of its association with power and knowledge.

Key Words: Black Power Movement, Education, Slavery, Knowledge

Introduction:

The accounts of black women were silenced and ignored by the dominant discourse of the whites that values the epistemological evidence—facts that could be malformed.

By analyzing and revealing the past from their viewpoint, contemporary black women writers compose their own literature through refashioning the images, values, and worldview of black people in their own voices in rejoinder to the history documented by others. Just as men had overshadowed women at the time, so had the popular narrative of the era erased the contributions of untold number of women as strategists and theorists, thinkers and doers.This article emphasizes Octavia Butler's placement of Kindred within the greater scope of the Black Power Movement and her reasoning for doing so. As an extension of the Black Power Movement, the education aspect of the novel- *Kindred* is greatly overlooked, and the main goal with this work is to emphasize the importance of education within the novel, more specifically as it is situated within the Black Studies Movement. As education is important, Butler utilizes lived experiences within her writing as a means to signify that education cannot fully encapsulate a period of time such as slavery. Therefore, I argue that as Butler has situated Kindred's characters as a response to the Black Power Movement, she has also established a relationship between education and experience and how those aspects fuel the main characters within the novel.This articlethus brings light to stories of unsung African American heroines of the Black Power Movement and Civil Rights Movement.

Research Methodology:

This article is solely based on content analysis. Content analysis is a research tool used to determine the presence of certain themes or concepts within a given text. Since black women's rights and education is the focus area of discussion , I have referred to the texts and theories by Mary Wollstonecraft and Thomson and Jackson. P.Milectic's views on Butler's idea of female education and women's response to Black Power Movement has been deployed to critically analyse the significance, role and necessity

of education among African American female slaves . Butler's work is often associated with the term "afrofuturism" (a movement in literature, music, art, etc. featuring futuristic or science fiction themes which incorporate elements of black history and culture) and to make justice with the above mentioned term I have derived ideas and notions from Sandra Govan . In order to foreground Butler's idea of freedom and women empowerment in this paper, several texts, philosophies, notions and ideas formulated by different educationists, theorists and activists have been wielded here.

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Discussion:

Female Education and Slavery: A Case Study of Octavia Butler's *Kindred*

Physical power and the sense of being in control is something that is always desired; however, it proves inferior to a more valuable asset: knowledge. Intellectual power is the sole factor that enables us to make logical descensions, differentiate between right and wrong, and most importantly it defines who we are as humans. The value of education is depicted in Octavia Butler's *Kindred,* when Dana's intellect clashes with Tom Weylin's authority over the slaves. First, the slave owners prominently loathe educated slaves; moreover, they repeatedly hinder Dana's ability to educate the enslaved. Furthermore, the slave owners recognize the power that stems from education, which is resembled when the slave owners desire to learn how to read.

History proves education to be one of the keys to the end of slavery. Maryland in 1815, like much of the south, was a hot bed for slavery plantations. For slave owners in particular, it was a benefit if their slaves were not educated, as they would be less likely to question the oppressive treatment, and not adequately be able to express the conditions under which they laboured. In the novel *Kindred* by Octavia Butler, various aspects of education are intertwined throughout,

effectively depicting how education and slavery do not go together cohesively. With education comes power and this is the reason why the plantation owner Tom Weylin imposed strict rules against their slaves learning to read or write. Specifically, in the case of Dana, the novel's protagonist, her intelligence led to her owners feeling inferior, which prompted many verbal and physical attacks, an exploitation of her abilities, and the overriding attempt to suppress the education of other slaves. Her education works as a sort of scarlet letter, allowing her to stand out, which is not always beneficial to her well-being. Kevin explained the complex that Tom was experiencing; "Weylin doesn't like the way you talk. I don't think he's had much education himself, and he resents you" (Butler,1992: 80). Dana feels as though it is her obligation to continually make the trips to the plantation not only to keep Rufus alive to make sure her lineage remains, but in order to experience the hardships that her ancestors withstood. By going through this process however, she did make people uncomfortable because she did not fit the stereotypical slave prototype. The white people viewed slaves as sub-human, and a black woman who was mentally superior was not something they would have encountered before. Dana explains what Margaret, Tom's wife, may have been feeling; "I don't think Margaret likes educated slaves any better than her husband does…. He can barely read and write. And she's not much better" (Butler,1992: 82). The absence of education on plantation life is a topic that is deeper than it would appear on the surface. It is a significant part of the stigma that has haunted the African American culture. After Dana attempts to escape the plantation, she is eventually corralled by both Tom and Rufus, at which point Tom utters; "Educated nigger don't mean smart nigger, do it?" (Butler ,1992:175). Whenever they were given the chance to poke fun at Dana, it made sense for them to target her mentally, to try and assure themselves that she was not capable of various acts of defiance. As the novel progresses, there comes a time when Dana must try and explain the logistics of her travel to Tom; a seemingly impossible task. In the midst of clarifying how time

seems to travel at different rates in both places, Tom responds; "Who in hell ever said you were an educated nigger? You can't even tell a decent lie. Six years for me is six years for you!" (Butler,1992: 200). It seems that whenever a nerve is struck, the anger taken out on Dana is projected at her intellect. Dana was not usually found in the field doing manual labour, but on one particular trip with the new overseer Evan Fowler in charge, she was expected to contribute. When he noted that she wasn't chopping effectively, Dana increased the grip on her knife in anger to which Fowler exclaimed "Try it and get it over with. I thought you was supposed to be smart" (Butler,1992: 211). Once again, the underlying issue of her education comes into play. Unlike her counterparts, Dana is more gifted than the white.

Butler assesses how one's education is ongoing, and the power that exists within knowledge and experience work together in the novel to break the social constructs of the Black mind and body. The education piece, and its connection to the Black Power and Black Studies Movements, is where I am placing my argument. As Philip Miletic notes, "Kindred significantly emerges from and responds to the literature of the Black Arts Movement and the rhetoric of the Black Power Movement that sought to erase or move past America's history of slavery and restricted black women's involvement and writing" (261). Miletic's attention is on the importance of education because even though, "Literacy may not have given Dana physical freedom…it gives her intellectual freedom when navigating through black history and black women's experiences" (264).

Equating matrimony with accoutrement Kevin extends into the present a classic type of human ownership-the marital exchange. Even Kevin's proposal to Dana whacks as a kind of servitude. Upon asking Dana to marry, he comments, "I'd let you type all of my manuscripts"(Butler, 1992: 109). Whether uttered in

yuck or sternness, Kevin essentially asks Dana to be his slave, to do work that he is fully able of doing himself.

Dana formerly appears unsusceptible to the experience of slavery because she lives in 1976 with her husband and outwardly they are relatively gratified with married life. A closer investigation of the text reveals that slavery's niggling continually re-visits and haunts black individuals not particularly interested in or familiarized with their historical lineage. Endeavoring to distance themselves from the past like Dana has tried to do proves insignificant because the institution of slavery is indefinite, strengthening over time. And although Dana is not or has not yet become a slave, she is a docile wife tied to the confines of home life. Because girls tend to "learn … by snatches," and learning is secondary to external beauty in their upbringings, "they do not pursue any one branch with that persevering ardour necessary to give vigour to the faculties, and clearness to the judgment." That is, girls' education is never sufficiently deep to allow for mastery of subjects, or even the maturation of natural intellectual abilities. As Wollstonecraft argues,because of this inadequate education, women tend to stagnate, both intellectually and morally, early in life. She articulates that, then marriage becomes the only option available to women for elevating themselves in the world. Therefore, as a writer, Dana's proficiency is overshadowed by her husband's assignments and publishing deadlines; because he is the only working writer, she is reduced to menial, witless labor for which she is not paid. Depicted in the text as a voracious reader, Dana is an unsuccessful writer, partially because she reckons too heavily on the belief that knowledge is fixed and contained.

Dana does not identify that past and future always intersect and collide. She fails to fathom the gravity of institutions developing and strengthening over space and time. This is exactly why she scavenges history book, in hope of existing in

antebellum Maryland; affirming that past is linear and that surviving slavery is a coup accomplished through reading books. Rather than perceiving history as fugitive, Dana soon cognizes, "nothing in my education or knowledge of the future had helped me escape" (Butler,1992:177). After retracing from the past a second time, Dana begin acquiring every book in their house on the subject of slavery, in vision of finding a certificate of freedom.Dana does not call a halt to reading and teaching until after being severely beaten; the threat of savagery does not unnerve her until after is it embedded and etched on her flesh. Once imprinted onto her skin, she is palpable, unwilling to live life as a slave any longer.

Conclusion :

African American girls and women have persisted since the days of slavery in the United States to become exceptionally accomplished scholars. Moreover, they have done so despite the many obstacles that have threatened, over the course of hundreds of years, to curtail such achievements. As stated by Thomas and Jackson (2007), "the educational advancements of African American women have clearly afforded them opportunities to play a critical role in the empowerment of African American communities and 'uplift' of the African American race" (p. 368). In many ways, their shared stories illustrate the veracity of the belief shared by enslaved Africans in the United States that education would be the key to true and enduring freedom. Still, we must be careful not to presume that the struggle for equity for African American girls and women is over. Freedom, after all, is a process, not an endpoint; there are still questions to explore as we continue along the journey.

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SRI-PAT GOVINDA DASADHAM, KANCHANNAGAR BARDHAMAN – A Shrine of Cultural and Religious Fusion and its Touristic Significance

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ABSTRACT

Any Hindu pilgrim tourist spot is considered as a cultural fusion zone where we found many different rituals, puja system, puja shastra and mantras, costumes, puja bhog and food habits, and also different preforming arts. This study is based on the Karch-kavi Guru Govinda Dasa Dham, at Kanchannagar, East Bardhman. The Dham or temple is an old religious institution which has been built by the help of local Vaishnav population and Guru Govinda Dasa's followers in late 16[th]century. Since then the temple has become a holy place to the Vaishnav devotees of West Bengal, Bangladesh and abroad (especially Russian Vaishnav devotees). It is mentioned that the celebrated temple and the deity has same importance and popularity as like as Kalighat, Kankaleshwari kali temple, Tarakeshwer, Sharba-mangala temple and so many other places in West Bengal. According to the oral history and evidences the Dham is developed into a heritage pilgrim spot. The study is trying to describe how the Dham transform into a hub of cultural and religious fusion. Also the paper is to try and prove how cultural tourism helps to improve and develop Kanchannagar's society into proper urban cultural society. This study is based on the primary survey on pre-scheduled questionnaire and the interview of Dham authority and workers. With the help of random sampling method, 100 tourists have responded though questionnaire who have visited Govinda Dham. Surveyor has taken3 different days to survey 100 tourists and 5 temple workers. Here the surveyor analyses the data through percentage calculation and presenting with various graphical representation method. The oral history and Dham activity are briefly discussed. The paper

also reveals the significance of the cultural tourism to create sustainable development in Kanchannagar through cultural tourism development.

Key words: Cultural fusion, religious fusion,cultural tourism, religious tourism and sustainable development.

OBJECTIVES OF STUDY:

1. To study the temple's oral history and tradition .
2. To identify cultural fusion in real field.
3. To study the impacts of tourism on the temple development and reconstruction of temple for devotees.
4. To study touristic activities and examine temple workers' cooperation with devotees for expand of cultural tourism as well.
5. To examine how cultural tourism bring holistic development on that particular area of Bardhaman.

DATABASE AND METHODOLOGY:

The Sripat Temple of Kanchannagar is studied with the temple survey, local people and tourists are survey. The households nearer to the temple has been surveyed with the help of pre-structured survey questionnaire covering temple development related, touristic activity related, some formal questions and some questions on how cultural tourism impacts in the local area development. 100 tourists on spot and 5 temple workers are surveyed who stay near to the temple with the help of stratified random sampling method. Various cartographic techniques have been used to further explain this surveyed data.

DE-LIMITATION AND LIMITATION OF THIS STUDY:

The study only focuses on Kachannagar Sripat Temple and its nearer area situated within the same ward. Extremely short stay is the limitation to understand the temple legacy of this Vaishnav settlement. Only 3 days were taken for survey. Guru Govinda Dasa's picture is taken from Google, also using some google map, web image to describe the mandir location. Other pictures are taken personally by the surveyor.

ABOUT TEMPLE HISTORY:

Guru Govinda Dasa was a very famous Bengali poet (known as 'Karchakavi' Govinda Dasa), the devotee of Lord Krishna and also Sri Chaitanya Mahaprabhu. He is also known as Kaviraja for his devotional song addressed to Radha-Krishna. He had composed songs extensively on Lord Krishna-Radha's love legends. Kanchannagar is the birth place of Kaviraja. The place of his birth was actually the residence of his maternal grandfather . After that Kaviraja resided in Shrikhanda, then Kumara nagar and after that he moved to the village situated at the Southern part of Padma river named Teliya Budhari with his family. After taking sanyaas and leaving his family behind, Kaviraja came to Gaudia-bango (place called Katoa) in year of 1528 (contradiction 1510 A.C.) to visit Sri Chaitanya Mahaprobhu. Mahaprabhu knew that Kanchan nagar was the birth place of kaviraj. He took Govinda to Kanchannagar and suggest him to stay in his own birth place (after independence Kanchan nagar became the part Bardhaman East, West Bengal 713103). According to the oral history - with the help of local family of Gaudia-Bango or Kanchannaga, he established a Upashana-griha (prayer hall) where Sri Mahaparbhu Chaitanya came and stayed with him and the devotees for some days. Later, Mahaprabhu departed for Puri Dhamon pilgrimage.

Gradually, the situation modified and evolved to its present form. In the year 2006 with the help of West Bengal Government and ISCON Mayapur authority, the Sripat Govind Dham was rebuilt and flourished properly.
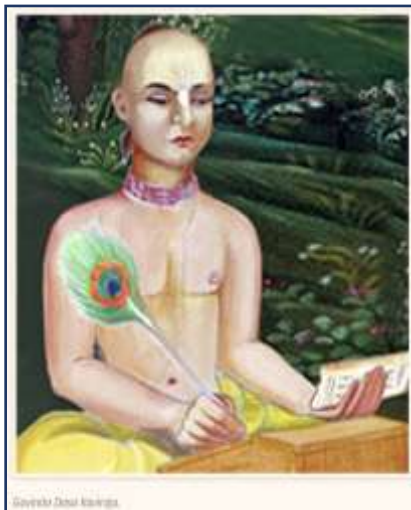
| GURU GOVINDA DASA | FRONT GATE OF GOVINDA DHAM |

FRONT VIEW OF SRIPAT GOVINDA DHAM (ESTABLISHED ONLATE 16TH CENTURY, REBULIT 2006)

Kanchan nagar is situated in East Bardhaman, and Govnida dham is located at(23.234831 Northing value of GPS; 87.820708 Easting value of GPS). The study area is elevated 34 meter above the sea level. The distance of Bardhaman Railway station to Kanchan nagar Govind dham is approx. 9.3 km (through NH2B & NH19) taking 20-25mins to reach the surveyed area. The place is situated on a flood plain of Damodar river, covering green vegetation, that indicates the area has excellent agricultural aspects.
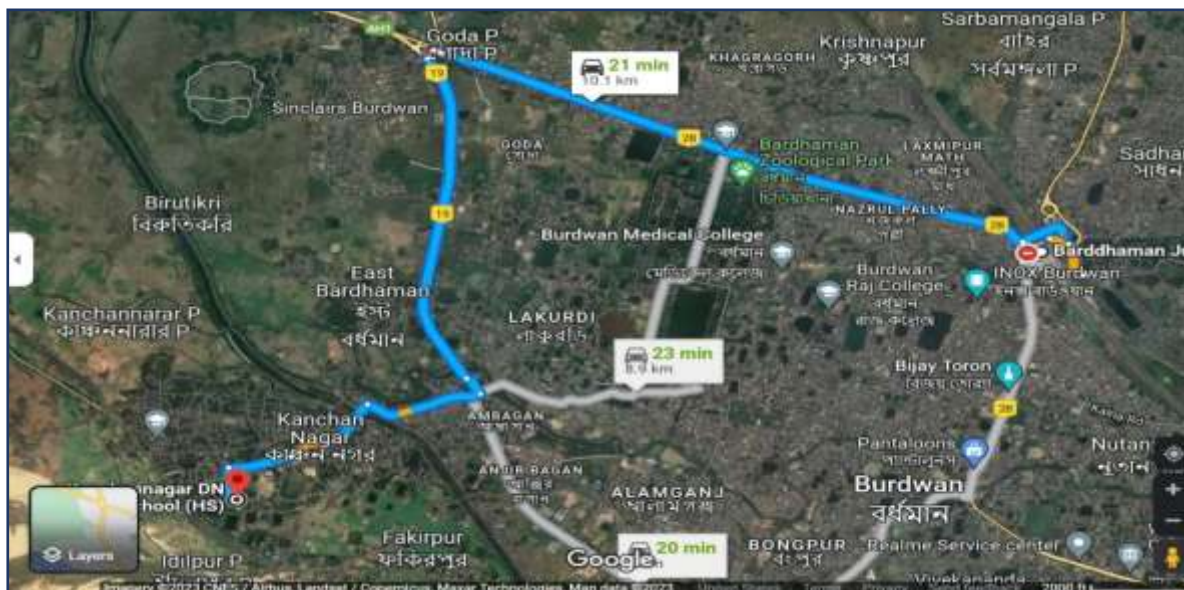
ROUTE MAP FROM BARDHAMAN RAILSTATION TO GOVINDA DHAM

Kanchan nagar Govinda Dham aerial view (yellow marking). Picture taken from Google map.

The study area's climatic condition is like 'AW1'/ Tropical savanna type, during summer average temperature is around30℃ and in winter approx. 18℃. According to the climatic report of Bardhaman study area falls under 150millimeter annual rainfall zone.

CULTURAL SETUP :

The temple was built during the undivided Bengal, so the structure of the temple manifests the unique blending of archaic art and architecture. According to the oral history of the temple, around 1550 A.D.16 followers came Kanchan nagar from Nabawdip Dham and they settled down beside the temple. Day by day they renovated and modified their hut into pakkabari. Unfortunately during British colonial period, the temple lost its importance and glory.

Kolkata Baghbazar residents Sri. Bhagabati Charan Das, Sri Madhusudan Karmakar, Sri Dhirendranath Chouwdhury and others along with the historians had discovered the house of 'Karcha-kavi Govinda Dasa' before 1950 A.D. The then living members of the poet's family Sri Aurobindo Dasa, Sri Gobindo Lal Dasa, the residents of Kanchan nagarwith the other local villagers showed them the path and narrated the history.

Later on the 21st Kartik month of Bengali year 1390 (1983-1984 A.D.) two ministers of West Bengal Government, Sri. Binoy Chowdhury and Sri. Jatin Chakraborty inaugurated the memorial of Karcha-Kavi Govinda Dasa. Gradually, the idol of Mahaprabhu Chaitanya, idol of disciple of Chaitanya Mahaprabhu-Nitai and Poet Govinda Dasa were installed. The sculptures of main mandir and Radha-Krishna idol is quite old (approx. of 300 years). Later it was re-modified and flourished. The idols are made of clay, and after every three years they are renovated. Idols are dressed in cotton clothes in summer and woolens in winter. Idols are accessorized with silver and golden jewellery during important occasions.

IDOLS OF GOVINDA DHAM (PICTURE DATED 15TH JANUARY 2023)

Minister Sri. Khiti Goswami had inaugurated the main gate of mandir in 2002 and built the three storied Guest house and new Bhog ghar of approx. 4000 sft. on 23rd July 2006. He helped to set up more effective and active mandir committee to maintain proper development of the mandir. Now Sri. Khokon Das and Sri. Tapan Kumar Ray, look after the mandir development.

LEFT PICTURE : GUEST HOUSE

ABOVE PICTURE : BHOG-DALAN & BHOGGHAR

7 Bigha land property which belongs to mandir is used for paddy cultivation. Mandir's own agricultural product is used for daily 'Bhog'. In the afternoon bhog distribution is done which visitors can have and even carry home with them. The annual donation received by the temple is used for bhog.So when the donation amount is increased, the bhogayojon are also improved. Now they charge 101/- Rs. for bhog and prasad, which was earlier free of cost for all visitors and devotees.

ABOVE TWO PICTURES AREOF VEGETABLE GARDEN BESIDE TEMPLE. .

Main festival of the temple is celebrated during DolJatra (HOLI)- Govindamela, Janmasthumi, Chaitanya birthday ,Poush Sankranti, Baul mela. The main festival of the temple called 'Govindamela' is celebrated every year, five days after Dol Utsav and a grand fair is organized. Then the fair was held only for a couple of days, whereas now it is celebrated for long eleven days. All arrangements for puja, reading of 'Korcha', Horinam-Sankirtan, the well-being of disciples and devotees are looked after by the temple workers and the vaishnav followers of the mandir.

Both Yellow circle demarking fair ground

TOURIST SURVEY OUT-COMES AND PERCEPTION & SIGNIFICANCE OF STUDY

100 tourists are surveyed, amongst them 37% population are local people who live in several parts of Bardhaman, 55% populations are Bengalis who live in several districts of West Bengal such as Kolkata, Hooghly, Howrah, Murshidabad, South 24 Paraganas, East Midnapur etc. Remaining 8% population are Bengalis visiting from Bangladesh. The bar diagram shows the above result.
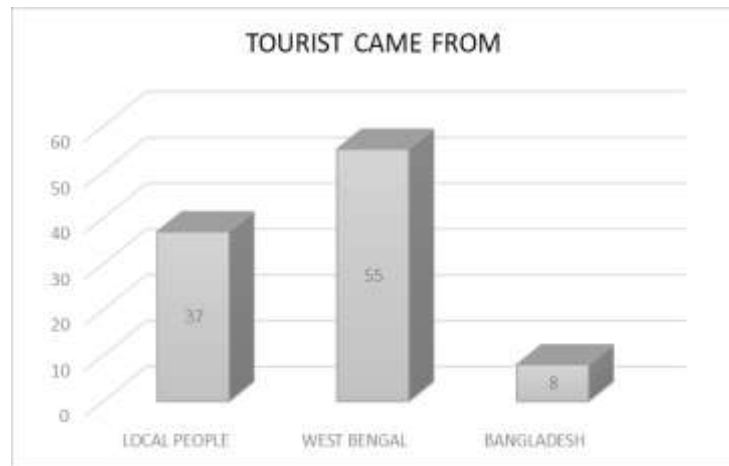
The chart indicates that temple is not only popular in particular one district of West Bengal, but also popular in the entire state and among neighboring country- Bangladesh. According to mandir authority, during the Govinda Mela, they found many foreigners (especially Russian Vaishnav) visiting every year and stayed in guest house for some days.

Through tourist survey it can be analyzed and proved that, this temple is the one of the hub of cultural as well as religious fusion. Population of different religions visit this place every year, there is no boundary, there is no restriction for celebrating temple culture. In Govinda mela every cultural community, every religious community can participate and celebrate. The diagram shows us 7% of population are Muslim and 9% of population are of other religions, people apart from
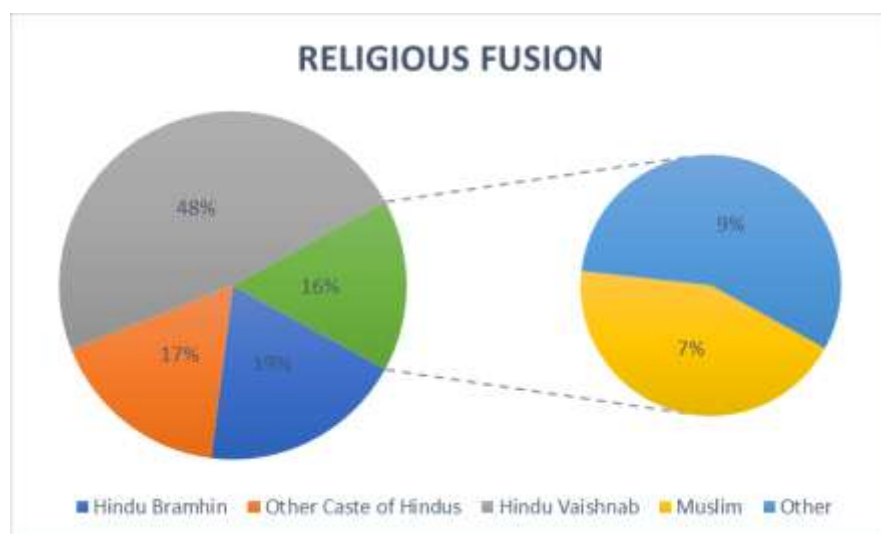
Hinduism. So we can say the temple activity partly helps to mix religions and cultures through tourism. Also the study says any caste of Hindu population can also celebrate and participate in the temple festive. This above data helps to justify that during festive this dham convert into a mix-cultural-religious hub.

The diagram shows us the tendency of expenses of tourist who visit this temple. Most of the population around 68% spend below Rs. 200/- while visiting. 19% of population spend 200-Rs. 400/- for their purpose and rest 13% population spend above Rs. 400/- The cost of temple tour is less than Rs. 200/- So any income group of society can easily visit and experience the wonderful cultural practice. But low donation amount can't help to properly develop any tourist spot for temple progress. There was no entry free or
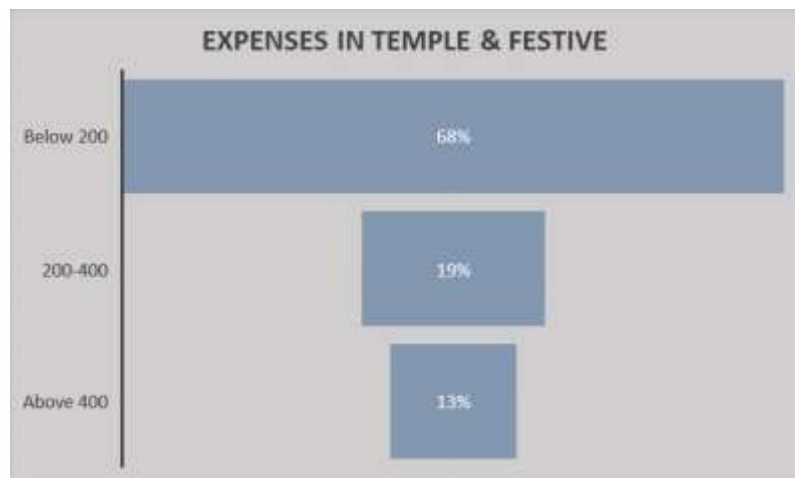
any mandatory charge to visit the place or mela, which sometimes can de-motivate the employees of the mandir. But the Government gives a large amount donation to mandir authority to maintain the standard and smoothly run the mandir activity. According to temple authority some local devotees are donating monthly puja upakaran like Flurits, Ghee, Dhoop-dhuno, Karpoor etc. Some of rich devotees who were unable to visit frequently were given annual donation via online money transferring mode to mandir charitable trust for development of Dham.

Survey indicates that 78% of population are revisitors, who often come to this place. Rest 22% of surveyed population are first timers, According to this 22% population, they learnt about this place from YouTube Blogs, and they actually came to Bardhaman to visit several holy places of this district,

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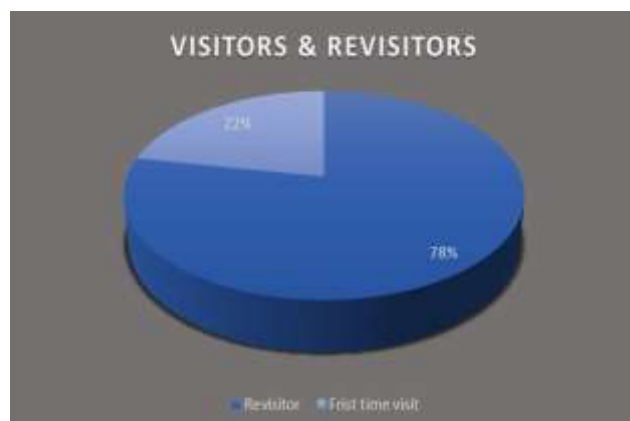
and Gobindo Dham is one of the main part of the whole tour because of its ancient past. As the contemporary society, uses social media platforms like YouTube or Facebook for getting the knowledge about unknown places, if mandir authority attempts to make any promotional blog and create some e-Books about the history of the mandir and the place, it can help to develop cultural tourism rapidly. More   touristic activity leads to more economic growth of this place.

78% of surveyed population who frequently visited this temple for several occasion, have answered about what are the attraction of this spot to revisit. In Govinda Mela, they all have visited in previous year. In this fair many performing cultures are the main attraction of this visitors. Like Karchasangit, Harinam-sangkirtan, Kobi-Gaan, Folk songs like baul gaan, Gita Pat by mandir Swamiji. Through survey report, 42% of the tourists visit this mela for Karchasangit (which   was   written by Kaviraja Govinda Dasa). 22% tourists or devotees came to the festival to listen to Gita Pathand Gita shloka charcha. Every year different Swamijisc ome to this dham from Mayapur Iscon and Ramkrishna misson also to recite Gita shloka and they discuss it in Bengali language so that all devotees can understands the meaning of shloka properly, it is the another attraction for tourists and devotees to revisit this place. In festive time many Bauls come and perform folk music without taking any fees. Kobi-gaanis another attraction forthe poetry lovers and musicians. This performing cultures are getting an open platform here to promote Indian folk culture through cultural tourism. Through   this mandir festive so many Bengali folk cultures revives and as well as mixed up with each another creates cultural fusion.
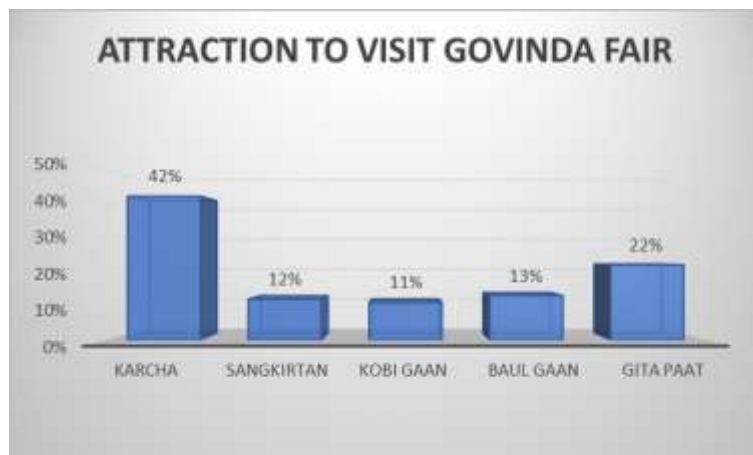
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IMPACTS OF TOURISM AS EVIDENT FROM THE SURVEY:

DISADVANTAGES:

1. Overcrowding is the major problem during the Mela. 90% of the tourists leaves negative impact on the locals.
2. A lot of scenic beauty and resources of nature are destroyed and hampered during the mela visit.
3. Loud speakers for programs and noises from increased automobiles and busting tourists create terrible noise pollution.
4. Increase in the garbage dumping and waste material increases the spreading of various diseases, like cholera and typhoid.
5. Sometimes there are parking problems for public as well private transports due to overcrowding during mela.
6. Mela boosts the increase of rats, flies, street dogs and cats. Hence. Objections are faced by the both the locals and tourists alike.
7. Roads are congested due to heavy traffic to the place from different routes, and the locals find it difficult during those mela days and their regular activities are delayed.
8. All transport fares and price of local items are hiked, hence the local people also face problems.
9. Sometimes mela constructions and decorations destroy land resources and it's fertility. Refurbishment takes long time after the mela ends.

