An International Scholarly Open Access, Peer-Reviewed, Refereed, Multidisciplinary Journal UGC and ISSN Approved Norms | ISSN: 2349-5162

INTERNATIONAL JOURNAL

OF EMERGING TECHNOLOGIES

AND INNOVATIVE RESEARCH

An International Scholarly Open Access Journal, Peer-reviewed, Refereed Journals, Impact factor 7.95 (Calculate by google scholar and Semantic Scholar | AI-Powered Research Tool), Multidisciplinary, Monthly, Indexing in all major database & Metadata, Citation Generator, Digital Object Identifier(DOI), Monthly, Multidisciplinary and Multilanguage (Regional language supported)

- Publisher and Managed by: IJPUBLICATION
- UGC Approved Journal no 63975(19)

Journal of Emerging Technologies and Innovative Research
International Peer Reviewed & Refereed Journals, Scholarly Open Access Journal
ISSN: 2349-5162 | ESTD Year: 2014 | Impact factor 7.95 | UGC, ISSN Approved Journal no 63975

Website: www.jetir.org | Email: editor@jetir.org

Website: www.jetir.org

JETIR

International Journal of Emerging Technologies and Innovative Research is published under the name of JETIR publication and URL: www.jetir.org.

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देसिल बयना, सबजन मिट्ठा

डॉ. संध्या कुमारी

माध्यमिक शिक्षिका

उत्क्रमित मध्य विद्यालय, विशुनपुर सुमेर नयाटोला, कांटी.

प्रस्तावना :--

‘देसिल बयना’ शब्द से तात्पर्य है अपनी देसी भाषा, वस्तुएँ, सामग्री या रचनाओं का समावेश । दूसरों की वस्तुएँ, उनकी भाषाएँ, कला, संस्कृति आदि लुभावनी तो होतीं हैं किन्तु संतुष्टि केवल स्वयं की वस्तुएँ, अपनी मातृभाषा, अपनी कला, संस्कृति आदि इन्हीं से प्राप्त होती है ।

साहित्य समाज का दर्पण होता है, इससे तात्पर्य यह है कि साहित्य की रचना जिस किसी भी कालखंड में हुई हो वह उस कालखंड के समसामयिक समाज की वास्तविकताओं को एक दर्पण की भांति प्रस्तुत करता है । एक कवि या लेखक अपने रचनाओं में उस काल के समाज, संस्कृति, धर्म, रहन-सहन आदि को दर्शाने का प्रयास करता है । कवि की कविता या लेखक का साहित्य समाज का वह आईना होता है जिसमें हम अपना बीता हुआ कल देख सकते हैं तथा अपने आज का मूल्यांकन कर आने वाले भविष्य को बेहतर बनाने की ओर अग्रसर हो सकते हैं ।

प्रस्तुतीकरण :--

मैथिल कोकिल महाकवि विद्यापति का प्रादुर्भाव भारत के पावन अंचल मिथिला के क्षितिज पर उस समय हुआ जब उत्तरभारत का मानव समाज अपने जीवन द्वंद्व के बीच व्याकुल हो रहा था । विद्यापति ने, एक मधुर फुहार की तरह, समाज को शीतलता प्रदान की । मंद लहरों के झोंके की भांति, इनकी रचनाएँ, राजा की गगनचुंबी अटालिकाओं से लेकर गरीबों की टूटी हुई फूस की झोपड़ी तक में उनके पद व्याप्त है ।

जब समस्त आभिजात्य वर्ग संस्कृत में काव्य रचना कर संतुष्टि पा रहा था, मिथिला के राजकवि विद्यापति ने भी संस्कृत भाषा में अनेक रचनाएँ की परंतु इनसे वह संतुष्टि का भाव नहीं पा रहे थे । तब उन्हें लगा कि सामान्य जन तक अपनी पहुँच बनाने के लिए इस स्फटिक शिला से नीचे उतरकर कुश की चटाई पे बैठना होगा और उन्होंने यह बताया की “देसिल बयना सबजन मिट्ठा” अर्थात अपनी रचनाओं को देसी भाषा में लिखना प्रारम्भ किया । इतना ही नहीं उन्होंने अपनी काव्यभाषा को बालचन्द्रमा की तरह सुंदर माना –

बालचन्द्र विजापई भाषा ।

दुह नहीं लगई दुज्जन हासा । ।

ओ परमेसर हर सिर सोहई ।

इ निश्चय नाअर मन मोहई । ।

उस समय संस्कृत एक समृद्ध भाषा के रूप मे स्थापित थी किन्तु यह जन भाषा नही थी वरन, विद्वत जन की भाषा तक ही सीमित थी । ऐसे मे, विद्यापति ने, जन भाषा का उपयोग किया और अधिकांश पुस्तकों की रचना मैथली एवं अवहट

