ROOTS

International Journal of Multidisciplinary Researches

ROOTS

ROOTS International Journal of Multidisciplinary Researches (RIJMR) is a peer reviewed, refereed and quarterly journal. The Journal is assigned by *National Science Library / NISCAIR, New Delhi and* powered & published by *Center for Resource, Research and Publication Services (CRRPS) Tamil Nadu - India*. The journal provides a valid space for academics, researchers and professionals to share the latest developments and advancements in Multidisciplinary Subjects. It aims to foster the exchange of ideas on a range of important international subjects and to provide stimulus for research and the further developments and updating of international perspectives. The international perspective is further enhanced and enriched by the geographical spread of the aspiring contributors.

There are many practical reasons to publish the research articles. We don't really understand what we have discovered until we write it up, when we submit an article for publication, we get back reviews and criticisms from colleagues and readers which undoubtedly can often be very helpful and sometime point our mistakes or shortcomings in the applied logic therein. When we share the results of our efforts through publication, we become a part of the scientific community. We benefit from the exchange of ideas and learn about what others have already done. We can often establish valuable collaborations with people on the other side of the planet even without seeing them. If everybody kept their results and ideas secret, the progress of science would slow to a crawl. If we want to benefit from the work others have done before we, it's only fair that we contribute our bit too. The process of research publication creates a mindset that is vital for research progress.

The scope of the Journal is to facilitate the researchers, scholars, resource persons and practitioners to come on a strong potential platform and to share their findings of the research with the rest of the world. So that intellectual decisions can be instilled to enrich societies as a whole with attitude of magnanimity and openness.

Dr. S. Balakrishnan
Publisher and Managing Editor
journalroots4u@gmail.com
www.crrps.in
09944212131

Dr.K. UTHAYASURIYAN
Professor and Head,
Department of International Business (School of Management)
Alagappa University, Karaikudi, Tamil Nadu – India

Dr.J. HELEN RATNA MONICA
Associate Professor of Chemistry,
The American College, Madurai, Tamil Nadu – India

Dr.J. JOHN SEKAR
Head & Associate Professor of English,
The American College, Madurai, Tamil Nadu – India

Dr.J. BALASUBRAMANIAM
Assistant Professor & Head,
Department of Journalism and Science Communication
Madurai Kamaraj University, Madurai, Tamil Nadu – India

Dr. PRADEEP D. WAGHMARE
Assistant Professor of History,
Ramanarain Ruia College, Mumbai– India

Dr.V. DARLING SELVI
Assistant Professor of Commerce,
Rani Anna Government College for Women,
Tirunelveli, Tamil Nadu – India

Dr.B.J. GEETHA
Assistant Professor of English,
Periyar University, Salem, Tamil Nadu – India

Dr.T. SUDHA
Assistant Professor of Economics,
Annamalai University, Chitambram, Tamil Nadu – India

Dr.S. DIRAVIDAMANI
Assistant Professor of English,
Periyar University College of Arts & Science,
Salem, Tamil Nadu – India

Dr.K. KAVIARASU
Assistant Professor of English,
Vivekananda College,
Kanyakumari, Tamil Nadu – India

Dr.M. VASIMALAI RAJA
Associate Professor, College of Education,
Alagappa University, Karaikudi, Tamil Nadu – India

GUIDELINES TO AUTHOR

About Roots

ROOTS International Journal of Multidisciplinary Researches (RIJMR) is a peer reviewed, refereed and quarterly journal. The journal provides a space for academics, researchers and professionals to share the latest developments and– advances in Multidisciplinary Subjects. This journal is an excellent forum for intra disciplinary and interdisciplinary study of various aspects of Arts, Science and Professional Studies as intellectually stimulating open platform for academicians, consultants, researchers, and business practitioners to share and promulgate their research works. Journal of Roots seek to publish research findings and articles that would promote research awareness and understanding dissemination.

Subjects for Papers

ROOTS Journal expects qualitative and standardized publications of original papers on research in Multidisciplinary Researches. An Agriculture, Anthropology, Education, Geography, Advertising, Botany, Business Studies, Chemistry, Commerce, Computer Science, Communication Studies, Criminology, Cross Cultural Studies, Demography, Development Studies, Library Science, Mathematics, Methodology, Management Studies, Earth Sciences, Economics, Bioscience, Entrepreneurship, Fisheries, History, Information Science & Technology, Law, Life Sciences, Logistics and Performing Arts (Music, Theatre & Dance), Religious Studies, Visual Arts, Women Studies, Physics, Fine Art, Microbiology, Physical Education, Public Administration, Philosophy, Political Sciences, Psychology, Population Studies, Social Science, Sociology, Social Welfare, Linguistics, Literature, Zoology and other inspiring topics to meet the present trend and craze of aspirants to satisfy them.

Call for Papers

The journal invites balanced mix of theoretical or empirical, conceptual papers to publish including research articles, case studies, review papers, comparative studies, dissertation chapters, reports of projects in progress, analytical and simulation models, technical notes, and book reviews, leading academicians, business peoples, corporate sectors, researcher scholars and students from academic institutions, research organizations, non – governmental organizations (NGOs), corporate sectors, civil societies, industries, and others from India and abroad.

Submission of Manuscript

1. Submit your article by email to **journalroots4u@gmail.com**.
2. The manuscripts/papers should be research based or related, original and comprise of previously unpublished material and must be presented following scientific methodology.
3. Authors must send an abstract of the paper not exceeding 250 words, all manuscripts must be in font style of Times New Roman, size: 12, line spacing: double spaced and submitted only in MS Word 2003/ 2007 version.
4. All manuscripts should follow the MLA or APA style manual. The full paper must not exceed 3000 words, including tables and references.
5. The manuscript should be well-organized to have Title page, Abstract, Keywords, Introduction, Literature Survey, Problem Definition, Material & Methods, Findings & Results, Interpretation & Discussion, Conclusion and References.

6. All quoted, reproduced material should clearly be referenced.
7. All contents should be original – authors' own words, ideas, findings and arguments.
8. Tables and figures should appear in the document near / after where they are referenced in the text. All figures and tables must have an intelligible caption in relation to the text.
9. Photographs must be sharp, and exhibit good contrast.
10. Correct and complete referencing of quoted and reproduced material is the obligation of the author. In the text, references should be inserted in parentheses in full.
11. If author uses a reference from an out-source, author should cite relevant source giving credit to the original author/contributor.
12. **Review of Article/Manuscript**
    ➢ The manuscript will be numbered and sent to the review committee for review- report.
    ➢ The author will be intimidated of the review and the process will take a maximum period of 15 – 20 days.

Ethical Policy
1. Authors are advised to adhere to the ethics of publication of his/her article to be considered for publication.
2. Acknowledgement of the original ideas, borrowed from other sources is imperative.
3. The authors of original research work (previously unpublished / under process for the publication elsewhere) should be an accurate submission of the work carried out,
4. provide the rationale of the significance of the research work in context with previous works, and should contain sufficient details to allow others for further research.
5. It will be the wholesome responsibility of the authors for such lapses if any on legal bindings and against ethical code of publication or communication media.

Plagiarism Alert & Disclaimer
1. The publisher & editors will not be held responsible for any such lapse of the contributor regarding plagiarism and unwarranted quotations in their manuscripts.
2. All submissions should be original and must have a "*statement of declaration*" assuring their research paper as an original and fresh work and it has not been published anywhere else.
3. It will be authors are sole responsibility for such lapses, if any on legal bindings and ethical code of publication.
4. Contributors are advised to be aware about Plagiarism and ensure their paper is beyond plagiarism as per UGC norms.

Publication Policy & Peer-review Process
Peer review exists to ensure that journals publish article which is of benefit to entire research community. Peer reviewers' comments and recommendations are an essential guide to inform the editor's decision on a manuscript that revisions and improvement. They are part of the publication process and actually help raise the quality of the manuscript. It also helps the readers to trust the research integrity of the article.
1. The Editor-in-Chief will primarily examine each manuscript.
2. The editor-in- Chief will advise the authors about the acceptance of the manuscript by email.
3. The manuscript will be evaluated on parameters of originality, practical importance, subject relevance, scientific level and contribution to the current academic scenario.
4. If the manuscript is accepted following publication policies.
5. Accepted manuscript will be forwarded to the double-blind peer review process. Such that the journal does not disclose the identity of the reviewer(s) to the author(s) and does not disclose the identity of the author(s) to the reviewer(s).
6. The review committee is not responsible for stripping of any information during panel review as the original author is not known to the committee.
7. Manuscript/paper will be published only when the article is 'commended for publication' from the review committee/editorial board.

8. If necessary the copy-editing work will be done by the members of the Editorial Board.
9. The review process may take minimum 20 working days.
10. In case of acceptance of the manuscript and commended for publication favorably, the manuscript will be published in online mode of time. If paper/article/manuscript is not commended for publication, the rejected manuscripts shall not be returned.

Copyright Notice

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, will not be published elsewhere in the same form, in English or in any other language, without the written consent to the Publisher. The Editors reserve the right to edit or otherwise alter all contributions, but authors will receive proofs for approval before publication.

Copyrights for articles published in *ROOTS International Journal of Multidisciplinary Researches (RIJMR)* are retained by the authors, with first publication rights granted to the journal. The journal/publisher is not responsible for subsequent uses of the work. It is the author's responsibility to bring any infringement action if so desired by the author.

Indexed

The journal will be indexed as per database norms. The Indexing will provide the manuscript to achieve its purpose of being accessible to worldwide readers. Easy accessible will increase as manuscript's and journal's reputation. It will be a source of the quality information in respective areas/studies.

Privacy Statement

We may collect the contact details from authors like names, designation with Institutional address, email addresses, postal address, phone numbers and other information to understand needs and provide with a better service that are entered in this journal site and will be used exclusively for the stated purposes of this journal.

Frequency of Publication of the Journal

Roots are a quarterly journal, will be published in February, May, August and November on respective Years.

Review and Evaluation Committee

Quarterly review committee meeting will be convened by the editor-in-chief. Authors are expected to submit their manuscript before 20 working days of the publication of the respective month. The journal will be published regularly as per Journal publication policy.

No article-processing charge Policy

As per our journal policy, No article-processing charge (APC) or publication fee to publish your articles in Bodhi International Journal.

Get your Roots journal Subscription

We provide personal or institutional Subscription. Subscriber will get all issues within the current year as four issues. No automatic renewal, subscription will expire automatically at the end of the publication year. For subscription, contact email.

Article Submission

Authors are kindly advised to send manuscripts along with registration & copyright forms. (Duly filled-in Registration form is mandatory with the paper for acceptance) Soft copy of the papers should be mailed to **journalroots4u@gmail.com**

Conference Proceedings

Roots will be published as special issues for the national / international conference and seminars volumes. The group of papers also will be published in Roots journal.

Aim & Objectives

Academic Excellence in research is continued promoting in research support for young Scholars. Multidisciplinary of research is motivating all aspects of encounters across disciplines and research fields in an multidisciplinary views, by assembling research groups and consequently projects, supporting publications with this inclination and organizing programmes. Internationalization of research work is the unit seeks to develop its scholarly profile in research through quality of publications. And visibility of research is creating sustainable platforms for research and publication, such as series of Books; motivating dissemination of research results for people and society

Disclaimer

Contributors are advised to be strict in academic ethics with respect to acknowledgment of the original ideas borrowed from others. The Publisher & editors will not be held responsible for any such lapse of the contributor regarding plagiarism and unwarranted quotations in their manuscripts. All submissions should be original and must be accompanied by a declaration stating your research paper as an original work and has not been published anywhere else. It will be the sole responsibility of the authors for such lapses, if any on legal bindings and ethical code of publication.