ADVANATGES:

1. The temple and its related people witness an increase in economic development.
2. Mixing of people brings mingling of different cultures like western and eastern fusion.

3. The place sees an increase in transport network and connectivity. Previously (around 10years age) Travelers had to walk 3kms from Rathtala (nearest bus stop) to reach Mandir but now direct Toto, auto-rickshaws are available for 24X7.

4. Locals sell home-made food items like khirer-mishti, hand woven flower garlands and handicrafts during the mela times.

5. Sales and marketing become the source of income for the locals.

6. Mandir charitable trust arranges medical camps, free eye and health check-ups and medicines for locals with the Doctors and nurses from Bardhaman Medical college and hospital.

7. Electricity and Drinking Water issues have been improved due to the development in the Fair and tourism in the locality.

8. Different shop owners and Rest room owners are satisfied by the crowd because of their increase in profit.

CONCLUSION:

Kancha nagar is a site of many historical importance. According to scholars, it was the capital city of Karna-suvarna or Rarh Region (Source: 8th Bengali literary Conference Publication). During that time, the place was renowned for knives and scissors as they were of high demand in the international market. Kanchan nagar was considered to be the "Sheffield of India" named after the famous industrial city of England "Sheffield". It was one of the leading manufacturers of war-weapons of the time, and also the "Kachari" or Court was situated here during the reign of Raja Shashanka. Majority of the population were from working classes like craftsmen and artisans.

With the establishment of the temple and spreading Vaishnav religious customs the local demographic structure of society has been changed, manufacturing of weapons have been stopped and only house items like utensils and surgical instruments are produced. Now the residents are of peaceful mind sets as they practice vaishnab culture.

From the survey result, it can be stated that the "rural" status of the ward has been upgraded to "Urban" status depending upon the income from temple activity and touristic influence. Thus the economic income of the place has been increased a lot since its foundation. Last 10

years have witness a drastic change in the adjacent areas due to the increase in the development of the temple and its various activities. Places have been re-decorated and updated with the construction of two main gates with the help from current government.

According to source of mandir authority, a donation of Rupees one crore will be credited for temple main building renovation and a construction of a permanent stage for cultural programs and celebrations of festivals and other occasions.

Due to the temple festivals and participation of people of different caste, religion and culture, there is a positive growth and unity among everyone. There is no discrepancy or religious dominancy in the area. Tourists and visitors from different places are welcomed heartily and till now no report of communal disturbance or interference has been found.

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Rebuilding of Embankment and Road Infrastructure in Post-Aila Period: A Micro Level Case study of HaripurVillage in South-Western Sundarban, India

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ABSTRACT:

Embankments and roads are playing a major role in life support infrastructural systemsfor the people of Sundarban. As the region is more prone to cyclonic disturbance, therefore the detailed government report shows embankments were breached and collapsed the road infrastructures due to cyclone Aila, the most destructive severe cyclone which hit the Sundarban region in 2009. Haripur village of Namkhana block was selected as the study areaof this research paper, located in south-western Sundarban of West Bengal in India. The objectives of this research paper were to measure the damages of the embankment and road infrastructure and to investigate their rebuilding after the disaster. This study was done using a geographical field survey, simple percentage analysis and cartographic methods. The findings are, more than 47% of the total embankment was fully breached and more than 48%of the total embankment was identified as partially damaged embankment. The fully breached embankment has been reconstructed newly, and partially breached embankments have been repaired again but not sufficiently. The study also shows that most of the bricks and earthen roads, identified before Aila, have been broken during Aila. These roads have been replaced by metallic roads under Pradhan Mantri Gram Sadak Yojanaand concrete paved roads under the state government project during the post-Aila rebuilding process.

1. INTRODUCTION:

The area comprising the active delta of the Sundarban region consists of land, water and mangrove forest. The human habitation land and water area include a network of saline water creeks and rivers. In the past, during the reclamation period, men constructed embankments to prevent inundation of the land area by saline water. At present these embankments protect the people of Sundarban from being inundated by tidal water. Cyclones formed in the Bay of Bengal often strike these areas. Tropical cyclone Aila hit this region on May 25th, 2009. Consequently, the area was flooded due to storm surges and embankment breaching. In some places, due to heavy storm surges, the water has overtopped the embankment and flooded the land area. Road infrastructure in Sundarban was very poor. Most of the roads were not metallic roads. These roads have been destroyed due to the high rate of flow of flood water during cyclone *Aila*. Somewhere, the embankment is used as a road. So, these two infrastructures are related to each other and are known as the lifeline of Sundarban. Recovery operations were started immediately after the disaster by the local government, Non-Government Organizations and the victim people themselves. Although initial recovery is slow in the short term, almost complete recovery is possible in the long term through different government projects.

2.1 LITERATURE REVIEW:

Many different types of studies have been conducted to assess the impact of cyclone *Aila* on the embankment and road infrastructure and their rebuilding in the post-*Aila* period. Mallick, Rahaman and Vogt (2011) studied that embankments in the island area of Bangladesh were breached due to storm surges and overtopping water during cyclone *Aila.* Earthen village roads were severely damaged by the inundation of saline water. They have suggested that rebuilding roads should be metallic and embankment should be reconstructed with increased height with proper afforestation and a much shallower riverward slope than the inland side. They observed that local people have been employed by Government and Non-Government Organizations to repair roads and embankments. Mukhopadhyay (2011) found that the embankments of Sundarban have been broken and damaged during Aila. He suggested repairing and rebuilding the damaged embankments in short term. He also recommended the acquisition of land for the rebuilding of the new embankment with proper compensation by

the government. Some organizations in India like the Adventist Development and Relief Agency (2011) have also evaluated the impacts of *Aila*on the embankment and road infrastructure of Sundarban in West Bengal where a large number of embankments and roads have been destroyed. Local community people participated in the reconstruction of the embankment. Jahan (2012) emphasised badly affected embankments and road infrastructure in Bangladesh during *Aila*.The main embankments have been repaired withthe financial support of the Bangladesh government. Kar and Bandyopadhyay (2015) assessed the breached embankments in the Gosaba CD block of the Sundarbanregion through remote sensing techniques.Mallick, Ahmed and Vogt (2017) pointed out in their research paper that cyclone *Aila* damaged the roads and collapsed the embankments in the South-Western Coastal Region of Bangladesh.Sadik et al. (2017) studied the continuation of the breaching of coastal embankments in Bangladesh. They found that breached embankments have been rehabilitated with the financial help of the World Bank after 4 years of *Aila*.

3. STUDY AREA:

Administratively the study area (Haripur) is a village of Haripur Gram Panchayet (GP) in Namkhana block under Namkhana Police Station in South 24 Parganas district of West Bengal, India. Haripur village was the worst affected mouza after cyclone Aila. The entire study area is located within the latitude of $21^0 35' 38''$ N and $21^0 38' 57''$ N and longitude $88^0 16' 34''$E and $88^0 17' 52''$ E.The Saptamukhi River boarded the east of this area. The northside is bordered by Ainsley creek, west and south sides of this area are bounded by Shibarampur and Fraserganj Gram Panchayet respectively **(Figure1)**.

4. OBJECTIVES:

This paper aims at the following points-

i.   To find out the effects of Aila on infrastructure mainly embankments and roads in the study area.

ii. To measure the types of infrastructural damages mainly embankments and roads.

iii. To estimate the nature of rebuilding the damaged embankments and roads during the post-*Aila* period
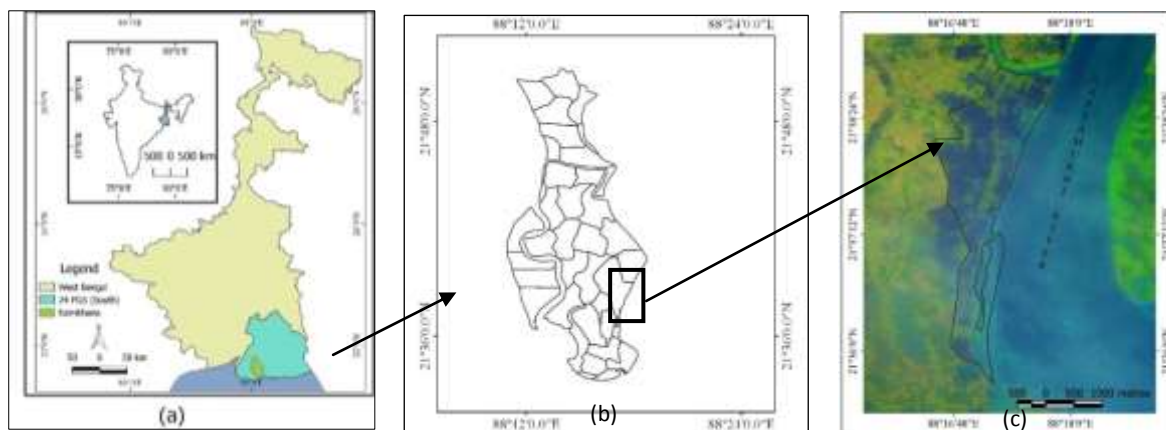
Figure 1: Location Map of the Study Area - (a) West Bengal in India, Namkhana block and South 24 Parganas in West Bengal; (b) Haripur village in Namkhana block, (c) Study Area.[Base map(Census Report2001, Govt. of India) superimposed on Landsat-5-TM satellite image. (Map projection: 32645-UTM and WGS-84 datum)] *Sources: refer to Table*

5. METHODOLOGY:

The present study attempts to reveal the impacts of Aila on embankments and roads as infrastructure and its recovery in the study area. The descriptive research methodology has been applied for this research. The study is based on both primary and secondary data. The study followed three following steps.

5.1 Pre-field study:

It is the first stage of this study through which all literature and texts relevant to this study have been studied by the author to find out the base of the study. Various secondary spatial data and non-spatial data like village-level maps, satellite images, cyclone reports of Aila,

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etc have been collected from different web portals of organizations **(Table 1)**.Before going to the field study a set of questionnaires have been framed for the survey of 100 households for the collection of primary data and conversation on before-Aila and post-Aila infrastructure. Pre-processed Landsat-5-TM satellite image which was captured on next day after the cyclone Aila event, 26th May 2009 has been collected for the detection of flood and water logging areas which was the study area **(Table 1)**. The census village map has been collected from the district census handbook of South 24 Parganas **(Table 1)**. Before going to the field visit some cartographic experiments have been done as follows. The pre-processed satellite image was analysed by remote sensing techniques in QGIS 3.14.10 software by preparing the False colour composite (FCC). For the preparation of FCC, all downloaded single band images were opened in QGIS 3.10.14 software using the SCP plugin and Band-1 to 7 had been stacked excluding Band-6. Then FCC had been created with 5-4-3 band combination as Multi Colour Band properties. After that, the collected village map was geo referenced (Image to Image technique) with Geographical Coordinate System-WGS 84. Then geo referenced village map of the study area has been superimposed on the stacked satellite image (raster image). In the next step, the geo referenced mouza map had been digitized and a vector layer was created. In this way inundated and the study area was detected and delineated.

5.2 Field Study:

It is important to mention that the author is a permanent inhabitant of this area. So, it was possible to continuous observation the study area. All embankments and roads have been inspected and measured during the field study by a physical measurement and GPS waypoint (Coordinates-UTM Zone 45, Spheroid and Datum-WGS-84) collection. The conversation about the pre-Aila and post-Aila conditions of embankments and roads has been made with randomly selected households. One member of each household was interviewed using the questionnaire.

5.3 Post-field Study:

The collected quantitative information about the damage and rebuilding condition of embankments and roads was computed by simple percentage analysis. The responses of the respondents about the rebuilding of infrastructure were simple percentage analyses presented by a bar diagram. All the collected data about the length of damaged embankments and roads have been tabulated. The present recovery condition of the embankment and roads also have been presented in the table. All these have been done using Microsoft Excel 2019. All data related to embankments and roads have been presented on the map by cartography techniques which are as follows. All present and previous infrastructure data have been captured by digitization technique using point and line geometry based on collected waypoints from the field. These vector layers have been superimposed on the online Google Satellite Image layer and Landsat-5-TM raster satellite image layer one by one. Then the rebuilding of damaged embankments and roads have been presented simultaneously by clippings of google earth images captured at different time intervals before and after *Aila*.

Table 1: Specification and Sources of Spatial Data and Materials used in this study

Data	Specification	Source
Landsat-5-TM Satellite Image	Satellite Name: Landsat-5 Sensor: Thematic Mapper Spatial Resolution: 30×30 metres Bands: 1,2,3,3,4,5,7 Path: 138 Row: 045 Date of Pass: 26th May 2009	USGS-Earth Explorer web portal
Census Village Map (Base map of the study area)	Scan Map (Based on 2001 Census Report)	District Census Report, South 24 Parganas, 2001
Google Earth Image	Date of Data Capture: 24th November 2006 (pre-Aila) 25th November 2014 (post-Aila) 05th November 2021 (Post-Aila)	Google Earth Pro (Online Historical Imagery)

Prepared by Author

6. RESULT AND DISCUSSION:

The inundated and water-logged area of the study area has been delineated from the FCC satellite image by identifying the blue tone on the image. Almost 99 % area was inundated by saline water due to the embankment breaching and overtopping of the water during storm sure of cyclone *Aila*.

The infrastructure of the affected Sundarban area was severely destroyed by cyclone *Aila* (Baten,2010; Sadik et al., 2017). The infrastructures of the study area mainly earthen roads and embankments are very poor. Most of the roads were not metallic.

We know that the embankment is the only protection element from aggressive natural phenomena regarding high tides and cyclones for the life and living of the people of Sundarban. It helps the area behind it from the inflow of water in high tide and storm surges during the cyclone. The total length of the embankment in the study areais3570 metres or 3.570 km. It has been found during the field visit that 3409.79 metres or 95.51% out of the total length of the embankment has been damaged. The damaged embankment has been divided into seven parts based on the damage and these parts have been denoted by their id number. Out of the total embankment of the study area along the Saptamukhi River, four parts (Id 1, 2, 3, 4) have been breached fully during the disaster. Three parts of the total embankment have been identified as partially breached (Id 5, 6,7) embankments over which water was overtopped **(Table2)**.

Almost 1718.66 metres or 48.42%of the total length of the embankment was partially breached. A total of 1681.13metresor 47.06% out of the total length of the embankment was breached or fully destroyed. A direct hit of the tidal wave with the embankment and excessive overtopping of saline water are the main causes of breaching the embankment during the storm surge which reached above 4 metres (Indian Meteorological Department Report, 2009) during the landfall of the cyclone. At that time saline water from the river started to inflow towards the land and inundated the study area. Frequent inundation was continued till the start of repairing the damaged embankments.

Rebuilding is the decisions and actions taken after a disaster to restore or improve destroyed infrastructure to reduce disaster risk. This process of efforts began immediately after a month of a disaster and continue until fully achieved. Reconstruction of the fully breached embankment started immediately after the disaster in the study area with the financial help of

the government using highly modern geotechnical and engineering techniques **(Figure 2e)**. That's why still now it is standing after a decade of construction as it was before. Interestingly it was noticed that the embankment was made somewhere shifted towards the interior of the cultivation land **(Figure 2d and Figure 2e)** or somewhere it was shifted towards the river bed **(Figure 2f)**.

Table 2: Characteristics of damaged embankments [Embankment id indicates damaged sites. The location of these sites isin Figure 2**]**

Embankment Id	Length (Metres)	%Of the damaged embankment to the total length of the embankment	Characteristics during disaster	Characteristics during the post-disaster period
1	518.27	14.52	Breached	New Construction
2	595.08	16.67	Breached	Temporary new construction
3	179.84	5.04	Breached	New Construction
4	387.94	10.87	Breached	New Construction
5	684.2	19.17	Partially breached	New Construction
6	968.61	27.13	Partially breached	Repaired
7	75.85	2.12	Partially breached	Repaired

Source: Calculation and Measurement by the Author as per primary data. [Lengths are measured by field survey and the map was prepared with 3645-UTM projected coordinate system and WGS-84 datum]

Both parts are stabled still now. Almost 1086.05 metres of the total breached embankment and 684.2 metres of the partially breached embankment were newly constructed**(Figure 3 and Table 2)**. Out of the total damaged embankment, 1044.46 metres were repaired permanently **(Figure 3 and Table 2)**. One part (Id. 2) of the embankment located**(Figure 2a)** in the south of the study area was temporarily constructed with earthen materials and a poor concrete building strategy, but again it was breached the next year of *Aila* **(Figure 2b and 2c)**. This part is highly dangerous to protect the ingress of saline water into the agricultural field.

In the study area, road infrastructure was very poor in the pre-*Aila* period. Most of the roads were made of bricks or earthen materials. Earthen roads are not suitable for transportation during the monsoon period. All earthen roads were washed out during the flood by cyclone *Aila*. Bricks roads are comparatively less destructed than earthen roads. All these roads are improved after Aila during the rebuilding process of infrastructure in the post-*Aila* period

(Figure 3). The damaged roads reconstructed after *Aila* like earthen roads were converted to brick roads, brick roads to the roads under *Pradhan Mantri Gram Sadak Yojana (*PMGSY) roads, earthen roads to PMGSY roads and from brick roads to paved concrete roads, earthen roads to paved concrete roads. PMGSY Road was constructed to connect Lakshmipur Abad and Haripur markets **(Table 3)**.
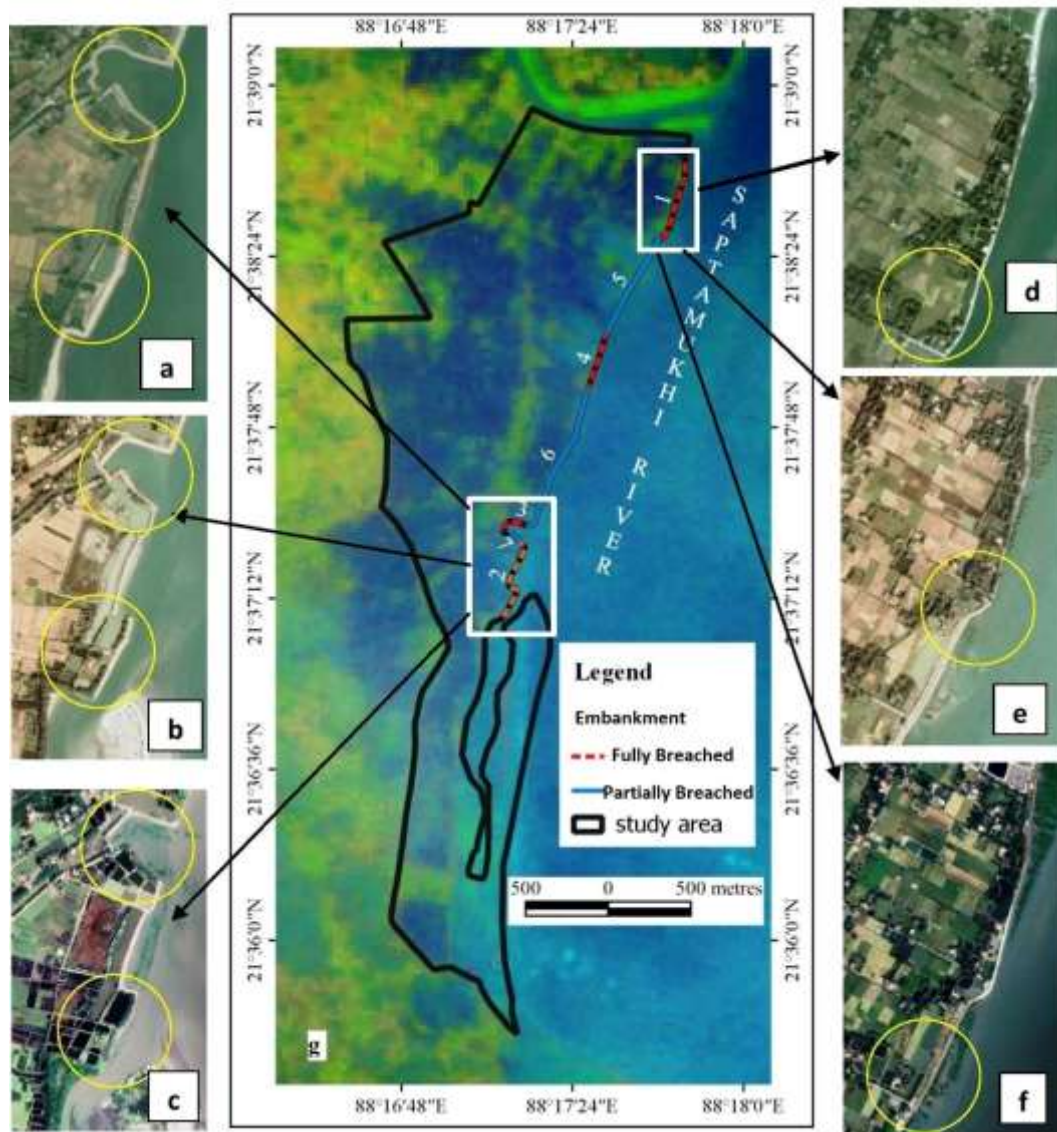
Figure 2: Characteristics of Embankments in pre-disaster, during the disaster and post-disaster period in the study area [*Yellow* colour circles indicate damaged embankment sites on *Google Earth* satellite image collected from *Google Earth Pro* version. Embankment in the southern part of the study area: (a) YoP 2006, (b) YoP 2014 and (c) YoP 2021; Embankment in the northern part of the study area: (d) YoP 2006, (e) YoP 2014 and (f) YoP 2021; (g) Study area and damaged embankment sites superimposed on Flood and Inundated Area based on Landsat-5-TM satellite image captured on 26.05.2009] YoP = Year of pass of satellite. Map was prepared with 32645-UTM projection coordinate system and WGS-84 datum.

The study found that above 80 % of respondents agreed that breached embankments are mostly rebuilt and 19 % of respondents agreed that moderately rebuilt and only 1% of respondents agreed that breached embankments are less rebuilt **(Figure 4)**. One most important thing in this study found that 35% of respondents agreed that partly breached embankments are mostly rebuilt and 64% of respondents indicated less rebuilt in the study area **(Figure 4)**.

Table 3: Condition of Road Infrastructure in pre-disaster and post-disaster period
[Road Id indicates the location of different types of roads which are superimposed on the study area map shown in Figure 3]

Road Id	Length (Metres)	Road character before Aila	Road character after Aila
A	298.68	Bricks Road	PMGSY Road
B	716.79	Bricks Road	PMGSY Road
E	677.49	Bricks Road	PMGSY Road
D	357.6	Bricks Road	PMGSY Road
C	1913.16	Earthen Road	PMGSY Road
F	51.61	Bricks Road	PMGSY Road
G	2350.93	Earthen Road	Bricks Road
H	613.47	Earthen Road	Paved Concrete Road
I	1680.09	Bricks Road	Bricks Road
J	3539.72	Bricks Road	Bricks Road
K	571.23	Earthen Road	Bricks Road
L	531.1	Earthen Road	Paved Concrete Road
M	806.87	Earthen Road	Paved Concrete Road
N	394.73	Earthen Road	Bricks Road

Source: Calculation and Measurement by the Author as per primary data.[Lengths are measured by field survey andthe map which was prepared with 32645-UTM projected coordinate system and WGS-84 datum]

The study revealed that above 90 % of respondents agreed that earthen roads are mostly rebuilt and 10% of respondents agreed that moderately rebuilt **(Figure 4)**. They also agreed that the inclusion of PMGSY in the road network of the study area creates a revolution in connectivity. The study also found that 36% of respondents agreed that brick roads are mostly rebuilt and 64% of respondents agreed that brick roads are rebuilt from the effect of Aila in the study area **(Figure 4)**.
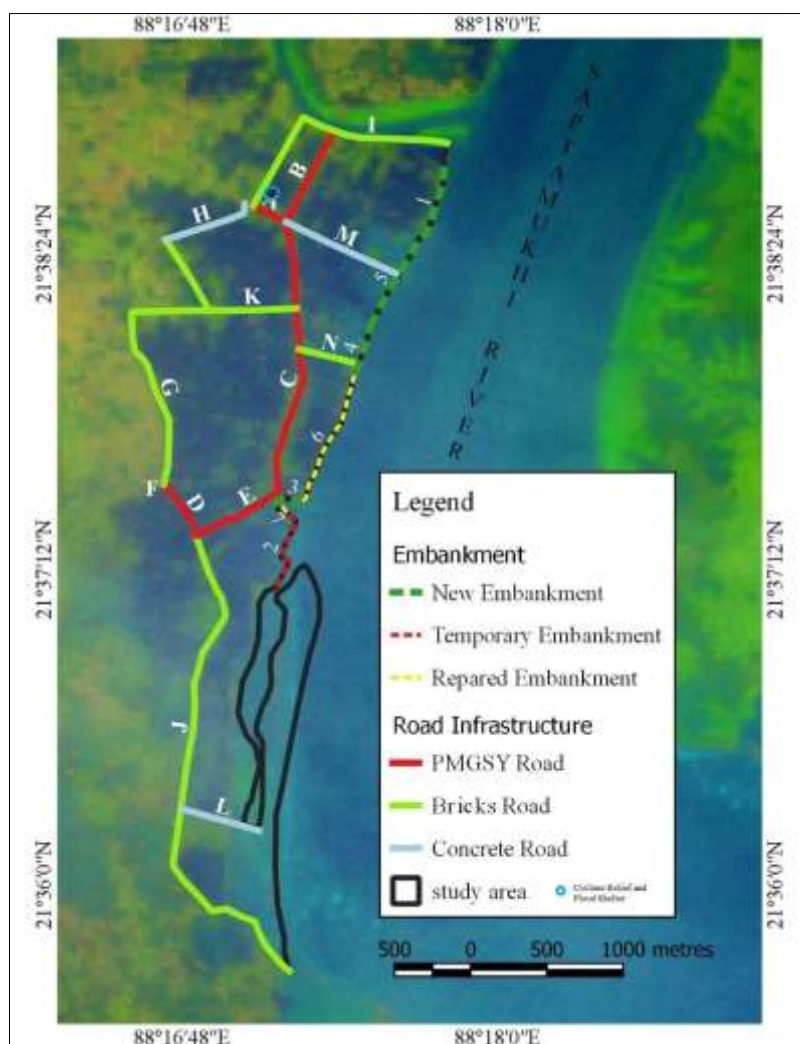
Figure 3:Present Road Infrastructure [Capital letters indicate road id and continuous colour lines are showing the present type of roads. Map is based on study area vector layer with 32645-UTM projection coordinate system and WGS-84 datum**]**
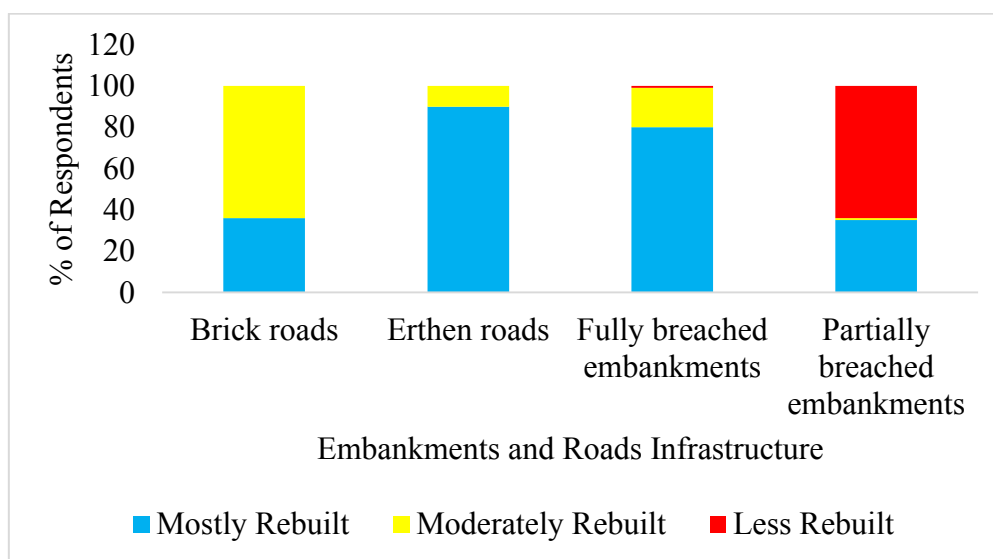
Figure 4: Views of local people on the rebuilding of infrastructure.*Source: Field Survey by Author, 2019*

CONCLUSION:

This study shows that *Aila* like every cyclone has caused extensive damage to the Sundarban region. Among these damages, the most important is the destruction of river embankments and road infrastructure. The extent of this damage was somewhere partial and somewhere complete. We already know that these two infrastructural elements of Sundarban are inextricably linked with the daily life of Sundarban. The problems created by the breaching of river embankments are frequent inundation of agricultural land and residential areas by saline water, disruption of communication. Due to the destruction of road infrastructure, the transport and communication system is severely hampered. Most of the roads are unpaved, causing great inconvenience in transportation and communication. This study reveals that government planning and financial incentives have made it possible to effectively restore and rebuild damaged river embankments and road infrastructure. Completely breached river embankments have been reconstructed with the help of modern technology. Partially breached river embankments have been repaired but many still remain.Among the road infrastructure, damaged earthen or brick roads have been converted into concrete.Some of them were converted to metallic roads under the Pradhan Mantri Gram Sadak Yojana. Although the recovery and reconstruction process were initially slow after the disaster, it was completed rapidly afterwards. People in the study area are as satisfied with the reconstruction of fully breached embankments but not as satisfied with the construction of partially breached embankments. Because the partially damaged embankment has not yet been reconstructed in that way. The main question of this research was, has it been possible to restore and rebuild the river embankment and road infrastructure damaged by cyclone *Aila*? The answer is almost possible. Thus, this study suggests that with government planning and financial incentives, the damaged river embankment and road infrastructure have been almost completely restored and rebuilt. Restoration and reconstruction of river embankments and road infrastructure will help reduce the risk of any future cyclone-related disasters. As a result, Amphan Cyclone in May 2020 did not have any disastrous impact in the study area.