मे किया । फलतः, जन समुदाय के लिए इसका अध्ययन सरल हो गया और खास कर पदावली तो मिथिला भाषी के लबों पर ही रहती थी ।

हिन्दी जगत मे बहुतेरे ऐसे साहित्यकार हुए, जिनकी पुस्तकों मे ऐतिहासिकता की कमी नहीं है, जैसे - रामवृक्ष बेनीपुरी, जयशंकर प्रसाद, रामधारी सिंह दिनकर, इत्यादि । दरबारी कवियों मे भी कालीदास, चंद वरदाई , बान भट्ट, आदि की रचनाएँ महत्वपूर्ण हैं । विद्यापति भी ऐतिहासिकता की परिधि में अपनी रचनाओं को ढालने का प्रयास किया है । विद्यापति (1360 ई॰ से 1447 ई॰) लोकभाषा के प्रथम शास्त्रीय महाकवि हुये, जिनकी पदावली को छोड़कर अन्य पुस्तकों में जैसे 'कीर्तिलता', 'कीर्ति पताका', 'पुरुषपरीक्षा', 'दानवाक्यावली', 'विभागसार' आदि में उन्होंने उस समय के समाज, संस्कृति, अपने राजा की राजनैतिक व्यवस्था, उनके ऐश्वर्य, शौर्य, इत्यादि को कुछ इस तरह समाहित किया कि वह अपने आप में अनूठा एवं अविस्मरणीय है । भूपरिक्रमा के द्वारा भौगोलिक ज्ञान का परिचय दिया ।

विद्यापति ने अपनी रचनाओं को कुछ इस तरह प्रस्तुत करने का प्रयास किया कि जिस को साधारण जनमानस सरलता से समझ सके और उस से लाभान्वित हो सके । इसीलिए उन्होंने अपनी रचनाओं को देसी भाषाओं में रचने का निर्णय किया । उनका कहना था कि "देसिल बयना सबजन मिट्ठा" । उन्होंने उस समय के राजवंश, उसकी आर्थिक, राजनैतिक इत्यादि व्यवस्था के साथ-साथ जनसाधारण के परिपेक्ष्य में भी अपनी रचनाएँ की जिसमें उन्होंने 'देसिल बयना' के भाव का विशेष ध्यान रखा ।

साहित्य में देसिल रचना का समावेश :--

बारहवीं शताब्दी के महाकवि जयदेव ने 'गीत गोविंद' रचकर अपनी ललित पदावली से शास्त्रीय संगीत, नृत्य आदि पर आधिपत्य किया था । विद्यापति ने गीत-गोविंद में पदों के अनुरूप लोकभाषा में पदों की रचना की जिससे उन्हें 'अभिनव जयदेव' भी कहा गया । विद्यापति की रचना में ब्याह- गीत 'बटगवनी, नचारी आदि देसिल बयना का ही सम्मिश्रण है ।इनकी रचनाओं में राधा-कृष्ण तथा शिव-पार्वती को विशेष स्थान प्राप्त है ।

'देसिल बयना' शब्द की सार्थकता इससे भी स्पष्ट होती है कि न केवल विद्यापति, अपितु इनके बाद विराट लोक-आधार पाने वाले परवर्ती कवि 'गोस्वामी तुलसीदास' ने भी अपने रचना का माध्यम क्षेत्रीय भाषा अवधी को ही बनाया । श्रीरामचरितमानस , दोहावली , कवितावली आदि इनकी महान रचनायँ हैं । इस संदर्भ में भी यह कहना यथोचित ही है क्योंकि उन्होंने इस महाग्रन्थ की रचना का प्रयास संस्कृत भाषा में करना चाहा था , किन्तु ऐसी मान्यता है कि रात को वे अपनी रचना तैयार करते और सुबह लुप्त पाते । फिर एक दिन स्वयं महादेव ने उन्हें स्वप्न में आकर इस ग्रन्थ को अपनी भाषा मे रचकर जन-जन तक पहुँचाने की प्रेरणा दी । ऐसा भी कहा जाता है कि उनके इस रचना को काशी के विद्वान पंडितों द्वारा मानने से इनकार किया गया तथा इसकी सत्यता को प्रमाणित करने को कहा गया । इसके लिए मंदिर में इनकी रचना को सबसे नीचे रखकर उसपर गीता भागवत इत्यादि को रखा गया और सुबह जब द्वार खुला तो तुलसीदास की रचना सबसे ऊपर पायी गयी । यह घटना इस तथ्य को दर्शाता है कि देसी रचना को ईश्वरीय कृपा भी प्राप्त होती है । अर्थित ईश्वर भी चाहता है कि महान रचनाकारों की रचनाओं को जन-जन तक पहुंचाया जा सके और उनमें विचार परिवर्तन लाया जा सके, क्योंकि किसी भी परिदृश्य या युग में विचार द्वारा ही परिवर्तन संभव है ।