Communication

Papers / Enquires should be mailed to Journalroots4u@gmail.com

CONTENTS

MULAIPARI – A TRADITIONAL CULTURAL RITUAL ASSOCIATED WITH FARMING IN TAMIL NADU

M.Bavani
Research Scholar
Department of Amrita Darshanam
Amrita Vishwa Vidyapeetham, Amritapuri, Kollam

Dr.V.S.Ramachandran
Assistant Professor
Centre for Environmental Studies
Amrita Vishwa Vidyapeetham, Coimbatore

Dr.Rajiv Prasad
Associate Professor
School of Business
Amrita Vishwa Vidyapeetham, Coimbatore

Abstract

Around the world almost all ancient cultures have many rituals and ceremonies associated with agriculture. These rituals are result of the realization that without Natures' blessings cultivation and successful harvest will not be possible. Mulaipari is one such ritual seen associated with farming in many parts of Tamil Nadu. The present study was conducted in Palamedu and periphery of Madurai city. The information on the ritual was collected through PRA (Participatory Rural Appraisal), RRA (Rapid Rural Appraisal) and personal interviews with people. Out of total of 67 respondents, 59 were female and eight males. Twenty-three of the responded said they know Mulaipari for more than 20 years, 13 said, they know it for past 10-20 years and 30 of them know about it only for the past 10 years or so. The ritual basically is sprouting of grains and is an important ritual conducted in villages of Madurai District during the month of March-August. Mostly the women of village are involved. They perform a folk dance called kummi aattom. Mulaipari has resemblance to another ritual from Ancient Greece called Adonis Garden. The similarity between Adonis garden ritual of Greece and Mulaipari in our study throws light on the cultural parallelism in the two continents – Europe and Asia. Modern education, changing life style and rapid urbanization are serious threat to the survival of this ritual. There is an urgent need to revive the ritual by creating awareness and interests in the minds of present generation.

Keywords: *Mulaipari, farming, agriculture, rain rituals, ancient wisdom, folk songs.*

Introduction

Cultures around the world are woven with rituals and most of them are rooted in Nature worship. Man started worshiping Nature when he learned that he is part of it and cannot live without it (Jocano, 1967; Unnikrishnan, 1995). Without Nature's blessings successful harvest of crops is impossible. Hence, rituals and ceremonies became the central part of agriculture (Jocano, 1967). Kem is a set of rituals associated with agricultural irrigation and pest management in Sri Lanka (Herath, 2010). In *kem,* pest control is done by a ritual called *Hirima Pideema* referring to Sun worship and irrigation management is done by *Vap Magula*, a traditional ploughing method. Kato (1988) explains various agricultural rituals performed in Negeri Sembilan, Malaysia. In the ritual *minta doa di hulu sungai,* prayer is done at the headwaters of rivers before the preparation of rice fields; *tanam setambun* is practiced before planting a fruit tree called *setambun; kenduri makan beras baru*, is done to show gratitude to Nature after harvest. When all the above are community based rituals the last one is done at household level, in addition to the community level, which marks the eating of newly harvested of the year. *Odu-odu* is a ritual for the bountiful harvest and Monongolid for the fertility of crops and domestic animals in Kimaragang, Malaysia (On, 2015).

Panadlok is a ritual done before sowing to protect the fields from insects in *Malitbog,* Central Philippines (Jocano, 1967). Kazakhs in Russia perform *Tassattyq* for getting a good rain (Mustafina, 2015). Volador is a ritual rain and *Xocotl Huetzi* a harvest ritual in Central Jalisco, Mexico (Beekman, 2003). Haland (2005) has recorded a ritual called *Kalogeros*, performed in Greece for getting good rains and good yield. Abu-Zahara (2014) has documented rain ritual in the Islamic community of North Africa, one in the Village of Sidi Ameur in the sahel of Tunisia and the other in Cairo.

Ambubachi is a ritual performed by women in West Bengal for getting adequate rainfall Samaddar (2006). Some agricultural families in Palghat District of Kerala State perform *Mundiyan kalasam* to guard their cattle and getting good yield from crops (Jossie and Sudhir, 2012). Likewise, *Sivothikku-vekkal* is done to invite Mahalakshmi, Goddess of wealth in Indian culture, before start of cultivation. The agriculture and rituals associated with it has references in Tamil as early as from Sangam literature (Veerasami, 1975; Katherine, 2009; Srinivasan, 2016). Fuller (1980) describes the theme of agricultural fertility in connection with the various festivals and rituals at Meenakshi temple for the goddess Meenakshi Amman in Madurai. *Mulaipari* is one such ritual seen associated with agriculture in many parts of Tamil

Nadu for the fertility and prosperity. Though *Mulaipari* is performed during auspicious occasions like wedding, temple festivities, agriculture, present study documents *Mulaipari* associated with agriculture. *Mulaipari* is offered to Mother Goddess, referred to as Amman in Tamil and SHE is worshipped as *Maariamman* (Maari = rain, Amman = Goddess), the rain God (Felix, 1998; Ondrich, 2016; Devan and Anju, 2018). Sivasubramaniyam (1988) has documented in detail the *Mulaipari* performed in Tirunelveli District of Tamil Nadu, where he has recorded it as an ecological ritual. A ritual similar to *Mulaipari* performed by women in ancient Greece has been documented by Frazer (1922), called Garden of *Adonis.*

Aadi perukku is a monsoon festival of Tamil Nadu celebrated in some parts of Tamil Nadu in the Tamil month of *Aadi* (15 Jul.-15 Aug.). The celebration of this festival is associated with worshipping the River Kaveri and its tributaries, when it has a higher water level due to monsoon rains (Krishnamurthy, 1951; Amrithalingam, 2014). During that time women carry *Mulaipari* on their head, move in groups, singing and dancing *kummi,* associated with *Mulaipari.* They move to the banks of the rivers, put the sprouted grains into the water and pray for the welfare of the family and fertility of the land.

Materials and Methods
a. Study Area
Madurai lies on the fertile plain of the River Vaigai, dividing the city into two equal halves. It is located at 9.93° N 78.12° E. The major crop is paddy, followed by millet, pulses, oil seed, sugarcane and cotton. It is hot and dry for eight months of the year. The average annual rainfall for the city is about 85.76 cm. Temperature during summer reaches a maximum of 40° C and a minimum of 26.3° C. Meenakshi temple is an ancient historic Hindu temple situated in the middle of the city. It is an academic centre of learning for Tamil culture, art, music and dance for many centuries.

b. Survey and Analysis
Field surveys were conducted for gathering information associated with *Mulaipari* with an emphasis on socio-cultural and psychological aspects. The data was collected through PRA (Participatory Rural Appraisal), RRA (Rapid Rural Appraisal) and personal interviews with people of the Palamedu and Madurai city.

Result and Discussion
Out of total of 67 respondents, 59 were female and eight males. Twenty-three of the responded said they know *Mulaipari* for more than 20 years, 13 said, they know it for past 10-20 years and 30 of them know about it only for the past 10 years or so.

Mulaipari as told by the respondents of our survey is given below for the wider public. The ritual basically is sprouting of grains and is an important ritual conducted in villages of Madurai dedicated to the Mother Goddess during the month of March-August. The ritual is performed by the women of villages. The women taking part in the ritual should be pure mentally, physically and physiologically. They often abstain from physical, mental and physiological pleasures, go fasting, keep away from non-vegetarian food.

The day before the ritual they collect fired earthen pots; seeds of cowpea, chickpea, pigeon pea, butter bean, green gram, pearl millet, maize; hay, cow dung and goat droppings powdered and kept separately. The place where the ritual is done is kept clean; the place could be their own home or a few of them perform together on one of their homes or done in temple or other common places where community come together. The fired earthen pots also will be cleaned. In the evening or at night the collected seeds are mixed and soaked in clean water in a clean vessel.

The next day ritual starts early in the morning before sun rise. They light oil (bronze) lamp in the room, make prayers to the Mother Goddess *Mariamman* and begin the procedure. First they fill the quarter of the earthen pots with hay, another quarter with moist powdered cow dung and on this the participating women spread seeds that has been soaked in water the previous night with prayers, thus making *Mulaipari*. The *Mulaipari* now will be covered with dry powdered goat dropping and for a day it will be covered with wet cloth. Oil lit lamp is the only source of light in the room and will remain burning day and night till the ritual is completed.

A few participants will become the care takers of *Mulaipari*, who only can enter the room to tend the Mulaipari. They regard *Mulaipari* as Aatha or Mother Goddess herself. They consider sprinkling water over *Mulaipari* as giving bath to Goddess and water for drinking, referred to as giving *"Theertham to Aatha"*. Seeds sprout, start growing and when tightly packed Mulaipari start growing, their stem often gets entangled. The care takers try their level best to separate the stems and they call it as *chikku edukkuradhu* as they believe that by this act they are combing the hair of Goddess herself; they take out the skin of the seeds as it comes out.

Every evening all the women and children of the village meet at that place where *Mulaipari* is growing and sing folk songs specific for the occasion and perform folk dance *kummiyattam*. As they clap their hands during the dance, they believe that the Goddess or Amman listens to the rhythm of the dance and song and grows well. The participants together make prayers to the Goddess with a peculiar sound made out of their mouth and

modulated with their tongue, called *Kuzhavai.*

By sixth or seventh day, the *Mulaipari* would have grown taller and to prevent them from falling a yellow thread is tied around it. On the tenth day, the *Mulaipari* is decorated with flowers, ear ring made out of leaf of palm tree called *katholai,* and dark beaded chain called karugumani, with the belief of decorating the Mother. Then *Mulaipari* is brought out of the dark room with prayers, each carried by women and young girls. They carry it on their heads to the temple and keep them in front of the deity. Then they sing *Mulaipari* song and do dance kummiyattam. The song would mention how they grew that *Mulaipari* or *Amman* and it has grown and they have offered it to Her. They pray Amman to fulfill their wishes and some women would have offered it as a gratitude for fulfilling their prayers. Everyone prays for good rain and good yield in agriculture, health, wealth and fertility for the people. Following this, they carry Mulaipari, go around the village with the sounds of *kuzhavai,* then proceed to the river bank. They immerse Mulaipari in water to culminate the ritual. The respondent said that as they complete this ritual, it would definitely rain and most of the time they return home fully drenched.

The larger part of the respondents was of 18-30 age class (Fig. 1) and this category had very little knowledge about *Mulaipari.* Around 50 per cent of respondent said *Mulaipari* is a ritual for rain, fertility, worship of Goddess and sprouting of seeds (Fig. 2), 25 per cent is of the opinion that it is for worshipping the Mother Goddes, *Mariamman.*

Fig.1. Mulaipari as a ritual defined by the respondents of Madurai District of Tamil Nadu
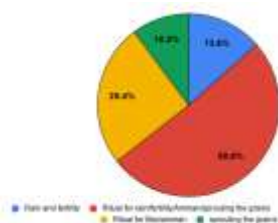
Fig.2. Mulaipari as a ritual defined by the respondents of Madurai District of Tamil Nadu

Nearly 41 % of them told they are performing this ritual because their ancestors have been doing this and they are following it (Fig. 3). Thirty per cent of them said they perform it for getting good rain, 21 % said for prosperity and remaining said for health and wealth.
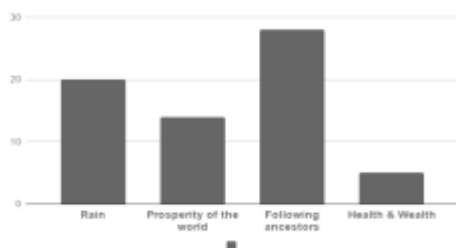
Fig. 3. Reasons for performing Mulaipari as per the respondents of Madurai District of Tamil Nadu

Religious reasons for performing the ritual. 50% of them said it is for worship, prayer for their wishes and as a token of their gratitude for fulfilled prayers.
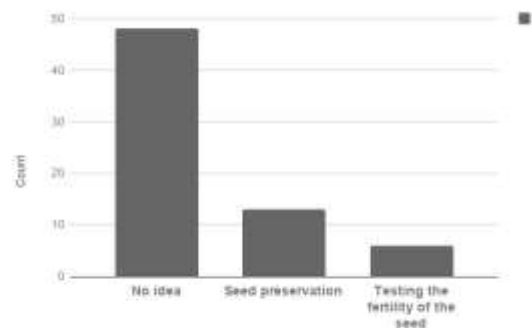
Fig. 4. The science behind performing Mulaipari as per the respondents of Madurai District of Tamil Nadu

When asked about the scientific aspects of *Mulaipari*, 47 of them believe that it has science but not aware of what it is (Fig. 4), 12 of them said it is for preservation of seeds, eight said for testing the germination of seeds.

Fifty-seven per cent is of the opinion that *Mulaipari* develops unity among the community, making them perform the ritual together forgetting about their fight/enmity; 9 per cent were not sure of whether community develops unity; 34 per cent were of the opinion that sometimes there is unity because of this ritual. Fifty-one per cent said growth of *Mulaipari* indicates prosperity of family/village, when it grows well they believe that they will become prosperous in the coming year and if it is not grown, they will not become

prosperous; 37 per cent said that they believe it sometimes; 9 per cent were not able to say anything; 3 per cent denied that the growth of *Mulaipari* indicates the growth of the family/village.