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Open Access: most needed initiative in research

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Abstract:

'The Bethesda Statement on Open Access Publishing, Budapest Open Access Initiative' and the 'Berlin Declaration on Open Access to Knowledge in Science and Humanities', first introduced the term "Open access". It has been defined as "Freely available literature on the public internet, permitting any users to read, download or copy and use them for any other lawful gaining access to the internet itself. The author's research and academic contributions are made accessible digitally without any cost only in the Open AccessInitiatives".

Open Access (OA) includes e-resources that are made commonly available on the internet free from any licensing and copyright restrictions. Conference proceedings, journal articles, books, theses, music, and videos, all can come under the purview of open access.

Present paper intends to provide consolidated knowledge of Open Access initiatives with reference to various open-access publishing models.At the same time, some measures have been mentioned here to distinguish between OA and predatory journals.Both the advantages and disadvantages of OA are to be pointed out with special reference to the Indian initiative towards this movement. The aim of this paper is to give a consolidated view of OA and also to increase the use of OERs.

Keywords: Open Access, Open Educational Resource, Creative Common, Open Access Licensing, Open Access models

Introduction:

Definition of 'Open Access' (OA) according to The Budapest OA Initiative is "free availability on the public internet, permitting any users to read, download, copy, distribute....full texts of these articles…without financial, legal, or technical barriers…" whereas the Bethesda and Berlin finally define it as "[when the] copyright holder must consent in advance to let users copy, use, distribute, transmit and display the work publicly and to make and distribute…in any digital medium for any responsible purpose." All these statements are leading to an idea that goes towards eliminating price barriers and permission barriers while attributing the work to the original author (Addair, 2015). In simplified form, it can be called that "Open access (OA) literature is digital, online, free of charge, and free of most copyright and licensing restrictions" (Suber, 2012).

Few publishers are controlling the publishing business. Even the best homegrown research, which is published in foreign journals, has to be purchased in foreign currency. So, it is an outstanding effort and a revolutionary movement that encourages free access to scholarly publications over the Internet. This effort abolishes the price and permission obstructions and ensures the maximum possible dissemination of research output.

The term 'Open Access' is considered to be the most recognized term in the sphere of Research and Publication in the higher education domain by providing freely accessible information through a number of access models almost without any restriction to all in need of that. Now, the pandemic has changed the reading habit a lot. People became more and more dependent on online resources due to their restricted movement duringthe pandemic.

The objective of the study:

To provide a clear picture of:

1. Open access initiative.

2. Different models and their utility.

3. Licensing of OA materials.

4. How to differentiate Open Access journals from Predatory one.

5. Advantages and disadvantages of open access.

6. Indian Initiatives towards the attainment of the goal.

Methodology:

As is done in bibliographical research, existing information gathered from different books, journals, websites etc. is reviewed. It is then analysed, synthesised, and interpreted to represent the idea in a new form that will help to comprehend the area in a better way.

Review of literature:

A thorough literature search has been done to get an idea about the research work published in the last few years. It is found that there were a number of studies made by different researchers throughout the world including India about Open sources.

Matonkar andDhuri(2021) conducted a survey amongst the students and faculty members of a college in Ponda, Goa; regarding their awareness of the Open access information during the covid 19 pandemic But it is very unfortunate that almost 50% of the respondents don't have any idea about the open-access resources provided by the publishers during the Pandemic. 32% of them don't have a clear idea about the open-source resources.

Lee (2020) examined the open access publication status after the Covid 19 pandemic. He showed in his article that the number of open-source publications has increased significantly after the pandemic. Countries with lesser GDP and having more impact of the pandemic have participated in scientific globalism.

Ola (2020) in his study shows that the Copyright system has not changed according to the changing scenario. Which resulted in an increase in malpractice. People started practising disobeying rather than obeying laws. The inefficiency of the current copyright system accelerated the open movement initiative.

Rakemane and Mosweu (2020) in their book chapter analyse different definitions of OA and then discussed its various aspects and describe OA in African perspective.

Costa (2016) studied in Latin American perspective. He showed that the growth and association of open access have been occurring in a different way in developed countries and the rest of the world. This is mainly due to the features of the scholarly communication system; especially the golden road Open access system has low presence of prestigious scientific commercial publishers. Addair (2015) highlighted the main purpose of OA. He opined that it is to provide information to readers in an online environment without any restrictions. Some OA model names also have been mentioned there.

Sahu and Arya (2013) perfectly commented that the open access movement has become the middle of dialogue during the last decade. Open access publishing facilitates researchers' and scientists' access to research literature through the internet freed from cost. The aim of this paper isto investigate the attention of open-access publishing among researchers and school members of Indian institutions, and to judge the event of open access initiatives in India. For studying awareness of open access publishing, a survey was conducted

among the researchers of IITs and IIMs in July-August 2012 by employing a closed ended questionnaire. the expansion of open access initiatives in India is analyzed through data collected from secondary sources, i.e. the websites of Ulrich's, DOAJ, ROAR, and Open DOAR. The results showed that India's contribution has increased within the previous couple of years. It had been found that the notice about such open-access information sources and initiatives among the research community is increasing.

Chanda (2020), in his study, offers a comprehensive look at the value of free online resources. Due to the simple accessibility of widely available resources on the internet, the use of open access e-resources is increasing. It is crucial to understand the legitimate source of these online information. The researcher collected a list of free online sources for this study and evaluated their applicability. Information is everything in the rapidly changing world of today, and it is freely available everywhere. However, since none of those sources are real, none of that information is reliable. The ideal place to discover reliable information is an open-access platform, where the majority of the material is both reliable and authentic.

Nasipudi and Gouda (2018) concluded that through its various publication strategies, open access publishing has attained a certain level of sustainability and has recently increased in size and volume. Even commercial publishers, who at first opposed all open access publishing initiatives, are gradually embracing open access approaches. The findings of this study suggest that open access publishing is flourishing and will continue to exist.

What is Open Access?

As the term refers, Open access refers to the resources that are open to all in terms of access. It makes Research publications freely available for the researchers. This initiative has changed the research scenario drastically. It is an international movement which got huge acceptance all over the world.

The American Research Libraries Association (ARL) Task Force defines open access as "a cost-effective way to disseminate and use information. It is an alternative to the traditional subscription-based publishing model possible by new digital technologies and networked communication".

According to Swan (2008) "open access is the immediate (upon or before publication), online, free availability of research outputs without any of the restrictions on use commonly imposed by publisher copyright agreements. It is definitely not vanity publishing or self-publishing, nor about the literature that scholars might normally expect to be paid for, such as books for which they hope to earn royalty payments. It concerns the outputs that scholars normally give away free to be published–journal articles, conference papers and datasets of various kinds".

Salient features of Open Access:

The following are the characteristics of open access as summarised by Jain (2012) and Suber (2012):

    i.   It is the free distribution of scholarly publications.

    ii.   Scholarly work is available to everybody without charge.

    iii.   It is devoid of copyright and licencing restrictions, allowing authors and users to collaborate freely.

    iv.   are free of any legal issues and have the authorization to use them.

    v.   Materials can be found on the internet.

vi.   Users have access to whole materials.

vii.   Anyone can use the material for free: Users have unrestricted access to the system.

viii.   Open access content can be in any format, ranging from text and data to video and audio, scholarly articles, software and multi-media.

Is Open Educational Resource (OER) and Open Access (OA) synonymous?

Both the terms seem to be synonymous while conducting a study. The borderline between these two terms is blurred, still, these two terms are not the same. Creative Common wiki suggests a variety of definitions. According to one of them, "Open Educational Resources are teaching and learning materials that you may freely use and reuse, without charge. OER often have a Creative Commons license that states specifically how the material may be used, reused, adapted, and shared." Open-access resources are also free to use and reuse. But the basic difference between them is the purpose of creation. OER is specially intended for teachers and students. Whereas Open access initiatives were taken to ease the share of research publications and academic journals freely. Though the licensing policy for both types is similar. So it can be concluded that 'All Open Educational Resources (OER) are open access. But all open access resources may not be OER.

Tracing the Open Access journey:

Year	OA Initiatives
1942	American sociologist Merton's declaration - "Each researcher must contribute to the 'common pot' and give up intellectual property rights to allow knowledge to move forward" can be considered the first idea of

	Open Access.
4th July 1971	Project Gutenberg, world's first free online digital library was introduced by Michael Hart.
14th August, 1991	Paul Ginsparg inaugurated the ArXiv repository in Los Alamos National Laboratory, which covers almost all science subjects now(Though not peer-reviewed). This is probably the first free online archive.
2000	PubMed Central (PMC), free full-text archive of Biomedical and life sciences journals started its journey under the supervision of National Center for Biotechnology Information (NCBI) at National Library of Medicine (NLM).
2001	Creative Common was established which issues copyright licences that allow people to share, edit or use a scholarly work without the conventional copyright restrictions.
2002	Budapest Open Access Initiative started. Here the term Open Access was first coined. 11th April, 2003- Bethesda Statement on Open Access Publishing originated.
22nd October, 2003	Berlin Declaration on Open Access

	published.
2003	Directory of Open Access Journal (DOAJ) started its journey.
13th September, 2013	The Indian Council of Agricultural Research had approved an Open Access policy.
2014	DepartmentofBiotechnology and Department of Science and Technology, under Ministry of Science and Technology, Government of India together declared their open access policy
30th March, 2020	Representatives from the scientific ministries of 122 nations met online, at the invitation of UNESCO, to discuss the importance of increasing funding for science and international cooperation in the framework of COVID-19. In order to avert and lessen global catastrophes, UNESCO Director-General Audrey Azoulay urged nations to strengthen scientific collaboration and include open science into their research initiatives. (*Open Access to Facilitate Research and Information on COVID-19, 2020*).

<u>Models of open access:</u>

The naming process of different Open Access Models by colour was adopted at the beginning of the movement. But it is not that convenient to understand the features. It is found that there are six types of models of Open Access:(*What Are the Different Types of Open Access? | Open Access Australasia*, 2021)

1. **Gold OA**- It refers to publishing in a journal that is completely open access, i.e., a journal that offers immediate, free access to all of its material online. A Creative Commons License is assigned to articles, defining how they can be used. Publishers may charge writers an Author Publishing Cost (APC) for Gold OA, which can be paid by either their institution or the individual researcher. Generally, open access journals that are maintained by universities typically don't charge either writers or readers.

2. **Green OA**- Green open publishing repositories typically just include summary information on publications, not the entire texts or final versions that authors post before submitting the text to a journal. For the full-text article, the publisher may fix an embargo period. No fees are associated with this model.

3. **Diamond OA**- Open access journals known as "diamond OA" are those that don't charge authors or readers any publication fees. Authors may retain their copyright. Diamond open access journals are frequently led by the community and backed by financial support from external bodies like universities, local or national infrastructure, or research funders. There are numerous Diamond OA journals worldwide,

4. **Hybrid OA**- Here the author is given the option of paying a fee to make his work freely accessible. As the journal actually is a subscription journal, other articles of the journal may not be open access. This model is highly criticised authors are recommended not to pay for publishing in such journals.

5. **Bronze OA**- When an article is made freely available without any proper licencing agreement that is called the Bronze Oa. It is not proper open access as the publisher may impose a fee at any time.

6. **Black OA**- There are some illegal publishers who share the content of subscription journals freely. These illegal publications are called Black OA.

Importance of Licensing and Copyright in OA:

Open Access licences are used to make copyright works more accessible and usable. The licence protects the author's intellectual property rights while allowing others to utilise the work. The right to reproduce, duplicate, adapt, and communicate the work are just a few examples of uses. The licence an author chooses will reflect the types of uses they permit for their work. The licence outlines the permissible uses and the requirements that others must meet in order to utilise the content legally. While there are additional open/public licences available, only the Creative Commons (CC) licences are widely recognised. Some other licenses are- *MIT, GNU GPL, Apache 2.0, Creative Commons, BSD licenses etc.*

Creative Common Licensing:

Creative Common is a universal non-profit organization. It issues a CC license that is accepted worldwide. CC licences are copyright licences, and therefore require copyright for

use. Creators and other right holders can utilise CC licences as legal tools to grant the public some usage rights while reserving other rights. People who want to maintain their copyright while making their work open to the public for certain uses might want to think about using CC licencing. This has changed the "all right reserved" concept to the "some rights or no right reserved" concept.

Anyone, from individual author to major institutions, can adopt a Creative Commons licence to provide the public permission to use their creative works in accordance with the law. " What can I do with this work?"- is answered from the re-user's perspective if a copyrighted work has a Creative Commons licence. (*About CC Licenses*, 2020).

There are six types of Creative Common licenses:

- **Attribution (CC BY)-** Allows distribution, reuse, mixing and adoption of materials. It allows commercial use. Author must be given the credit.

- **Attribution Share Alike (CC BY-SA)-** Allows distribution, reuse, mixing and adoption of materials. It allows commercial use. The author must be given the credit and the mixed or modified creation must be licensed under the same licensing terms. Wikipedia uses this type of licensing.

- **Attribution-No Derivs (CC BY-ND)-** This licensing allows sharing of documents with any others even commercially, but adopted forms cannot be shared. Here also credit must be given to the author.

- **Attribution-Non-Commercial (CC BY-NC)-** Allows distribution, reuse, mixing and adoption of materials non commercially with proper acknowledgement. New work need not be licenced under the same terms.

- **Attribution-Non Commercial-ShareAlike (CC BY-NC-SA)-** Allows distribution, reuse, mixing and adoption of materials non-commercially only with proper acknowledgement. The new work also has to be licensed under the same terms and conditions.

- **Attribution-NonCommercial-No*Derivs* (CC BY-NC-ND)-** This licensing pattern is the most conservative in nature, it allows downloading and sharing documents in original form with proper acknowledgement. It does not allow change and commercial use.

Benefits of Open Access:

Full form ???(BBB) open access statement and related literature identified the main benefits of scientific OA publishing. UNESCO open access initiative identifies the following benefits:

1. Avoids duplication of research effort, and the resulting financial and time waste enhances the transparency of scientific research funding and fosters a wider understanding of outstanding scientific questions.

2. Increases the accountability of public institutions .

3. Facilitates the search of information through metadata .

4. Helps people to better appreciate scientists and their work.

5. Closes gaps in the access to knowledge and enables the building of knowledge databases and re-using of published results.

6. The promotion of scientific knowledge and its wide dissemination has clear benefits not only for researchers but also for society as a whole. It serves the interests of many groups, such as:

   a. **Authors:** It gives them a worldwide audience and increases the visibility and impact of their work.

b. **Universities:** It increases the visibility of their faculties and research, reduces their expenses for journals, and advances their mission to share knowledge.

c. **Teachers and students:** It puts rich and poor on an equal footing by eliminating the need for payments or permissions to reproduce and distribute content.

d. **Libraries:** With Open Access, librarians can help users find the information they need, regardless of the budget-enforced limits on the library`s own collection.

e. **Citizens:** it informs on decisions that are important to everyone. It gives them access to research documents, most of which are unavailable in public libraries and for which they have paid through their taxes.

f. **Readers:** It gives them barrier-free access to the literature they need.

g. **Journals:** It makes their articles more visible, discoverable, retrievable, and useful. This visibility enables to effectively attract submissions, subscriptions and advertising.

h. **Donors:** It increases the return on their investment in research, making the results more widely available. It also provides fundamental fairness to taxpayers or public access to the results of publicly-funded research

i. **Governments:** It also promotes democracy by sharing non-classified government information as widely as possible.

Drawbacks of Open Access:

Researchers experience many disadvantages, most of which are related to the transition to an open access publishing model. Only in the long run, additional efforts will bring tangible

benefits to the researchers themselves. This affects the priorities they give in switching to this new publishing model. (*Pros and Cons*, 2020.)

<u>Disadvantages from the researchers' point of view are:</u>

1. Researchers are evaluated based on their ability to publish in high-impact factor journals, especially in the natural sciences, medicine and economics. However, it takes time for new journals, both traditional and open access journals, to gain an impact factor. In addition, the impact factor has been debated in recent years, and research is going on to find another way to reward and evaluate scientists.

2. The number of high-quality, completely freely accessible journals varies widely in many areas. In some areas, it is very few or not enough.

3. Publishing in open access journals can be an additional administrative burden, but delivering articles to traditional journals is usually easy online.

4. During this transition period, most research institutes are not yet ready to pay the Author Processing Fee (APC). Therefore, this is associated with additional, often significant costs for researchers. However, many universities these days have funding for open access publishing.

5. Researchers are often spammed by OA publishers of questionable quality ("predatory journals") which can affect the perception of OA publishing models. It takes some effort to separate the wheat from rice husks. The database has been improved to make the quality of open access publishers more transparent. Before publishing,authors should see if the journal has been reviewed by either the Quality Open Access Marker (*QOAM*) or Scirev.sc database. Directory of Open Access Journals (*DOAJ*) also evaluates the quality of journals. Using this application, open access journals can receive a DOAJ seal.

6. Distributing publication data and the full text of a publication to a repository represents additional work for researchers.

How to differentiate between Predatory journals and Open Access Journal with APC?

With the expanse of open access journals and the change to online publishing, academic publishing has also been increasing greatly. At the time of proposing their academic works for publication, contributors must be aware of predatory journals and publishers.

To prevent the publication of pirated editions, educational and research institutions can use Web of Science, Journal Citation Reports (JCR, Clarivate Analytics, formerly Thomson-Reuters), or Scopus, Web of Science, DOAJ, PubMed, MEDLINE (Shrestha, 2021). Local, national, and international regulators need to award research grants and evaluate researchers' achievements in research grants and degrees while taking strong action against pirated publications.

Some factors that differentiate Predatory journals are:

1. Publication costs of these types of journals are much higher.

2. Time taken to publish an article is much less than the mainstream or Open access publication process.

3. The rate of acceptance of a paper in the Open Access publication is less as it thoroughly checks the plagiarism issue and also the acceptance process is peer-reviewed.

4. Open Access has authentic and high-quality abstracting and indexing journals (e.g. DOAJ) which the predatory journals do not have.

5. The impact factor is lower in the non-predatory open access journal compared to the predatory one as it does not actually assess the content.

6. The editorial team of a journal determines it's reliability. Predatory journals use fictitious editors' name or they include the name of eminent persons without their consent.

Indian initiative towards Open Access:

- M. S. Swaminathan Research Foundation, Chennai organised two workshops on Open Access in 2004. This can be considered the first Open Access Related Activity in India. (Wikipedia contributors, 2022)

- In 2006, the National Knowledge Commission in its recommendations suggested that "access to knowledge is the most fundamental way of increasing the opportunities and reach of individuals and groups". (*Recommendations*, 2018)

- In 2009 UGC made the submission of thesis and dissertation mandatory in INFLIBNET repository SODHGANGA. It provides free full-text access to thesis and dissertations of Indian Universities. It has now 366488 theses. Shodhgangotri is also another repository that complements Sodhganga. It hosts the synopsis of the research proposals.

- In 2011, the Council of Scientific & Industrial Research (CSIR) registered their open Access Mandates and Policies.

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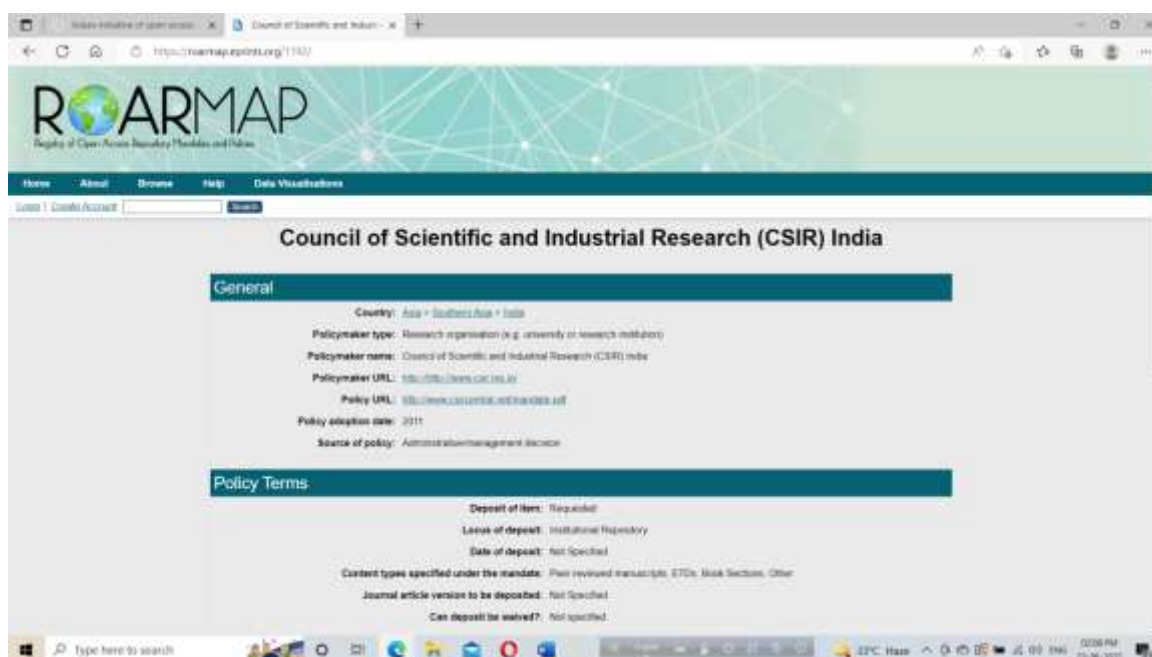
- Till July 2022, 18 institutions (Bharathidasan University, BhogawatiMahavidyalaya, Kurukali, CGIAR, Council of Scientific & Industrial Research, Council of Scientific and Industrial Research (CSIR) India, Department of Biotechnology and Department of Science & Technology, Ministry of Science & Technology, ICRISAT International Crops Research Institute for the Semi-Arid Tropics, IITH Indian Institute of Technology Hyderabad, Indian Council of Agricultural Research, Institutional Repository@AIKTC, International Journal Online of Humanities (IJOHMN), M S University, Madurai Kamaraj University, Mahatma Gandhi University, National Institute of Oceanography, National Institute of Technology, Rourkela, National Knowledge Commission, Society of Open Science) have registered their Open Access Mandates and Policies. (*Browse by Country - ROARMAP*, 2019)
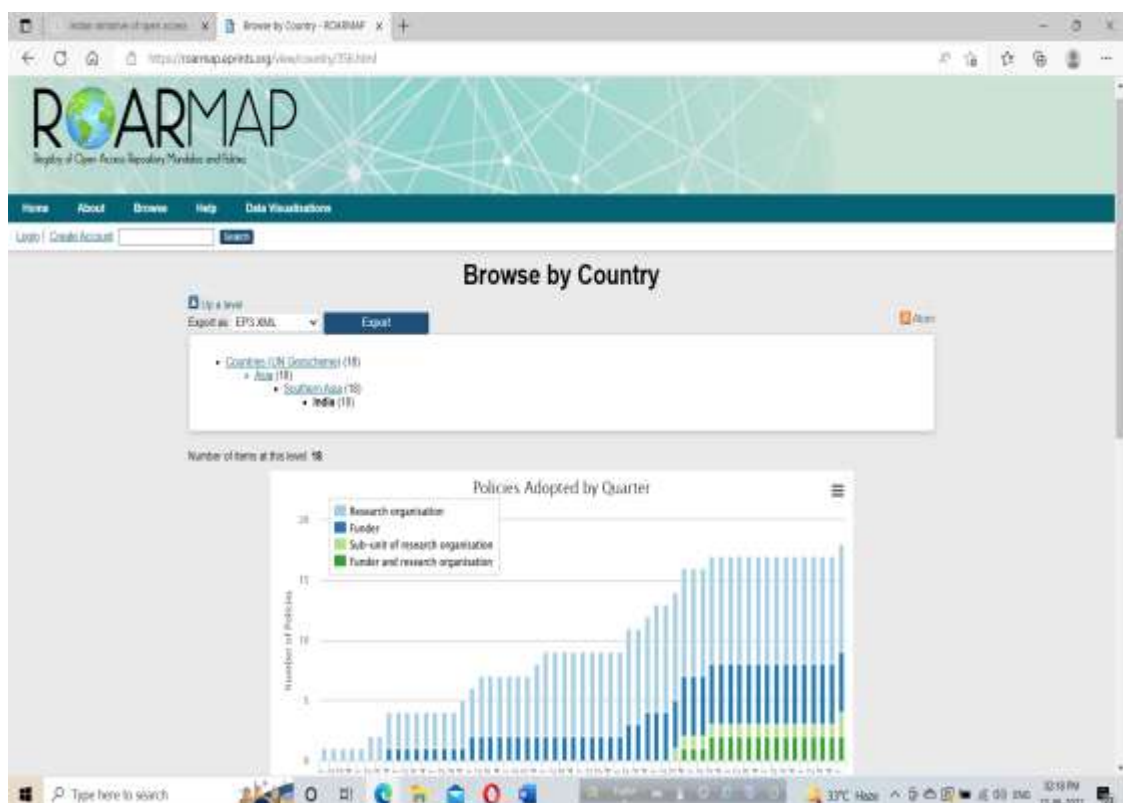
- Till July 2022, total 418 Indian journals have been indexed in DOAJ.
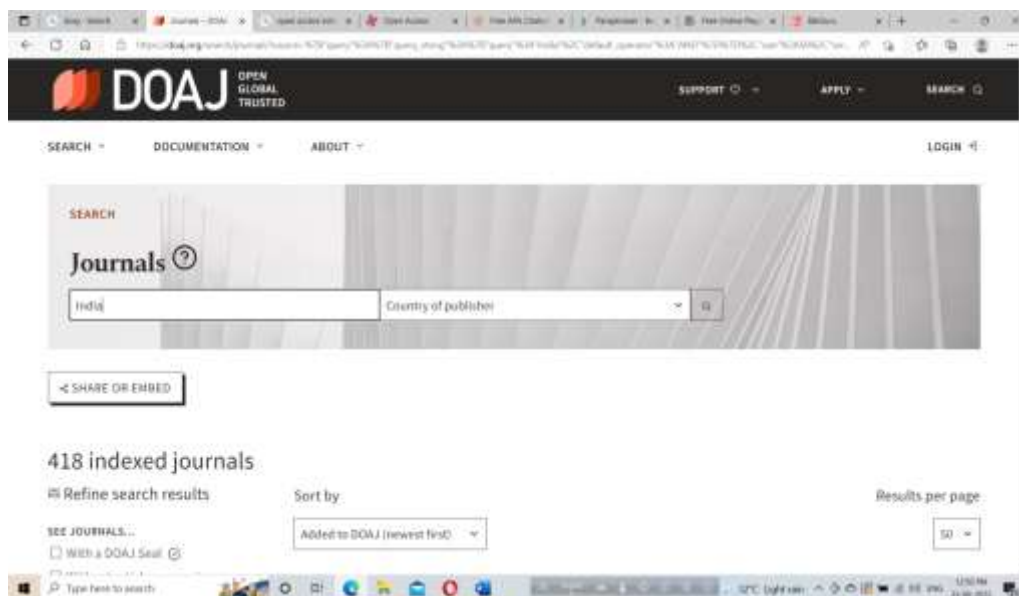
- In Pub Med, 120,676 Indian journals were found till June 2022 having free full text access.
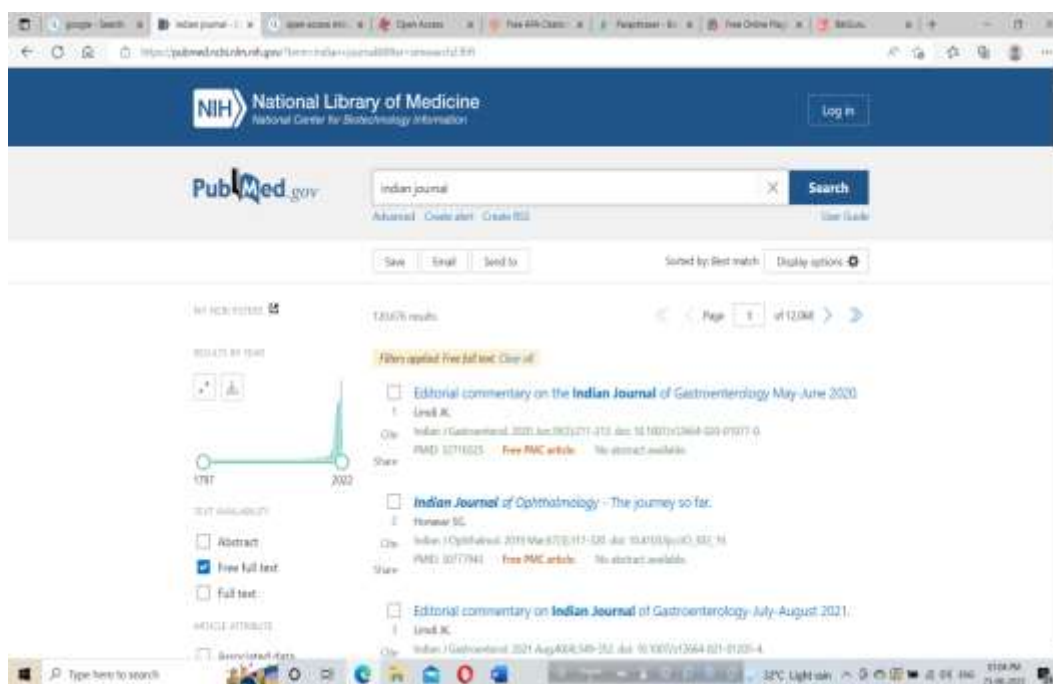
- In 2017, Open Access India had developed and recommended a draft 'National Open Access Policy' to the Ministries of Human Resource Development and Science & Technology. (Wikipedia contributors, 2022)

- In 2018, "The University Grants Commission's thesis repository, Shodhganga, an initiative of Ministry of HRD, encourages the authors to tag the submissions with Creative Commons Licence Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0)" (Wikipedia contributors, 2022)

- In 2020, 'Science, Technology and Innovation Policy' (Government of India Ministry of Science & Technology Department of Science & Technology, draft) recommend to make preprints and post prints available through a central repository. (Wikipedia contributors, 2022)

- In 2022, IndiaRiv re-Inaugurated using 'Open Preprint Systems' of 'Public Knowledge Project'. (Ramesh, 2022)

Conclusion:

Open Access Initiative wins the attention of National and International levels. There are many open access initiatives at the national level that provide free and uninterrupted access to scientific communication. It will improve the quality and standard of research and also will minimise the digital divide. Many people are doing research to establish the importance of OA. Open access to academic journals is beneficial to scholars and has extensive support. As a concept, it requires a viable revenue model and a great deal of commitment from

sponsors.Instead of persuading the journal publisher, we need to focus primarily on producing open repositories.Although we see that the open access movement has grown steadily and has continued to garner support, especially within the academic research community, we have yet to realize the original vision of research knowledge being shared widely and free of charge. Publisher paywalls still exist and many institutions still make tenure and promotion decisions based on publication in established and more traditional journals. In India, UGC supports and promotes open access initiativesthrough INFLIBNET, an inter-university centre.ShodhGanga, Shodhgangotri, The institutional repository, e-PGPathhala, (INFLIBNETinitiative).