संस्कृत के विद्वान होते हुए भी यदि विद्यापति लोकभाषा मे रचना कर्म की ओर प्रवृत हुए तो वह मिथिला के पवित्र माटी का ही प्रताप है । यही वह भूमि है जहाँ जगतमाता सीता ने जन्म लिया था । भूमि से उत्पन्न होने के कारण इनका एक नाम भूमिजा भी है । गोस्वामी जी इनके ससुराल की भाषा को अपनी रचना का आधार बनाया था ।

विद्यापति का आविर्भाव ऐसे समय में हुआ जब सम्पूर्ण उत्तरभारत राजनैतिक दृष्टि से शक्तिहीन,सामाजिक दृष्टि से विपर्यस्त, आर्थिक दृष्टि से पंगु और नैतिक दृष्टि से लुंजपुंज हो गया था । स्वयं विद्यापति ने अपनी "कीर्तिलता" मे इस अपकर्ष का मार्मिक वर्णन किया है । अनुमानतः 1360 ई॰ मे मिथिला के विसपी(विसफी) गाँव में इनका जन्म हुआ था । पिता गणपति ठाकुर, राजा गगनेश्वर ठाकुर के राजपुरोहित थे । इसलिए विद्यापति का राजदरबार मे आना जाना होता था । राजा कीर्ति सिंह के दरबार मे रहकर इनका साहित्य सृजन का कार्य आरंभ हुआ । राजा शिवसिंह के समय विद्यापति की रचना को एक नया मोड़ मिला । प्रेमी और गुणी राजा शिवसिंह और उनकी प्रियतमा लखिमा देवी के रूप सौन्दर्य का सानिध्य पाकर विद्यापति शृंगार गीत रचने के लिए प्रेरित हुए । उन्होंने अपनी रचना में शिवसिंह को कृष्ण एवं लखिमा देवी को राधा की छवि देकर अपनी रचना को प्रेम और शृंगार रस से अलंकृत किया है । किन्तु दुर्भाग्यवश तीन वर्ष के शाषन के पश्चात ही यवनों के साथ युद्ध में शिवसिंह का निधन हो गया था ।

महाकवि विद्यापति ने अवहट में राजा शिवसिंह के शौर्य व ऐश्वर्य को अपनी रचना 'कीर्तिलता' और 'कीर्ति पताका' में दर्शाया है । उनकी इसी रचना नें उन्हें वीरगाथा काल के अन्य महाकवियों की पंक्ति में खड़ा करती है । आज भी मिथिला के समाज के हर वर्ग में व्यक्ति के जन्म से मृत्यु तक काव्य अभिव्यक्ति का माध्यम इनके पद रहे है । राधा - कृष्ण परक शृंगार गीतों के अलावा महेशवानी, नचारी, दुर्गा स्तुति, गंगा स्तुति, आदि की रचना की । उनकी इसी भावना ने उनके जन्म , उनके नाम को एक पर्व के रूप में मनाने को उत्प्रेरित किया जिसे आज भी 'विद्यापति पर्व' के रूप मे मनाया जाता है । विद्यापति का अवसान कार्तिक धवल त्रयोदशी के दिन हुआ था और दो दिन बाद पूर्णमासी पड़ती है, जिन तीन दिनों का विद्यापति पर्व मनाया जाता है ।

इनकी इसी भावना से स्वयं महादेव भी अपने आप को विद्यापति से दूर नहीं रख पाये और 'उगना' रूप में उनके अनुचर बनकर रहने लगें । यद्यपि इस संदर्भ में ऐसी भी धारणा है की एक बार विद्यापति तसि रेत में प्यास से बेचैन होने पर उगना द्वारा जल दिये जाने पर विद्यापति पहचान गए की यह जल कोई साधारण नीर नही अपितु स्वयं महादेव के जटा से निकली गंगाजल है और इस घटना ने विद्यापति के समक्ष उगना के वास्तविक स्वरूप को प्रकट कर दिया । यही कारण है कि एक बार विद्यापति द्वारा अपनी पत्नी के समक्ष उगना के वास्तविक स्वरूप के परिचय देते ही महादेव अंतर्ध्यान हो गए जिससे विद्यापति व्याकुल होकर कहने लगे –