Discussion

Adonis Garden from ancient Greece (Frazer, 1922) has resemblance to *Mulaipari*, where it is an annual festival celebrated by Greek women to mourn the death of Adonis, the consort of Aphrodite; also for getting good rain, good yield from their crops; fertility of earth and people. Here baskets or pots were filled with sand, in which wheat, barley, lettuces, fennel, and various kinds flowers were sown, grown for eight days. When we keep *Mulaipari* in dark room they raised Adonis Garden in open sunlight. With the heat of the sun, the plant grows fast, as the roots don't keep pace with the growth of stem due to space constraint, the plants wither away as they grew while our plants kept in dark room remains healthy till the end of the ritual. At the end of the eighth day, Greek women carried it with the image of Adonis, and threw them into the sea or into rivers as we do it with *Mulaipari.*

Panadlok ritual in Malitbog society function both as psychological and as cultural mechanisms which reinforce individual and group life, unify social relationships in the community and integrate the customs and traditions of the people (Jocano, 1967). A similar situation is identified in the present study where people in our survey at Madurai said *Mulaipari* develops a sense of unity in the community. Herath (2010) mentions about the culture of clapping in kem ritual, done for pest management and water management in Sri Lank; claps chase away bird pests. In our study people said clapping helped in germination of seeds and growth of plants.

Mulaipari is a ritual performed to Goddess *mari amman*, the rain God. Similar rituals for getting good rain is available for Negeri Sembilan in Malaysia (Kato, 1988); Kimaragang in Malaysia (On, 2015); Malitbog in Central Phillipinnes (Jocano, 1967); Kazakhs in Russia (Mustafina, 2015); in Central Jalisco, Mexico (Beekman, 2003); in Greece (Haland, 2005); Sidi Ameur in North Africa and in Cairo (Abu-Zahara, 2014); West Bengal (Samaddar, 2006); Palghat in Kerala (Jossie and Sudhir, 2012); in Greece (Frazer, 1922)

Hot summer months and continuous rainy days are the time when many diseases spread in tropical countries. Madurai remains hot and dry during major part of the year and the ritual is conducted when the temperature is at its maximum. *Mundiyankalasam* is a ritual associated with agriculture performed during rainy season in Palghat, Kerala (Jossie and Sudhir, 2012). Maintaining mental, physical hygiene is important for both the rituals. Maintenance of hygiene

prevent spread of diseases to an extent said people in Madurai and similar finding is recorded by Jossie and Sudhir (2012) in Palghat.

Conclusion

The similarity between Adonis garden ritual performed in ancient Greece and *Mulaipari* in our study throws light on the cultural parallelism between the two continents – Europe and Asia. The *Mulaipari* ritual has religious, spiritual and scientific aspects; prayers, song, dance with clapping hands can create positive vibration in the place and this could be the reason for creation of unity among the people, sprouting and growth of plants in room with minimum light. However, the younger generation with modern education are not aware of agriculture rituals like *Mulaipari* and in future these rituals fade away from the society. The need of the hour is to find out more scientific aspects of such rituals, document them and propagate them that so that the rituals are handed over to the next generation and kept alive.

Acknowledgement

References

1. Abu-Zahara N. (1988), The rain rituals as rites of spiritual passage, *Int. J. Middle East Stud*. (20), 507-529.
2. Amrithalingam, M. 2014. Rivulet in myths and folklore of Tamil Nadu. *Eco News*, 20 (3): 12-16
3. Beekman, C. S. 2003. Agricultural pole rituals and rulership in late formative central Jalisco. *Ancient Mesoamerica*, 14 (2): 299-318.
4. Devan, C.J.V. and Anju, M. 2018. The village deity of Tamil Nadu: a case study of mariyamman's myth. *Int. J. Research Culture Society*, 2 (6): 79-81.
5. Felix, W. 1998. Christianity in Hindu Polytheistic Structural Mould. Converts in Southern Tamilnadu Respond to an Alien Religion during the Vasco da Gama Epoch. *Archives de sciences sociales des religions*, 103: 67-86.
6. Frazer, J.G. 1922. The golden bough: A study in magic and religion. *Macmillan and Co.*
7. Fuller, C.J. 1980. The divine couple's relationship in a south Indian temple: Mīnākṣī and Sundareśvara at Madurai. *History of Religions*, 19 (4): 321-348.
8. Haland, E.J. 2001. Rituals of magical rain-making in modern and ancient Greece: A comparative approach. *Cosmos*, 17: 197-251.
9. Herath, H.M.D.R. 2010. The cultural dimension of some agricultural rituals in Sri Lanka.

Economic Review, (April/May): 68-71.

10. Jocano, F.L. 1967. Agricultural rituals in a Philippine barrio. *Philippine Sociological Review,* 15 (1/2): 48-56.

11. Jossie, E. Jose, and M. A. Sudhir. 2012. Mundiyānkalasam: An Eco-cultural Ritual of Ancient Farming Community. *Studies of Tribes and Tribals* 10 (1): 7-12.

12. Kato, T. 1988. Agricultural rituals and rice cultivation in Negeri Sembilan: A reconstruction from oral history. *Japanese J. Southeast Asian Studies,* 26 (2): 109-131.

13. Krishnamurthy K. R. 1951. *Ponniyin Selvan.* Vol. 1. Vanathi pathippakam, Chennai.

14. Mustafina, R. M. 2015. Rituals of the agricultural cycle of the Kazakhs: Rite of calling for rain. *The Anthropologist,* 22 (3): 553-559.

15. On, K.L. and Pugh-Kitingan, J. 2015. The impact of christianity on traditional agricultural practices and beliefs among the Kimaragang of Sabah. *Asian Ethnology,* 74 (2): 401-424.

16. Ondrich, M.-P. 2016. Amman Movies: An Introduction. *J. of Religion and Film,* 9 (2): 5.

17. Samaddar, A. 2006. Traditional and posttraditional: a study of agricultural rituals in relation to technological complexity among rice producers in two zones of West Bengal, India. *Culture & Agriculture,* 28 (2): 108-121.

18. Sivasubrahmaniyam, A. 1988. Mantiram Cadangukal. *New Century Book House,* Madras.

19. Srinivasan, T. M. 2016. Agricultural practices as gleaned from the Tamil literature of the Sangam Age. *Indian J. History of Sci.,* 51.2 (1): 167-189.

20. Unnikrishnan. E. 1995. *Sacred groves of North Kerala: Eco-Folklore study (Malayalam).* Samskriti, Kannur, Kerala.

21. Veerasami, V. 1975. Agriculture in the Vedic and Cankam Periods. *J. Tamil Studies,* 8: 33-39.

22. Young, K. K. 2009. History and Imagination: Tamil Culture in the Global Context. *University of Toronto Quarterly,* 78 (1): 186-187.

POTENTIAL OF SCIENTOMETRIC MEASURES OF HARMFUL IMPACTS OF GLOBAL WARMING ON HUMAN HEALTH AND EMERGING NEW DISEASES

Dr.E.R.Subrahmanyam
Principal (Retired)
Sree Konaseema Bhanoji Ramars College
Amlapurum, Andhra Pradesh

Dr.Ramesh Kundra
Senior Scientist (Retired)
NIST & Development Studies
K.S. Krishnan Marg, Pusa, New Delhi

Abstract

This paper is a bibliometric study of a large set of publications dealing with research studies on climate change and aims at mapping the relevant literature incorporating a slew of quantitative data. It is beyond doubt that global warming is happening. The mean temperature of the earth is rising gradually and taking its toll. The adverse effects of the warming trend and the change of climate are being observed all over the world in many ways. The harmful impacts on human health and emergence of new diseases are of particular concern. It is feared that the observed severity as well as projected increased frequency of climate related impacts will further exacerbate the adverse effects on human health. The excessive ambient heat and humidity exposes humans to heat stress making them vulnerable to many harmful effects such as heat stroke. Extreme weather patterns caused by warming oceans and changing climate have brought an increase in infectious diseases both new and emerging. It should be understood that the changing climatic conditions are helping to sustain the disease carrying vectors for longer periods of time giving scope for their rapid multiplication. New climates are also being created allowing the introduction and survival of new vectors. It is to be noted that in recent years there has been a spurt in many mosquito-borne diseases notably malaria, dengue, chikungunya elephantasis, zika virus infection etc. in several parts of the world. Humid and warm atmosphere is favourable for the growth of mosquitoes and other vectors. Consequent on climate changes the diseases causing organisms are becoming resistant to antibiotics and disinfectants. Many diseases that were considered to be completely eradicated are reemerging. The incidence of dengue has grown dramatically around the world in recent years.

In India, the states of Telangana and Andhra Pradesh, in particular suffered the worst outbreak of the disease which claimed many lives. The other vector-borne diseases malaria, chikungunya and elephantiasis are also causing worry. Lancet Medical Journal recently reported that India ranked 4th in global incidence of malaria in 2017 with 4% of cases worldwide reported in the country. It should be understood that the main culprit for the alarming rise of serious diseases all over the world is global warming and climate change. This paper underscores the present deplorable surge of many diseases if due to failure of all countries to control global warming and cautions that humanity would become helpless in the event of appearance of novel viruses.

Introduction

While writing the paper we plowed through a pile of papers published since 1980. We noticed that there was a rapid increase in the publications with a doubling every 5-6 years. The major field covered in the papers was biomass research followed by climate modeling. Research dealing with adaptation, migration, risks and vulnerability to global warming surprisingly received less attention till 2005. However, subsequently the papers dealing with these issues increased exponentially. Scientists working within this research field now-a-days have the advantage of modern information systems which offer data bases and analytical tools providing a better overview on their entire research fields. However, most of the researchers are unable to take advantage of these modern systems due to lack of access and experience. A welcome development in recent times is the publication by scientometricians, a series of bibliometric analyses stimulated by growing scientific, political and public attention of research on climate change. These publications appeared both in subject specific journals in the field of climate change as well as bibliometric journals. We made a scientometric analysis of the available literature in research papers related related to climate change impact on health besides the recent warning of world scientists, the study report in Lancet medical journal, IPCC Annual Report, WHO Reports, World Malaria Reports and national newspapers for authentic and reliable data.

Climate change and global warming have become the defining challenge of our times. In the early 1990s scientists were all obsessed with the environmental impacts of this challenge but paid little attention to the effects on health. But, several studies by researchers and environmental experts have revealed the possible effects of climate change on health and spread of diseases. Climate change is shown to put additional pressure on land and its ability to ensure food

,water and other conditions vital for wellbeing. It has been recognized now that public health is a precondition for and an indicator of all dimensions of sustainable development. The UNFCCC Conference of Parties (COP 22) noted that almost 25% of disease and approximately 12.6 million deaths are attributed to modifiable environmental factors

Theing Planet Warm

Berkely Earth has recently released analysis of land-surface temperature records going back 250 years, about 100 years further than previous studies. The analysis shows that the rise in average world temperature is approximately 1.5o C in the past 250 years and 0.9 C in the past 50 years alone. The UN Science Advisory Committee sounded alarm bells by revealing that the global temperature is already 1.1o C above pre-industrial times and 0.2o C warmer than 2011-2015 periods. The report ' United in Science' noted that the average temperature for 2015-19 is the warmest on record. The global mean sea level rise increased from 3.04 mm per year in 2007-16. Heat waves were also the deadliest in the 2015-19 periods affecting the continents and setting many national temperature records. The reports further said that it is increasingly becoming clear that human-induced climate change is responsible for extreme weather events in the form of floods storms, heat

waves droughts etc. The report further observed that medium and low-income countries will see the worst impact on their economies.

Source: George Luber, US Center for Disease Control and Prevention

The IPCC Annual Report 2014 had noted that health of human population was sensitive to changes in weather patterns and other aspects of climate change. The report stated that effects occurred directly due to changes in temperature and precipitation and occurrence of heat waves, floods, droughts and wildfires. Indirectly health might be damaged by ecological disruptions such as crop failures and shifting pattern of disease vectors created by climate change or social response to climate change like migration.

Increasing Disease Burden

There has been a rise in diseases carried by insects such as mosquitoes, flies and ticks. Climate change has a strikingly noticeable influence on these vectors in a number of ways- which include change of the length of life cycle and variation of breeding

conditions. Owing to warmer climate these vectors mature early and produce more off springs in their life as their life cycles are getting shorter. This ultimately leads to rapid enhancement of vector population. Further the distribution of parasites and pathogens will be directly affected by global warming but also indirectly through effects on host range and abundance. Those areas which were unfavorable for vectors of many diseases are becoming favorable due to increasing humidity and global temperature. Consequently disease organisms are shifting and expanding their areas. They are emerging in areas that were previously considered free from that particular disease.