The growth of **open research** brings with it greater opportunities for collaboration and communication within and across disciplines. The work of academic researchers is enhanced when there are opportunities to discuss the research with peers and collaborate on projects. Open research opens up new paths for collaboration which can become a much-needed support, especially early in a career. Researchers from smaller institutions may not have access to a group of peers within their discipline. As we move into the future and open access datasets and data analyses become more available, they provide early career researchers (ECRs) with models of how research studies can be conducted and disseminated. In addition, open access datasets provide researchers with data for their own studies, which may be difficult to collect, especially as they are just beginning their careers.

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Movie Recommendation using User-Aware Clustering

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Abstract

All product driven sites are using recommendation system for enhancing their businesses. A very common method to recommend products to a user *X* is by finding a set *U* of users having similar tastes and preferences to *X*, and then recommending products to *X* which have been appreciated by the users in *U*. This approach is called collaborative filtering and is a very popular technique for recommendation. Collaborative filtering methods can be efficiently implemented using clustering techniques. Clustering approach creates groups of users based on some criteria. The criteria can be demography, time or rating of a product, but the preferences of an individual user are often ignored while forming the clusters. If we consider age as a clustering criteria, then users falling under an age range is grouped together, and collaborative filtering algorithm is

implemented on the group to find similar users. But falling under the same age group may not always reveal the real taste of an individual. In this work, we propose an approach to make the recommendation algorithm user-aware by clustering the users of the system on the basis of a criterion which would also take users' preference into consideration. Collaborative filtering which is not user aware may lead to finding correlation between vastly dissimilar users, which might actually be wastage of time for something that will cause inaccurate recommendation. The experiments conducted on the MovieLens-10M dataset produced encouraging results, which validates the efficacy of the proposed approach.

1. Introduction

Recommendation system works on huge datasets, and therefore clustering techniques are used to achieve faster recommendations [1, 2, 3]. Users are divided and put into various clusters according to some specified criteria. In recommendation systems, a general trend is to first cluster the users based on their ratings of a product, demography, time and age [4, 5]. Then, after clustering, typically a collaborative filtering algorithm is applied within the clusters to find similar users in the cluster, and finally, products are recommended to a target user on the basis of the choices of similar users [6, 7]. However, the clusters formed using the above mentioned criteria are typically not user-aware. They are standalone clusters where users are included based on criteria of the clusters only, but without considering any characteristics of an individual user. Sentiment analysis is an upcoming trend in the recommendation system, where the comments and reviews of users are analyzed to find what the user would really prefer, but rating, reviews

and comments of a user cannot be considered as an independent parameter as the product and its quality determines the comments and the reviews [8]. For example, say we have a user X aged 25 years. X likes action movies more than adventure movies. Now, X has watched some action movies and some adventure movies and has given low ratings to more than a few action movies because he did not much like the movies he watched, whereas he liked the adventure movies he watched and has given high rating to those adventure movies. Now User Y, also aged 25 years, prefers adventure movies over action movies. Y has given high rating to more than few adventure movies, and low rating to action movies, which also synchronizes with his preference for the genres.

In the above example, firstly, the rating of user X does not represent his preference of the movie genre he likes to watch, because in practice, rating is not an independent parameter. Rating of a movie depends on the direction, the plot, the acting involved with the movie, which is the product in consideration here, in other words it can be said that product quality is one of the factors that affects the rating. Thus rating cannot be considered as a fully user-aware parameter because rating is steered by conditions which are beyond user preferences. Secondly, let us assume that the clustering criterion used is age. By that criterion, user X and user Y might be put into the same cluster. Collaborative filtering in the above cluster will rank user X and user Y high in similarity and recommend adventure movies to user X, but as it has been stated, user X prefers action movies more than adventure movies in general, so X would have rather preferred some action movies in the recommendation list. Therefore, clustering based on age is also not user-aware, and clustering based on such a criterion puts all users of the same age group in the same cluster, remaining unaware of users' choices. Therefore, in this paper, we are trying to propose forming user-aware clusters, i.e., clusters based on an independent parameter of user

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preference, such that when users are put into a cluster, it is solely based on their choice for being in that cluster.

2. Literature Review

When implementing a recommender system, Collaborative Filtering (CF) [1, 3] is the most commonly used technique. Memory based and model based are the two common categories of CF systems.

In memory based systems [9, 10], we find a set of K users who are most similar in terms of product usage and ratings to the target user and then predict the ratings of the products unused by the target user on the basis of the ratings of those similar users. On the contrary, model based systems [11, 12] use machine learning or data mining techniques to compute a model on the basis of the available data and then the model is used to predict the unknown ratings.

CF technique though very popular, has to overcome the challenge arising out of the fact that users normally give ratings to only a small portion (less than 1%) of the available items and as a result, majority of the entries in the rating matrix remain blank. This sparse nature of the rating matrix hampers the accuracy of the predicted rating. Also, as CF algorithms require similarity computations among users or items, this computation becomes extremely costly when the number of users and items grows rapidly. Modern e-commerce websites may suffer serious problems if this scalability issue is not addressed properly in the underlying recommendation algorithms.

In order to address the sparsity and scalability problems, clustering techniques were proposed. Generally, two types of clustering are used – one on the basis of the users [13, 14] and the other on the basis of the items [15] present in the dataset. There has also been some work on simultaneous clustering of users and items [16]. Sarwar et al. proposed a k-means based user

clustering strategy to group users into different clusters [13]. The recommendation work is performed by constraining the neighborhood of the target user within the cluster he/she belongs. In the user clustering based approach proposed by Torres and Mendoza [17], the authors combined the benefits of memory based CF and clustering based CF methods by proposing a novel distance metric that can compute a neighborhood within as well as outside the cluster frontiers. Moreover, their approach is also scalable as it can be easily integrated in a parallel setup, which reduces the computational cost significantly. Recently, Selvi and Sivasankar proposed a modified k-means based recommendation algorithm, where the most influential data points (users) in a cluster that are needed to provide accurate recommendations, are chosen on the basis of an adaptive artificial neural network (ANN) [18].

In typical item-based clustering methods, the distance function used to compute the similarity between two items depends on the co-rated items, i.e., the users who have rated both the items. However, in a sparse environment, there exist very few co-rated items, which may compromise the recommendation accuracy. To deal with this sparsity issue, Deng et al. proposed a clustering scheme where distance between two items is computed utilizing the entire set of user ratings and thus avoiding the use of only co-rated items [19]. The similarity between two items is calculated on the basis of Kullback-Leibler divergence from the perspective of item probability distribution and k-medoids based clustering algorithm is implemented for forming item clusters. A smoothing-based CF method was introduced by Xue et al. [20] for data smoothing and neighborhood selection on the basis of the clusters generated from the training data. Combining the advantages of both memory-based and model-based CF, they achieved more precise recommendations with enhancement in scalability. A multiclass co-clustering model (MCoC) was presented by Xu et al. [16] to improve the performance of CF based systems. Rather than

confining each user and item into one cluster, they proposed more than one user-item clusters and indicated that better recommendation quality may be achieved if recommendations are produced using the correlated clusters and not the entire rating matrix. Recently Feng et al. proposed a scalable parameter-free approach for co-clustering items and users simultaneously [21]. Once the clusters are determined, existing CF based algorithms like item-based CF are executed in each cluster for providing recommendations. User-item relations were represented using a bipartite network, which is then used for co-clustering the users and items.

Clustering on the basis of movie genres to improve prediction accuracy and reduce the computational cost was proposed by Fremal and Lecron [22]. There is a cluster for each movie genre and movies are placed in different clusters according to the genres they belong to. Since a movie can be a part of several clusters (being from multiple genres) and as each cluster provides its own rating prediction, weighting techniques are used to reduce these results into one final evaluation. In order to limit the dimensions of the product space involved in e-commerce applications, Liao and Lee [23] proposed a self-constructing clustering model. Recommendations are generated using the individual clusters and then a re-transformation is performed to offer a list of suitable products as recommendations to each user. A new approach of recommendation using multi-type clustering was proposed by Ma et al. [24]. Two user clustering methods: trust based and similarity based along with one item based clustering are systematically combined to further enhance the recommendation accuracy. The work proposed in this paper is closely related to the clustering based recommendation approaches. Most of the clustering approaches discussed above use only the ratings as the basis of clustering. However in this work, we implement clustering by utilizing both the ratings and tags assigned by the users to their preferred movies.

3. Our Contribution

Every product exhibits properties. From the set of properties of a product, we propose to identify a property or a vector of properties with finite cardinality, which would indicate unbiased user preference and then that single property or vector of properties can become the clustering factor for the users. Clustering based on a user-aware parameter would help the recommender system to converge towards a target user's paradigm of choices. For example, if the product is restaurant, then cuisine is a property that can be considered as an independent parameter for users' choices, whereas for products like books and movies, genre can be considered as an independent parameter. In our work, we propose a movie recommendation system that creates clusters on the basis of the preferred genre(s) of a user. Every target user prefers movies from specific genres and tends to watch movies from the set of preferred genres. Most of the movie recommendation sites classify movies based on a finite number of genres that does not change dynamically. Thus the genre of a movie can be considered as a property with finite cardinality that projects preference of an individual without the influence of how a movie is.

4. Clustering Scheme

In clustering based recommendation system, clustering is normally done once (offline). Thus it enhances the scalability of the system while providing online recommendations. Movie recommendation systems typically work with a fixed set of genres under which they categorize the movies. Let's say, the set of genres is G, where $|G| = n$. So we can have n clusters where each cluster contains users who have preferences for movies of that particular genre. For example, if G = {Action, Comedy, Romance, Adventure, Thriller, Sci-fi}, then $|G| = 6$, and thus our proposed system would have 6 clusters. We have presented a sample movie preference of a few users in Table 1. As given in Table 1, User1 has seen 4 movies in total, out of which 3 movies

fall under adventure genre. Therefore we can conclude that 75% of the movies seen by User1 fall under adventure genre.

Table 1: Sample movie preferences of four typical users

User	Movie Name	Genre
User1	Saturn 3	Adventure, Sci-Fi, Thriller
	Excalibur	Action, Romance
	Total Recall	Action, Adventure, Sci-Fi, Thriller
	Tarzan, The fearless	Action, Adventure
User2	12 Monkeys (Twelve Monkeys)	Sci-Fi, Thriller
	Sudden Death	Action
	GoldenEye	Action, Adventure, Thriller
	Mirage	Acton, Thriller
User3	You So Crazy	Comedy
	Airheads	Comedy
	Barcelona	Comedy, Romance
	Another Stakeout	Comedy, Thriller
User4	Blink	Thriller
	Blown Away	Action, Thriller
	Another Stakeout	Comedy, Thriller
	12 Monkeys (Twelve Monkeys)	Sci-Fi, Thriller

Table 2: Summary of the genre preferences of users (% of movies watched in each genre)

Genre	User1	User2	User3	User4
Adventure	**75**	25	0	0
Sci-fi	50	25	0	25
Thriller	50	**75**	25	**100**
Action	**75**	**75**	0	25
Romance	25	0	25	0
Comedy	0	0	**100**	25

In Table 2, each cell indicates percentage of movies watched by user u in genre category g where g belongs to the set M$ovieGenre$= {Action, Comedy, Romance, Adventure, Thriller, Sci-fi}. Note that summation of each column of Table 2 will be greater than equal to 100, where $Movie_u$ is the set of movies watched by user u and $MovieGenre_m$ are the genre categories of movie m, i.e.,

$$\sum_{\forall m\ in\ Movie_u} |MovieGenre_m| \geq |Movie_u|$$

Now, considering the rows, each row gives

$$rowsum = \sum_{\forall u} percentage\ of\ movies\ watched\ by\ user\ u\ in\ the\ genre\ g$$

where $u \in$ {User1, User2, User3, User4}

Since the user preferences have been considered independently, $\forall g \in MovieGenre$, rowsum = 0 if no user has watched movies in genre g, and rowsum = $|u|$ * 100 if every movie watched by u falls under g.

From the above data presented in Table 2, it can be concluded that irrespective of how the movies were, User1 likes movies under genre adventure and action, because 75% of the movies he watched were from adventure and action genre. Similarly, User2 has seen 75% of the movies from thriller and action category. All the movies watched by user3 belongs to comedy and all movies watched by user4 are thriller movies, however, as some movies belong to multiple genres, some other cells in the columns for User3 and User4 have non-zero entries. If we consider a threshold value of 75% and above, then User1 is included in the clusters of action and adventure and User2 is included in cluster of thriller and action, user3 in comedy only and user4 in thriller only. The algorithm for the clustering approach discussed above is presented in Algorithm 1 and is pictorially represented in Figure 1.

From the above examples, we can state that not only did the clusters converge towards preferences of the users; even users with similar preferences for action movies were also clustered together tending towards more similar users being grouped together which expected to give more precise recommendations.

Fig 1: Pictorial representation of the clustering scheme based on example given above
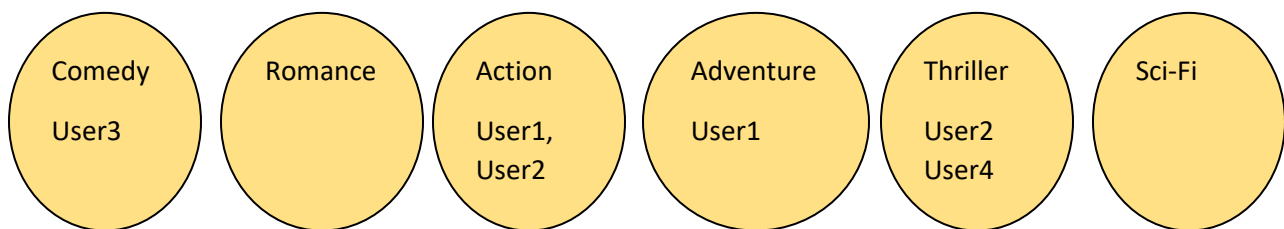
Algorithm 1: Clustering the Users

Input: Set of users U, set of products P, set of user-aware properties G, threshold value T

Output: n = |G|, clusters of users based on product property

Step1: |G| number of clusters of users are formed

Step2: For each user u in U, do

Step3:   For each g in G, do

Step4: $sum_g = 0$

Step5:   For each product p in P_u used by u, do

Step6:   For each g in G, do

Step7   If g is a property of p then $sum_g = sum_g + 1$

Step8   End

Step9   End

Step10:   For each g in G, do

Step11: $agv_g = sum_g / |P|$

Step12:   If $avg_g \geq T$ then include u in cluster g

Step13   End

---

5. Recommendation Scheme

In our work, we have used user-user collaborative filtering, where correlation between the users have been calculated using Pearson Correlation. Given below is the Pearson Correlation formula: Suppose we have two users *up* and *uq*, the Pearson's correlation coefficient similarity between them are calculated using following equation:

$$\text{sim}(up, uq) = \frac{\sum_{i \in I}(r_{up,i} - \bar{r}_{up})(r_{uq,i} - \bar{r}_{uq})}{\sqrt{\sum_{i \in I}(r_{up,i} - \bar{r}_{up})^2}\sqrt{\sum_{i \in I}(r_{uq,i} - \bar{r}_{uq})^2}}$$

Here, I is the set of items rated by both users *up* and *uq*. $\bar{r}_{up}$ and $\bar{r}_{uq}$ are the average ratings given by up and uq while $r_{up,i}$ and $r_{uq,i}$ are respectively ratings of user *up* and user *uq* on item *i*. For all the users having a Pearson correlation greater than a threshold value T with user *u*, prediction for the target user *u* for an item *p* is calculated as:

$$\text{Pred}_{u,p} = \bar{r}_u + k \sum_{j=1}^{n} sim(u,j)(r_{j,p} - \bar{r}_j)$$

Here, *n* denotes the number of users similar to *u*, while $\bar{r}_u$ and $\bar{r}_j$ represents the average rating of user u and its neighboring user j respectively. *k* is a normalizing factor and *sim(u, j)* calculates the correlation or similarity between *u* and *j*.

After prediction, the Root Mean Square Error (RMSE) [25] for the training set is calculated. Three sets of results for each user have been calculated with the threshold Pearson correlation being taken as 0.55, 0.65 and 0.75.

Algorithm 2: Recommendation Algorithm

Input: Pearson correlation threshold T, set of users U

Output: RMSE of predicted recommendation for every cluster

Step1: for each user c in U do

Step2:   Find the set of clusters CL where c has been included

Step3:   For each cluster L in CL, do

Step4:   For each user l in L, do

Step5:   Find $PC_{c,l}$ // $PC_{c,l}$ = Pearson correlation between c and l

Step6:   if $PC_{c,l} > T$, then consider l as a similar user and recommend movies

                                   to c based on choice of l, and calculate RMSE

Step7:   End

Step8:   End

Step9: End

6. Experimental Setting

We conducted several experiments to evaluate the effectiveness of the proposed method. In this

section, we describe the experimental settings in detail.

6.1 Data description

We have tested our algorithms on a sample dataset of MovieLens-10M [26]. The dataset contains

10000054 ratings from 71567 users on 10681 movies. These ratings are integers on a scale from

1 to 5. Note that, ML-10M dataset includes only those users who have rated at least 20 movies.

The dataset contains movies on 18 genres. The genres for this dataset are: Action, Adventure,

Thriller, Sci-Fi, Horror, Comedy, Romance, Children, Fantasy, Drama, IMAX, Crime, Mystery,

Animation, War, Musical, Film Noir, and Western. Since there are 18 genres, our algorithm

forms 18 clusters.

6.2 Evaluation metrics

In order to evaluate the accuracy of our proposed recommendation approach, RMSE (Root Mean Square Error) metric has been used. We have calculated RMSE for every target user. RMSE for a user u considering a cluster CL is defined below.

$$RMSEu, CL = \sqrt{\frac{\sum_{j=1}^{n}\left(ratingA_{u,j} - ratingP_{u,j,CL}\right)^2}{n}}$$

Here, $ratingA_{u,j}$ is the original rating given by a user u to movie j and $ratingP_{u,j,CL}$ is the predicted rating of user u for movie j calculated by the algorithm on the basis of similar users in cluster CL, and n is the total number of movies rated by u. Lower RMSE values denote better prediction accuracy.

7. Results and Discussion

We have reported the accuracy results of our experiments performed on ML-10M dataset using different correlation values in Tables 3, 4 and 5. Table 3 and Table 4 reports the RMSE values of 2 sample users 'A' and 'B', and in Table 5 we have reported the average RMSE values across all the users of the dataset. We see from the these tables that the clustering approach followed in this paper has given quite good values for RMSE – being consistently less than 0.5 and only once crossing the popular threshold of 0.5. So, the results indicate that this clustering scheme may be considered for recommendation.

Table 3: RMSE data for user A

Pearson Correlation	RMSE
0.55	0.48675
0.65	0.45382
0.75	0.41759

Table 4: RMSE data for user B

Pearson Correlation	RMSE
0.55	0.51374
0.65	0.47871
0.75	0.43637

Table 5: Average RMSE of the sample dataset

Pearson Correlation	RMSE
0.55	0.47687
0.65	0.44721
0.75	0.41351

8. Conclusion and Future Scope

A clustering parameter has been termed as user aware if the parameter independently determines the preference of a user. The parameter does not necessarily involve any sentiment analysis because the parameter so used portrays a user's choice without any influence of mood, time or quality of product or any other external factors. One way of clustering movies without having the influence of ratings in the clustering system is based on the genre of the movie. In such a clustering scheme, movie as a product is not playing any role. The advantage of this method is that the clustering brings the algorithm closer to user choices and clusters users with similar tastes together. Another advantage of this clustering is that there are no issues of the outliers because the clustering used in the system only uses the concept of inclusion. There is no cluster

center or concept of distance from cluster centers. A disadvantage of the method is that the clustering is based on a feature of the product, if only that feature can be treated as an independent parameter. The problem will arise in case of such products that will not readily give the option of such features. Secondly, the clustering of users is product centric, that is, when the product changes the clustering would also change. Comparative study of the algorithm remains part of future scope of the research. Secondly, in the paper we have only put the users in the best clusters or clusters with their top preference. Consideration of second or third choice in case of genres has not been included. This might be a concern if the product is something else other than movie, which again lies as part of future scope of this research.

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ARTICLES IN BENGALI

সরস্বতী : একনামেদুইঅঙ্গ

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'সরস্বতী' পদটি আমাদের কাছে বহুল প্রচলিত। পদটি শুনলেই বর্তমানে শুধু দেবী মাহাত্ম্যটিই বারংবার আমাদের মনে ধরা দেয়। কিন্তু সরস্বতী কি শুধুই একজন দেবী হিসেবে বরাবর পূজিত হয়েছেন? নাকি এর বাইরেও তাঁর অন্য কোন পরিচয় বা তাৎপর্য রয়েছে সেটিই আমার এই শোধপত্রের বিষয়। এখানে আমি চেষ্টা করেছি বৈদিকযুগও তার পরবর্তী যুগে সরস্বতীর কি মাহাত্ম্য ছিল, বা কি কি রূপে তাকে দেখা হয়েছে সেটি সংক্ষেপে তুলে ধরার। সেখানে বেদে একাধারে যেমন সরস্বতীকে কখনো যজ্ঞেরঅগ্নিরূপে, কখনো বা সূর্যের রশ্মি কিংবা তেজের সঙ্গে তুলনা করা হয়েছে, আবার কখনোতাকে ধনদাত্রী কিংবা অন্নদাত্রী রূপেও কল্পনা করা হয়েছে। আবার সেই একই বেদেই কখনো কখনো সরস্বতীকে আর্যভুমির অন্যতম প্রধান নদী হিসেবেও কল্পনা করা হয়েছে। শুধু বেদেই নয় , এই সরস্বতী নদীর বিভিন্ন আখ্যানের উল্লেখ আমরা বৈদিক পরবর্তী যুগের পুরাণগুলিতে এবং মহাভারতেও পাই। এই শোধপত্রে বিভিন্ন পুরাণের দৃষ্টিভঙ্গি থেকে আমরা এই চিরকালীন সরস্বতীর বিভিন্ন রূপগুলি উন্মোচন হতে দেখব।

প্রাসঙ্গিক শব্দসমূহ:সরস্বতী, দেবী, অগ্নি, তেজ, নদী

সূচনাঃ

'সরস্বতী'এই শব্দটি উচ্চারিত হলে প্রথমেই যেটি আমাদেরমনে আসে তা হল জ্ঞানের দেবীবাবিদ্যারদেবী।যাঁকে আমরা বাগ্দেবীনামেও আরাধনা করে থাকি।'বাক্'- এরঅর্থহল'শব্দ'। পুরাণও পুরাণোত্তর আধুনিক কালে বাক্ বাজ্ঞানের অধিষ্ঠাত্রী দেবী রূপে সরস্বতী প্রসিদ্ধা। এইসুপ্রসিদ্ধা দেবীকে নিয়ে সুদীর্ঘ আলোচনা বৈদিক কাল থেকেই প্রচলিত।একাধারে তিনি যেমন আজ জ্ঞানদাত্রী ঠিকই, কিন্তু এই সরস্বতীর শুধু দেবীমাহাত্ম্যটাই কি সব?এইপ্রশ্নবহুবারআমাদেরসামনেউঠেএসেছে।আমরা সকলেই অল্পবিস্তর জানি যে তাকে সর্বপ্রথম বেদেই বারংবার নদী রূপেও কল্পনা করা হয়েছে।

বেদে পুরুষ দেবতার তুলনায় নারী দেবতার সংখ্যাএবং তাদের প্রাধান্য অনেকাংশেই কম।তবুও স্বল্প সংখ্যক নারী দেবতার মধ্যেযাঁরাযাঁরা প্রাধান্য লাভ করেছেন তারা হলেন অদিতি, ঊষা এবং সরস্বতী।ঋগ্বেদেউক্তহয়েছে-

"ভারতীড়েসরস্বতীযাবঃসর্বাউপক্রবে।

তান্শ্চোদয়তশ্রিয়ে।"[আচার্য শর্মা শ্রীরাম (সম্পা.), (২০০৫), ঋগ্বেদ সংহিতা (ভাগ-১), যুগ নির্মাতা যোজনা প্রেস, (১/১৮৮/৮), ⬜ ⬜ ২৮৫]

অর্থাৎ এর ⬜⬜⬜⬜⬜অগ্নিরূপা ভারতী, সরস্বতী ⬜ ⬜ ইলা⬜ ⬜⬜⬜⬜⬜আহ্বান জানানো হচ্ছে।এটিকিন্তুলক্ষ্যণীয়বিষয়যে, আমাদেরপরিচিতএতদেবীদেরমধ্যেএকমাত্রসরস্বতীরউল্লেখইবেদেরয়েছে।আচার্য

সায়ণ, যাস্ক প্রমুখ ভাষ্যকারগণএই দেবীত্রয়কে অগ্নি বা আদিত্য রূপে গ্রহণ করেছেন। সায়ণাচার্য এইতিন দেবীকেদ্যুলোক, ভূলোক ও অন্তরীক্ষলোকেঅবস্থিত অগ্নি রূপে অর্থাৎ যথাক্রমে সূর্য, অগ্নি ও বিদ্যুৎ এই তিনটি রূপে ব্যাখ্যা করেছেন।কোথাও বা এইতিন দেবীকে তিনটি যজ্ঞেরঅগ্নি রূপেও আরাধনা করা হয়েছে।যজ্ঞাগ্নিরূপাএইতিন দেবী এক এবং অভিন্ন রূপে স্বীকৃত হয়েছেন। একইভাবে সূর্যওঅগ্নির অভিন্নতা হেতু এরা সূর্যেরওতেজ কিংবাজ্যোতিরূপেস্বীকৃত হয়েছিলেন।সেই জন্যই এইদেবীত্রয় সূর্যরূপীইন্দ্রেরপত্নী রূপে কল্পিত হয়েছেন এবং পরবর্তীকালেদেবী সরস্বতী, ব্রহ্মা বা সূর্য-বিষ্ণুর পত্নীতেওপরিণত হয়েছেন।এছাড়াওবিভিন্নপুরাণে সরস্বতীকে 'ভারতী' নামেও আখ্যায়িত করা হয়েছে।এখনও সেই একই প্রথা লক্ষ্য করা যায়।অদিতি, ঊষা এবং সরস্বতীএইদেবীগণকেত্রিস্থানস্থিতবাক্‌রূপেওআখ্যায়িত করা হয়েছে।পূর্বেইবলাহয়েছেসরস্বতী যে যজ্ঞেরদেবী তা ঋগ্বেদের বেশ কয়েকটি মন্ত্র থেকে সুস্পষ্ট।এছাড়াও কোথাও বা সরস্বতীকে পবিত্রতারপ্রতীকরূপে,কোথাওঅন্নদাত্রী ও কোথাও বাধনদাত্রীরূপেও বারংবার আরাধনা করা হয়েছে।ঋগ্বেদেইআমরাপাই-

"পাবকাঃনঃসরস্বতীবাজেভিির্বাজিনীবতী।

যজ্ঞংবষ্টুধিয়াবসুঃ।।"[আচার্য শর্মা শ্রীরাম (সম্পা.), (২০০৫), ঋগ্বেদ সংহিতা (ভাগ-১), যুগ নির্মাতা যোজনা প্রেস, (১/৩/১০), □ □ 8]

"চোদয়িত্রীসুনৃতানাংচেতন্তীসুমতীনাম্‌।

যজ্ঞংদধেসরস্বতী।।" [আচার্য শর্মা শ্রীরাম (সম্পা.), (২০০৫), ঋগ্বেদ সংহিতা (ভাগ-১), যুগ নির্মাতা যোজনা প্রেস, (১/৩/১১), □ □ 8]

"মহোঅর্ণঃসরস্বতীপ্রচেতয়তিকেতুনা।

ধিয়োবিশ্বাবিরাজতি।।" [আচার্য শর্মা শ্রীরাম (সম্পা.), (২০০৫), ঋগ্বেদ সংহিতা (ভাগ-১), যুগ নির্মাতা যোজনা প্রেস, (১/৩/১২), □ □ 8]