उगना रे मोर कतए गेला ।

कतए गेला शिव कदहूँ भेला ।।

भांग नहीं बटुआ रूसि वैस लाह ।

जेहि हेरि आनि देल हंसि उठलाह ।।

विद्यापति नें 'शिव-पार्वती विवाह गीत' तथा 'राधा-कृष्ण प्रेम वर्णन' के द्वारा उस समय की धार्मिक भावनाओं को स्पष्ट किया है । लोगों नें इन रचनाओं को अपने परंपरा मे शामिल कर के अपने भागवत प्रेम को दर्शाया ।

इस प्रकार विद्यापतिकालीन समाज का दर्पण उनके द्वारा रचित साहित्य था । उसी दौरान और भी बहुत से कवि एवं लेखक हुए जिनसे समाज की वस्तुस्थिति को देखा जा सकता है । जैसे गोस्वामी तुलसीदास, कालीदास, आदि । निश्चित रूप से यह कहना की कोई अतिश्योक्ति नही होगी की 'साहित्य , समाज का दर्पण होता है ' ।

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Problems of Teachers of primary schools of Surat City

Dr Kshama S Dikshit
Asso. Professor,
Hill wood college of education Gandhinagar.

Introduction: -

The 21st century is the century of knowledge explosion, the biggest development of this century is the development of science and technology. Today a revolution is taking place all over the world in both science and education. Discover new things every day, new miracles every day appearing. Today's human beings have benefited in the field of education.

Many discoveries have transformed education. The world has become a small home. Innovative discoveries in science have radically changed the way human beings live, education, industry, business, physical facilities, etc. Today, mathematics and science have entered every sphere of public life. There is no field of life in which mathematics is not used in one way or another, today mathematics is becoming important in all spheres of life.

Today is the age of science and technology. In such circumstances, mathematics-science education in the existing education can be made ritual based on activity-centered, life-centered and experience-based. Students are expected to develop scientifically through the teaching of various subjects. The teacher is at the forefront of the process of shaping this academic life. The teacher has an important responsibility to provide proper and necessary guidance, encouragement and motivation to the students. Teachers have to make successful use of innovations, changes and innovations in the field of education. So today's teachers should adopt new approaches and new method.

Various new ideas of education are being welcomed today. So the level of education in our country is getting higher. But at the same time, corruption in education is on the rise due to globalization and privatization. Student enrollment, tuition fees, outcomes as well as staff and teachers are being financially exploited in education. In today's age of science and technology, new discoveries and changes are constantly taking place. Due to which the standard of living of the people has gone up. In all this the condition of the teachers becomes extremely pitiable. Teachers in the business of education in India have to handle the business as well as the responsibilities of home and family. Because of this teachers have to face various problems. There are economic, social, physical, educational and psychological problems.

Teachers experience stress because of such problems. The effect of this mental stress on education does not go unnoticed. So teachers have to endure a lot. Therefore, a humble attempt has been made to carry out the present research in order to find out the problems faced by the teachers working in the primary schools of Gujarat state at present.

Previous Review

Pande and Del(2003) A comparative study of the problems of married and unmarried teachers of higher secondary schools, Ph.D. Mahashodh Nibandh Varanasi: Mahatma Gandhi Vidyapith

Gurjar Dharmvir (2006) A study of occupational stress and anxiety of working women in Surat city in relation to their educational level ,Ph.D. Vir Narmad Dakshin Gujarat University

Pande and Del(2003) 300 teachers were selected as sample. There was no difference in the teaching and educational experience problems of married and unmarried teachers.

Gurjar Dharmvir (2006) In the above research, the translation into Gujarati by Dr. Pravinaben Buddhadev used "Professional Stress Test as well as Sinha.A and Sinha.S Proposed Anxiety Test." Among the working women of Surat city, the level of stress was found to be low and the level of anxiety was found to be very high. While in the presented research a study was conducted on the social, psychological and physical infrastructure problems of primary school teachers.

Practical definitions of terms

"Problems means riddles, questions or riddles."

It can be said for a problem that it takes time to get a solution to a question which is not possible to solve immediately and a question which confuses the person becomes a problem.

Explaining the problem of research in the context of psychological research, Curliger (1986) states that "a problem is a questionable sentence or statement by which it is asked what kind of relationship there is between two or more families."

Objectives of study

(1) To study the social problems experienced by the primary school teachers of Surat District.

(2) To study the psychological problems experienced by the primary school teachers of Surat District.

(3) To study the physical infrastructure problems experienced by the primary school teachers of Surat District.

Study Questions

(1) What are the social problems of primary school teachers in Surat?

(2) What are the psychological problems of primary school teachers in Surat?