The increase of vector population causes increased feeding rate to combat dehydration caused by enhanced warming of climate. Consequently, there is higher vector-human contact besides expanded seasonal and spatial distribution. The pathogens will have faster incubation in vector and expanded distribution. Extreme weather patterns are the prime reason for the observed surge of infectious diseases both new and emerging. Rainy seasons are extended in some areas while droughts are prolonged in some others. New climates are introduced in in different areas across the globe. All these can be cited as part of climate change.

Mosquito-Borne Diseases a Growing Threat

Mosquito-borne diseases are the greatest threat to humans as they include malaria, encephalitis, dengue fever, chikungunya, Rift valley fever and yellow fever. Studies have shown higher prevalence of these diseases in areas that have experienced extreme flooding and drought. During July-October, the cities of Patna, Mumbai, Hyderabad, and several other areas across India that faced water logging due to heavy rains and flooding recorded spike in vector-borne diseases especially those carried by mosquitoes. Studies have discounted the belief that mosquitoes roam about in small areas and cannot fly to higher altitudes but established that they have the ability to fly as high as 400 m and travel to far off places with the help of wind. The new study by scientists revealed that even if mosquitoes at one place are controlled, those from other places are invading the areas thwarting all mosquito control efforts. This ability of the mosquitoes to thrive and multiply in a warming planet is making malaria control a difficult task.

Stagnant pools of water are created in normally dry areas when they receive increased rainfall. Similarly, flooding creates more standing water allowing mosquitoes to breed. Moreover, warmer climate helps these vectors to feed more and faster. As the climate warms over oceans and coastal areas, higher temperatures are also creeping to

higher altitudes allowing mosquitoes to invade new areas they had never been able to reach and survive before. It is also due to warmer climate that malaria could return even to the developed world.

Ticks & Viruses

Ticks, the blood-sucking arthropods are important as vectors of several diseases. Black-legged tick, a carrier of Lyme disease is also thriving in warmer temperatures allowing them to feed and grow at a faster rate. Other vector-borne diseases on the rise due to extreme weather include hanta virus, tuberculosis, cholera, West Nile virus, zika virus etc.

After the 1877 discovery that mosquitoes transmitted filariasis from human to human; malaria, yellow fever and dengue were shown to have similar transmission cycles. By 1910 other major vector-borne diseases such as African sleeping sickness, plague, Rockey mountain spotted fever, Chagas disease etc., had all been shown to require a blood-sucking arthropod vector for transmission to humans. Though the vector-borne disease control programmes in various countries showed some success during 1940-70, a number of such diseases began to reemerge in the 1970s and this resurgence has greatly intensified in the past 20 years. It is claimed by researchers that global warming and climate change, inter alia, played an important role in the virulent reappearance of these diseases particularly in Africa, Asia and Latin America

Environmental and community health researchers are currently paying attention to the dengue, chikungunya and malaria diseases throughout the world particularly in India and several other developing countries including Small Island Developing States because these diseases are so prevalent now-a-days and also because the outbreaks seem to be linked to climate change,

Malaria

Cerebral malaria, a form of deadly malaria, has appeared in Africa highland areas such as Kenya highlands. These cases are noticed frequently in places like Nairobi. These are the places where malaria was non-existent till the end of the 19th century. Hence these places were called malaria and mosquito-free areas so that the people living in these areas didn't have immunity against malaria parasite, Anopheles mosquitoes which transmit malaria can successfully complete their life cycles when atmospheric temperature is above 160C. Temperature of these African highland areas was cooler and even colder during winter. So Anopheles mosquito and hence malaria could not thrive. But with the global warming the temperature became favorable for both mosquitoes and malaria parasite. The glaciers in these hilly areas started melting and the atmosphere became

moist and warm. This was very favorable for mosquitoes and malaria parasites. This way malaria reached the so called safe areas. When People in these areas do not have immunity against malaria they suffer from malaria in its dangerous form and often succumb to it.

According to WHO, in 2017 it was estimated that 435000 deaths due to malaria had occurred globally of which 403000 deaths (93%) were in the African region. According to a Lancet report India ranked 4th in global malaria cases. Of the 219 million cases reported globally in 2017, nearly 10 million were from India making it the 4th most affected by the disease- only behind the African countries Nigeria, Congo and Mozambique. The report also noted that the urban environment as in Chennai particularly suited the Anopheles stephensi mosquitoes.

A fluctuation of 2 or 3 degrees could create exceptional breeding grounds for mosquitoes, for larvae to grow and mature mosquitoes to carry the virus to infect people that have never been exposed before.

Ministry of Health, Government of India released in July 2019, this year's figures concerning the cases of vector-borne diseases like malaria, dengue and chikungunya.

	Reported in India	In Delhi
Dengue	91	22
Malaria	92	44

Among the 11 nations with 70% of the world's burden of malaria, only India has managed to reduce its disease burden registering a 24% decrease between 2016 and 2017, according to World Malaria Report 2018. With about 9.5 million malaria cases in 2017 down 3 million cases since 2016, India is no longer among the top three countries with the highest malaria burden. However, 1.25 billion Indians-94% of its population- are still at risk of malaria, the report noted. World Malaria Report 2019 noted that India was one of the only two countries to report a reduction in malaria burden in 2018. The other nation was Uganda. India witnessed a 28% fall in malaria cases between 2017 and 2018.Further only seven out of 28 Indian states and 9 UTs accounted for 90% of the estimated malaria cases in 2018. As per the report, an estimated 228 malaria cases were reported across the world in 2018, reduced from 251 million cases in 2010 and 231 million cases in 2017.
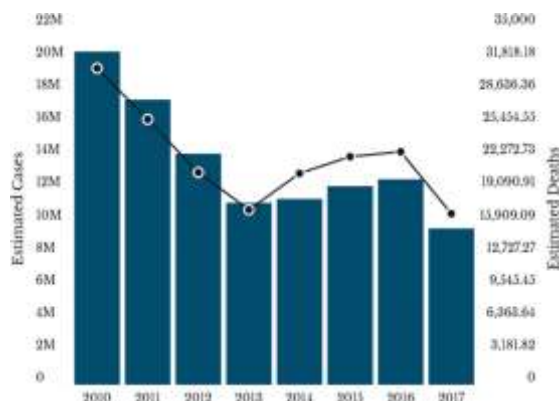
Dengue

Dengue is the second most important tropical disease after malaria. The global incidence of dengue has grown dramatically in recent decades. About half of world's population is at risk. There are about 50-100 million cases of dengue fever each year. Dengue is found in tropical and sub-tropical climates worldwide mostly urban and semi-urban areas. Dengue virus is transmitted by female mo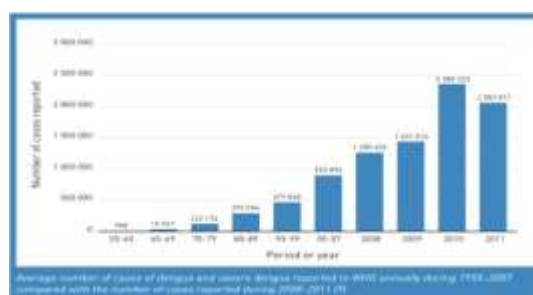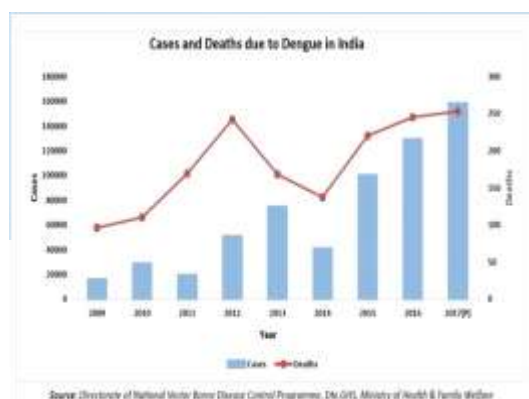squitoes mainly of the species Aedes aegypti. This mosquito also transmits chikungunya, yellow fever and zika infection. Dengue is widespread throughout the tropics with local variations in risk influenced by rainfall, temperature and unplanned rapid urbanization.

Before 1970 only a few countries had experienced severe dengue epidemic. The disease is now endemic in more than 100 countries in the WHO regions of Africa, the Americas, the Eastern Mediterranean, South-East Asia and the Western-Pacific. Not only is the number of cases rising with the disease spreading to new areas but also dreadful outbreaks are occurring. The year 2016 is on record for the large dengue outbreaks worldwide. Once again a sharp increase of dengue cases was observed last year i.e., 2019 in several countries including Australia, Cambodia, China, Malaysia, India, Bangladesh, Vietnam and Philippines. The 2014 report of WHO 'A Global Brief on Vector-borne Diseases' has noted that environmental changes were causing an increase in the number and spread of many vectors worldwide and there had been a 30- fold increase in dengue cases in the past 50 years with huge human and economic costs.

In mid-July 2019 Philippines health authorities declared a 'national dengue alert'. In early August the department of health declared a 'National Dengue Epidemic'. By now the number of cases has soared to 170,000 with 720 deaths. A dengue outbreak has been reported in many parts of India affected by severe floods. As of 6 October, about 900 people tested positive for dengue in Bihar including 640 cases in Patna due to water-logged streets. According to press reports Telangana was under the grip of dengue for over three months during the monsoon season 2019. Positive cases touched three-figure mark every day across the state on some days. The spike in dengue cases in Telangana particularly in Hyderabad city in July-September 2019 caused alarm. As on 5 September 530 confirmed cases have been reported in the state of which more than370 are from Hyderabad. The disease has claimed more than 50 lives. Despite the steps taken by the Health department positive cases continued and the suspected dengue deaths figure had crossed 70 this season. While this year many states of India recorded a spurt in vector- borne diseases, Andhra Pradesh appeared to be the worst hit. In just one week between September 7

and 13, a total of 86 people were diagnosed with dengue in Visakhapatnam district alone as against 118 cases in the entire state. As many as 194 dengue cases were reported in the district in October 1 to 18 as against 151 cases in October last year. Simultaneously 56 cases of malaria were reported in the state of which 35 patients were from Visakhapatnam district. The districts of East Godavari, Visakhapatnam, Guntur and Chittoor also reported an increase in dengue and malaria cases. Fear of the deadly diseases gripped the tribal areas.

Cases and Deaths due to Dengue in India

Source: Directorate of National Vector Borne Disease Control Programme, Dte.GHS, Ministry of Health & Family Welfare

Average number of cases of dengue and severe dengue reported to WHO annually during 1955-2007 compared with the number of cases reported during 2008-2011 (*)

According to National Health Profile 2018, dengue outbreak s in India continued since 1950s but severity of the disease has increased in the last two decades. In Delhi dengue cases almost doubled up between 2013 and 2017. Number of dengue cases was the highest in a decade. As reported in 'Down to Earth' magazine, June 2018, the number of dengue cases was as follows.

2017	188,401
2013	78,808
2009	60,000

(According to National Vector-borne Disease Control Programme and National Health Profile 2018)

As per government reports, a total of 2058 dengue cases and 539 malaria cases were registerd in the two months from October 14 to December 12 of 2019 in the state of Andhra Pradesh

Date	Malaria	Dengue
October 14-20	79	323
October 21-27	64	325
October 27-November 3	54	250
November 4-10	56	246
November 11-17	74	287
November 25-December 01	44	247
December 02-08	65	126
December 09-12	38	88
Total	539	2058

Dengue caused havoc in the district of East Godavari also in 2019. It was estimated that as many as 1500 dengue positive cases were recorded in government and private hospitals put together while the

disease resulted in about 100 deaths in the district.

Chikungunya

Chikungunya has been identified in nearly 40 countries in Asia, Africa, Europe and the Americas. Between 2001 and 2011, a number of countries reported on outbreaks of this viral disease which is spread by the Aedes mosquito. In the Americas, in 2016 there was a total of 349936 suspected and 146914 confirmed cases reported to the Pan American Health Organization (PAHO) regional office. Countries reporting most cases were Brazil, Bolivia and Columbia. In the African region, Kenya reported an outbreak of chikungunya resulting in more than 1700 suspected cases. In 2017 Pakistan continued to respond to an outbreak which started in 2016. As reported in 'Down to Earth 'magazine the National Health Profile 2017 puts the number of clinically suspected cases in India increased from 18,840 to 63,679 from 2013 to 2017 or by 70%. Several states saw a significant spike in the number of cases of the vector borne disease.