এইঋকগুলিরঅর্থহল- দেবীসরস্বতী; যিনিসকলকেপবিত্রতাপ্রদানকরেন, যিনিসকলকেপুষ্টিদানকরেনএবংযিনিবুদ্ধিপূর্বককৃতকর্মেধনপ্রদানকরেন, তিনিযেনআমাদের (যজমানের) যজ্ঞকেসফলকরেন।যেদেবীসদাসত্যবচনেরপ্রেরণাদিয়েথাকেন, এবংযিনিভালোমানুষদেরসুমতিপ্রদানকরেন, এছাড়াওযিনিনদীরূপেপ্রবাহিতহয়েজলপ্রদানকরেনএবংযারাশুভকর্মকরেথাকেনতাদেরবুদ্ধিকেআরওপ্রখরকরেতোলেন, সেইদেবীসরস্বতীযেনআমাদের (যজমানের) যজ্ঞকেসফলকরেন।

আবার কোন কোন ঋকে বলা হয়েছে সরস্বতী দ্যাবা পৃথিবী ব্যাপ্ত করে থাকেন।তিনি তাঁর নিজের দীপ্তি দ্বারা স্বর্গ,মর্ত, অন্তরীক্ষ লোককে দীপ্তিময় করেতোলেন।অর্থাৎ স্বর্গ, মর্ত, অন্তরীক্ষ এই তিন লোককে যিনি নিজের দীপ্তি দ্বারা পূরণ করেন তিনি যে অবশ্যই সূর্য বা সূর্যের কিরণ হবেন তা বলা বাহুল্য। সুতরাং সরস্বতী কেবল অগ্নি নন, তিনি স্বয়ং সূর্যের তেজস্বরূপওবটে।একটিব্রাহ্মণের উপাখ্যানেও দেখা যায় যে সেখানে সরস্বতীর সঙ্গে আদিত্যের একটি সম্পর্ক প্রতিষ্ঠা করা হয়েছে।সেখানে দেখানো হয়েছে মর্তের আদিত্য অর্থাৎ অগ্নিকে, স্বর্গে বাদ্যুলোকে প্রতিষ্ঠা করতে সরস্বতী বক্রহয়েছেন।এখানে জ্যোতির্ময় সরস্বতীর নদীরূপতাপ্রাপ্তির একটি ইঙ্গিত রয়েছে।'সরস্‌'শব্দের প্রকৃত অর্থ'জ্যোতি'অর্থাৎ আলোকময়ী বলেই তিনি সর্বশুক্লারূপেবর্ণিতহয়েছেন।আবার কোথাও কোথাও দেখা যায় তিনি বৃষ্টির দেবতা ইন্দ্রের পত্নী এবং তিনি নিজেও জল বর্ষণ করে থাকেন।এভাবেই দেখা যাচ্ছে যে ঋগ্বেদেরকোথাওসূর্যাগ্নিরদুতিরূপেআবারকোথাওবানদীরূপে;এইদুটি রূপেই সরস্বতীর ধারণা বারবার প্রকাশিত

হয়েছে।ঋগ্বেদের যুগে সরস্বতীও সিন্ধু নদীর পুনঃ পুনঃ উল্লেখ থেকে অনুধাবন করা যায় যে এই দুটি নদী তৎকালীন যুগে বিশেষ প্রাধান্য লাভ করেছিল এবং এই দুইটি নদীর মধ্যেও আবার সরস্বতী অধিকতররূপেস্তুতা হয়েছেন। তাই বলা যায় যে সরস্বতী আর্যভূমির সর্বপ্রধান নদী ছিল।সরস্বতী কে উদ্দেশ্য করে ঋগ্বেদের আরেকটি সুবিখ্যাত মন্ত্র হলো-

"অম্বিতমে, নদীতমে, দেবিতমেসরস্বতি।

অপ্রশস্তা ইব স্মসি প্রশস্তিমম্ব নস্কৃধি।।" [আচার্য শর্মা শ্রীরাম (সম্পা.), (২০০৫), ঋগ্বেদ সংহিতা (ভাগ-১), যুগ নির্মাতা যোজনা প্রেস, (২/৪১/১৬), □ □ ৬১]

এইসরস্বতী নদীর তীরে প্রসিদ্ধ রাজারা বাস করতেন এমনটাই সর্বত্র বর্ণিত হয়েছে এবং সুপ্রসিদ্ধ পঞ্চজাতিও সেখানে বসবাস করত এমনটাও বর্ণনা করা হয়েছে।মনেকরাহয়একসময় এই নদী সরস্বতী হিমালয় থেকে উৎপন্ন হয়ে স্বাধীনভাবে প্রবাহিত হয়ে সাগরে পতিত হয়েছিল। এ প্রসঙ্গে একটি কথা বলে রাখা দরকার যে শুধু জল নয়, জলের মত সূর্যের রশ্মিও কিন্তু গতিশীল।অতএব সূর্যের জ্যোতিরূপা এবং জলময় সরস্বতীর গতিশীলতা দুটিইএখানে বহাল রইল।পরবর্তীকালে মহাভারতে, পুরাণে এবং বিভিন্ন কাব্যে যেখানে সরস্বতীপুনরায়স্তুতাহয়েছেন,সেখানে সরস্বতী যে প্রধান এবং সর্বাপেক্ষা গুরুত্বপূর্ণ একটি নদী ছিল তা বিভিন্ন উল্লেখ থেকে আমাদের কাছে পরিষ্কার।তবেমহাভারতের পূর্বেই এই সরস্বতী অদৃশ্য হয়ে গেছে এমনটা ধরে নেওয়া জেতেই পারে।কারণ মহাভারতে কিন্তু বারংবার সরস্বতীর অদর্শনের এক প্রকার উল্লেখ পাওয়া যায়। মনে করা হয় যে রাজপুতানার মরুভূমিতে সরস্বতী তার গতি হারিয়ে ফেলেছিল।কিন্তু সমগ্র স্রোতধারা তখনও হয়তো বিলুপ্ত হয়ে যায়নি। বর্তমানেও বহু ঐতিহাসিকগণ, ভূ-তাত্ত্বিকগণ, প্রত্নতাত্ত্বিকগণ বিভিন্নভাবে উন্নত স্যাটেলাইট ব্যবস্থা ইত্যাদির মাধ্যমে এখনও সরস্বতীনদীকে নিয়ে নিরন্তর খোঁজ চালিয়েযাচ্ছেন।অতএব এখনওযে সরস্বতীকে নানা দৃষ্টিভঙ্গি থেকে ব্যাখ্যা করার একটা চেষ্টা হয়েচলেছেতাবলাবাহুল্য। আমি আমার এই শোধপত্রে বিশেষ কিছু পুরাণের দৃষ্টি দিয়ে নদীরূপা সরস্বতীর একটা চিত্র তুলে ধরারসামান্য প্রচেষ্টা করেছি।

সাহিত্যপর্যালোচনাঃ

আমিআমারএইশোধপত্রেঋগ্বেদেরকিছুমূলমন্ত্রএবংকিছুকিছুনির্বাচিতপুরাণেরভিত্তিতেসরস্বতীররূপটিকেতু লেধরারচেষ্টাকরেছি।এরজন্যআমিঋগ্বেদেরও নির্বাচিত পুরাণগুলিরকিছু প্রাথমিক উৎস (Primary Source) এবংকিছুগৌণসম্পদবাউৎসের (Secondary Source) সাহায্য নিয়েছি।

গবেষণা পদ্ধতিঃ পূর্বেই বলেছি যে এই শোধপত্রেমূলঋগ্বেদেরও কিছু নির্বাচিত পুরাণের প্রাথমিক উৎস (Primary Source) এবংকিছুগৌণউৎসের (Secondary Source) □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ ওপরভিত্তিকরেবিশেষপর্যবেক্ষণওবিশ্লেষণেরমধ্যদিয়ে আমি আমার দৃষ্টিভঙ্গিকে এখানে উপস্থাপন করার একটা ছোট প্রয়াস করেছি।

আলোচনাঃ অধিকাংশ পুরাণেই সর্বপ্রধান তিনটি নদীর নাম উঠে এসেছে, সেইতিনটিনদীহল গঙ্গা, সিন্ধু এবং সরস্বতী।সেখানে বিশেষত সরস্বতী নদীকে নির্ভর করে; তার তীরে তীরে গড়ে ওঠা নানা প্রসিদ্ধ তীর্থক্ষেত্রের নাম পাওয়া যায়। এছাড়াও বহু গিরি, পর্বত, প্রদেশ, জনজাতি প্রভৃতিরও উল্লেখ সেখানে রয়েছে।

ব্রহ্মাও পুরাণ একটি অন্যতম গুরুত্বপূর্ণ পুরাণ। সেইব্রহ্মাও পুরাণেরঊনপঞ্চাশতম অধ্যায়েরআলোচনায় দেখা যায় যে সেখানে ভারতবর্ষেরভূখণ্ডেরবিস্তৃতবর্ণনারয়েছে।সেখানেদেখাযাচ্ছেযেসরস্বতী নদীর তীরে মন্দর,

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মৈনাক, বিদ্যুৎ, পাণ্ডুর ইত্যাদি বিভিন্ন পর্বতাদি রয়েছে। এছাড়াও অন্যান্য অনেক ক্ষুদ্র ক্ষুদ্র পর্বতেরওবর্ণনা রয়েছে। সেই পর্বত সমাকীর্ণ দেশগুলোতেআর্যওম্লেচ্ছগণ যথানিয়মে বসবাস করতেন এবং এই সকল জনগণ যেসবনদীর জল পান করতেন তাদের মধ্যে অন্যতম হল গঙ্গা, সিন্ধু, সরস্বতী, চন্দ্রভাগা, যমুনা, ইরাবতী ইত্যাদিএবংএইসকলনদীগুলিইহিমালয়পর্বতথেকেউদ্ভূতহয়েছেএমনটাওসেখানেউল্লিখিতহয়েছে।উদাহরণস্বরূপবলা যায়-

"তৈর্বিমিশ্রাজনপদাআর্য্যম্লেচ্ছাশ্চনিত্যশঃ।

গীয়ন্তেযৈরিমানদ্যোগঙ্গাসিন্ধুঃসরস্বতী।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৩৯৬বঙ্গাব্দ),

ব্রহ্মাণ্ডপুরাণ,প্রথমনববভারতসংস্করণ, নবভারতপাবলিশার্স, (৪৯/২৮), পৃ. ২১৩]

উক্ত শ্লোক থেকেপরিষ্কার বোঝা যাচ্ছে যে সরস্বতী নদীর তীরে কিন্তু একসময়একটি বিশালসভ্যতা গড়ে উঠেছিল।

এই একই ধরনের উল্লেখ আমরা বামন পুরাণেওপাই।বামনপুরাণেরবত্রিশতমঅধ্যায়েসরস্বতীনদীরউল্লেখরয়েছে।সেখানেঋষিগণবলছেন-

"কথমেষাসমুৎপন্নানদীনামুত্তমানদী।

সরস্বতীমহাভাগাকুরুক্ষেত্রপ্রযায়িনী।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),

বামনপুরাণ,দ্বিতীয়নবভারতসংস্করণ, নবভারতপাবলিশার্স, (৩২/১), পৃ. ১৩৫]

অর্থাৎনদীগণেরমধ্যেঅন্যতমএকটিপ্রধাননদীহলসরস্বতী।সেখানেঋষিরাবলছেনযেএইনদীকুরুক্ষেত্রেরমধ্যদিয়েপ্রবা হিতহয়েছে।কিন্তুএকইসঙ্গেতাঁদেরমধ্যেকিছুজিজ্ঞাসাওদেখাদিয়েছে, যেমনএইনদীকিরূপেউৎপন্নহয়েছেনএবংকিরূপেইবাএইশুভাবহানদীব্রহ্মসরোবরেপৌঁছেছেন?শুধুতাইনয়চলারপথে পার্শ্বভাগেবিভিন্নতীর্থস্থানপ্রভৃতিউৎপাদনকরেছেনএবংকখনোদৃশ্যকখনোবাঅদৃশ্যগতিতেপশ্চিমেপ্রবাহিতহয়েছেন, সেইসকলবিষয়েঋষিগণলোমহর্ষণেরকাছেবিশদেজানতেইচ্ছাপ্রকাশকরেছেন।লোমহর্ষণঋষিতখনএইনদীরউৎপত্তিত থাপ্রবাহমানতারবর্ণনাপ্রসঙ্গেবলেছেন-

"ব্রহ্মবৃক্ষাৎসমুদ্ভূতাসরিচ্ছ্রেষ্ঠাসনাতনী।

সর্ব্বপাপক্ষয়করীস্মরণাদপিনিত্যশঃ।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),

বামনপুরাণ,দ্বিতীয়নবভারতসংস্করণ, নবভারতপাবলিশার্স, (৩২/৩), পৃ. ১৩৫]

এরঅর্থহলএইযেএইসনাতনীসরিৎশ্রেষ্ঠাসরস্বতীনদীব্রহ্মবৃক্ষথেকেউদ্ভূতহয়েছেনএবংসর্বদাস্মরণকরামাত্রইইনিসকল রসর্বপাপক্ষয়করেথাকেন।কথিতরয়েছেযেএইপুণ্যতোয়ামহানদীসহস্রসহস্রশৈলমালাবিদারিতকরেযখনদ্বৈতবনেপ্রবে শকরেন,তখনঋষিমার্কণ্ডেয়সরস্বতীকেসকলেরপ্রসূতি, বেদেরঅরণিএবংজগতেরমঙ্গলবিধায়িনীরূপেস্তুতিকরেছেন।জগতেরসমস্তজলযেমনসাগরেরপ্রতিষ্ঠাপায়তেমনইযাকি ছুসৎ, অসৎএবংযামোক্ষবোধেরপ্রবর্তক, তারসমস্তইযেনসরস্বতীতেইপ্রতিষ্ঠাপেয়েছে।এমনকিদারুস্থবহ্নিওভূমিস্থগন্ধেরন্যায়পরব্রহ্মঅক্ষরএবংবিশ্বক্ষরাত্মক উভয়েইযেনতারমধ্যেইঅধিষ্ঠিত।মনেকরাহচ্ছেযেসমস্তবিশ্বচরাচরসেইসরস্বতীরমধ্যেইপ্রতিষ্ঠিতএবংসেইত্রিমাত্রায়ু ক্তওঙ্কারঅক্ষরেরমাধ্যেমেদৃশ্যওঅদৃশ্যসমস্তবস্তুইতাতেবিরাজিত।এতেলোকত্রয়, বেদত্রয়, অগ্নিত্রয়, তিনটিজ্যোতি, ধর্মাদিবর্গত্রয়, তিনগুণ, তিনবর্ণ, তিনধাতু, তিনঅবস্থা, এছাড়াওপিতৃগণ, এবংঅণিমাদিঅষ্টসিদ্ধিসমস্তইযথাক্রমেপ্রতিষ্ঠিতরয়েছে।এইউত্তমমাত্রাত্রয়ইসরস্বতীরপ্রকৃতরূপ।এভাবেইঋষিমার্কণ্ডে

যসরস্বতীরস্তুতিকরেছেন।বামনপুরাণেরএইঅধ্যায়েরএকেবারেশেষেএকটিস্তবেদেখাযায়সরস্বতীপ্রত্যুত্তরেবলছেন,যে তিনিউদ্যমেরসঙ্গেঋষিমার্কণ্ডেয়েরউদ্দিষ্টপথেইপ্রবাহিতহবেন।এরপরেতেত্রিশতম অধ্যায়ে দেখা যাচ্ছে ঋষিলোমহর্ষণ বলছেনযেমার্কণ্ডেয়মুনিরকথামতদেবী সরস্বতীপ্রবাহবতী হয়ে কুরুক্ষেত্রে প্রবেশ করলেন, এবংসেখানে সরস্বতী প্রথমে রন্তুক ওপরে কুরুক্ষেত্রকে পরিপ্লাবিত করেনএবং তারপর তিনি পশ্চিমঅভিমুখে প্রবাহিত হন।

"তত্রসারন্তুকংপ্রাপ্যপুণ্যতোয়াসরস্বতী।

কুরুক্ষেত্রংসমাপ্লাব্যপ্রয়াতাপশ্চিমাংদিশম্।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ), বামনপুরাণ,দ্বিতীয়নবভারতসংস্করণ, নবভারতপাবলিশার্স, বামনপুরাণ, (৩৩/২), পৃ. ১৩৭]

এবংলোমহর্ষনআরওবলছেনযে সেই পশ্চিম অভিমুখেই ঋষিগণের দ্বারা সেবিতসহস্রসহস্র তীর্থ আছে,সেইতীর্থসমূহকেস্মরণকরলেপূণ্যহয়, দর্শন করলে পাপেরক্ষয়হয় এবং সেখানে স্নান করলে অতি বড় দুষ্কৃতী ব্যক্তিরও পূণ্য জন্মায়।যারা অত্যন্ত শ্রদ্ধার সঙ্গে সেই সকল তীর্থস্মরণ করেনএবংসেইসকলতীর্থেস্নানকরেন তারা পরমগতি প্রাপ্ত হন।মানুষপবিত্রকিংবাঅপবিত্রযেঅবস্থাতেইথাকুকনাকেন, পুণ্ডরীকাক্ষেরস্মরণকরলেইতারশরীরওমনবিশুদ্ধহয়েথাকে।এবং লোমহর্ষনআরও জানান যে তিনি কুরুক্ষেত্রে যাবেন এবং সেখানে সর্বপাপ থেকে তিনি মুক্ত হবেন।যেকোনমানুষের ক্ষেত্রে মুক্তির পথ হিসেব চারটি পথ বা উপায়ের কথা বলা হয়েছে, সেগুলি হলব্রহ্মজ্ঞান,গয়াশ্রাদ্ধ,গোগৃহে মৃত্যু এবং কুরুক্ষেত্রে বসবাস।এছাড়াওবলাহয়েছেযেসরস্বতীওবৃষদ্বতীএই দুই নদীর মধ্যবর্তী ভূ-ভাগহলেদেবতাকর্তৃকনির্মিতব্রহ্মাবর্ত।এমনকিএটাওবলাহয়েছেয়ে, অতি দূর দেশ থেকেও কোন ব্যক্তি যদি বলে যে সে কুরুক্ষেত্রে যাবেবা কুরুক্ষেত্রে গিয়েবসবাস করবে; তাহলেই তার সকলপ্রকার পাপ নাকি দূরীভূত হয়ে যায়এবংকোন ধীর ব্যক্তি যদি সরস্বতীর তটভূমিকে আশ্রয় করে বসবাস করেন; তবে তার ব্রহ্মজ্ঞানলাভ হবেই, এই বিষয়েকোন সংশয় আর থাকে না।যেস্থানেদেবতা, ঋষি,সিদ্ধসংঘ সর্বদাইকুরু-জাঙ্গলের সেবা করেনসেখানেকোন মানুষযদিপ্রতিনিয়ত সেই স্থানের সেবা করেন তাহলে তিনি তার অন্তরেই এক সময় ব্রহ্ম দর্শন করতে পারেন।এছাড়াও বলা হয়েছে যে,বর্তমানে যে সকল মানুষ এক চঞ্চলমনুষ্যজীবনঅতিবাহিতকরছেন;সেইপ্রকারমুমুক্ষু পুরুষ নিয়ত চিত্তেইসেখানেবসবাস করেন এবং যে সকল দুষ্কৃতকারী ব্যক্তিনিত্য সেই স্থানে বাস করে,সেইউভয়প্রকার ব্যক্তিরাইবহুজন্মসঞ্চিতকলুষতাথেকে মুক্ত হয়ে যানও হৃদয়েরমধ্যেই সুনির্মল সনাতন দেবের সাক্ষাৎ লাভে সমর্থ হন।বলাবাহুল্য কুরুক্ষেত্র একটি সাক্ষাৎব্রহ্মবেদিরূপে নির্দিষ্ট হয়েছে। সুতরাং কেউ যদি নিত্য ঐ স্থানের সেবা করেনতবে সেই মানুষের পক্ষে ব্রহ্মপদ লাভ অত্যন্তসুলভে হয়ে থাকে।এই প্রসঙ্গে আরও বলা হয়েছে যে কালেরনিয়মেই নক্ষত্র বাতারকাদেরওহয়তো একটা পতনের ভয় থাকে কিন্তু কুরুক্ষেত্রে কারো মৃত্যু ঘটলে সেই সব মানুষদের কখনোই পতিত হতে হয়না।এমনকিশুধুমানুষইনন, ব্রহ্মাপ্রভৃতিদেবতাগণ, ঋষিগণ, সিদ্ধওচারণগণ,এঁনারা গন্ধর্ব ওঅপ্সরাগণেরসঙ্গে মিলিত হয়েস্থানেরআকাঙ্ক্ষায়কুরুক্ষেত্রেরইসেবাকরে থাকেন।কুরুক্ষেত্রে গিয়ে শ্রদ্ধার সঙ্গেস্থাণুহ্রদে স্নান করলে অবশ্যইমনেরসকলসঙ্কল্প সিদ্ধ হয়, এমনটাও বলা হয়েছে। এছাড়াওনিয়ম সহকারেব্রহ্মসরপ্রদক্ষিণ, রন্তুকগমন, ওপুনঃপুনঃ ক্ষমা প্রার্থনা করে সরস্বতীনদীরজলেস্নান সেরেসেখানেযক্ষকেদর্শন ও প্রণাম করে পবিত্র ধূপওনৈবেদ্যপ্রভৃতিনিবেদন করারকথাবলাহয়েছে।এছাড়াওচৌত্রিশতমঅধ্যায়েসপ্তবন, সপ্তনদীওবিভিন্নতীর্থস্নানেরমাহাত্ম্যবর্ণনাপ্রসঙ্গেবলাহয়েছে-

"বনান্যেতানিবৈসপ্তনদীঃশৃণুতমেদ্বিজাঃ।

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সরস্বতীনদীপুণ্যাতথাবৈবতরণীনদী।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),

বামনপুরাণ,দ্বিতীয়নববভারতসংস্করণ, নবভারতপাবলিশার্স, বামনপুরাণ, (৩৪/৬), পৃ. ১৩৯]

অর্থাৎসরস্বতী, বৈতরণী,

গঙ্গাইত্যাদিযেসপ্তনদীআছেতারপ্রত্যেকটিমহাপুণ্যদায়িনীওসর্বপাপহারিণী।এবংএদেরমধ্যেএকমাত্রসরস্বতীসর্বকা

লেপ্রবাহিতহয়,

অন্যসমস্তনদীশুধুমাত্রবর্ষাকালেইপ্রবাহিতহয়এমনওবর্ণনাকরাহয়েছে।অর্থাৎএককথায়বলতেগেলেসরস্বতীনদীএবং

তাকেভিত্তিকরেগড়েওঠাঠাকুরক্ষেত্রওঅন্যান্যস্থানপ্রভৃতিসবইযেনপবিত্রতারএকমূর্তপ্রতীকস্বরূপ।এইসমস্তআলোচনা

থেকেই অনুভব করা যায় যে সরস্বতীর মাহাত্ম্য এবংগুরুত্বসেযুগেকতটা ছিল।

এরপর চলে আসি মৎস্যপুরাণেরচতুর্দশাধিকশততম অধ্যায়ে, সেখানে দেখা যায় যে বিভিন্ন ঋষিগণলোমহর্ষণতথাসূত ঋষির কাছে এসেছেন ভারতবর্ষের নানা বিবরণ শোনবার জন্য। বিশুদ্ধ আত্মা ভারতবর্ষেরপ্রজাবর্গেরবিবরণপ্রসঙ্গে সেখানে বলা হয়েছেযেপ্রজাদের উৎপাদন ও ভরণপোষণেরকারণস্বরূপমনুকেইভারতবর্ষবলা হয়। এইরূপ উক্ত হয়েছে যে, যে স্থান থেকে মানুষেরা স্বর্গ, মোক্ষ এবং এই দুটির মধ্যমভাব, এই তিন প্রকার অবস্থাই লাভ করতে পারে তাকেই ভারতবর্ষ বলে নির্ণয় করাহত।পুরো ভূমন্ডলেএইএকটি স্থান ছাড়া আর কোথাওমর্ত্যেবসবাসকারীদের ধর্মকর্মবিহিত হয়নি। এই ভারতবর্ষের নয়টি ভাগের কথা সেখানে বলা হয়েছে।ইন্দ্রদ্বীপ, কশেরু,তাম্রপর্ণীইত্যাদিরূপেতিনিতারবর্ণনাদিয়েছেন।এরমধ্যেভারতনামকদ্বীপ হল নবম।এরবিস্তৃতিপ্রসঙ্গেবলাহয়েছেযে, এইদ্বীপদক্ষিণথেকেউত্তরেসহস্রযোজনপর্যন্তবিস্তৃত এবং কুমারী অবধিগঙ্গা প্রবাহ পর্যন্তআয়তএবংএরউচ্চতা সমুদ্র থেকেক্রমশদশসহস্রযোজনপর্যন্তবিস্তৃত।এই দ্বীপের একেবারে প্রান্ত ভাগে সর্বত্রই ম্লেচ্ছগণ অবস্থান করেন এরূপ বলা হয়েছে।এছাড়াওপূর্বএবংপশ্চিমেযবনওকিরাতদেরবসবাসেরবর্ণনা রয়েছে। মধ্যভাগে বিভাগ অনুসারে রয়েছে ব্রাহ্মণ, ক্ষত্রিয়, বৈশ্য, শূদ্রজাতিরমানুষেরা। এরা যেসেখানেশুধু বাস করতেন তাই নয়;যজ্ঞ, বাণিজ্য প্রভৃতির দ্বারা জীবিকা নির্বাহ করতেন এমনটাই বিবৃত রয়েছে।তারা স্বস্ববর্ণঅনুযায়ীকর্ম করতেন এবং কর্ম অনুসারে ধর্ম অর্থ এবং কাম এই ত্রিবর্গ নিষ্পন্ন করতেন এবং একে অপরের সঙ্গেসুখেই সময় অতিবাহিত করতেন।এমনটাও বলা হয়েছে যে সেখানে মানুষ দেরস্বর্গ-মোক্ষপ্রভৃতি সাধনারজন্যসকাম ভাব এবং নিষ্কাম ব্রহ্মচর্যাশ্রমপ্রভৃতিচারটিআশ্রমের প্রবর্তন ছিল।এবংসম্রাটেরধারণাপ্রসঙ্গেবলাহয়েছে যে, যে মানবদ্বীপ তীর্যকভাবে স্থিত রয়েছে,সেই সমগ্র স্থানটিকে যে ব্যক্তি জয় করতে পারেন তিনিই সম্রাট বলেসেখানেকীর্তিত হন।এছাড়াও এইমহানবর্ষেসাতটিকুলপর্বতের কথা বর্ণনা করা হয়েছে, যথা- মহেন্দ্র, মলয়, সহ্য, শক্তিমান, ঋক্ষবান,বিন্ধ্য ও পারিযাত্র। এদেরসামনেই আরো সহস্র সহস্র পর্বত আছে এমনটাই বিবরণ রয়েছে। তার মধ্যে আবার কতগুলি জনপদের নাম পাওয়া যায়। এই জনপদগুলির মধ্যে আর্য ওম্লেচ্ছগণমিশ্রিতভাবে অবস্থিত আছে।এইপুরাণেওএকইভাবেউল্লিখিতহয়েছেযেসেইসব অধিবাসীরাযেসব নদীর জল পান করে থাকেন, তার মধ্যে যেগুলি প্রধান সেগুলি হল গঙ্গা, সিন্ধু, সরস্বতী, শতদ্রু, চন্দ্রভাগা, যমুনা ইত্যাদি।

"তৈর্বিমিশ্রাজনপদাআর্য্যাম্লেচ্ছাশ্চসর্বতঃ।

পিবন্তিবহলান্দ্যোগঙ্গাসিন্ধুঃসরস্বতী।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (২০১৫),

মৎস্যপুরাণ,তৃতীয়নববভারতসংস্করণ, নবভারতপাবলিশার্স, (১১৪/২০), পৃ. ৩৩৬]

তাহলে এখানেওদেখা যাচ্ছে যে যেসব নদীতীরে সভ্যতা গড়ে উঠেছিল তার মধ্যে কিন্তু সরস্বতী অন্যতমা।

ঠিক এই একই প্রকার বর্ণনা পাওয়া যায় মার্কন্ডেয় পুরাণেরসপ্তপঞ্চাশতম অধ্যায়ে। সেখানেও মার্কণ্ডেয় ঋষি ভারতবর্ষের নয়টি ভেদের কথা বলেছেন- ইন্দ্রদীপ,কশেরুমান, তাম্রবর্ণ গভস্তিমান, নাগদ্বীপ, সৌম্য, গন্ধর্ব, বারুণও নবমহলভারত।এখানেওএকইভাবেবলাহয়েছেযে, এই ভারত নামক যে নবমদ্বীপ; সেটি সাগর দ্বারা পরিবৃত এবং দক্ষিণ ও উত্তরে সহস্রযোজন পর্যন্ত বিস্তৃত।বর্ণিতহয়েছেযেএরপূর্বপ্রান্তেকিরাতগণও পশ্চিমসীমায়যবনগণবসবাস করতেন এবং মধ্যভাগে ব্রাহ্মণ, ক্ষত্রিয়, বৈশ্য ও শূদ্র গণবাস করতেন। তারা যজ্ঞ, অধ্যয়ন ও বাণিজ্য প্রভৃতিস্বস্বকর্মেনিযুক্তিছিলেন এবং তার দ্বারাই তারা পবিত্রহতেনএমনটাওবলাহয়েছে।অন্যান্য পুরাণের ন্যায় এখানেও বেশ কিছু পর্বতের নাম পাওয়া যায়, যেমন- মহেন্দ্র, শক্তিমান, মলয়, বিন্ধ্যপ্রভৃতির বর্ণনা সেখানে রয়েছে এবংআরওবেশকিছু ছোট ছোট পর্বত রয়েছে। সেসব পর্বতময়ভূমিতেআর্য এবংম্লেচ্ছ জনপদমিশ্রিতভাবেবসবাসকরতেন এবং একই ভাবে বলা হয়েছে তারা যে সমস্ত উৎকৃষ্ট নদীর জল পান করতেন তার মধ্যে রয়েছে গঙ্গা, সরস্বতী, চন্দ্রভাগা, যমুনা ইত্যাদি।