(3) What are the physical infrastructure problems of primary school teachers in Surat?

Area of research

As the present research aims to study the problems of primary school teachers, the survey method has been used to know the opinions of women in order to know the problems of teachers and address them. Since the opinion of the teachers has been surveyed by preparing the opinion of the research presented here, the method of study presented is that of the survey journalist.

Construction of Tools:

The researcher used self-written feedback to gather information in the presented research.

Table 1

In opinion of content components

Sections of opinion	Name of the department	Number of statements
A	Social problems	9
B	Psychologicalproblems	8
C	Physical infrastructure problems	9

A total of 26 studies were included in Section A of the final opinion presented. In the case of these statements, at the point of punch, that is, in order to express an opinion on the point of complete consent, partially agreed, neutral, partially and fully agreed, the box (✓) should be marked in front of the statements.

In addition, there were three open form Questionnaire for elementary school teachers in Section B of the Opinion.

Plan for Data Collection

In the present research, the researcher was to collect information from the primary school teachers of Gujarat state. The researcher first went to the District Education Office of the city of Surat in the state of Gujarat and got information about the primary schools. In the present research, the researcher, after getting information about the schools, visited the teachers with the permission of the principals of the selected schools and gave appropriate instructions and asked them to fill up the feedback immediately. While in some schools it was withdrawn after three or five days.

The present research collected data of 200 teachers from 75 selected schools from different areas of Surat city. It was then analyzed for evaluation based on the information obtained.

Data Analysis Technique

Various arithmetic methods are available for the analysis of the information 4obtained. But since the presented study was of survey type, Kai class technique was used for analysis of data. The researcher used the feedback to get the opinions of the trainees. The feedback had 26 statements in three sections in total. His views on this were to be verified in the box from one point to another. Opinion based versions were obtained on each statement of opinion to know the calculation of their answers. The opinions received from the trainees on each statement were then graded as per Table 2.

Table 2

Allocation of marks to the statements of opinion

No.	Agreed rank and merit	Totally agree	Partly agree	Neutral	Partly disagree	Totally disagree
1.	Positive	5	4	3	2	1
2.	Negative	1	2	3	4	5

The above series shows the merits given to the statements. In which party statements were considered as positive statements and 5,4,3,2,1 and absolute statements were considered as negative statements and 1,2,3,4,5 marks were given respectively.

Testing of study Questions

Table 3

Analysis and interpretation of teachers' opinions on social issues

No.	Statement	Totally agree	Partly agree	Neutral	Partly disagree	Totally disagree	The value of kai class	Average score	Order of priority
1	Teachers do not get enough pride in the society	74 / 37.2%	28 / 14.00%	23 / 11.50%	24 / 12.00%	51 / 25.50%	49.15	2.75	8
2	It is difficult to come and go as the place of work is far away.	59 / 29.50%	54 / 27.00%	35 / 17.50%	24 / 12.00%	28 / 14.00%	24.55	3.46	4
3	Students do not maintain the respect of the teacher	52 / 26.00%	41 / 20.50%	37 / 18.50%	24 / 12.00%	46 / 23.00%	11.15	2.86	7
4	Mathematics and science teachers	89 / 44.50%	46 / 23.00%	34 / 17.00%	11 / 5.50%	20 / 10.00%	92.85	3.87	3