Other Diseases

Lyme disease and Babiosis (bacterial diseases) have reached warmer areas of England and USA too where these were not seen before. The reason is that due to global warming, temperature of these new areas became favorable for the ticks. Zika virus is also noticed in several countries. Zika has become epidemic in Brazil due to global warming and climate change. It started after heavy rains in Southern Brazil and Uruguay in preceding winter.

Cholera is reemerging now. Many patients of cholera are found in developed countries also. The disease is spread by house flies. These house flies grow rapidly in hot and moist climate. Small pox which had been declared nonexistent in 1980 is likely to reappear in near future.

We can have altogether new diseases i.e., diseases which never existed before due to these climate changes. In such a case we will be helpless because for these diseases neither we have drugs and vaccines nor our bodies would have immunity against them. The novel Chinese Carona virus is a serious threat as there is no antiviral available. As on January 26, the virus claimed 56 lives and infested over 2000 people. However, its link to climate change is to be investigated.

Paris Accord a Health Accord

The WHO has warned that records for extreme weather events are being broken at an unprecedented rate and that there is a real risk for the world to lose its capacity to sustain human life if the Earth's climate is further altered by adding even more heat trapping green house gases. "We see the Paris Agreement as a fundamental public

health agreement of the century. If we don't meet the climate challenge, if we don't bring down GHG emissions, then we are undermining the environmental determinants of health on which we all depend. We undermine water supplies, we undermine our air, we undermine food security" said Dr Diarmid Campbell- Lendrum, WHO Team Lead on Climate Change and Health. It is unfortunate that the US has pulled out of the Paris Accord without understanding the consequences of ignoring climate change impact on public health.

Climate change clearly harms health in many ways. A review of studies published between 2009 and 2014 link climate change to increase in a wide range of health problems including asthma and other respiratory disorder, heart disease induced by heat stress, infectious diseases, water borne diseases that can cause dangerous bouts of diarrhea in children and mental health issues such as depression and post traumatic stress disorder following climate –related natural disasters such as hurricane.

Conclusion

Reversing the trend of emergent vector-borne diseases is a major global challenge.

Vaccines are available for a few diseases, say, yellow fever, Japanese encephalitis and malaria. However, they are not widely used. Malaria vaccine RTS, S has been introduced for babies and toddlers only in Ghana, Malawi and recently in Kenya. Environmentally safe insecticides and research on alternative approaches such as biological control are needed. Organic farming and natural farming which adopt eco-friendly agricultural practices need to be encouraged. In addition to economic support for research; human resources are needed to develop and implement sustainable prevention programs. Policy changes must be initiated to support public health approaches to disease prevention. Since climate change and the consequent harmful impacts concern the entire world a global response by way of inter governmental collaboration is needed in the spirit of the Paris Agreement. Above all, a global people's movement against global warming and climate change is urgently required. Prime Minister Narendra Modi has rightly remarked at the UNGA Climate Summit 'the time for talks on climate is over; the world needs to act now to protect environment'. It is unfortunate that the 2-week long COP 25 in Madrid ended without reaching an agreement on global carbon markets. The international community has lost an important opportunity to show increased ambition on migration, adaptation and finance to tackle the climate crisis.

References

1. Effects of global warming on human health-Wikipedia
2. Climate change impacts on human health- UN Report April 2017
3. Climate change and insect-borne disease; facts and figures-By Priya Shetty
4. Jayashree Nandi: Hindustan Times-23 Sept 2019
5. The PH dengue outbreak and rising global dengue risks-emasia review news&analysis
6. Climate change and health in small island developing states; A WHO special initiative
7. AR5 Climate Change 2014: Human Health, Impacts, Adaptation and Co-benefits
8. A Global Brief on Vector-borne Diseases-WHO
9. Climate change& Mortality-Nov 2017. International Actuarial Association
10. Deccan Chronicle, The Hans India &TOI newspapers
11. Climate change 2014 - IPCC Synthesis report 2014. Available from: http://www.ipcc.ch/report/ar5/syr/
12. Anderegg WRL, Prall JW, Harold J, Schneider SH, Expert credibility in climate change. Proceedings of the National Academy of Sciences of the United States of America. 2010, 107(27): 12107-9. pmid: WOS:000 279572100014.
13. Li W. Zhao Y. Bibliometric analysis of global environmental assessment research in a 20-year period. Environment Impact Assess Rev. 2015; 50. 158-66. pmid: WOS: 000346214900017.
14. Climate Change 2014 – IPCC Synthesis Report. Summary for policymakers 2014. Available from: https://www.ipcc.ch/pdf/assessm ent-report/ar5/syr/AR5_SYR_ FINAL_SPM.pdf

TEACHING GRAMMATICAL STRUCTURES USING INTERACTION

Dr.V.Jeya Santhi
Assistant Professor of English
SDNB Vaishnav College for Women (Autonomous)
Chromepet, Chennai

Dr.R.Selvam
Associate Professor & Head in English
V.H.N. Senthikumara Nadar College (Autonomous)
Virudhunagar

Abstract

Grammar is the sound, structure, and meaning system of language. All languages have grammar, and each language has its own grammar. People who speak the identical language are able to communicate well because they naturally know the grammar system of that language - that is, the rules of making meaning. And knowing about grammar offers a window into the human mind and into our remarkably complex mental capacity. In order to speak and write English effectively, it is necessary to use the language correctly. However, to become effective speakers and writers of English, the students need guidance mainly in grammar. They need to learn how to transfer their knowledge of grammatical concepts from oral language to written language. This paper is a study on the application of interactive teaching methodology while teaching grammatical items especially Sentence Pattern and If-Conditional Clause in the language classroom for enhancement of the learners' communication skills using interactive teaching techniques. This research is also an effort to upgrade the learners' level of comprehension and make them respond effectively in the second language in their discourse.

Keywords: *grammar - system of language, window into human mind, knowledge transfer from oracy to literacy, upgrading learners' comprehension and communication*

Grammar is imperative in any language because it makes one to converse and write efficiently. Grammar names the types of words and word groups that make up sentences not only in English but in any language. As human beings, we can put sentences together and we can all do grammar. But to be able to talk about how sentences are built, about the types of words and word groups that make up sentences, one should

know about grammar. It helps us to understand what makes sentences and paragraphs clear, interesting and precise. And it offers a window into the human mind and into our miraculously complex mental capacity; it also implies finding out the fact that all languages and all dialects follow grammatical patterns. The present study explores the ways to enhance language acquisition using the grammatical items selected and thereby correspond efficiently.

Grammar: A Review

Etymologically, the word "grammar" is related to the word "glamour!" Sriram opines, "…grammar is, at least a very interesting, and often an exciting, subject of study" (p, 2). The dictionary defines "grammar" as the "rules by which words change their forms and are combined into sentences." Grammar can be part of literature discussions when we and our students closely read and analyze the sentences in poetry and stories. W. Nelson Francis in his "The Three Meanings of Grammar" defines "grammar" as "the set of formal patterns in which the words of a language are arranged in order to convey larger meanings" (299-312). Kolln calls for more careful definition of the word grammar - her definition being "the internalized system that native speakers of a language share". Research strongly suggests that the most beneficial way of helping students improve their

command of grammar in writing is to use students' writing as the basis for discussing grammatical concepts. Rather than striving to teach all grammatical concepts to all students, teachers should prioritize and provide instruction on the grammatical elements that most affect their students' ability to speak and write effectively. Teachers should also be sensitive to individual students' readiness to learn and apply grammatical concepts.

Weaver proposes a distinct approach to teaching grammar in the context of writing (1998). She writes, "What all students need is guidance in understanding and applying those aspects of grammar that are most relevant to writing." As students revise and edit their writing, teachers can provide grammar instruction that guides students in their attempts to identify and correct problems in sentence structure and usage. As writing is a complex and challenging activity for many students, teachers should focus on the grammatical concepts that are essential for the clear communication of meaning.

Research conducted since the early 1960s showed that grammar instruction that is separate from writing instruction does not improve students' writing competence (Braddock and others, 1963; Hillocks, 1986). In addition, research indicates that the transfer of formal grammar instruction to writing is not applicable

to larger elements of composition. Through detailed studies of students' writing, Shaughnessy (1977) concludes that the best grammar instruction is that which gives the greatest return for the least investment of time. She advocates four important grammatical concepts: the sentence, inflection, tense, and agreement. She recommends that teachers encourage students to examine grammatical errors in their own writing. She also cautions teachers not to overemphasize grammatical terminology to the detriment of students' ability to understand and apply the concepts.

Each language has its own rules of correctness, known as rules of grammar. People associate grammar with errors and accuracy. Grammar is also associated with boredom or boring and mechanical exercises. The image of the grammarian is that of a dull, lifeless person, far removed from the pleasures of this world or even the bliss of the next. The poet Robert Browning has taught us how to visualize a grammarian's funeral. No one has ever spoken about a grammarian's birthday party or wedding. But the fact is that Indian learners who are not sure of the grammar of English often make mistakes while using English (Bikram K. Das, 1). Kolln concludes with a stirring call to place grammar instruction at the center of the composition curriculum: "our goal should be to help students understand the system they know unconsciously as native speakers, to teach them the necessary categories and labels that will enable them to think about and talk about their language".

Keeping in view the above discussion, it is concluded that grammar, if taught using interactive methodology can motivate and inspire the learners in learning the second language and make them respond effectively in their communication.

A Study on the Grammar Issue
Research Statement

The present study is an attempt to explore the problems associated with learning a non-native language (L2) using grammatical structures and the ways to prevail over the challenges in conversing in English. To find out the latent probabilities on enhancing language learning, an analysis was done by conducting a fifteen hour course on selected grammatical items.

Objectives of the study

The main objective of the study was to provide tangible evidence for using grammatical structures in learning the language. To achieve this purpose, the study attempts to find answer to the following questions:

- Why is grammar issue in learning a language so important?
- What do the findings of this educational research suggest about the value of formal grammar instruction?

The study has limitations as it was conducted among the samples (belonging to rural area) selected for research; and two grammar topics were selected i.e. 'sentence pattern' and 'if-conditional clause'. The study material is prepared by the researchers themselves for classroom use in their teaching process.

Population: Research Instrument

The research was conducted on the selected forty four samples of first year undergraduate students of an autonomous Arts and Science College. Among these samples, fifteen are female samples; and twenty-nine are males. Quantitative methodology was used to analyze the samples' level of learning with the distribution of a questionnaire at the end of the course. Descriptive analysis and differential analysis were used for statistical treatment.

Teaching Methodology

The samples of experimental group were directed to undergo a pre-test on 'Sentence pattern' and 'If-conditional clause' to assess their level of understanding in the chosen topics. Twenty questions on both were given. It includes 'Identify Sentence Pattern, Frame sentences for the following pattern, Identify the type of the conditional clause, Match the given sentences with the apt types. The results showed that many had familiarity with the topic in their school days; but they were unfamiliar with the definition, explanation and exercise in worksheet. Some samples had no knowledge of the topics as well as exercises. However, many struggled hard to complete the pre-test within the allotted time. Their performance in the pre-test was noted for analysis. Then, training the samples in the chosen grammatical items - 'sentence pattern' and 'if-conditional clause' using interactive teaching method started.

The learners were selected in random for individual as well as pair or team work to do grammatical exercises. Teaching grammar was spread out throughout all the learning activities as grammar must be taught incidentally while training the skills. Only L2 was used for teaching and the samples were advised to use the second language in their classroom learning process to enhance their level of language.

In listening skill, the sub-skills such as intensive listening, identifying patterns and types, post-listening tasks were given focus. To enhance speaking skill, question answer techniques, situational language usage, conversational skill and analytical skill were trained. In reading skill, intensive reading, while-reading tasks and independent reading were main focus. The sub-skills of writing skill such as logical reasoning, substitution method and inductive learning were drilled. Chalk and talk were the two effective teaching aids while teaching grammar. The learners were encouraged to make

use of the blackboard when they were ready with the answers.

- The session started with brainstorming activities to motivate the samples' interest in learning grammar.
- In 'sentence pattern', instead of giving explanation on the form and functions of subject, verbal, object, complements and adjuncts which are part of the basic patterns, they were trained by asking questions; and from their answers, they were taught the different patterns of sentences, i.e. SVO, S V IO DO, SVA etc.
- For example,
  'I / am reading.'

Could you identify the parts of speech of this sentence?

The participants answered enthusiastically – S V, S V C, etc.

The samples were asked to find out the function of the word 'reading' to make them realize their error in answer. Then, they were asked -

'Can you add a word to this sentence?'

Varied answers from the participants such as - a book, a newspaper, a short story, etc.