"তৈঃপীয়ন্তেসরিচ্ছ্রেষ্ঠাযাস্তাঃসম্যঙনিবোধমে।

গঙ্গাসরস্বতীসিন্ধুশ্চন্দ্রভাগাতথাপরা।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),মার্কণ্ডেয়পুরাণ, তৃতীয়নবভারতসংস্করণ, নবভারতপাবলিশার্স, ৫৭/১৬), পৃ. ২৪৫]

অর্থাৎ বারবারই কিন্তু সরস্বতী নদীকে কেন্দ্র করে সভ্যতার এক বিশেষ প্রতিচ্ছবি উঠেএসেছে।

একইভাবে পদ্মপুরাণের তৃতীয় অধ্যায়ে ভারতবর্ষের পাহাড়, নদ-নদী বর্ণনা প্রসঙ্গে সরস্বতী নদীর কথা উঠে এসেছে। সেখানে উক্ত হয়েছে-

"অন্যে তু যে পরিজ্ঞাতা দুঃখাদুঃখোপজীবিনঃ।

আহম্লেচ্ছাংশ্চ ধর্মজ্ঞাস্তে মিশ্রাঃ পুরুষা দ্বিজাঃ।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),পদ্মপুরাণ *(স্বর্গখণ্ড)*, প্রথমনবভারতসংস্করণ, নবভারতপাবলিশার্স, (০৩/১০), পৃ. ১২]

"নদীং পিবন্তি বিপুলাং গঙ্গাং সিন্ধুং সরস্বতীম্।

গোদাবরীং নর্মদাঞ্চ বাহুদাঞ্চ মহানদীম্।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),পদ্মপুরাণ *(স্বর্গখণ্ড)*, প্রথমনবভারতসংস্করণ, নবভারতপাবলিশার্স, (০৩/১১), পৃ. ১২]

এই শ্লোকগুলি থেকেও পরিষ্কার বোঝা যাচ্ছে যে এখানেও সকল বর্ণের মানুষগণ যে একত্রে মিশ্রিত ভাবে বসবাস করতেন সেটাই বলা হচ্ছে। এবং একইভাবে সেই সকল মানুষগণ যেসব নদীর জল পান করে জীবন অতিবাহিত করতেন তার মধ্যে অন্যতম হল সরস্বতী, যাকে মাতৃতুল্য বলে আখ্যায়িত করা হয়েছে। পুনরায় পদ্মপুরাণের দ্বাদশ অধ্যায়ে বলা হয়েছে-

"ততো গচ্ছেত রাজেন্দ্র দ্বারপালং সবর্ণকম্।

তস্য তীর্থং সরস্বত্যাং যথেন্দ্রস্য মহাত্মনঃ।।" [পণ্ডিততর্করত্নপঞ্চানন (সম্পা.), (১৪২০বঙ্গাব্দ),পদ্মপুরাণ *(স্বর্গখণ্ড)*, প্রথমনবভারতসংস্করণ, নবভারতপাবলিশার্স, (১২/৫৩), পৃ. ৭৮]

বিভিন্ন নদীর তীরে গড়ে ওঠা কুরুক্ষেত্র প্রভৃতি তীর্থক্ষেত্রের বর্ণনা প্রসঙ্গে এই শ্লোকটি উক্ত হয়েছে। সেখানে কোন তীর্থক্ষেত্রে গেলে কি প্রকার ফল লাভ সম্ভব সেই বিষয়ে আলোচনা রয়েছে। সেখানেই আলোচনা প্রসঙ্গে এসেছে দ্বারপাল নামক তীর্থক্ষেত্রের কথা। বলা হয়েছে যে সেই দ্বারপাল তীর্থ মহেন্দ্র তীর্থের ন্যায় সরস্বতী নদীর তীরে অবস্থিত। এই সরস্বতী নদীর জলে স্নান করলে মানুষের অগ্নিষ্টোম যজ্ঞের ন্যায় পুণ্যফল লাভ হয় এমনটাই বর্ণনা করা হয়েছে। এভাবেই সরস্বতী নদীকে ঘিরে সভ্যতার উন্মেষের চিত্র সেখানে ফুটে উঠেছে।

উপসংহারঃ   অর্থাৎ আমরা দেখতে পেলাম যে এই শোধপত্রে উক্ত প্রত্যেকটি পুরাণে সরস্বতী নদীর একটি উজ্জ্বল উপস্থিতি বর্তমান। বারংবার এই নদীর উৎপত্তি থেকে শুরু করে তার বহমানতা, এক কথায় তার গোটা গতিপথ বর্ণিত হয়েছে এবং চলার পথে কত কত তীর্থক্ষেত্র, নগর এবং তাকে ভিত্তি করে বেঁচে থাকা নানা জনজাতি ইত্যাদির বিস্তৃত বিবরণ লক্ষ্য করা যায়।সরস্বতীকে নিয়ে বহু গবেষণা আলোচনা-সমালোচনা ইত্যাদি বহু যুগ ধরেই চলেছে এবং আগামীতেও হয়তো তা প্রবহমান থাকবে। একদিকে বহু গবেষক যেমন বলছেন যে সরস্বতী নদী একসময় বহমান ছিল। কিন্তু কালের নিয়মে কিংবা বলা যায় আবহাওয়ার চরম পরিবর্তন ইত্যাদি নানাভৌগলিক কারণেও সরস্বতী নদী হয়তো মাটির অভ্যন্তরে ক্ষতসলিলা হয়ে থেকে গেছে। অর্থাৎ সরস্বতী এখনো আমাদের কাছে একইভাবে রহস্যময়ী। আজও স্যাটেলাইট ইত্যাদি উন্নত প্রযুক্তি বিদ্যার প্রয়োগের মধ্য দিয়ে সরস্বতীর অস্তিত্বের খোঁজ বিজ্ঞানীরা চালিয়ে যাচ্ছেন। হয়তো ভবিষ্যতে একসময় এই রহস্যের উন্মোচন সম্ভব হবে। আবার উল্টোদিকে কিছু গবেষক আছেন যারা সরস্বতী নদীর পুরো অস্তিত্বকেই অস্বীকার করছেন। তাই এই প্রশ্ন মনে থেকেই যায় যে সাহিত্য তো সমাজেরই একটি দর্পণ, তা সব সময়ই একটি কালের, একটি স্থানের, এবং তাকে ভিত্তি করে গড়ে ওঠা জনজীবন বা সমাজ ব্যবস্থার কথাই তুলে ধরে। সেখানে বৈদিক যুগ থেকে শুরু করে পরবর্তী পুরাণ যুগেও সরস্বতী নদীর বিদ্যমানতা কিন্তু একইরকম ভাস্বর রূপ নিয়ে বর্তমান। সেটা কি পুরোটাই কাল্পনিক? নাকি তাতে কিছু ইতিহাসের সত্যতা বিদ্যমান? এটা আমাদের আজও ভাবায়। এভাবেই বিভিন্ন পুরাণের দৃষ্টি দিয়ে সরস্বতীর একদিকে নদীরূপের বহমানতার সাথে চলমান বা গতিশীল বিদ্যার অধিষ্ঠাত্রী সরস্বতী দেবীর একটিযোগসূত্র আমরা খুঁজে দেখার চেষ্টা করলাম। এভাবেই সরস্বতীর একই অঙ্গে বিভিন্ন রূপ, অর্থাৎ একটি বর্তমানে বিদ্যার অধিষ্ঠাত্রী দেবীরূপেএবং অপরদিকে সরস্বতীর নদীরূপতার যে ঐতিহাসিকতা, দুটোই মিলেমিশে যেনএকাকার হয়ে আমাদের সামনে বারবারই ধরা দিয়েছে।

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সারসংক্ষেপঃ

ভাষা বা সাহিত্যের মূল উপাদান বর্ণ। বর্ণের সমষ্টিই বর্ণমালা। লিপিতে প্রকাশ করার সময় তাদের অক্ষর বলা হয়। প্রকাশময় পরমেশ্বর প্রাণময় নাদযুক্ত হয়ে জীবের আধারচক্রে প্রবিষ্ট হন। তারপর মনোময় সূক্ষ্মরূপ প্রাপ্ত হয়ে মন্ত্র-স্বর-বর্ণ রূপে অভিব্যক্ত হন। বর্ণমালার সূক্ষ্ম ও অব্যক্তরূপ এই মাতৃকা। এই অক্ষর অবিনশ্বর। শব্দব্রহ্মবাদীরা অনাদিনিধন ব্রহ্মকে 'অক্ষর' বলে অভিহিত করেছেন। 'অনাদিনিধনং ব্রহ্ম শব্দতত্ত্বং যদক্ষরম্। বিবর্ততেহর্থভাবেন প্রক্রিয়া জগতো যতঃ'। বর্ণমালা সৃষ্টি প্রসঙ্গে গূঢ়ার্থজ্ঞাপক পৌরাণিক একটি আখ্যান আছে। ভগবান শিব নৃত্যাবসানে চতুর্দশবার ডমরুধ্বনি করেছিলেন। সম্ভবতঃ চতুর্দশ-ভুবনকে প্রধ্বনিত করার জন্য। এদেরকেই একত্রে 'মাহেশ্বরসূত্র' বা 'শিবসূত্র' বলা হয়।

বৈদিক মন্ত্র সমূহের অভ্রান্তপাঠের জন্য বেদের অর্থ যথাযথ বোঝার জন্য ছয় বেদাঙ্গের উৎপত্তি। এর মধ্যে শিক্ষা নামক বেদাঙ্গ বেদের ধ্বনিবিজ্ঞান। কতকগুলি বর্ণ একত্রে ঝংকৃত হয়ে সৃষ্টি করে অক্ষর। এই বর্ণময় অক্ষর যখন আমরা উচ্চারণ করি তখন তার সাথে এসে মেশে উচ্চারণের একটা ঝোঁক, শ্বাসাঘাত বা প্রস্বর (accent), এবং স্বরের একটা শক্তি বা মাত্রা। সবমিলিয়ে থাকে আবার একটা বিশিষ্ট অর্থ বিনিয়োগ। একটা অক্ষরের মধ্যে পাঁচটি বিষয় বর্তমান। যথা-স্বর, বর্ণ, প্রস্বর, মাত্রা, এবং বিনিয়োগ। 'স্বর' মানে স্বর্গ, আর 'বর্ণ' মানে মহিমা গরিমা দীপ্তি। স্বর্গের মহিমা ও দীপ্তি নিয়ে এই স্বরবর্ণমালা। দেবতাদের স্বরই মানবের কণ্ঠস্বর- 'সপ্তস্বরাীকণ্ঠোস্থিতাঃ স্বরাঃ' (অমরকোষ)। স্বরবর্ণই সুর হয়ে ধ্বনিত বা উদ্গাত সামগানে। স্বর অর্থও সুর। শক্তি-সমন্বিত ব্রহ্মের আত্মবিসৃষ্টির যে বিশ্বযজ্ঞ তাই বীজাকারে স্বরবর্ণমালা।

সুতরাং অক্ষর যে ব্রহ্ম এ' শুধু ঋষিবাক্য নয়, বিজ্ঞান এবং লজিকও বটে। শব্দ ও বর্ণ– Sound এবং Colour দুটো যে একই কথা তা আজ বিজ্ঞানসম্মত। শব্দই রূপে-বর্ণে ছবি হয়ে ওঠে। বর্ণ হল স্বরকম্পনের ব্যঞ্জনা। সঙ্গীতে যেমন আছে প্রত্যেকটি রাগের এক-একটা বিশেষ রূপ ও বর্ণ। তাঁরা বর্ণকে দুভাগে ভাগ করেছেন,

স্বরবর্ণ ও ব্যঞ্জনবর্ণ। যেন পুরুষ আর প্রকৃতি। চৈতন্য ও শক্তি। স্বরবর্ণ স্বতন্ত্র-স্বাধীন আত্মস্থ স্বনির্ভর। নিত্যসত্ত্ব নির্গুণ। স্বরবর্ণ স্বরূপত ব্রহ্মপুরুষ আর ব্যঞ্জনবর্ণ প্রকৃতিস্বরূপ। ব্রহ্মপুরুষের আশ্রয়েই তাঁর শক্তির প্রকাশ। তাই স্বরবর্ণের আশ্রয় ছাড়া ব্যঞ্জনবর্ণ উচ্চারিত হতে পারেনা। ব্যঞ্জনের বর্ণবৈচিত্র্য স্বরের নির্বর্ণ পটের উপরেই খেলছে, পট সরিয়ে নিলেই ছবিও অদৃশ্য। যে ভাষায় স্বরবর্ণের সংখ্যা বেশি সেই ভাষার স্বরব্যঞ্জনা ও বৈচিত্র্যও বেশি। স্বরবর্ণ স্বভাবতই সুস্পষ্ট এবং গম্ভীর। স্বরবর্ণ যদি বেশি থাকে তাহলে ভাষার সুস্পষ্টতা ও গভীরতাও বেশি হয়।

সমস্ত দেবতার তেজ ও দীপ্তি, শক্তি ও ক্রিয়া বীজ আকারে স্বরবর্ণ। স্বরবর্ণ যদি সৃষ্টির বীজরূপে গণ্য হয় তাহলে ব্যঞ্জনবর্ণ সৃষ্টির অঙ্কুর। অঙ্কুরের মধ্যে যেমন অন্তর্লীন থাকে মহীরুহ, তেমনি ব্যঞ্জনবর্ণের মধ্যে সমস্ত সৃষ্টি। 'বিশ্বমাত্মগতং ব্যঞ্জন্ কূটস্থো জগদঙ্কুরঃ'। অসীম অনন্ত নির্বিশেষ ব্রহ্ম এই ব্যঞ্জনের মধ্যে প্রকট হয়েছেন। 'প্রপঞ্চং আত্মগতং স্বস্মিন্ সূক্ষ্মরূপেণ স্থিতং ব্যঞ্জয়ন্ প্রকটয়ন্ সর্বত্র'। ভগবানের দেহ থেকে স্বরবর্ণ, স্পর্শ থেকে ব্যঞ্জনবর্ণ, ইন্দ্রিয় থেকে চারটি উষ্মবর্ণ (শ-ষ-স-হ), আত্মবল থেকে অন্তস্থবর্ণ (য-ব-র-ল), এবং আনন্দময় বিহার থেকে সপ্তস্বর (ষড়্জ, ঋষভ, গান্ধার, মধ্যম, পঞ্চম, ধৈবত ও নিষাদ)। কেননা স্বয়ং ভগবান ব্যক্ত-অব্যক্ত স্বরূপে বেদব্রহ্মময় মূর্তি। 'শব্দব্রহ্মাত্মনস্তস্য ব্যক্তাব্যক্তাত্মনঃ পরঃ'। পরমাত্মা ভগবান স্বয়ং প্রকাশমান হয়ে মহাশূন্যে-মহাব্যোমে, দ্যুলোকের আদিত্যবর্ণ ঝল্মল্ করে উঠল, জেগে উঠল ধ্বনিময় বেগ ও কম্পন, আকাশস্তনী পৃথিবীর বক্ষ কম্পিত হতে লাগল, শব্দময়-গতিময়-বর্ণময় নিবিড় এক আনন্দস্পর্শ ঐ মহাকাশ আর এই পৃথিবী, সব নিয়ে স্বয়ং ব্রহ্ম। দৈবদৃষ্টিতে দেখলে প্রথম পাঁচটি ব্যঞ্জনের মধ্যে রয়েছেন সমস্ত দেবতারা।

বিশ্বব্রহ্মাণ্ডের সকল তত্ত্ব উপাদান ও গুণের আধার আমাদের এই দেহ। দেহ আসলে 'বর্ণব্রহ্মময় বপুঃ'। পৃথিবী তার আপন অক্ষ বা মেরুকে আশ্রয় করে আবর্তিত হচ্ছে। পৃথিবীর এই অক্ষ (axis) হল অ-ক্ষ 'ক্ষমেরুকেঃ'। অর্থাৎ অ থেকে ক্ষ পর্যন্ত একান্নটি বর্ণমালা। ব্রহ্মার হাতের অক্ষমালা অ থেকে ক্ষ সমস্ত বর্ণমালা। মা কালীর গলায় একান্নটি ছিন্নমুণ্ডমালা আসলে বর্ণমালার মাতৃকারূপ। মাকালী কালের সৃষ্টির ঊর্ধ্বে দাঁড়িয়ে আছেন অন্ধকার দিগ্বসনা মূর্তিতে। যার ব্যক্তরূপ সমগ্র বর্ণমালা। মহাশক্তির যত ক্রিয়াকারীত্ব ও গতিবৃত্তির ভাবস্পন্দন হল এই বর্ণ। বর্ণমালা সৃষ্টিশক্তির সূক্ষ্ম তরঙ্গমালা।

শব্দসঙ্কেতঃ

অক্ষরব্রহ্ম, বর্ণোৎপত্তি, বর্ণসমাম্নায়, অর্থতত্ত্ব, স্বর-ব্যঞ্জন-লক্ষণ, বর্ণরহস্য ও মাহাত্ম্য।

ভূমিকাঃ

আলোচ্য শোধপত্রের মাধ্যমে অক্ষরের উৎপত্তি তত্ত্বকথন তথা মাহাত্ম্য উদ্ঘাটন করতে চেয়েছি। আমরা যদি ভাষার বাহ্যিক গঠন ও উৎপত্তির দিকে না তাকিয়ে তার অন্তর্নিহিত আধ্যাত্মিক সত্যের অনুসন্ধান করি তাহলে দেখতে পাবো, স্বরধ্বনি উঠে আসছে অন্তরাত্মার শক্তিরূপে, আমাদের অন্তশ্চেতনা এবং অবচেতনা থেকে। মনের মধ্যে এসে এই শক্তি সচেতন হয়ে উঠেছে বিশিষ্ট ধারায়। অন্তরাত্মার এই শক্তিকেই বৈদিক ঋষিরা বলেন বাক্, বাগ্দেবী। সকল শব্দই অনন্তের ধ্বনিরূপ। শব্দ ধ্বনিত হয়ে আবার মিলিয়ে যাচ্ছে অনন্তে। অক্ষরের বিবর্ত হতেই এই জগতের সমস্ত প্রক্রিয়া সম্ভব হয়েছে।

যে ভাষায় স্বরবর্ণের সংখ্যা বেশি সেই ভাষার স্বরব্যঞ্জনা ও বৈচিত্র্যও বেশি। স্বরবর্ণ স্বভাবতই সুস্পষ্ট এবং গম্ভীর। স্বরবর্ণ যদি বেশি থাকে তাহলে ভাষার সুস্পষ্টতা ও গভীরতাও বেশি হয়। সংস্কৃত যে পৃথিবীর শ্রেষ্ঠ ধ্বনিগম্ভীর সুস্পষ্ট সুললিত ভাষা, তার কারণ এর স্বরবর্ণের সংখ্যা সবচেয়ে বেশি। অ, আ, ই, ঈ, এই রকম ষোলোটি স্বরবর্ণ যে পরপর সাজানো হয়েছে তার মধ্যেও সুনির্দিষ্ট বৈজ্ঞানিক পদ্ধতি ও যুক্তি বিদ্যমান। শরীরের অঙ্গসংস্থানের মতোই তা যথাযথ এবং অপরিবর্তনীয়। সংস্কৃত বর্ণ-বিন্যাসে বৈজ্ঞানিক রীতি আছে। মনে রাখতে হবে বর্ণমালা হল ভাষার স্বরলিপি। সঙ্গীতের স্বরলিপির মতই। একে অগ্রাহ্য করলে ভাষা শুধু ব্যাহতই হবেনা, আহতও হবে। ভাষার বিকার বা বিকৃতি আসবে।

প্রত্যেকটি বর্ণের গুণবৈশিষ্ট্য গভীরভাবে অনুধাবন করলে সৃষ্টির অন্তর্নিহিত তত্ত্ব বা সত্যকে জানতে পারবো। প্রতিটি বর্ণই সজীব শক্তিবীজ। বর্ণমালার বীজাত্মক শক্তিই শব্দের ভ্রূণ অবস্থা। গর্ভস্থ ভ্রূণের গঠনরহস্য না জানলে যেমন পূর্ণাবয়ব মানবদেহের প্রকৃত বিজ্ঞান জানা যায়না, ভাষার ক্ষেত্রেও তাই। বর্ণমালা মাতৃকাযন্ত্রের অন্তর্গত ভ্রূণবিজ্ঞান। আশা করি পাঠকগণ এই শোধপত্রের দ্বারা বর্ণমালার বৈচিত্র্য এবং সৃষ্টিতত্ত্ব বিষয়ক জিজ্ঞাসায় কিয়দাংশে উপকৃত হলেও আলোচ্যপত্রের উদ্দেশ্য সাধিত হবে।

বিষয়ভিত্তিক ব্যাখ্যাঃ

বর্ণ বা লিপির অপর নাম অক্ষর বা মাতৃকা। বর্ণমালার সূক্ষ্ম ও অব্যক্তরূপ এই মাতৃকা। এই অক্ষর অবিনশ্বর। মনের ভাব মুখের ভাষায় প্রকাশিত হয়ে তা পরক্ষণেই নষ্ট হয়ে যায় কিন্তু অক্ষর স্থায়ী প্রতীক। 'ক্ষরন্ত মোক্ষেহপি'-

অক্ষর মোক্ষ, ককারাদি বর্ণ (অমরকোষ-নানার্থবর্গ)। শব্দব্রহ্মবাদীরা অনাদিনিধন ব্রহ্মকে অক্ষর বলে অভিহিত করেছেন। তাঁদের মতে অক্ষরের বিবর্ত হতেই এই জগতের সমস্ত প্রক্রিয়া সম্ভব হয়েছে। 'অনাদিনিধনং ব্রহ্ম শব্দতত্ত্বং যদক্ষরম্। বিবর্ত্তেহর্থভাবেন প্রক্রিয়া জগতো যতঃ'(১)।। বার্ত্তিককার কাত্যায়ন বলছেন –'অক্ষরং ন ক্ষরং বিন্দ্যাৎ' অর্থাৎ যা ক্ষীণ বা ক্ষরিত হয় না তাই অক্ষর। আবার ব্যাপ্তার্থক অশ্ ধাতুর উত্তরে ঔণাদিক সরন্ প্রত্যয় যোগে অর্থ প্রকাশ করাই 'অক্ষর' এর কাজ। বর্ণ ও অক্ষর পর্যায়বাচক শব্দ (Synonym)। 'সব্যঞ্জনঃ সানুস্বারঃ শুদ্ধো বাপি স্বরোহক্ষরম্'। বর্ণমালা সৃষ্টি প্রসঙ্গে গূঢ়ার্থজ্ঞাপক পৌরাণিক একটি আখ্যান আছে। ভগবান শিব নৃত্যাবসানে চতুর্দশবার ডমরুধ্বনি করেছিলেন। সম্ভবতঃ চতুর্দশ-ভুবনকে প্রধ্বনিত করার জন্য। এদেরকেই একত্রে 'মাহেশ্বরসূত্র' বা 'শিবসূত্র' বলা হয় (২)। এই সূত্রসমূহেই 'অক্ষর (= বর্ণ) সমাম্নায় নির্দেশিত (order sets of sounds, order sets of grammatical units)। সেই ধ্বনি থেকেই বর্ণমালার সৃষ্টি। 'নৃত্যাবসানে নটরাজরাজো ননাদ ঢক্কাং নবপঞ্চবারম্। উদ্ধর্তুকামঃ সনকাদিসিদ্ধানেতদ্বিমর্শে শিবসূত্রজালম্' (৩)।।এখন প্রশ্ন হল এই বর্ণাবলীর উপদেশ কেন? উত্তরে বার্ত্তিককার বলেছেন, -

"বর্ণজ্ঞানং বাগ্বিষয়ো যত্র চ ব্রহ্মবর্ততে। তদর্থমিষ্টবুদ্ধ্যর্থং লঘ্বর্থং চোপদিশ্যতে"।।

ব্যাকরণ পদশাস্ত্র। সুপ-তিঙন্ত পদরাশিই পুষ্পিত এবং প্রতিমণ্ডিত হয়ে বেদরূপ ধারণ করেছে। অক্ষর বা বর্ণসমূহ সেই পদসমূহের সংঘটক বিষয় তাই বেদজ্ঞানে পরম্পরাক্রমে তার অবদান রয়েছে। বর্ণদোষাদি রহিত না হলে পদজ্ঞান বা বাক্যজ্ঞান অসম্ভব। অভীষ্ট বেদপাঠের ফললাভ হবে না। এজন্য বর্ণমালার যথাযথ জ্ঞান অত্যাবশ্যক। বর্ণগুলিকে 'বর্ণ' কেন বলা হয় তা তান্ত্রিক সাহিত্যে আলোচিত, প্রত্যেক বর্ণের ধ্যান এবং স্বরূপ চর্চা বর্তমান।

বর্ণপরিচয় বলতে আমরা সাধারণত অক্ষর পরিচয় মনে করি। কিন্তু বর্ণ আর অক্ষর এক জিনিস নয়। যেমন- 'অগ্নি' কথাটি দুই অক্ষরের (অ + গ্নি) কিন্তু এর মধ্যে বর্ণ আছে চারটি (অ + গ্ + ন্+ ই) অর্থাৎ কতকগুলি বর্ণ একত্রে ঝংকৃত হয়ে সৃষ্টি করে অক্ষর। এই বর্ণময় অক্ষর যখন আমরা উচ্চারণ করি তখন তার সাথে এসে মেশে উচ্চারণের একটা ঝোঁক, শ্বাসাঘাত বা প্রস্বর (accent), এবং স্বরের একটা শক্তি বা মাত্রা। সবমিলিয়ে থাকে আবার একটা বিশিষ্ট অর্থ বিনিয়োগ। একটা অক্ষরের মধ্যে পাঁচটি বিষয় বর্তমান। যথা-স্বর, বর্ণ, প্রস্বর, মাত্রা, এবং বিনিয়োগ। উপনিষদের ভাষায় বলা যায়,-'বর্ণঃ স্বরঃ। মাত্রা বলম্। সাম সংতান। ইত্যুক্তঃ শীক্ষাধ্যায়ঃ'(৪)।। এই সবগুলির যথার্থ জ্ঞান না থাকলে আমাদের অক্ষর পরিচয় হবেনা। কোনো একটির বিকৃতি

ঘটলেই গোটা অক্ষরটারই বিপত্তি এমনকি অর্থবিপর্যয় হবে। পাণিনি বলেছেন, মন্ত্রের যথার্থ জ্ঞানের জন্য স্বর, বর্ণ, অক্ষর, মাত্রা, ও বিনিয়োগ এবং অর্থের জ্ঞান আবশ্যিক,- "স্বরো বর্ণোহক্ষরং মাত্রা বিনিয়োগোহর্থ এব চ। মন্ত্রং জিজ্ঞাসমানেন বেদিতব্য পদে পদে"।।

প্রাথমিকভাবে স্বর তিন রকমের- উদাত্ত, অনুদাত্ত ও স্বরিত। "উদাত্তশ্চানুদাত্তশ্চ স্বরিতাশ্চ স্বরাত্রয়ঃ" (পাণিনীয় শিক্ষা, ১১)। স্বরবর্ণ তিন প্রকার- হ্রস্বস্বর, দীর্ঘস্বর, প্লুতস্বর। স্বরের নিজস্ব শক্তি মাত্রা দ্বারা নির্ণীত। হ্রস্বস্বর বা লঘুস্বর একমাত্রা, দীর্ঘস্বর বা গুরুস্বর দুই মাত্রা, প্লুতস্বর তিন মাত্রা। সমস্ত ব্যঞ্জনবর্ণই অর্ধমাত্রা। "একমাত্রো ভবেদ্ হ্রস্ব দ্বিমাত্রো দীর্ঘ উচ্যতে। ত্রিমাত্রস্তু ভবেৎ প্লুতো ব্যঞ্জনাধ্বর্ধমাত্রম্"।।

স্বরবর্ণ অক্ষের আদিতে আপন মহিমায় উপস্থিত হয় কিন্তু অক্ষরের ভিতরে বা শেষে স্বরবর্ণ তার আকৃতি পরিবর্তন করে কতকগুলি চিহ্নের মাধ্যমে পরিদৃষ্ট হয়। এই বর্ণ চিহ্নগুলি সঙ্গীতের সুরচিহ্নের মতো (muscical notations)- া, ি, ী, ু, ূ , ে , ৈ , ো , ৌ । ব্যঞ্জনবর্ণের কিছু চিহ্ন আছে যা 'ফলা' নামে পরিচিত। য-ফলা (্য), র-ফলা (্র),ব-ফলা (্ব) ইত্যাদি। স্বর উচ্চারণের সময় কোথাও কম-বেশি প্রস্বর বা শ্বাসাঘাতের ঝোঁক পড়ে, এই তারতম্য এবং ওঠা-নামায় অক্ষরের বিনিয়োগে একটা বিরাট ভূমিকা আছে। একটু পরিবর্তন হলেই শব্দার্থ পাল্টে যায়। শব্দ অশুদ্ধ ও দুষ্ট হয়ে পড়ে। "দুষ্টঃ শব্দঃ স্বরতো বর্ণতো বা"। (মহাভাষ্য-পতঞ্জলি), যাস্ক তাঁর নিরুক্তগ্রন্থে বলেছেন-এই অপশব্দ ভাষার একটা ভয়ঙ্কর অপরাধ। এতে শুধু অর্থ বিপর্যয়ই ঘটেনা, অশুদ্ধ শব্দ বাগ্ব্রজ হয়ে বক্তার ক্ষতিসাধন করে (৫)।