	are respected in the society.								
5	Not enough time can be given to social occasions due to job.	89 44.50%	54 27.00%	23 11.50%	18 9.00%	16 8.00%	98.65	2.09	9
6	The school teachers attend each other there on a social occasion.	92 46.00%	53 26.50%	32 16.00%	14 7.00%	9 4.50%	114.35	4.03	2
7	Some parents quarrel with such teachers at school.	59 29.50%	51 25.50%	35 17.50%	33 16.50%	22 11.00%	22.0	3.46	4
8	Teachers are honored with pride during Teacher's Day celebrations.	151 75.50%	19 9.50%	14 7.00%	9 4.50%	7 3.50%	387.2	4.49	1
9	Teachers do not get proper respect in the society	37 18.50%	45 22.50%	36 18.00%	24 12.00%	58 29.00%	15.75	3.11	6
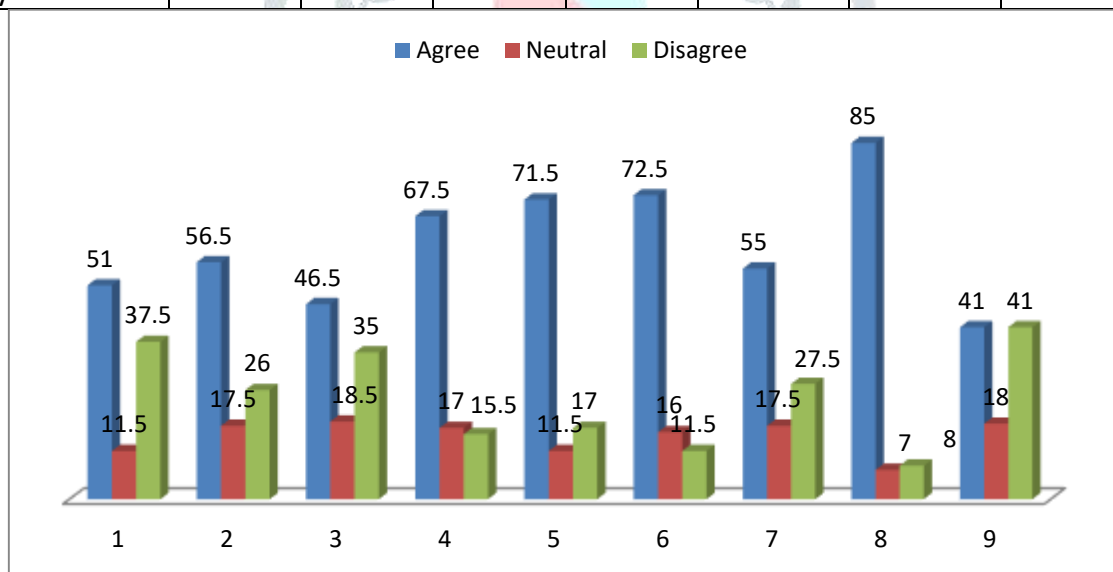
Graph showing analysis and interpretation of teachers' opinions on social problems

Table 4

Analysis and interpretation of teachers' opinions on psychological problems

No.	Statement	Totally agree	Partly agree	Neutral	Partly disagree	Totally disagree	The value of kai class	Average score	Order of priority
1	There is no encouragement for good work from the	41 20.5%	40 20.00%	25 12.50%	38 19.00%	56 28.00%	12.15	3.14	6

	administrators in the school.								
2	The school has a family-like atmosphere	106 53.00%	45 22.50%	29 14.50%	13 6.50%	7 3.50%	158.0	4.15	2
3	Other teachers at the school are not satisfied with your progress.	37 18.50%	42 21.00%	46 23.00%	30 15.00%	45 22.50%	4.35	3.02	8
4	The school is dominated by senior teachers.	67 33.50%	43 21.50%	34 17.00%	20 10.00%	36 18.00%	29.75	3.43	4
5	Excessive time at school can lead to mental fatigue.	64 32.00%	48 24.00%	30 15.00%	23 11.50%	35 17.50%	26.35	3.42	5
6	Excessive workload of math-science teachers brings tension	68 34.00%	54 27.00%	28 14.00%	19 9.50%	31 15.50%	41.15	3.55	3
7	Excessive curriculum stress makes students angry	42 29.50%	46 25.50%	44 17.50%	27 16.50%	41 11.00%	5.65	3.11	7
8	The school principal congratulates you on your good work	124 20.5%	42 20.00%	18 12.50%	7 19.00%	9 28.00%	239.85	4.33	1

Graph showing analysis and interpretation of teachers' opinions on psychological problems
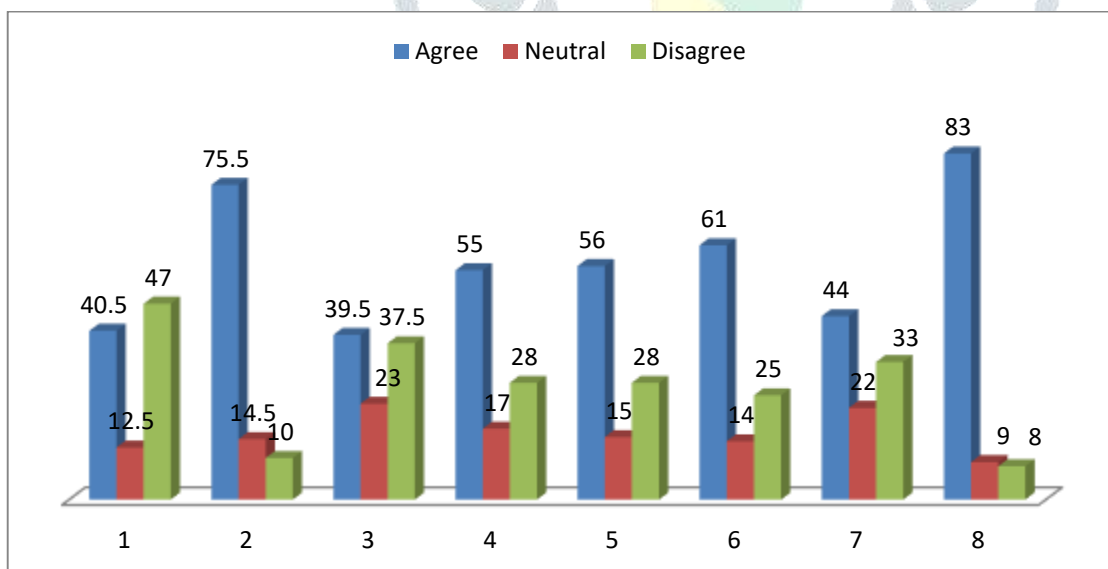
Table 5