'I / am reading / a book.' - SVO

Thus they were taught object. Then they were asked to add another word that would give additional information. Again, they gave different answers related to the sentence.

'I / am reading / the newspaper / in the morning.'

So, they learnt the structure SVOA. They also understood the fact that if we drop adjuncts, the meaning of the sentence is acceptable. But if we drop subject, verb and complement, there is no meaning.

- Framing sentences in the given pattern and identifying the pattern of the given sentence were drilled.
- Similarly, in 'if-conditional clauses', they were taught the rules inductively by pictures, substitution tables; and situations were made use of, to make the learners comprehend clauses and identify the types of clauses. They were directed to come out with a lot of sentences on the three types.
- Situations with flow of information (in all the three types) from specific to general were given. For example:
  'What will you do if you fall ill?'
  'What would you do if you were an angel?'
  'What would have you got if you had studied well?'
- Schema theory was made use of by the learners to associate the given question with their previous knowledge and identify the answer. From their specific answers, general rules regarding conditional clauses were taught.

Sentences on 'Open/ Factual/ Probable condition, Improbable condition and Unfulfilled condition' were taught.

- Substitution method' and 'matching' with three types of conditional clauses were given practice.
- Framing sentences using 'if' conditional clauses were given focus.
- The respondents were drilled in analyzing the sentence, finding out the type and transforming into other two types.
- After continuous training, individual as well as pair work was given. Worksheet exercises were given as home assignments.

Throughout the session, the samples were encouraged to utilize their reasoning skills, prior knowledge, intelligence, and mental focus. To improve the functional knowledge of grammar, many exercises employing inductive learning were adopted in the class. Substitution tables, identifying the given sentence pattern, framing sentences on the given pattern, choosing the best option, identifying the types of conditional clauses and transformation were some of the activities used to teach specific grammatical items. Care was taken that all the samples were given opportunity to participate in interactive activities. Such learner-centred as well as learning-centred activities promotes skill development. After fifteen hours of training, the samples were given post-test to evaluate their grammatical competence. Subsequently, they were directed to answer the questionnaire (Tables 3, 4 and 5) for statistical analysis.

Results

Table 1 Pre-Test result

Group	Samples	Passed	Failed
Experimental Group	44	23	21

Table 2 Post-Test result

Group	Samples	Passed	Failed
Experimental Group	44	**38**	**6**

The scores of the pre test and post test showed that the experimental group had shown difference in their performance after training. It exposes the need of task-based activities and interactive methodology to be used in classroom teaching.

Data Collection and Analysis

The performance of the samples in the questionnaire was collected and the data was analyzed.

Table 3 Close-ended Responses of Samples on Learning using Interaction

Qn. No.	Question	Yes	No
1.	Do you like learning grammar before this course? a. Yes b. No	14	30
2.	Usually students feel bored with Grammar lessons. Is it easy to learn Grammar using this methodology? a. Yes b. No	35	9

3.	Does this method suit the students who want to learn English instantly? a. Yes b. No	10	34
4.	Grammar is vital for learning a language a. Yes b. No	44	0
5.	Do you feel you have improved your language after attending this short-term course? a. Yes b. No	44	0

For the close-ended questions four and five, there was no discrepancy among the samples. This shows that the samples are new to this classroom drill method and they know the value of 'English language' in higher studies and job market. They accept the concept that grammar is to be taught not as a subject but as an activity. For the questions one and three, majority of the samples disagreed because grammar is supposed to be a topic of boredom and self-effort is also needed for learning any language. It is also clear from the question two that grammar cannot be learnt instantly.

We can conclude that the samples are aware of the importance of English language and they are welcoming the ways to overcome the challenges in learning the language using formal grammar so as to converse effectively in the target language.

Table 4: Open-ended questions [Responses on the basic idea about learning a language using grammatical items]

In Descriptive Analysis for open-ended questions, the average was found out by Mean for the expected set values to know the attitude of the samples after this training course.

Qn.No.	Question	Option-a	Option-b	Option-c	Option-d	Total
6.	Which skill do you want to improve in this method? a. Listening skill b. Speaking skill c. Reading skill d. Writing skill	5 (11.4%)	20 (45.5%)	4 (9.0%)	15 (34.1%)	44
7.	Your idea about this functional application of grammatical teaching methodology - a. uncomfortable b. motivated to speak in English c. a new way of learning grammar d. makes grammar boring	5 (11.4%)	20 (45.5%)	16 (36.3%)	3 (6.8%)	44

The data in Table Four illustrates that for the question six, 11.4% of the respondents opted option (a) i.e. 'uncomfortable', 45.5% of the samples viewed it as 'motivation to speak freely in English' (option b), 36.3% of the respondents accepted it as 'a new way of learning English grammar' (option c) and three chose option d (6.8%) as their answer which explains clearly that learning grammar using interactive methodology is not all a boredom.

For the question seven, 11.4% of the samples chose 'Listening skill' (option a), 45.5% of the respondents wanted to improve their 'Speaking skill'(option b), 9% considered 'Reading skill' as the basis for learning grammar (option c) and 34.1% of the samples chose 'Writing skill' (option d) as their choice. This proves the fact that the samples are interested in improving speaking and writing skills by undergoing this methodology.

Table 5: Comparing the Alternatives
Responses of the Samples about the issue of learning grammar

In Differential Analysis for question eight, Chi-Square test was applied for the statistical evaluation to determine the critical values based on the degrees of opinions by the samples, and to compare the alternatives between the samples (male and female) to decide the right choice.

Qn. No.	Question	Variable	Uninteresting	Interesting	Total	x^2
8.	Learning grammar inductively using the selected items - uninteresting / interesting	Category 1 (Male)	9	20	29	0.607
		Category 2 (Female)	3	12	15	
		Total	12	32	44	

* df = 1   **Table Value of x^2 at 0.05 level = 03.841**

Table Five illustrates that the calculated value of x^2 is 0.607. The value of x^2 lies between 0.10 and 0.5 probability levels which is less than the table value 3.841 at 0.05 level. This means that x^2 value is nearly 0.6. So,

we can conclude that the proportion of learning a language is interesting to the samples using interactive methodology in their place of learning and living with teacher as the facilitator and mentor.

Key Observations

At the beginning of the fifteen day course, the samples hesitated to answer before undergoing pre-test. But there were a lot of changes in the samples' attitude after this training and they began to converse in English. The entire class was interested in the 'listening, speaking and writing' activities and they were also assigned 'reading' task with worksheet exercises. Framing sentences using grammatical structures is an effective method for helping students to develop fluency and variety in their own writing style. Collaborating in peer group help the students improve their own grammar skills and understand the importance of grammar which is a tool for effective communication. In the inductive approach, the learners were aware of 'noticing' that help them in identifying the concept in both the items taught to them.

But at the same time, using this methodology in teaching grammatical items has its own limitations. Until the language teacher is familiar with interactive teaching techniques, finding the right one for teaching the grammatical items is a task. The teachers should also be interested in teaching grammar inductively or else they should be trained by English Language Teaching experts. Another task is – if the teachers are not skilled in their language usage, the learning process may be slowed down. If learning grammar becomes an issue, the learners never come forward enthusiastically to learn formal grammar in the target language and it pulls them back.

Recommendations

The National Council of Teachers of English and the International Reading Association (1996) published Standards for the English Language Arts based on professional research and best classroom practices. While the standards acknowledge the importance of grammar concepts, they clearly recommend that students learn and apply grammar for the purpose of effective communication. Strategies such as writing conferences, partnership writing, grammar mini lessons, and peer response groups are all valuable methods for integrating grammar into writing instruction.

By embedding formal grammar in writing instruction using exercises, teachers can positively affect students' actual writing skills. Incorporating grammar terms while teaching also help the students understand and apply grammar purposefully in their own writing. When students link the study of grammar and language patterns to the wider purposes of communication and artistic development, they are more likely to incorporate such study into their working knowledge (p. 37). Further experimental research on this field helps the grammarians, teachers and educationists to have a wider outlook

on the value of formal grammar instruction and strengthens the learners' language learning process more effectively.

To Sum Up

Today's spirited world needs effective communication for achievement in career. Grammar helps the under-achievers in learning the second language comfortably and they can also do wonders. But the successful implementation depends upon the classroom teaching methodology and learning; and applying it in day-to-day procedure. If appropriately followed, language acquisition through grammatical structures will be a life-long learning process for the learners.

Works Cited

1. Bikram, K Das. (2006). Functional Grammar and Spoken and Written Communication in English. New Delhi: Orient Longman Private Limited.
2. Braddock, R., Lloyd-Jones, R., & Schoer, L. (1963). Research in Written Composition. Urbana, IL: National Council of Teachers of English.
3. Hillocks, G., Jr. (1986). "Research on Written Composition: New Directions for Teaching." Urbana, IL: ERIC Clearinghouse on Reading and Communication Skills and the National Conference on Research in English.
4. Shaughnessy, M. P. (1977). Errors and Expectations: A Guide for the Teacher of Basic Writing. New York: Oxford University Press.
5. Sriram, T. (2012). Modern English grammar and Usage. Hyderabad: English and Foreign languages University.
6. Weaver, C. (1998). Lessons to Share on Teaching Grammar in Context. Portsmouth, NH: Heinemann.

A STUDY ON CONCEPT OF THE 'SELF' IN THE NOVELS OF SHASHI DESHPANDE'S 'THAT LONG SILENCE' AND 'THE BINDING VINE'

G.S.Roopa Rani
Lecturer in English
PES College, Bangalore, Karnataka

Dr.Shashikanth Kurodi
Professor in English
S.D.M College, Ujire, Karnataka

Abstract

Indian women novelists have been distinctive in reflecting the Indian realistic themes in their novels. Shashi Deshpande is one such famous the acclaimed contemporary Indian women novelist who has reflected Indian cultural issues. The novels of Shashi Deshpande deal with the feminine sensuality, manage the family issues, trying to work out the issues in the marriage with the fine understanding of human character. The treatment of gender and sexuality traversing the barriers of class and caste in the society is remarkable. The works of Shashi Deshpande are not confined to specific class or society, but it is about the people who hardly manage to endure within the standards of middle-class society. Most of the novels of Shashi Deshpande have female central characters and work through a female consciousness and perspective and explore the quest of oneself to fulfil as a person being free from her imposed roles as daughter, sister, spouse, mother. The writer has analysed a diversity of ordinary household problems. The paper proposes to examine her description of the woman's inner world, quest for identity, power play and the women as 'The Other' and binary oppositions. It will attempt formulations based on the observations and insights emerging from this study. The main concern is to see the female protagonists' desire to find them selves to construct place for oneself to develop on one's own.

Keywords: *Identity crisis, Self, female consciousness, Binding Vine, That Long Silence, Shashi Deshpande.*

Indian writing in English has been impudent in demonstrating the realities in the fictions, novels and dramas. Indian writers in English have provided various insights of changing site of life, social conditions and other realities. English Literature has integrated all the varieties in its dominion. The enormous scope of feminism has helped women writers across the world

after the origin of feminism, as a concept and political movement originated from the west. The Indian women writers reflected the concept of women marginality and the condition of women in the society of their period.

The plight of the modern women has been neglected in the name of duty and responsibilities. Though constitution has provided provisions to women enjoy, the discrepancy persists sill in the modern women and she is a victim of male dominance and patriarchal decrees of society. Over the several decades, the number of novels which have appeared are in great number, dealing with the diverse subjects related to anguish of women. The depiction of women in the modern writings is powerful and the novels have deified the women like patient, devotional, dedicated soul and submissive.

Among many Indian women writers in English, Shashi Deshpande is one among the most mainstream women writers in India. Being the daughter of the famous kannada playwright Rangaram, she is more connected to the presentation of real inner world of women. She is born in Dharwad in 1938. Shashi Deshpande has contributed ten novels and several collections of short stories. Her works have drawn critical attentions because of the detailed, sensible interpretation of the Indian women in the domestic horizon. The main characters of Shashi Deshpande are the women who

are trying hard to articulate one's own voice and persistent in quest to define oneself. The centre of her fictional world is a woman, who is successfully managing the role of daughter, sister, wife, daughter-in-law, mother, being the victims of patriarchal decrees. The novels deal with woman's psyche, the desire to find one's identity and to create own world being independent. The strong point about her fiction is her delineation of the women's inner world.

The two novels of Shashi Deshpande, *That Long Silence* and *The Binding Vine,* depict the confrontations of the modern literate Indian women who are caught in the conventional norms of patriarchal society. Both the novels not only realistically mirrored the cries that engulf present day women but also portrays a horde of female's troubles, predicaments and depression. The main characters in the novels who go through several stages from unconsciousness to awareness about one's own self. A male partner not only changes a female's identity form a girl to woman, but he dominates her whole life to an extent of making herself as a part of husband's identity.In both the novels the female protagonists go through the various stages to attain self-awareness.