আসন, প্রাণায়ামাদি প্রভৃতিক্ষেত্রে কোন ত্রুটি-বিচ্যুতি হলে পরিণামস্বরূপ শরীরে মারাত্মক ক্ষতি হতে পারে। এমনকি বিকলাঙ্গ হওয়ার সম্ভাবনাও থাকে। তেমনি বাণীর ভিতর দিয়েও প্রাণবায়ু চৈতন্যযুক্ত হয়ে বিহার করেন। দেবতারা নগর বা বিহার করেন বলেই তো সংস্কৃত বর্ণমালার নাম দেবনাগরী। খ্রীষ্টপূর্ব তৃতীয় শতকে বর্ণমালা প্রথম চালু হয়। আনুমানিক ৫০০ খ্রীষ্টপূর্বাব্দে দক্ষিণ সেমিটিক অঞ্চল থেকে ব্রাহ্মীলিপি ভারতে আসে। খ্রীষ্টপূর্ব তৃতীয় শতকের শিলালেখ থেকে প্রধানতঃ উত্তরদেশীয় ও দক্ষিণদেশীয় ভেদে দু-প্রকার বর্ণমালার কথা জানা যায়। প্রথম খৃষ্টাব্দ থেকে লিখন পদ্ধতিতে ব্রাহ্মীলিপি বিভিন্ন আঞ্চলিক বর্ণমালায় পরিণত হয়। উত্তরভারতে এই লিপি দেবনাগরী নামেই আত্মপ্রকাশ করে। আবার আর্যগণ যেখানে বসতি স্থাপন করে তাদের পবিত্র ভাষা বলতে শুরু করে সেই স্থানকে তারা নগর বা নগরী বলতো। কালক্রমে গৈরিকাদি বর্ণের মাধ্যমে লিখনপদ্ধতি বিস্তার করলে সেই বর্ণমালাকে 'দেবনাগরী' বা 'নাগরী' বলা হত। ভাষার ত্রুটি বা বিঘ্ন হলে ক্ষতি বা হিতে বিপরীত হয়,

তার দৃষ্টান্ত বেদের ব্রাহ্মণভাগে বলা আছে। উচ্চারণকালে স্বর যখন উচ্চগ্রামে পৌঁছায় তখন তাকে 'উদাত্ত' (acute or raised accent) বলে। পাণিনি যাকে বলছেন-'উচ্চৈরুদাত্ত'। আবার স্বর যখন নিচে নেমে আসে তখন তাকে 'অনুদাত্ত' (grave accent) বলে। পাণিনির ভাষায় 'নীচৈরনুদাত্ত'। আর স্বর যখন উদাত্ত এবং অনুদাত্ত এই দুই স্বরের মাঝে একটা সমাহার অবস্থায় থাকে তখন তাকে বলে 'স্বরিত'। 'সমাহারঃ স্বরিতঃ' - পাণিনি।

বেদপাঠে চোদ্দ রকম দোষের আশঙ্কা করেছেন মহর্ষি যাজ্ঞবল্ক্য। অক্ষর সম্বন্ধে ভীতি বা শঙ্কা, উচ্চস্বর, অস্পষ্ট কণ্ঠস্বর, অনুনাসিক স্বর, কর্কশ স্বর, মূর্ধিস্বর বা অত্যন্ত চড়াস্বর, স্থানভ্রষ্ট উচ্চারণ, কুস্বর, বিরস স্বর, বিশ্লিষ্ট উচ্চারণ, অক্ষরকে ঘা মেরে মেরে উচ্চারণ, অস্থির পাঠ (ছন্দ-তাল-লয়হীন পাঠ) প্রভৃতি। কি কি গুণ থাকলে শুদ্ধভাবে সংস্কৃত পাঠ করা যায় পাণিনি তার একটা বর্ণনা দিয়েছেন। 'মাধুর্যমক্ষরব্যক্তিঃ পদচ্ছেদস্তু সুস্বরঃ। ধৈর্যং লয়সমর্থঞ্চ ষড়েতে পাঠকাঃ গুণা'।। 'বিনিয়োগ' কথার অর্থ বিশেষরূপে নিয়োগ বা প্রয়োগ (application)। যজ্ঞানুষ্ঠানে যথাবিধি মন্ত্রের প্রয়োগকেই বিনিয়োগ বলা হয়েছে। মন্ত্র কি ভাব নিয়ে কোন্ দেবতার উদ্দেশ্যে কিরকমভাবে ব্যবহার করতে হবে তার যথার্থ জ্ঞান। সাধারণভাবে শব্দের যথার্থ প্রয়োগ (সামান্য ও বিশেষ অর্থে)।

'স্বর' মানে স্বর্গ, আর 'বর্ণ' মানে মহিমা গরিমা দীপ্তি। স্বর্গের মহিমা ও দীপ্তি নিয়ে এই স্বরবর্ণমালা। স্বরবর্ণকে বলা হয় স্বরব্রহ্মণ। ব্রহ্ম যখন শব্দের ভিতর দিয়ে আপনাকে প্রকাশ করেন তখনই সৃষ্টি হয় স্বরব্রহ্মণ। ভাগবত তাই স্বরব্রহ্মণকে 'শ্রীকৃষ্ণের পাদপদ্ম' বলে অভিহিত করেছেন- 'স্বরব্রহ্মাণি নিভার্তহৃষীকেশপদাম্বুজে'(৬)। স্বর্গই ধ্বনিময় হয়ে ওঠে বাক্যন্ত্রে। দেবতাদের স্বরই মানবের কণ্ঠস্বর-'সপ্ততন্ত্রীকণ্ঠোস্থিতাঃ স্বরাঃ' (অমরকোষ)। স্বরবর্ণই সুর হয়ে ধ্বনিত বা উদ্গাত সামগানে। স্বর অর্থও সুর। নারদীয় শিক্ষায় সামগানের সাতটি স্বরকে সঙ্গীতের সাতটি স্বরের সঙ্গে যুক্ত করা হয়েছে। 'সপ্তস্বরাশ্রয়ো গ্রামা' (অমরকোষ) স্বরগ্রাম বা সারগম্ হল- সা রে গা মা পা ধা নি অর্থাৎ মধ্যম, গান্ধার, ঋষভ, ষড়জ, ধৈবত, নিষাদ। এবং মৌলিক স্বরবর্ণও সাতটি- অ, ই, উ, ঋ, ৯, এ, ও। 'যৎসামানাং প্রথমস্য বেণোর্মধ্যমঃ স্মৃতঃ। যোহসৌ দ্বিতীয়ো গান্ধারস্তৃতীয়স্তৃষভঃ স্মৃতঃ।। চতুর্থঃ ষড়জ ইত্যাহুঃ পঞ্চমো ধৈবতো ভবেৎ। ষষ্ঠো নিষাদো বিজ্ঞেয়ঃ সপ্তমঃ পঞ্চমঃ স্মৃতঃ'(৭)।। স্বরবর্ণকে ঋষিরা বলেছেন ব্রহ্মযজ্ঞ- 'স্বরসম্পন্নতয়া আর্ত্বিজ্যং কুর্য্যাৎ'(৮)। ব্রহ্মশক্তিকে বলা হয় 'স্বরা'। শক্তি-সমন্বিত ব্রহ্মের আত্মবিসৃষ্টির যে বিশ্বযজ্ঞ তাই বীজাকারে স্বরবর্ণমালা।

এখন বর্ণগুলির অর্থ, পরিচয়, প্রকৃত তত্ত্ব কি সে বিষয়ে আলোকপাত করা যাক-

(অ)

শ্রীমদ্ভাগবদ্গীতার মাধ্যমে আমরা জানতে পেরেছি 'অ' মানে শ্রীকৃষঃ –'অক্ষরাণামকারোহস্মি' (গীতা-১০/৩৩); 'অকারো বাসুদেবঃ স্যাদাকারশ্চ পিতামহঃ'। পাঠান্তরে-'অকারঃ কেশবঃ প্রোক্তঃ' (অমরকোষ, কোষমালা, একাক্ষরকোষঃ-১)। 'অ' মানে আবার পিতামহ। অল্পতা, অপ্রাশস্ত্য, অন্যতা, অভাব, বৈপরীত্য বোঝাতেও 'অ'-কার ব্যবহৃত। ওঙ্কার বা প্রণবের প্রথম অক্ষর 'অ' (অ+উ+ম)। 'অ'-চেতনার জাগ্রত অবস্থা। 'অততি তিষ্ঠতীতি বা' -তারানাথ বাচস্পতি এই অর্থ করেছেন। সহানুভূতি বোঝাতে 'অ'- 'অ অবদ্যং'; তিরস্কার অর্থে 'অ' – 'অপচসি ত্বং জাল্ম' (পাণিনি)। অঃ হলেন মহেশ্বর-'অঃ স্যাদ্দেবো মহেশ্বরঃ'। অন্যার্থে কৃশকটি, অসুর, কচ্ছপ, অঙ্গন, যুদ্ধ, মহত্ত্ব, রাজপ্রাসাদের অন্দরমহল, অলঙ্কার, উমা, যজ্ঞাগ্নিশিখা, মন্ত্রশক্তি, লাগাম, রথের অশ্ব, চন্দ্রমণ্ডল। "কৃষঃ শঙ্করো ব্রহ্মা শক্র সোমহনিলহনলঃ। সূর্যঃ প্রাণো যমঃ কালো বসন্তঃ প্রণবঃ সুখী"-(সৌভরী একার্থনামমালা)। অর্থাৎ শিব, ব্রহ্মা, বায়ু, বৈশ্বানর, সূর্য, ইন্দ্র, সোম, অনিল, অনল, কাল, প্রণব 'অ'-কার এর সমার্থক। ' অং স্যাচ্চ পরমং ব্রহ্ম'- অং অর্থ পরম ব্রহ্ম।

অব্যক্ত পরম যে অক্ষর, সমস্ত প্রকাশের বর্ণের অতীত যে অবর্ণ, তিনিই আত্মশক্তিযোগে এই বর্ণময় বৈচিত্র্যের সৃষ্টি করেছেন,- "য একোহবর্ণো বহুধা শক্তিযোগাদ্। বর্ণাননেকান্ নিহিতার্থো দধাতি"(৯)।।

(আ)

'পূজায়ামপি মাঙ্গল্যে আকারঃ পরিকীর্তিতঃ' (অমরকোষ) পূজা মাঙ্গল্য অর্থে 'আ'। বিস্ময়, আনন্দ, খেদ সূচক অব্যয় 'আ'। ব্যাপ্তি, ঈষৎ, সীমা, সম্যক্, ব্যাপ্তি, বৈপরীত্য সূচক উপসর্গ 'আ'। বিদ্বানগণের সন্তুষ্টিবিধানের জন্য 'আ' ব্যবহৃত-'আ পরিতোষাদ্ বিদুষাং ন সাধু মন্যে প্রয়োগবিজ্ঞানম্' (কালিদাস-অভিজ্ঞানশকুন্তলম্)। পাণিনি ব্যাকরণে 'আঙ্ মর্যাদাভিবিধ্যোঃ' (অষ্টাধ্যায়ী ২/১/১৩-পাণিনি) সূত্রের দ্বারা মর্যাদা, সীমা বা অভিবিধি বোঝাতে 'আ' অব্যয় প্রযুক্ত। আবার বার্তিককার কাত্যায়ন মতে 'আঙঃ প্রতিজ্ঞায়ামুপসঙ্খ্যানম্' (বার্তিক) বক্তব্যের মাধ্যমে প্রতিজ্ঞা অর্থাৎ দৃঢ়ভাবে অঙ্গীকার করা অর্থে প্রয়োগ দেখিয়েছেন।

(ই)

'ইকারো উচ্যতে কামো' (অমরকোষ)। 'ই' এর অর্থ-কামদেব, মদন। বিস্ময়, বেদনা, অধীরতা বোঝাতেও 'ই'। 'ইঃ কামঃ স্থাণুরিন্দ্রোঽর্কো বরুণঃ পাদপঃ দ্বিপঃ'। শুচিঃ শ্রীমানজো বালো বিরিঞ্চিঃ কৃত্তিবাসুতঃ' (১০)।। 'ই' মানে আবার বরুণ, পাদপ, দ্বিপঃ, শুচি, বিরিঞ্চি, কৃত্তিবাস। শত (১০০) সংখ্যা বোধক 'ই'-কার। আগমন (ইত্বন্, ইতম্), গমন (ইত্বর, ইত্যা), জ্ঞান (ইতম্) প্রভৃতি বোদ্ধব্য এই 'ই'-কার।

(ঈ)

'ঈ' মানে লক্ষ্মী – 'লক্ষ্মীরীকার উচ্যতে' (অমরকোষ)। 'ঈ' এর অর্থ আবার পরিব্যাপ্ত হওয়া, চক্ষু (ঈক্ষতে), ইচ্ছা করা, ভক্ষণ করা, যাওয়া, ভিক্ষা করা, দীপ্তি পাওয়া, গর্ভধারণ করা প্রভৃতি।

অ, আ, ই, ঈ এই চারটি স্বরবর্ণের অর্থ আমরা জানলাম। কিন্তু এই এক-একটি বর্ণের আলাদা আলাদা অর্থ করা হয়েছে এর পিছনে যুক্তি কি? তাৎপর্য কি? বৈদিক ঋষিরা যাকে বলেছেন ব্রহ্মবাক্ বা গৌরী (১১)। সুতরাং অক্ষর যে ব্রহ্ম এ' শুধু ঋষিবাক্য নয়, বিজ্ঞান এবং লজিকও বটে। শব্দ ও বর্ণ– Sound এবং Colour দুটো যে একই কথা তা আজ বিজ্ঞানসম্মত। শব্দই রূপে-বর্ণে ছবি হয়ে ওঠে। বর্ণ হল স্বরকম্পনের ব্যঞ্জনা। সঙ্গীতে যেমন আছে প্রত্যেকটি রাগের এক-একটা বিশেষ রূপ ও বর্ণ। ভাবতে আশ্চর্য লাগে আমাদের মুনি-ঋষিদের সত্যদৃষ্টির গভীরতা দেখে। তাঁরা বর্ণকে দুভাগে ভাগ করেছেন, স্বরবর্ণ ও ব্যঞ্জনবর্ণ। যেন পুরুষ আর প্রকৃতি। চৈতন্য ও শক্তি। স্বরবর্ণ স্বতন্ত্র-স্বাধীন আত্মস্থ স্বনির্ভর। নিত্যসত্ত্ব নির্গুণ। স্বরবর্ণ স্বরূপত ব্রহ্মপুরুষ আর ব্যঞ্জনবর্ণ প্রকৃতিস্বরূপ। ব্রহ্মপুরুষের আশ্রয়েই তাঁর শক্তির প্রকাশ। তাই স্বরবর্ণের আশ্রয় ছাড়া ব্যঞ্জনবর্ণ উচ্চারিত হতে পারেনা। ব্যঞ্জনের বর্ণবৈচিত্র্য স্বরের নির্বর্ণ পটের উপরেই খেলছে, পট সরিয়ে নিলেই ছবিও অদৃশ্য।

যে ভাষায় স্বরবর্ণের সংখ্যা বেশি সেই ভাষার স্বরব্যঞ্জনা ও বৈচিত্র্যও বেশি। স্বরবর্ণ স্বভাবতই সুস্পষ্ট এবং গম্ভীর। স্বরবর্ণ যদি বেশি থাকে তাহলে ভাষার সুস্পষ্টতা ও গভীরতাও বেশি হয়। সংস্কৃত যে পৃথিবীর শ্রেষ্ঠ ধ্বনিগম্ভীর সুস্পষ্ট সুললিত ভাষা, তার কারণ এর স্বরবর্ণের সংখ্যা সবচেয়ে বেশি।

স্বরধ্বনিকে এত সূক্ষ্মভাবে অনুধাবন করা, বিশ্লেষণ করা, পর্যায় নির্দেশ করা ঋষিদের বৈজ্ঞানিক দৃষ্টির এক পরাকাষ্ঠা। সংস্কৃতে স্বরবর্ণের সংখ্যা ষোলোটি, প্লুতস্বর ধরলে পঁচিশটি। অ, আ, ই, ঈ, এই রকম ষোলোটি স্বরবর্ণ যে পরপর সাজানো হয়েছে তার মধ্যেও সুনির্দিষ্ট বৈজ্ঞানিক পদ্ধতি ও যুক্তি বিদ্যমান। শরীরের অঙ্গসংস্থানের মতোই তা যথাযথ এবং অপরিবর্তনীয়। সংস্কৃত বর্ণ-বিন্যাসে বৈজ্ঞানিক রীতি আছে। প্রথমে 'অ', এরপর 'আ',

তারপরে 'ই', তারপর 'ঈ' এইভাবে ষোলোটি স্বরবর্ণ সাজানো আছে, কোনোভাবেই এলোমেলো বা আগে-পরে হলেই হ-য-ব-র-ল। মনে রাখতে হবে বর্ণমালা হল ভাষার স্বরলিপি। সঙ্গীতের স্বরলিপির মতই। একে অগ্রাহ্য করলে ভাষা শুধু ব্যাহতই হবেনা, আহতও হবে। ভাষার বিকার বা বিকৃতি আসবে। বেসুরো, বেতালা বিকট গানের মত। এই স্বরধ্বনির প্রকাশ অন্তরাত্মার জাগরণের মত। The chosen medium of the soul's self-expression'. (শ্রী অরবিন্দ)। অন্তরাত্মার স্বতঃস্ফূর্ত ধ্বনিরূপকেই ভাষাতাত্ত্বিক পেঙ্কা বলছেন- phusis। শরীরের পেশী ও স্নায়ুর মিলিত কম্পনে শব্দের সৃষ্টি। ম্যাক্সমুলার এবং আধুনিক ভাষাতাত্ত্বিকগণ এর নাম দিয়েছেন- thesis। অন্তরাত্মার এই শক্তিকেই বৈদিক ঋষিরা নাম দিয়েছেন- বাক্, বাগ্দেবী। তন্ত্রমতে বাক্শক্তির বিভিন্ন স্তর নির্দেশ করা হয়েছে। যথা- বৈখরী, মধ্যমা, পশ্যন্তী ও পরা।(১২)

কণ্ঠ থেকেই স্বরধ্বনির প্রথম প্রকাশ তাই তা' কণ্ঠস্বর। সেই ধ্বনি হল 'অ'। এই 'অ' প্রথম এবং আদি স্বর। এই স্বর আকাশের মতো সর্বব্যাপ্ত এবং সকলবর্ণের আশ্রয়। অতএব 'অ' সকলের অগ্রে এবং সকলের অন্তরে। 'অ' ব্রহ্ম, 'অ' নারায়ণ, সমস্ত সৃষ্টি ও ভাবের অয়ন বা আশ্রয়। 'কাশিকা' তে আচার্য নন্দিকেশ্বর বলেছেন- 'অকারো ব্রহ্মরূপঃ সর্বগুণঃ সর্বব্বস্তুষু।... অকারঃ সর্ববর্ণাভ্যঃ প্রকাশঃ পরমেশ্বর। আদ্যমন্তেন সংযোগাদমিত্যেব জায়তে'।। 'অ' কার যখন দীর্ঘস্বর হয়ে যায় তখন তা 'আ'। ফলে বিস্ময়, আনন্দ, আরো পরিব্যাপ্ত হয়ে ছড়িয়ে পড়লো। 'অ' এবং 'আ' একই স্বরের হ্রস্ব-দীর্ঘরূপ। পাণিনি সূত্র করলেন-'অকঃ সবর্ণে দীর্ঘঃ' (অষ্টাধ্যায়ী- ৬/১/১০১)।

(উ)

ওঙ্কার বা প্রণবের দ্বিতীয় ধ্বনি (অ+উ+ম)। চেতনার অন্তরাত্মার সূক্ষ্ম স্বপ্নাবস্থা। 'উ' অর্থ উমেশ (সিদ্ধান্তকৌমুদী)। 'উ' অর্থ আবার শব্দ, নাদ বা গর্জন করা। 'সিংহধ্বনিরুন্নাদ' (কুমারসম্ভব-১/২৬)। 'উ' অর্থ শঙ্কর – 'উকারঃ শঙ্করঃ প্রোক্ত' (অমরকোষ)। নিষেধ, মাত্রা বা সীমা-'উ মেতি মাত্রা তপসো নিষিদ্ধা' (কুমারসম্ভব-১/২৬)।'উ' অর্থ ব্রহ্ম, চন্দ্রমণ্ডল, কাল, নারদ, মার্কণ্ডেয়, রাবণ; (সৌভরী একার্থনামমালা)। জিজ্ঞাসা বা দাবি করা অর্থেও 'উ'; যথা 'উনেতি'। 'লক্ষণে/রক্ষণে চ অপি উকার উকারো ব্রহ্মণি স্মৃতঃ' (পাঠান্তর)

(ঊ)

১৭৬

'ঊকারো ব্রহ্মণিস্মৃতঃ' (অমরকোষ)– অর্থাৎ রক্ষা করা, ব্রহ্মণ। এর অন্য অর্থসমূহ হল-শিব, অগ্নি, তৃষ্টা, পূর্ণচন্দ্র, দরিদ্র, সরমা- 'বহিির্নিশাকরঃ পূর্ণো দরিদ্রো সরমাধিপ'। (সৌভরী একার্থনামমালা)। 'ঊধনি'-অন্ধকার অপসারিত হয়ে ঊষা, প্রভাত বা আলোর প্রকাশ। 'লক্ষণে/রক্ষণে চ অপি উকার উকারো ব্রহ্মণি স্মৃতঃ' (পাঠান্তর)।

এখন প্রশ্ন হতে পারে যে শব্দ ও অর্থের মধ্যে কোনো সম্পর্ক আছে? নাকি নিছক মনগড়া? তারা কি পরস্পর ওতপ্রোত? আলো ও উত্তাপ, চিৎ ও শক্তি, কৃষ্ণ ও রাধা, নাকি হর-পার্বতীর মতো? উত্তরে বলা যায়, বর্ণের সব অর্থ প্রতিভাত হয়েছে সাক্ষাৎদৃষ্টিতে। ঋষি অরবিন্দ বলেছেন, - 'Word is to make us see, not to make us think or feel'. কেননা সকল শব্দই অনন্তের ধ্বনিরূপ। শব্দ ধ্বনিত হয়েই আবার মিলিয়ে যায় অনন্তে। এ' বিষয়ে অরবিন্দ চমৎকার বলেছেন, - 'soar straight into the pure empyrean of the infinite.'

(ঋ)

এবারের আলোচ্য সপ্তমস্বর- 'ঋ'। এই 'ঋ' সংস্কৃত ভাষাকে দিয়েছে পৃথিবীর অন্যান্য ভাষার থেকে এক বিশিষ্টতা। এই ধ্বনি উঠেছে মস্তিষ্কে, মূর্ধায় (cerebral)। মূর্ধন্য ঋ-তে এসে প্রাণবায়ুর একটা যোগ সাধিত হয়। যোগীরা এর অর্থ ও তাৎপর্য বুঝবেন। অন্তরাত্মার চিৎশক্তি বাকের উদ্দীপনায় মন চালিত হয়ে দেহের অগ্নিকে তপঃ কে চাপ দেয়। তার ফলে প্রাণবায়ু সঞ্চালিত হয়। তারই ফলে স্ফূরিত প্রাণকে বেদের ঋষিরা নাম দিয়েছেন- মরুৎগণ। 'আত্মা বুদ্ধ্যা সমেত্যার্থান্ মনো যুঙ্ক্তে বিবক্ষয়া। মনঃ কায়াগ্নিমাহান্তি স প্রেরয়তি মারুতম্।। (পাণিনীয় শিক্ষা)। দেহাভ্যন্তরস্থিত তপোস্তপ্ত অগ্নি দ্বারা সঞ্চালিত প্রাণবায়ু বা মারুতম্ যখন মস্তিষ্কে ওঠে তখন রণিত হয় মূর্ধন্যস্বর ঋ। বর্ণ হিসেবে 'ঋ' এর অর্থ চলা ,ঊর্ধ্বগতি। বিশ্বচরাচরের সত্যের যে ছন্দ মহাসৃষ্টির যে বিলসন ক্রিয়া, তাই হল ঋ বা ঋত। অমরকোষ মতে-'ঋকারো বেদমাতা (পাঠান্তরে 'দেবমাতা')। 'ঋচ্ছতেরিত্যাগ্রায়ণঃ' (নিরুক্ত-১/৯) মহাকাশের অনন্তগম্ভীর নাদধ্বনি-'ঋচ্ছন্তীব খে উদ্গান্তাম্' (নিরুক্ত-১/৯)। যোগীদের কাছে মহাকাশ মূর্ধন্য চেতনা, নাদরূপ ঋ। এই গভীর বিপুল বৃহতের মাঝে দেবতারা বিরাজ করেন। 'ঋতেন পৃথ্বী বহুলে গভীরে' (ঋগ্বেদ ৪/২৩/১০)। 'ঋ' এর অপর অর্থ সত্য। 'ঋতাবৃধ ঋতাবানা' (ঋগ্বেদ ৫/৬৫/৫)। সত্যের স্পর্শ দিয়ে প্রত্যেকটি মানুষকে ধরে রয়েছেন-'ঋতস্পৃহ ঋতবানো জনে জনে' (ঋগ্বেদ ৫/৬৭/৪)।

(৯)

ঋ এর পরবর্তী স্বর '৯'-কার। এটা দন্ত্য বর্ণ নয়, মূর্ধন্যস্বর। শ্রীঅরবিন্দ এর উচ্চারণ দেখিয়েছেন- লৃখ (lr)। যদিও আমরা সাধারণভাবে 'লি' উচ্চারণ করি। কিন্তু সঠিক উচ্চারণ হবে লৃখ (lr) অর্থাৎ ঋ এর তরল ধ্বনি (liquid sound)। মহর্ষি অরবিন্দের বক্তব্য অনুযায়ী বৈদিক কোমল-'ড' মূর্ধন্য-'ল' তে পরিণত হয়েছে। 'ঋতি সবর্ণে ঋ বা, ৯তি সবর্ণে ৯ বা বার্তিকানুসারে হোতৃ + ৯-কারঃ = হোত৯কার, হোতৃকারঃ এরূপ হয়। ভাষাতত্ত্বগত ভাবে প্রাচীন বৈদিক সংস্কৃতে ল- এর একটা মূর্ধন্যস্বর ছিল। উচ্চারণ অনেকটা লৃ+ড়ৃ। ঋগ্বেদের প্রথম-মণ্ডলের প্রথমে অগ্নিসূক্তের মন্ত্রে রয়েছে-'অগ্নিমীড়ে পুরোহিতম্...'। যদিও পরবর্তীকালে বৈদিক সংস্কৃত থেকে ৯-কার লুপ্ত হয়ে যায়, তবে তামিল, মারাঠা ভাষাতে স্থান পেয়েছে। "The Vedic modification of the soft cerebral ᵈd into a cerebral ḷ . This sound disappears in later Sanskrit, but has fixed itself in Tamil and Marathi. Such is the simple instrument out of which the majestic and expressive harmonies of the Sanskrit language have been formed." -Sri Aurobindo (১৩)। বাংলা ভাষায় লি-কার এর প্রাধান্যে যেমন ভাবে '৯-কার যেন ডিগবাজি খায়', ফলতঃ বর্তমানে '৯'-কারের লুপ্ত অবস্থা।

(এ, ঐ, ও, ঔ)

এই চারটি স্বরবর্ণের মধ্যে মৌলিক স্বর দুটি- এ, ও। অন্য দুটি মৌলিক নয়। ঐ, ঔ- যুগ্মস্বর, দ্বিস্বর বা স্বরসন্ধি। এদের অবয়বে দুটি করে স্বর থাকা সত্ত্বেও একবর্ণের মতোই ব্যবহার হয়। সন্ধির ফলে সৃষ্ট তাই এদেরকে 'সন্ধ্যক্ষর' বলা হয়। ও + ই = ঐ, ও + উ= ঔ অর্থাৎ দুটি করে স্বরধ্বনি মিশে জোড়স্বর তৈরি হয়েছে। ইংরেজীতে যাকে 'Dipthong' বলা হয়। এ, ঐ তালব্যবর্ণ, উচ্চারণস্থান তালু (Palate), ও,ঔ ওষ্ঠ্যবর্ণ, উচ্চারণস্থান ওষ্ঠ (Lip)। স্বরযন্ত্রে ধ্বনি নিঃসরণ হয় প্রথমে কণ্ঠে তারপর তালুতে এবং শেষে ওষ্ঠে। অতএব বাগ্যন্ত্রের উচ্চারণের স্বাভাবিক নিয়মেই আসবে প্রথমে এ, ঐ তারপরে ও, ঔ। এই চারটি দীর্ঘস্বর একত্রে সম্মিলিত হয়েছে ব্রহ্মা, বিষ্ণু, মহেশ্বর বা রুদ্র দেবতায়। 'এ'- বিষ্ণু, 'ঐ'- মহেশ্বর, 'ও'- ব্রহ্মা, 'ঔ' এর অর্থ রুদ্র। "একারঃ কথিতো (উচ্চতে) বিষ্ণুরৈকারশ্চ মহেশ্বর। ওকারস্তু ভবেদ্ব্রহ্মা ঔকারো রুদ্র উচ্যতে"।। (অমরকোষ)। এইভাবে স্বরবর্ণমালার শেষ সারিতে দাঁড়িয়ে আছেন সৃষ্টি-স্থিতি-প্রলয়ের দেবতা।

সমস্ত দেবতার তেজ ও দীপ্তি, শক্তি ও ক্রিয়া বীজ আকারে স্বরবর্ণ। স্বরবর্ণ যদি সৃষ্টির বীজরূপে গণ্য হয় তাহলে ব্যঞ্জনবর্ণ সৃষ্টির অঙ্কুর। অঙ্কুরের মধ্যে যেমন অন্তর্লীন থাকে মহীরুহ, তেমনি ব্যঞ্জনবর্ণের মধ্যে সমস্ত সৃষ্টি। 'বিশ্বমাত্মগতং ব্যঞ্জন্ কূটস্থো জগদঙ্কুরঃ'(১৪)। অসীম অনন্ত নির্বিশেষ ব্রহ্ম এই ব্যঞ্জনের মধ্যে প্রকট