Analysis and interpretation of teachers' opinions on physical infrastructure facilities

No.	Statement	Totally agree	Partly agree	Neutral	Partly disagree	Totally disagree	The value of kai class	Average score	Order of priority
1	The school lacks adequate classrooms according to the number of students.	58 29.00%	34 17.00%	23 11.50%	24 12.00%	61 30.50%	33.65	4.50	2
2	Classrooms are small according to the number of students.	39 19.50%	47 23.50%	26 23.00%	24 12.00%	64 32.00%	26.95	2.87	8
3	The school does not have a science laboratory	49 24.50%	32 16.00%	24 12.00%	28 14.00%	67 33.50%	31.85	3.16	7
4	The laboratory has course wise equipment.	81 40.50%	44 22.00%	26 13.00%	24 12.00%	25 12.50%	59.35	3.66	5
5	Appropriate math models are not available in the school	55 27.50%	44 22.00%	30 15.00%	28 14.00%	43 21.50%	12.35	2.80	9
6	The school trustees do not provide adequate physical facilities	29 14.50%	37 18.50%	34 17.00%	43 21.50%	57 28.50%	11.6	3.31	6
7	The school has an overhead project facility.	110 55.00%	27 13.50%	28 14.00%	9 4.50%	26 13.00%	159.25	3.93	4
8	The school has a separate drinking water facility for the staff.	125 62.50%	21 10.50%	20 10.00%	13 6.50%	21 10.50%	226.9	4.08	3
9	The school has adequate blackboard facilities.	166 83.00%	20 10.00%	11 5.50%	3 1.50%	6 3.00%	454.15	4.78	1
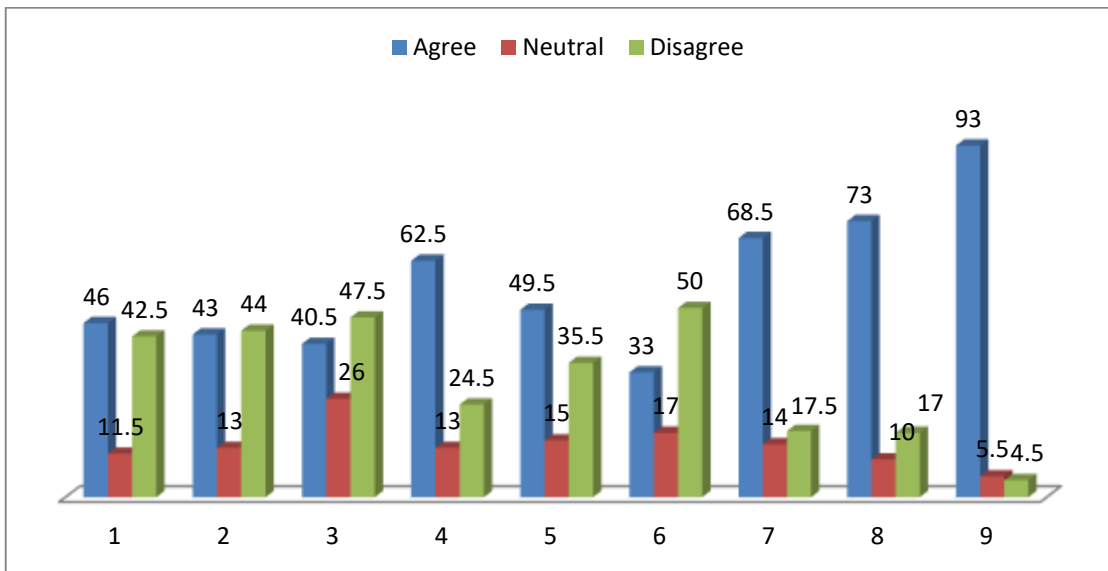
Graph showing analysis and interpretation of teachers' opinions on physical infrastructure problems

Findings of Study

Findings on a social problem

1.The teacher no longer gets enough pride in the society

2.Not enough time can be given to social occasions because of the job.