The novel *That Long Silence* deals with an Indian couple Jaya and Mohan. Jaya, a housewife who finds her life very monotonous and she longs for a disruptionwhich would bring her a

relief from her routine which has made her life very boring. She Longs for something excited and adventurous which would tremble them and take them out form routine. Jaya often contemplates about war or other happenings around. The novel is an investigation of the behavioural pattern of the female characters and the societal structure of female identity.

The Binding Vine deals with a central character Urmila, who goes in defence for other women's issues. Hardly any main central character of Shashi Deshpande has ever imagined of surpassing the confined boundaries of their lives. The characters of her novels Indu, Jaya, Sarita, Urmila or Sumi try to examine their lives and to change their traditional roles. In this novel the spirit of sisterhood is notable. Through this strong rebellious character Urmila, the writer focuses on the idea of liberation of women. The protagonist tries to help the misery women who is unique unlike other main characters of Shashi Deshpande. She tries to formulate vine of love from which the female characters who are in trouble can go beyond their frustration and to come forward tofind their deliverance.

Female identity, quest for oneself, female voice in the novels of Shahi Deshpande are well addressed. 'Self' is one of the central concepts which haunt human existence in this temporal world. Man spends a lot of time pondering over the feelings, perceptions and real or imagined ideas about himself. Since childhood, man is nurtured with some ideas about the self. He develops some ideas of his own about his own self and many things in his environment, his awareness of certain objects around him, his familial and social interaction, and leads to the basis of the experience with the self. The notion of self develops in a cultural context which has the element of continuity, keeps changing with the interaction of people and places, and when the gap between ideas and reality persists, the person may feel alienated, isolated and betrayed. Gulf between ideas and reality, material and spiritual, consciousness and unconsciousness divide the man into many selves which ultimately leave him fragmented and the victim of endless crises.

Jaya is haunted by the ghosts of Suhasini and Sita, the ghosts, which haunt her more than terror, and make him more fearful than fear. She analyses and finds that "the ghost most fearful to confront is the ghost of one's own self." (pg. 13)

Love and marriage are interrelated concepts of human relations. It has various forms and relation of husband and wife is one of its forms This relation has been the major concern of feminists all over the world. The most stable, pious and natural form of love, and its expression in daily life changes with time and space, from a permanent fountain to occasional drops. A woman

has no equal share in this expression too, which will only lead to suppression, suffocation and dissatisfaction. This is nicely brought out by Shashi Deshpande in *That Long Silence*. A male partner not only changes a female's identity from a girl to a woman but dominates her whole life to such an extent that she accepts herself as a part of his identity. Woman admits everything mutely not because she is feared of changing the society, but she is afraid of changing herself, her relation and her imposed identity. She becomes so suppressed from within, that hardly she feels the need to change her predefined roles and assume her new identity.

The need to permit space for each other, the liberty to express, mutual respect and the importance to complement the relationships are very well highlighted. The endless struggle between traditions patriarchal norms and self-expression, freedom for women. The novels deeply focus on this endless crisis as well as the themes of incompatible relationships, the quest for identity, are emphasised in her fiction. In the novel *That Long Silence,* Jaya finds oneself in the process of introspection. Her initiative towards finding oneself is when she becomes assertive and refuses to hand over the key to Mohan when they visit Dadar flat. Jaya says: "He continues to stand there for a moment, the handheld out. It now looks like a supplicatory gesture." (p.8) The former self, who was portrayed in many of her writings appear very ridiculous to her. "Looking through these diaries, I realised, was like going backwards. As I burrowed through the facts, what I found was the woman who had once lived here. Mohan's wife, Rahul's and Rati's mother. Not myself." (p. 69).

Jaya realises that her true self was missing all the years in being dutiful wife and a mother. The supressed anger transforms her anxious and incapable. She says: "…no woman can be angry. Have you ever heard of an angry young woman? … A woman can never be angry; she can only be neurotic, hysterical, frustrated" (p.147). Jaya cannot be viewed as a feminist, but she is a woman who is stuck in a struggle between being submissive and being assertive. At one point she decides to come out of the isolated self and to be the real one. So, she starts reacting sharply and decides to come out of the confined role. She determines to assert herself instead of being quiet. This tells in the lines; "I will have to speak, to listen; I will have to erase that long silence between us." (p. 192). Jaya represents all those women who mutely succumbs oneself to the defined roles. Despite being potential to achieve and grow by herself, She is confined in by the beliefs submerging the society and get nothing but emptiness in her life. A very robust message is conveyed to society through Jaya's character: "women should accept their responsibility for what they are and see

how much they have contributed to their own victimization." That Long Silence is the planning of a woman toward the expression of oneself which will shatter the silence and provide new insights because". Life has always to be made possible"(p.193). She starts questioning herself being so disturbed due to the changes in their life. She realises that the identity of woman is not dependent on man and not only in being a daughter, wife, mother but to see oneself and in finding real 'you'. This self-analysis makes Jaya fearless. But after being a person with no individuality, it becomes difficult to describe her real 'self' for her.

In the novel Binding Vine, the protagonist Urmila is a voice of women who struggle in their miserable domestic environment not subjugating but articulating and trying to correct everything for herself and for other women too. The novel also explores on the biological needs of women and her right on her body in martial realm. Urmila feels distanced form Kishore form the day of their marriage. She realized that "he looked trapped." (P.137) She says: " Each time you leave me the parting is like death." (p.139) whenever she tries to tell her emotional insecurity, Kishore asserts himself sexually, but to her," Sex is only a temporary answer, I came out of it to find that the lights had come back...I was afraid of what I would see, I turned round and fell asleep." (p.140) She

gives up the hope and decides to articulate voice and to find herself.

Shashi Deshpande's protagonists represent women who are caught in the traditional system in this world. Quest for the self and insight into psyche of Indian women are the major ideas of her fictions. She tries to address the issues which are not openly talked about, she motivated the women to break the silence through her protagonists. Indeed, its not easy to break up or overlook the stereotypical system of society but eventually apparent failures mustered the inner strength. She has been a realist writer who has dedicated towards women's predicament.

To conclude, the novels of Shashi Deshpande revulsion the contradiction and male imposed barrier in the society. She portrayed the inner world of modern women who have stuck between their responsibilities imposed by the society and the inner self. She has tired to explore on the same concept in her novels. Their unvoiced emotions and words need to be enunciated out louder for this patriarchal society even in this modern era. Modern women are still concealed their true self and identity due to several factors which are hindering them to be what they are. As a writer, Shashi Deshpande has articulated the dilemma of women which is truly thought provoking for all those people and the system to encourage women to be true to their self.

References

1. T.M.J. Indra Mohan. Ed. " *Shashi Deshpande A Critical Spectrum*(Atlantic Publishers and Distrubuters,2004)

2. Naik K. Chanchala. Ed. "*Writing Difference: The Novels of Shashi Deshpande.*" (New Delhi, Pencraft, 2005)

3. Dr. Sagar, Prem "*Narain's Shashi Dehpande: That Long Silence*" (Lakshmi Narain Agarwal, Agra) "n.d."

4. Sherya, "Caught in a Maelstom," Review of The Binding Vine. The Economic Times, No.31, 1994. 32 3. Subhash, K. Jha,

5. "Coming to Terms with Tragedy," Review of The Binding Vine, The Economic Times, No.30, 1994.34

6. Atrey Mukta, KirpalViney, *Shashi Deshpande A Feminist Study of Her Fiction,* (B.R Publishing Corporation, New Delhi)

7. Sharma, S. *Shashi Deshpande's Novels: A Feminist Study.* New Delhi: Atlantic Publishers and Distributors, 2005

8. Tripathi, J.P. "*The Binding Vine and Indian Ethos". The Fiction of Shashi Deshpande.* ed. R. S.

9. Deshpande, Shashi. *That Long Silence,* New Delhi, Penguin Books India, 1989.

10. Deshpande, Shashi. *The Binding Vine.* New Delhi: Penguin, 1992.

SHIFTING IDENTITIES: A STUDY ON THE EFFECT OF MULTICULTURAL ASPECTS IN JHUMPA LAHIRI'S THE LOWLAND

Dr.K.Shanmuga Sundarraj
Assistant Professor of English
Government Arts and Science College, Kovilpatti

T.Umaa Parameswari
Assistant Professor of English
Rajapalayam Rajus' College, Rajapalayam

Abstract

Jhumpa Lahiri was born to Bengali parents and she was given an Indian name as Nilanjana Sudeshna Lahiri. She gained experience through her parents' life as they are immigrants to London. Along with her parents she understood the pain of alienation which they faced in the new immigrant nation. Though she was born in London, she understood the emotional feelings of her parents towards their mother country. Her short story collection was praised by many critics as the representation of Indian culture. But some of them felt that the collection does not represent Indians in their true nature. The Lowland by Jhumpa Lahiri is her second novel which focuses the two main characters Subash and Udayan. But it is also a novel which focuses on the shifting identity of a woman when she is given a chance to free herself from the clutches of social system where she feels that she cannot develop or improve or even get her own identity. In this novel Jhumpa Lahiri tries to explore various situations where the female try to exhibit their identity. Of all the characters in the story, Gauri is probably the hardest to like as for as Indians are concerned.

Keywords: *immigrant, isolation*

Introduction

Lahiri's *The Lowland* is considered as a story of two brothers Subhash and Udayan. Both of them had different notions towards life. The novel portrays how the Naxalite Revolution in Calcutta changes the life of the two brothers. Gauri, seems to be more advanced in her age. She wants to be independent in all her decisions. To Subhash she is the representation of the modern woman whom he liked to have in her life. The ideas of Gauri and Udayan made them come closer with each other. And they got married afterwards. After their married life it seems to be

more important to analyze the character of Gauri from her own perspective. When analyzed closer, it is clearly visible that Gauri struggles a lot to prove herself as an unique identity different from all other women of her age.

"From time to time he drew out the picture and looked at it. He wondered when he would meet Gauri, and what he would think of her, now that they were connected. And part of him felt defeated by Udayan all over again, for having found a girl like that." (The Lowland, 45)

Sense of Alienation

Gauri emerges as a different person which the then society never expected from any female. She proves herself different from all other female protagonists like Aashima Ganguly in *The Namesake* and Hema in *Unaccustomed Earth*. Lahiri's women characters are usually soft, polite, submissive as expected by Indians. Because of their typical Indian nature they get a high place in the minds of the readers. But Gauri becomes an anti heroine before the eyes of the readers as they never expected such an Indian woman who avoids all her responsibilities. And this irresponsible nature of Gauri towards her family make the audience hate her. She herself gets alienated from her whole family and thereby tries to remain aloof without any relationship.

She married Udayan because of her attraction towards his revolutionary ideas. To Udayan she seemed to be different who is not for all petty things in life. He explains to Subash the character of Gauri as '*she prefers books to jewels and saris. She believes as I do.*' (The Lowland, 46). By their marriage he makes Gauri to take part in all his revolutionary movements along with all his other male friends. The reason he married Gauri is that he felt she can support him in all his actions. He also thought that she can assist him in achieving his goal which would not have been possible if he has married an ordinary submissive girl. By supporting her husband, she seems to be more in terms with ordinary Indian women but she also insists her own thoughts to her husband. In this manner she exposes herself who never want to commit herself to the ordinary duties of a household which she is expected to do.

After the death of Udayan, she marries Subash with the hope that atleast he can fulfill all her dreams of becoming an individual giving her own identity in the society. She at the time of her marriage with Subash is with Udayan's unborn child. She does not realize whether the child would accept her decision in the future. As a mother she never thought of the child or its future. She was always worried about her own ambitions and life. She thought of marrying Subash as an escape from the accepted norms of the

society. She heartlessly abandons her daughter and never offers a good explanation for it. Although it's quite obvious that she never loved Subhash ,it is expected from her that she'd be grateful to himfor taking her away from his controlling, regressive parents and bringing her to the United States. Throughout the book, Subhash is the epitome of selflessness. But Gauri who suffers from depression after the death of Udayan is further drawn within her own self after the birth of her child Bela. She is unable to show any love and affection as a mother to Bela. Compared with her it is Subash who understands Gauri's position and takes care of Bela with a motherly love and attachment. But this behaviour of Subash makes Gauri to feel even bitter of her own self. She gets anger not only towards others but also towards her own self. "*……and every time Subhash took over, so that she could get some rest or take a shower or drink a cup of tea before it turned cold, every time he picked Bela up and comforted her when she cried so that Gauri did not have to, she could not deny the relief she felt at being allowed, however briefly, to step aside.*" (The Lowland, 116)

This parental care of Subash over Bela made her feel that she is an unwanted person in the family. Gauri ultimately leave both Subhash and Bela .She moves to California to pursue her academic interests in philosophy. It is impossible for an Indian woman to leave her own child without care. But Gauri does it.