হয়েছেন। 'প্রপঞ্চং আত্মগতং স্বস্মিন্ সূক্ষ্মরূপেণ স্থিতং ব্যঞ্জয়ন্ প্রকটয়ন্ সর্বত্র'। বর্ণমালা সৃষ্টি প্রসঙ্গে ভাগবত চমৎকার কাব্যময় বর্ণনা করেছেন। পরমাত্মা পরব্রহ্মের যে স্বধা, আপন ধাম থেকে নিঃসৃত অকারাদি তিন বর্ণ। 'ত্রয়োবর্ণা অকারাদ্যা'- অর্থাৎ অ-উ-ম= ওঁ। সেই ওঙ্কারই 'বীজং সনাতনম্'। সেই থেকে ভগবান হ্রস্ব-দীর্ঘ স্বরবর্ণ, স্পর্শ উষ্ম অন্তস্থ ব্যঞ্জনবর্ণ সৃষ্টি করলেন। 'ততোহক্ষরসমাম্নায়মসৃজড্ভগবানজঃ। অন্তস্থোষ্মস্বরস্পর্শ-হ্রস্বদীর্ঘাদিলক্ষণম্'(১৫)।। ভগবানের দেহ থেকে স্বরবর্ণ, স্পর্শ থেকে ব্যঞ্জনবর্ণ, ইন্দ্রিয় থেকে চারটি উষ্মবর্ণ (শ-ষ-স-হ), আত্মবল থেকে অন্তস্থবর্ণ (য-ব-র-ল), এবং আনন্দময় বিহার থেকে সপ্তস্বর (ষড়্জ, ঋষভ, গান্ধার, মধ্যম, পঞ্চম, ধৈবত ও নিষাদ)।। কেননা স্বয়ং ভগবান ব্যক্ত-অব্যক্ত স্বরূপে বেদব্রহ্মময় মূর্তি। 'শব্দব্রহ্মাত্মনস্তস্য ব্যক্তাব্যক্তাত্মনঃ পরঃ' (১৬)।

আর সেই প্রকাশময় জগৎ হল ঋগ্বেদ। সৃষ্টির যে দিব্য প্রকাশমহিমা তার প্রথম উদ্ভাস প্রথম পাঁচটি ব্যঞ্জনবর্ণে- ক-খ-গ-ঘ-ঙ।

(ক বর্গ - ক খ গ ঘ ঙ)

'ক'-আত্মা, পরমাত্মার প্রকাশ, প্রকাশমান পৃথিবী। অমরকোষে বলা হয়েছে-'কশ্চাত্মা চ সমাখ্যাতঃ কঃ প্রকাশ উদাহৃতঃ'। ক= সৃষ্টিপদ্ম। 'পৃথিব্যাং কুঃ সমাখ্যাতাঃ'। ব্রহ্মা, বিষ্ণু, মন, সূর্য, চন্দ্র, অগ্নি, কামদেব, কাল প্রভৃতি। 'খ'-'খমিন্দ্রিয়ং সমাখ্যাতং খমাকাশমুদাহৃতম্। খং স্বর্গে চ সমাখ্যাতং খং সর্পে চ প্রকীর্তিতম্' (অমরকোষ)। 'খ'-এর অর্থ আকাশ, ইন্দ্রিয়, মহাশূন্য, আদিত্য, সূর্য (খমণি, খদ্যোতনঃ), পৃথিবী (খন্তনী), মহাকাশ মণ্ডল (খগোল)। 'গ'-'গণপতিরুদ্দিষ্টো গো গন্ধর্ব্বঃ প্রকীর্তিতঃ'। গণেশ, গমনকারী, ধ্বনি, নাদ, স্বর, গন্ধর্ব্ব, (মধ্যমা বাক্) সরস্বতী, পৃথিবী, মাতা প্রভৃতি। 'ঘ'-'ঘো ঘণ্টায়াং সমাখ্যাতঃ কিঙ্কিণী ঘা প্রকীর্তিতা'। 'ঘ'-এর অর্থ হল ঘন্টা-কিঙ্কিণী ধ্বনি। মহাকাশের ধ্বনিতরঙ্গ, নাদকম্পন, পেষণী, পর্বতদ্বার, সমস্ত ধ্বনি নাদের একটা পরিস্ফুট ঘনত্ব- 'ঘনশ্চ প্রকীর্তিতা'-(অমরকোষ)। 'ঙ'-'ঙকারো ভৈরবঃ খ্যাতঃ ঙকারো বিষয়ে স্মৃতঃ'-(অমরকোষ)। গর্জন, রাগ-বিশেষ ধ্বনিময়তা (ঙবতে), প্রাণতুরঙ্গ (প্রাণস্তুরগো), ঙং=ধরা, রমা, ঙঃ= ব্রহ্ম। 'ভৈরব'- শিবের অবতার। মৃত্যু এবং বিনাশের সঙ্গে সম্পর্কিত, কাল ভৈরব।

ক-বর্গীয় পঞ্চবর্ণ (ক-খ-গ-ঘ-ঙ) পর্যালোচনা করলে দেখা যায় যে, পরমাত্মা ভগবান স্বয়ং প্রকাশমান হয়ে মহাশূন্যে-মহাব্যোমে, দ্যুলোকের আদিত্যবর্ণ ঝল্মল্ করে উঠল, জেগে উঠল ধ্বনিময় বেগ ও কম্পন, আকাশস্তনী

পৃথিবীর বক্ষ কম্পিত হতে লাগল, শব্দময়-গতিময়-বর্ণময় নিবিড় এক আনন্দস্পর্শ ঐ মহাকাশ আর এই পৃথিবী, সব নিয়ে স্বয়ং ব্রহ্মা। দৈবদৃষ্টিতে দেখলে প্রথম পাঁচটি ব্যঞ্জনের মধ্যে রয়েছেন সমস্ত দেবতারা। ক= কেশব, বিষ্ণু, অগ্নি, বায়ু, যম, সূর্য। খ= সূর্য, আদিত্য। গ= বিষ্ণু। ঘ= পূষা (দ্বাদশ আদিত্যের একজন, হিন্দু বৈদিক দেবতা, কশ্যপ ও অদিতির পুত্র, সভা, বিবাহ, যাত্রা, রাস্তা, গবাদি পশুর দেবতা প্রভৃতি)। ঙ= ব্রহ্মা, শিব।

(চ-বর্গ – চ, ছ, জ, ঝ, ঞ)

'চকারশ্চন্দ্রমাখ্যাত-(ভাস্করে) স্তস্করশ্চ প্রকীর্ত্তিতঃ'। চ-এর অর্থ চন্দ্রকিরণ, সূর্য, চক্ষু। 'নির্ম্মলং ছং সমাখ্যাতং তরণী ছঃ প্রকীর্ত্তিতঃ'। ছ- নির্মল, বিশুদ্ধ, তরণী, কুত্রাচিৎ তরল, ছেদন বা ছেদক। জ-বেগ, স্বজন, জঘনদেশ (কোমর বা কটিদেশ), জাত, জন্ম, নিশীথ, জয় (জয়ন), ব্যঞ্জনবর্ণ-'ব্যঞ্জনে জঃ প্রকীর্ত্তিতঃ', জনন, জনক (পিতা), শিব, বিষ্ণু, সূরি, যোজন, গায়ন (গীত)। 'ঝ'-অর্থ শব্দ, নাদ, ঝঙ্কার, ঝঞ্ঝা, নষ্ট, বায়ু, মৎস্য। 'ঝঞ্ঝাবাতে ঝকারঃ স্যান্নষ্টে ঝঃ সমুদাহৃতঃ। ঝকারশ্চ তথা বায়ৌ'। 'ঞ'- 'গায়নে প্রোক্ত ঞকারো ঘর্ঘরধ্বনৌ'। অর্থাৎ গায়ন, ঘর্ঘর ধ্বনি বা নাদ, শব্দ।

(ট-বর্গ - ট, ঠ, ড, ঢ, ণ)

'ট'-কার এর অর্থ টঙ্কার, পার্থিব ধ্বনিসমূহ, করধ্বনি, রজত, মুদ্রা, খড়্গকোষঃ। 'ঠ'- মহেশ্বর, মহাদেব, মহাশূন্য, বৃহৎ, ধনসম্পদ 'ঠো মহেশ্বর আখ্যাতঃ শূন্যে চ প্রকীর্ত্তিতঃ। বৃহদ্ধনৌ চ ঠঃ প্রোক্তস্তথা চন্দ্রস্য মণ্ডলে'। 'ড'-কারের অর্থ শঙ্কর, ডমরু (বাদ্যবিশেষ), ত্রাস, ধ্বনি, ভীম। 'ঢ'-কার ঢক্কা, নিনাদ, নির্ঘুণ, কিন্নর, নির্ধন প্রভৃতি। 'ণ'-কার 'ণকারঃ কীর্ত্তিতো জ্ঞানে নির্ণয়েহপি'। কীর্তি, নির্ণয়, জ্ঞান, নিশ্চয়, সুকৃতি প্রভৃতি অর্থ।

(ত-বর্গ – ত, থ, দ, ধ, ন)

'ত'-অর্থ পুণ্য, চোর (তস্করঃ), পুচ্ছম্, ম্লেচ্ছ, সদাচার-বিহীন, ক্রোড়ম্, অমৃত, বাত, পবন, বায়ু। 'থ'- এর মানে পাহাড় (শিলোচ্চয়), পর্বত, ভয়-ভীতি, রক্ষা, নত, রাশি। 'শিলোচ্চয়ে থকারঃ স্যাৎ থকারো ভয়রক্ষণে'। 'দ'- কলত্র, দান, ইচ্ছা, রক্ষক ইত্যাদি। 'ধ'-কার ধনদাতা (ধনদঃ), ধনী (ধনীন্), ধাতরি, ধী (পণ্ডিত), ধিষণা, ধনেশ, ধর্মশীল, বসুন্ধরা, ভারবাহক,। 'ন'-কার অর্থ আকার, চেহারা, সৌগত, বুদ্ধ, সুন্দর, বন্ধ, স্তুতি, তরণী,। 'নশব্দঃ স্বাগতে বন্ধৌ বৃক্ষে সূর্যে চ কীর্ত্তিতঃ'।

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(প-বর্গ - প, ফ, ৰ, ভ, ম)

'পবনে পঃ সমাখ্যাতঃ'। পবন বা বায়ু, পান করা, পতন, পত্রম পাদ, পূর্ব দিক, কুবের, পশ্চিম দিক, রাজা। 'ফ'-এর মানে ঝঞ্ঝা, বাত, কফ, বাতবেদনা, অক্ষর, কোপ বা ক্রোধ, নিষ্ফল-ভাষণে, আহ্বান, কঠোর। বর্গীয় 'ৰ'-কারার্থ প্রচেতা, কলস, পক্ষী, দিগ্‌শূন্য গমন, ফল, বক্ষঃস্থল, গদা প্রভৃতি। 'ভ'-'নক্ষত্রং ভং বুধৈঃ প্রোক্তং ভ্রমরে ভঃ প্রকীর্তিতঃ'। নক্ষত্র, ভ্রমর, ভবন, আলো, দীপ্তি, প্রকাশ, শুক্রাচার্য্য, সদ্‌গুণ, গুঞ্জন, ভানু, ভাস্কর, পৃথিবী, ভূমি, ভয়। 'ম'-কার মহেশ্বর, শিব, চন্দ্রমা, বেধা, লক্ষ্মী, মাতৃ, বন্ধন, ওঙ্কার ধ্বনির অন্তিম বর্ণ, যজ্ঞ, ইন্দ্র।

(অন্তস্থবর্ণ - য, র, ল, ব)

'য'-ধ্বনির গূঢ়ার্থ- 'যশো যঃ কথিতঃ শিষ্টৈর্যো বায়ুরিতি শব্দিতঃ'। যশ, বায়ু, শব্দ, কুবের, যাত্রা, যান, বিয়োগ, ত্যাগ ইত্যাদি। 'র'- রাম, কামনা, কাম, কামানল, বহ্নি, বেগ, রোদন, ভূমা, ধনাদি, ইন্দ্রিয়, ধন-নিয়ন্ত্রণ, ধান, ভয়, বাস্ত, দান। 'ল'-কারার্থ ইন্দ্র, বায়ু, লবণ, দানার্থ, শ্লেষ, সাধন, প্রলয়। 'লঃ শ্লেষে চাশয়ে চৈব প্রলয়ে সাধনেহপি লঃ। মানসে করুণে চৈব লকারঃ সান্ত্বনেহপি চ'। ল= বর্ণগন্ধময় পৃথিবীর বীজমন্ত্র লং। 'লং পৃথিব্যাত্মক গন্ধ'। 'ব'-কারের অন্তস্থ ব এটি। 'বদন্তি শং বুধাঃ শ্রেয়ঃ শশ্চ শান্তা নিগদ্যতে'। জ্ঞান, বুদ্ধি, শান্ত, শ্রেয়।

(উষ্মবর্ণ - শ, ষ, স, হ)

'শ'-বর্ণার্থ -শঙ্কর, সুখ, শ্রেয়, শয়ন (শয্যা), আহ্ব (বলা), হিংসা (শত্রু), শম্ভু, চন্দ্র। 'ষ'-কার 'ষড়ভ্যঃ স্থানেভ্যঃ জায়তে যঃ সঃ ষড়জঃ'। বায়ু, ষড়জঃ (স্বরবিশেষ), শ্রেষ্ঠত্ব, গর্ভবিমোচন। 'স'- সোম (সোমরস, সোমদেবতা), আনন্দবিশেষ, উপসর্গ, লক্ষ্মী, গো, সংসর্গ, বানর, সর্ব। 'হ'-কোপণ বা ক্রোধার্থে, ধারণ, সম্বোধন, হেতু নির্ণয়ে, বারণ বা নিষেধ, পাদপূরণে, আকাশ, অশ্ব, সূর্য, প্রভৃতি।

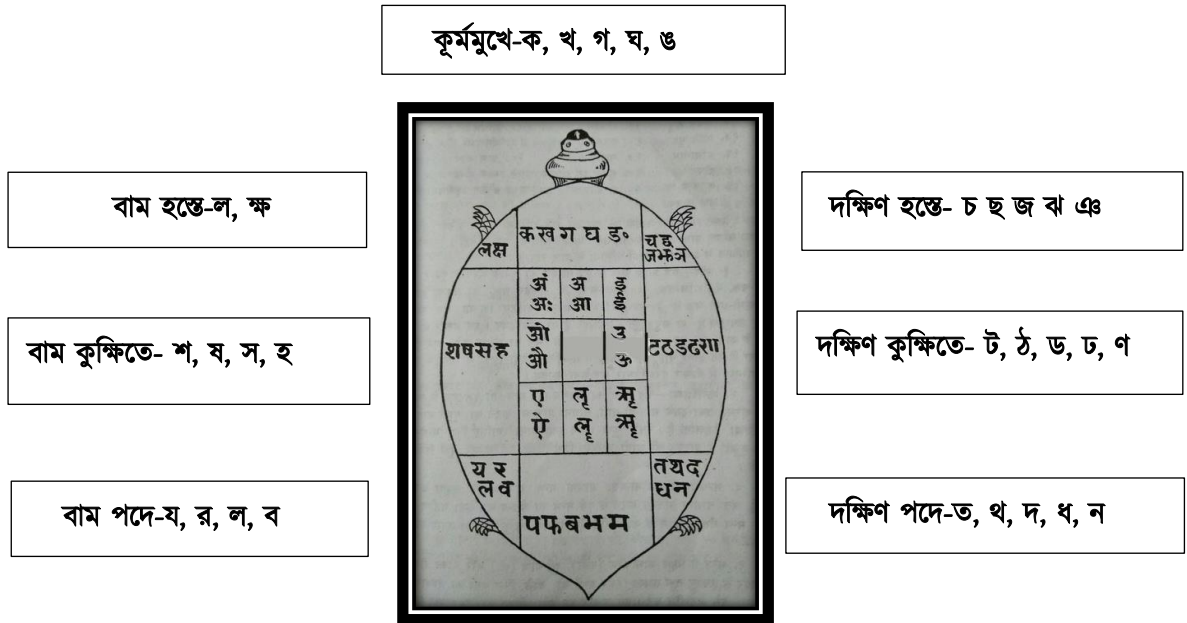**(অযোগবাহ বর্ণ - (অং) ০ং, (অঃ) ০ঃ)**

অঃ এবং অং -বিসর্গ এবং অনুস্বারকে স্বরবর্ণরূপে গণ্য করা হয়। (০ঃ) বিসর্গ= বিসৃষ্টি, ম্‌ /০ং 'মোহনুস্বারঃ'। 'অং স্যাৎ চ পরমং ব্রহ্ম অঃ স্যাচ্চেব দেবো মহেশ্বরঃ'। অনুস্বার বর্ণ অনুনাসিক, বিসর্গ হল কণ্ঠ্যবর্ণ।

বর্ণমালার পঞ্চভৌতিক গুণ ও বৈশিষ্ট্য অনুসারে রাঘবভট্ট পাঁচ ভাগে ভাগ করেছেন। 'বায়বগ্নিভূজলাকাশাঃ পঞ্চাশল্লিপয়ঃ ক্রমাৎ'।(১৭)

বায়ু	অগ্নি	ভূ	জল	আকাশ
অ, আ	ই, ঈ	উ, ঊ	ঋ, ৠ	৯, ৡ
এ	ঐ	ও	ঔ	অং
ক	খ	গ	ঘ	ঙ
চ	ছ	জ	ঝ	ঞ
ট	ঠ	ড	ঢ	ণ
ত	থ	দ	ধ	ন
প	ফ	ব	ভ	ম
য	র	ল	ব	শ
ষ	ক্ষ	ল	স	হ

চিত্র- বৃহৎ তন্ত্রসার মতে

সমস্ত বর্ণমালাকে কুক্ষিগত করে রয়েছেন যে দেবতা ঋষিরা তাঁর রহস্যময় নাম দিয়েছেন 'কূর্মদেবতা'। পূজা বা সাধনায় আসনশুদ্ধির জন্য মন্ত্র বিনিয়োগ আছে- 'আসনমন্ত্রস্য মেরুপৃষ্ঠঋষিঃ সুতলং ছন্দঃ কূর্ম্মো দেবতা আসনোপবেশনে বিনিয়োগঃ। 'পৃথিব্ত্যা ধৃতা লোকা দেবিত্বং বিষ্ণুনা ধৃতা, তঞ্চ ধারয় মাং নিত্যং পবিত্রং কুরুচাসনম্' (পুরোহিত-দর্পণ)। ঋষি-মেরুপৃষ্ঠ, ছন্দ-সুতল, কম্বুপৃষ্ঠ ও সুতল মসৃণতার ইঙ্গিত করে। কূর্ম হল ভগবানের দেহ। কূর্ম অর্থই বাস্তু বা গৃহ অথবা আসন। কূর্ম শব্দের মধ্যে চারটি বর্ণ-ক্+উ+র্+ম্। 'ক'-বিষ্ণু, 'উ'-রক্ষাকর্তা বা আশ্রয়দাতা, 'র'-অগ্নি বা সৃষ্টিবহ্নি, এবং 'ম'-মায়ের কোলের মতো নিবিড় নিরাপদ স্নেহবন্ধন।

কূর্মমুখে-ক, খ, গ, ঘ, ঙ

বাম হস্তে-ল, ক্ষ		দক্ষিণ হস্তে- চ ছ জ ঝ ঞ
বাম কুক্ষিতে- শ, ষ, স, হ		দক্ষিণ কুক্ষিতে- ট, ঠ, ড, ঢ, ণ
বাম পদে-য, র, ল, ব		দক্ষিণ পদে-ত, থ, দ, ধ, ন

চিত্র- কূর্মচক্র

ভগবান বিষ্ণুর দশ অবতারের এক অবতার কূর্ম। সমুদ্রমন্থন কালে স্বয়ং বিষ্ণু কূর্মরূপ ধারণ করে মন্দার পর্বতকে তাঁর পৃষ্ঠে ধরে রেখেছিলেন(১৮)। পৌরাণিক এই আখ্যানের তাৎপর্য হল,- জগতের অটল স্থিতি, দৃঢ় ভিত্তি। কূর্ম তার কঠিন খোলসের বা আবরণের দ্বারা বাহ্যিক আঘাতকে স্পর্শ করতে দেয়না। নিজেকে ইচ্ছেমতো গুটিয়ে নিয়ে দুর্ভেদ্য আচ্ছাদনে আত্মগোপন করতে পারে। কূর্মচক্র না জেনে সাধককৃত যাবতীয় জপ-তপ, যাগ-যজ্ঞ, নিষ্ফল এবং অনর্থকারী। 'কূর্মচক্রমবিজ্ঞায় যঃ কুর্যাজ্জপ-যজ্ঞং তস্য যজ্ঞফলং নাস্তি সর্বানর্থায় কল্প্যতে' (১৯)।

কূর্মচক্রের বিশেষ গুরুত্ব হল বর্ণমালার অবস্থান, সূক্ষ্ম তত্ত্ব, সম্যক জ্ঞান লাভ করেই সাধনার আসন গ্রহণ আবশ্যিক। এই চক্রের মুখের দিকে রয়েছে 'ক'-বর্গ এটাই চক্রের দীপ্তস্থান। এটাই সাধনার প্রকৃষ্ট আসন। 'দিক্ষু পূর্বাদিতো যত্র ক্ষেত্রাদ্যক্ষর সংস্থিতি'। বর্ণমালার এই প্রত্যেকটি বর্ণের গুণবৈশিষ্ট্য গভীরভাবে অনুধাবন করলে সৃষ্টির অন্তর্নিহিত তত্ত্ব বা সত্যকে জানতে পারবো। প্রতিটি বর্ণই সজীব শক্তিবীজ। বর্ণমালার বীজাত্মক শক্তিই শব্দের ভ্রূণ অবস্থা। গর্ভস্থ ভ্রূণের গঠনরহস্য না জানলে যেমন পূর্ণাবয়ব মানবদেহের প্রকৃত বিজ্ঞান জানা যায়না, ভাষার ক্ষেত্রেও তাই। বর্ণমালা মাতৃকাযন্ত্রের অন্তর্গত ভ্রূণবিজ্ঞান। শ্রী অরবিন্দের ভাষায় বলা যায়,- 'a kind of science of linguistic embryology'.

উপসংহারঃ

বিশ্বব্রহ্মাণ্ডের সকল তত্ত্ব উপাদান ও গুণের আধার আমাদের এই দেহ। বৈদিক ঋষিরা তাই বলেছেন,- 'পৃথিবী মে শরীরে শ্রিতা' (তৈত্তিরীয় আরণ্যক-৩/১০/৮/৭)। অর্থাৎ সমস্ত পৃথিবী আমার শরীরকে আশ্রয় করে আছে। জগতের মূল যে তত্ত্ব যে শক্তি যে উপাদান আমাদের দেহও তাই দিয়ে গড়া। দেহ আসলে 'বর্ণব্রহ্মময় বপুঃ'। পৃথিবী তার আপন অক্ষ বা মেরুকে আশ্রয় করে আবর্তিত হচ্ছে। পৃথিবীর এই অক্ষ (axis) হল অ-ক্ষ 'ক্ষমেরুকৈঃ'। অর্থাৎ অ থেকে ক্ষ পর্যন্ত একান্নটি বর্ণমালা। ব্রহ্মার হাতের অক্ষমালা অ থেকে ক্ষ সমস্ত বর্ণমালা। তন্ত্রবিদ্যায় নিহিত আছে 'বর্ণময়ীং মালাং সর্বতন্ত্র প্রকাশিনীং' (বৃহৎ তন্ত্রসার)। বাগ্দেবী সরস্বতীর হস্তে আছে শ্বেতাক্ষসূত্র।শ্বেতবর্ণ পরাবাক্ তুরীয়ের প্রতীক। নিদ্রিত সর্পের ন্যায় কুলকুণ্ডলিনী শক্তিই ঐ বর্ণমালারূপ অক্ষমালার সূত্র। মা কালীর গলায় একান্নটি ছিন্নমুণ্ডমালা আসলে বর্ণমালার মাতৃকারূপ। মাকালী কালের সৃষ্টির

উর্ধ্বে দাঁড়িয়ে আছেন অন্ধকার দিগ্বসনা মূর্তিতে। যার ব্যক্তরূপ সমগ্র বর্ণমালা। মহাশক্তির যত ক্রিয়াকারীত্ব ও গতিবৃত্তির ভাবস্পন্দন হল এই বর্ণ। বর্ণমালা সৃষ্টিশক্তির সূক্ষ্ম তরঙ্গমালা।

পাদটীকাঃ

১। ভর্তৃহরি- বাক্যপদীয়-১/১ 'অনাদিনিধনং ব্রহ্ম শব্দতত্ত্বং যদক্ষরম্। বিবর্ততেহর্থভাবেন প্রক্রিয়া জগতো যতঃ'।।

২। ১। অ ই উ ণ্ ২। ঋ ৯ ক্ ৩। এ ও ঙ্ ৪। ঐ ঔ চ্ ৫। হ য ব র ট্ ৬। ল ণ্ ৭। ঞ ম ঙ ন ম্ ৮। ঝ ভ ঞ্ ৯। ঘ ঢ ধ ষ্ ১০। জ ব গ ড দ শ্ ১১। খ ফ ছ ঠ থ চ ট ত ব্ ১২। ক প য়্ ১৩। শ ষ স র্ ১৪। হ ল্ ;

৩। কাশিকা- নন্দিকেশ্বর।

৪। তৈত্তিরীয়োপনিষৎ শীক্ষাবল্লী, দ্বিতীয় অনুবাক।

৫। "মন্ত্রো হীনঃ স্বরতো বর্ণতো বা মিথ্যাপ্রযুক্তো ন তমর্থমাহ। স বাগ্বজ্রো যজমানং হিনস্তি যথেন্দ্রশত্রুঃ স্বরতোহপরধাৎ"।। পাণিনীয় শিক্ষা, ৫৪

৬। শ্রীমদ্ভাগবত-মহাপুরাণ-৬/৫/২২

৭। নারদীয় শিক্ষা

৮। বৃহদারণ্যকোপনিষদ ১/৩/২৫

৯। "য একোহবর্ণো বহুধা শক্তিযোগাদ্ বর্ণাননেকান্ নিহিতার্থো দধাতি। বি চৈতি চান্তে বিশ্বমাদৌ স দেবঃ স নো বুদ্ধ্যা শুভয়া সংযুনক্তু।। শ্বেতাশ্বতর উপনিষদ, ৪/১

১০। সৌভরী একার্থনামমালা

১১। 'গৌরীনির্মায় সলিলানি তক্ষত্যেকপদী দ্বিপদী সা চতুষ্পদী। অষ্টাপদী নবপদী বভূবুষী সহস্রাক্ষরা পরমে ব্যোমন্'। - ঋগ্বেদ ১/১৬৪/৪১

১২। 'পশ্যন্তী মধ্যমা বাচি বৈখরী শব্দ-জন্মভূঃ। ইচ্ছাজ্ঞানক্রিয়াত্মাহসৌ তেজরূপা গুণাত্মিকা। ক্রমেণানেন সৃজতি কুণ্ডলী বর্ণমালিকাম্। -শারদা তিলক ১/১০৯

১৩। Sri Aurobindo - 'Vedic and Philological Studies'

১৪। শ্রীমদ্ভাগবত-মহাপুরাণ- ৩/৬/২০

১৫। শ্রীমদ্ভাগবত-মহাপুরাণ-১২/৬/৪৩

১৬। শ্রীমদ্ভাগবত-মহাপুরাণ-৩/১২/৪৬-৪৮

১৭। বৃহৎ তন্ত্রসার

১৮। 'সুরাসুরাণামুদধিং মথ্নতাং মন্দারাচলম্ দধ্রে কমঠরূপেণ পৃষ্ঠ একাদশে বিভুঃ'। (শ্রীমদ্ভাগবত-মহাপুরাণ-১/৩/১৬)

১৯। বৃহৎ তন্ত্রসার

সহায়ক গ্রন্থপঞ্জীঃ

১। অমরকোষ বা অমরার্থ চন্দ্রিকা- শ্রীমদ্‌গুরুনাথ বিদ্যানিধি-ভট্টাচার্য। সংস্কৃত পুস্তক ভাণ্ডার।

২। A Higher Sanskrit Grammar & Composition পাণিনীয়ম্‌। ডঃ প্রবোধচন্দ্র লাহিড়ি, ডঃ হৃষীকেশ ভট্টাচার্য। দি ঢাকা স্টুডেন্টস্‌ লাইব্রেরী।

৩। বেদাঙ্গবর্ণ- অমলেশ ভট্টাচার্য। আর্যভারতী।

৪। সংস্কৃত ব্যাকরণ ও ভাষা প্রসঙ্গ- করুণাসিন্ধু দাস। সদেশ।

৫। পাণিনীয় শব্দশাস্ত্র- সত্যনারায়ণ চক্রবর্তী। সংস্কৃত পুস্তক ভাণ্ডার।

৬। বেদভাষা নির্মিতি বা সংস্কৃত ব্যাকরণ- ডঃ বিশ্বরূপ সাহা। সংস্কৃত পুস্তক ভাণ্ডার।

৭। সংস্কৃত সাহিত্যের ইতিহাস- ডঃ দেবকুমার দাস। সদেশ। বলরাম প্রকাশনী।

৮। শ্রীমদ্‌ভগবদ্গীতা- পণ্ডিত শ্রীযুক্তভূতনাথ সপ্ততীর্থ কর্তৃক অনূদিত ও ব্যাখ্যাত, শ্রীযুক্ত নলিনীকান্ত ব্রহ্ম কর্তৃক সম্পাদিত। নবভারত পাবলিশার্স।

৯। তৈত্তিরীয়োপনিষৎ - স্বামী জুষ্ঠানন্দ। উদ্বোধন কার্যালয়।

১০। মহর্ষিবেদব্যাসপ্রণীতং শ্রীমদ্ভাগবত-মহাপুরাণম্‌। গীতা প্রেস, গোরখপুর।

১১। Vedic and Philological Studies – Sri Aurobindo

১২। ব্যুৎপত্তিমালা– (A Sanskrit Dictionary of Derivative Meaning) শ্রীহরিনাথ তর্করত্ন। বাণী প্রেস, কলিকাতা।

১৩। কৃষ্ণযজুর্বেদীয় শ্বেতাশ্বতরোপনিষদ্‌। স্বামী বিশুদ্ধানন্দ গিরি কর্তৃক অনূদিত ও সম্পাদিত। শ্রীগুরু লাইব্রেরী।

১৪। অমরকোষাভিধানম্‌- শ্রীচন্দ্রমোহন ভট্টাচার্য। ক্যালকাটা, পি এম সুর এণ্ড কোং। ক্রাউন প্রেস্‌।

১৫। বৈদিক সাহিত্যের রূপরেখা- ডঃ শান্তি বন্দ্যোপাধ্যায়। সংস্কৃত পুস্তক ভাণ্ডার।

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