Others may say that it is quite irresponsible on the part of Gauri to leave her daughter who needs much attention from the mother than from a father. From the point of Gauri, she never wanted to stand as a barrier between the father and the daughter.

She felt that without her presence they would go on with a happy life which she can never provide with all her disturbances in her mind. By leaving them both together she thought that they can make a family of their own. As per Indian tradition it is expected from a mother the care and support that she offer a child with utmost interest, but in the case of Gauri, she never took interest in bringing up the child. What is expected of a mother was provided by Subash to her child. This clearly explains the character of Subash who takes interest in providing a family to Gauri.

"*She'd convinced herself that Subhash was her rival, and that she was in competition with him for Bela, a competition that felt insulting, unjust. But of course it had not been a competition; it had been her own squandering. Her own withdrawal, covert, ineluctable. With her own hand she'd painted herself into a corner, and then out of the picture altogether.*" (The Lowland, 180)

Shifting Identity
Gauri from the beginning of the novel was shown as a character who is not interested in showing herself as a mere homemaker or a person who is

interested in following the social norms that is meant for a woman to follow. She has innovative ideas which actually attracts her towards Udayan who goes away from the laid norms of the society. She expects total independence in terms of finance, social rules, expected behaviour of a woman and so on. Once Subash enters her world after the death of Udayan and brings her to America she actually feels an air of freedom from the so called social expectations from a widow. When she comes to America, she wants to change herself in all the possible ways. She cuts her hair, starts wearing pants and shirts. She does not want to follow anything which would remind her of her past life in India- a marriage, Child borne to another man, early widowhood. She almost wants to forget everything and wants to find a new identity of herself in the new land where she can give a burial to all her past and to start a new life.

"*And nevertheless she remained, in spite of her Western garments, her Western educational interests, a woman United Nations agency spoke English with a distant accent, whose physical look and complexion were permanent and against the scenery of most of America, still unconventional. She continued to introduce herself by an uncommon name, the primary given by her folks, the last by the two brothers she had wed.*" (Lahiri, 236)

The inherent quality of seeking freedom in the character of Gauri is best seen in all her decisions and may be this is the quality that she wants to pass over to her child. She considers all the social laws as a boundary which is not giving the real freedom to women. She tries to break it up in all possible manners. To her ideology the newly seen country supports her cultural cravings. She tries to use it in all ways.

When there comes a situation that whether to stick to her own homeland culture or to accept the new culture which she faces now, Gauri boldly chooses the present new culture which extends its helping hands to forget all her past bitter experiences. This is quite clearly portrayed at the end of the story how she leads a separate life by leaving all her connections with her motherland.

Lahiri talks about the female independence through the character Gauri. Gauri is a symbol of a women who has a thirst in finding her own identity in the society. Gauri moves closely with the persons whom she thought would provide her some security in her life. She didn't realize that she has abandoned the secured life provided to her by Subash. In the process of getting her own identity she rejected a life which any women would easily get in her life. Bela, her daughter who never got the affection of a mother, decided to go on with her own life without a partner. To her it is enough if the child is taken care by any one of the parent. She had great respect for her father Subash.

She never asked questions to Subash about her mother when she left them. She never wanted to disturb her father by asking questions regarding her mother. As a child all her needs was taken care of by Subash. She got satisfied with the love he has shown her.

Conclusion

Therefore, it's possible to say that the novel mainly focuses on the female freedom.The character of Gauri is left in discussion in a problematic way. She is a person who doesn't leave her life in the hands of fate rather she decides her own life both in marrying Udayan initially and Subash later. In leaving Bela with Subash also, she is taking her own decision. She never wanted to tie herself with the familial bonds thereby losing all her personal ambitions and goals. So it is seen that Gauri from the beginning of the story never wanted to have an ordinary life as other girls would have wished for in their life. Whatever decision she took in her life it is not that others asked her to do so but it is she who decided her life to be in such a manner. After her leaving from Subash and Bela she didn't regret over her decision, instead she thought that it is the right decision.

References

1. Lahiri, Jhumpa. The Lowland. London: Random House,2013
2. Rushdie, Salman. Imaginary Homelands: Essays and Criticism 1981-1991. London: VintageBooks, 2010.
3. Zizek, Slavoj. "Enjoy Your Nation As Yourself!" Tarrying with the Negative: Kant, Hegel, and the Critique of Ideology. Durham: Duke University Press, 1993.

SCIENTIFIC ABILITIES OF HIGH SCHOOL STUDENTS IN RELATION TO SCIENCE INTEREST

P.H.Jebalin Paul
Research Scholar
N.V.K.S.D.College of Education Attoor, Kanyakumari &
Assistant Professor of Physical Science
Christian College of Education, Marthandam

Dr.V.S.Mini Kumari
Associate Professor in Biological Science
N.V.K.S.D.College of Education, Attoor
Kanyakumari

Abstract

Development of scientific abilities is an important objective of teaching science in 21st century. Scientific ability is considered as an important factor for fostering students' performance in Science learning. The purpose of this study was to find out the correlation between science interest and scientific abilities of high school students. The sample consisted of 200 high school students studying in different schools of Kanyakumari District. The study revealed that significant positive correlation exists between science interest and scientific abilities of high school students. It was also found that gender had no influence on scientific abilities of high school students, but the locality and type of school management had influence on the scientific abilities of high school students.

Introduction

Humanbeings are very curious by nature. This curiosity has driven them since time immemorial to explore the world around them. Initially the pace of development and exploration was very slow. But with the availability of better tools of exploration in the last few years and also as a result of industrial revolution in the west and the developed countries, the pace of development and exploration has increased manifold. Humans exploratory activities have resulted in the accumulation of vast source of knowledge called science.Conant defined science as "An interconnected series of concepts and conceptual schemes that have developed as a result of experimentation and observation and are fruitful of further experimentation and observation. (Mohan, 2004).

Scientific ability encompasses the reasoning and problem solving skills involved in generating, testing and revising hypotheses or theories, and in the case of fully developed skills, reflecting on the process of knowledge acquisition and knowledge change that result from such inquiry activities (Morris, Kloos&Amaral, 2012). According to Kuhn, Scientific ability is a specific type of intentional information seeking, one that shares basic reasoning mechanisms and motivation with other types of information seeking (Morris, Kloos&Amaral2012). The scientific ability differs from other types of information seeking that it requires additional cognitive resources as well as an integration of cultural tools.

Need and significance of the study

Learning science requires the coordination of a complex set of cognitive, affective and motivational strategies and skills.Scientific abilities refers to the important procedures, processes and methods that scientists use while constructing knowledge and solving problems. To help students develop these abilities, one needs to engage students in appropriate activities. The students should learn science through active involvement that is through first-hand investigative experiences. The teaching of science should aim at developing certain abilities in the students such as ability to analyse, ability to predict from the given data, ability to sense a problem, ability to generalize and ability to infer.

In the present educational system there is little emphasis for the development of scientific abilities among students. Now a days, teaching is examination oriented and teachers are not following pupil centred methods for teaching science. So far achieving the objectives of teaching science, the methodology of teaching science should be changed. Scientific abilities are influenced by factors like attitude, interest, intelligence etc. The present study is an attempt to find out the relationship between science interest and scientific abilities of high school students.

Objectives of the study

1. To study the level of scientific abilities of high school students.
2. To find whether there is any significant difference in the mean scores of scientific abilities of high school students with respect to the background variables gender, locality and type of school management.
3. To study the correlation between science interest and scientific abilities of high school students

Hypotheses

1. There will be significant difference in the mean scores of scientific abilities of male and female high school students.

2. There will be significant difference in the mean scores of scientific abilities of rural and urban high school students.
3. There will be significant difference in the mean scores of scientific abilities of high school students studying in government, aided and self-financing schools.

Methodology

The normative survey method was adopted for conducting the present study. The sample consisted of 200 high school students studying in different schools of Kanyakumari district. The tools used for the collection of data were Scientific Ability Test constructed and validated by the investigator and Science Interest Inventory (SII-MK) constructed by Karuna Shankar Misra (2012). The collected data were analysed using the statistical techniques such as percentage, arithmetic mean, standard deviation, t-test and Pearson's correlation.

Results and discussion

Table-1 Percentage wise distribution of sample according to different levels of scientific abilities

Scientific Ability	Count	Percent
Low	16	8.00
Medium	143	71.50
High	41	20.50
Total	200	100.50

From the above table it is seen that the percentage of samples according to low, medium and high levels of scientific ability were 8.00%, 71.5% and 20.5% respectively. This indicates that, majority of the high school students have medium level of scientific ability.

Table-2 Comparison of Scientific Abilities based on Gender

Gender	Mean	SD	N	t	p	Level of significance
Male	13.18	6.54	91	1.439	0.152	Not Significant
Female	14.59	7.31	109			

From table-2 it is seen that the obtained t-value (t=1.439) is not significant at any level. This result indicates that there is no significant difference between the male and female high school students in their scientific abilities. So it can be concluded that gender has no influence on scientific abilities of high school students.

Table-3 Comparison of Scientific Abilities based on Locality

Locality	Mean	SD	N	t	p	Level of significance
Rural	12.76	6.24	103	2.497	0.013	Significant at 0.05 level
Urban	15.21	7.53	97			

From table- 3 it is seen that the obtained t- value (t=2.497) is significant at 0.05 level. This result indicates that there is significant difference between the rural and urban high school students in their scientific abilities. The mean score of urban students (15.21) is higher than that of the rural students (12.76). So, it can be concluded that locality has influence on the scientific abilities of high school students.

Table: 4 Comparison of Scientific Abilities based on the type of school management

Type of management	Mean	SD	Source	Sum of squares	df	Mean square	F	p	Level of significance
Government	16.30	8.66	Between GP	565.11	2	282.56			
Aided	13.13	6.14	Within GP	9153.28	197	46.46	6.081	0.003	Significant at 0.01 level
Private	11.38	2.97	Total	9718.40	199				

From table-4 it is seen that the obtained F-value (F=6.081) is significant at 0.01 level. This result indicates there is significant difference between the government, aided and self-financing school students in their scientific abilities. So it can be concluded that the type of management of the school has influence on the scientific abilities of high school students.

Table: 5 Correlation between science interest and scientific abilities of high school students

N	R	Level of significance
200	0.204	Significant at 0.01 level

As shown in the above table, science interest and scientific abilities of high school students are positively correlated and significant at 0.01 level for the total sample. The correlation between the variables may be described as low.

Findings

1. Majority of high school students have medium level of scientific abilities
2. There is no significant difference between the male and female high school students in their scientific abilities.
3. There is significant difference between the rural and urban high school students in their scientific abilities.
4. There is significant difference between the government aided and self-financing school students in their scientific abilities
5. Science interest and scientific abilities of high school students are positively correlated and significant at 0.01 level.

Conclusion

The study revealed that, significant positive correlation exists between science interest and scientific abilities of high school students. It was also found that gender had no influence on scientific abilities of high school students, but the locality and type of

school management had influence on the scientific abilities of high school students. Since the ninth standard students have only medium level of scientific abilities, the teachers should take necessary steps to foster scientific abilities among the students. The teacher is expected to be an expert in science process skills and transfer thoseskills to students through practical knowledge. Teachers should view students as active learners and provide them varied opportunities to explore and experiment. Furthermore a positive attitude towards learning science can be nurtured among students for the development of scientific abilities.

References
1. Jayakumar, R., and Maria Ugin Joseph,C., (2018). An inquiry into the reasoning and ability of high school students. Research and reflections on education, 16(1), 2-4.
2. Joshua Elizabeth (2016). Scientific reasoning of higher secondary school students. Research and reflections on education, 14(3), 11-13.
3. Mangal, S.K., (2005). Teaching of Physical Sciences. Meerut: International Publishing House
4. Mohan,Radha., (2004). Innovative science teaching. New Delhi: PHI Pvt.Ltd.
5. Morris, J Bradley., Kloos, Heidi., Amaral, L. Joseph., (2012). Current topics in childrens learning and cognition. Croatia: Intech Publishers Pvt. Ltd.