3. Some parents quarrel with such teachers at school.

4.Teacher's Day celebration time teachers are honored with pride.

Findings on a psychological problem

1. School administrators give incentives for good deeds.

2. The school has a family-like atmosphere.

3. The school is dominated by senior teachers.

4. Mental fatigue is felt due to the dual responsibility of family and job.

5. The academic workload in the school is excessive.

Findings on a physical infrastructure problem

1.The school does not have enough classrooms according to the number of students.

2. In some schools the size of the classroom is proportional.

3. Some schools have science labs.

4. Schools have adequate physical facilities.

Academic outcomes of the study

1. The teacher should be respected on social occasions.

2. Parents should also treat teachers with respect.

3. The work shift rate in the school should be reduced so that the teachers do not feel mentally exhausted.

4. The senior teachers of the school should treat the junior teachers well.

5. Teachers' progress Other teachers should also show pride towards them.

Conclusion

There are many problems in primary and secondary schools. The problem of teachers changes over time so that if research is conducted on various problems from time to time, the direction of appropriate solution can be achieved. The research presented is a small piece of research trying to understand the problems of teachers. The research presented like other research will be a suitable guide for the principals, teachers as well as new researchers involved in the field of education.

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NON - COMMUTATIVE REPRESENTATION OF SEMI GROUP MEASURES

Dr. Arun Dayal

Deptt. Of Mathematics, D.P.C.S.S.(Miller) Sr. Sec. School, Patna.

ABSTRACT

In this paper we extend some properties of probability measures, in its non-commutative frame work under the assumption of convolution semigroups and the associated semigoup of operators on the L^2 space of normalised Haar measure, when G is the real line. Using Peter-Weyl theory, we extend some properties of pseudo differential operators on compact groups. We show that the Hunt semigroup and its generator are pseudo differential operators in the sense of Ruzhansky and Turunen. We show here that the generator has the same Sobolev regularity as the Laplacian. We derive the transition kernel for convolution semigroups of cenetral measures. We derive a necessary and sufficient condition for the semigroup to be trace-class for any positive time which is equivalent to that the corresponding probability measure has a squareintegrable density.

KEY WORDS

Convolution semigroups, Central measure, Symmetric measure, Gaussian measure, Fourier transform, Brownian motion.

1. INTRODUCTION

Let G be a compact group with neutral element e and let M(G) be the set of all probability measures defined on (G, B(G)) where B(G) is the Borel σ −algebra of G. $\mu \in$ M(G) is central or conjugate- invariant if $\mu(\sigma A \sigma^{-1}) = \mu(A)$ for all $\sigma \in G, A \in B(G)$ It is said to be symmetric if $\mu(A^{-1}) = \mu(A)$ for all $A \in B(G)$. Let $M_C(G)$ $(M_S(G))$ be the subsets of $M(G)$ comprising central (symmetric) measures and let us define $M_{C,S}(G) = M_C(G) \cap M_S(G)$. Normalised Haar measure on G is denoted d_π when integrating functions of $\sigma \in G$.

Let $\hat{G}$ be the set of all equivalence classes of irreducible representations of G. We identify equivalence classes with a particular representative element. The trivial representation as denoted by δ . Each $\pi \in \hat{G}$ acts as a $d_\pi \times d_\pi$ unitary matrix on a complex linear space V_π having dimension d_π . We define the Fourier transform of each $\mu \in M(G)$ to be the Bochner integral

$$\hat{\mu}(\pi) = \int_C \pi(\sigma)\mu(d\sigma). \text{ ----------------} _1 \text{-----------------------(1)}$$

Where $\pi \in \hat{G}$. We use the relation

$$\widehat{\mu * \nu}(\pi) = \hat{\mu}(\pi)\hat{\nu}(\pi).$$

INFINITELY DIVISIBLE PROPERTIES OF CONVOLUTION SEMIGROUP OF PROBABILITY MEASURES

2. THEOREM

If G is a compact Lie group and $\mu \in M_{C,S}(G)$ is infinitely divisible then for each $\pi \in \hat{G}$ there exists $\alpha_\pi \leq 0$ such that $\hat{\mu}(\pi) = e^{\alpha\pi}I\pi$.

Proof

Heyer derived that μ may be embedded as μ_i into a vaguely continuous convolution semigroup of probability measures $(\mu_t, t \geq 0)$ where μ_0 is normalised Haar measure on a closed subgroup of G. We thus find that for each $\pi \in \hat{G}, (\hat{\mu}_t(\pi), t \geq 0)$ is a strongly continuous contraction semigroup of matrices acting on V_π we write $\widehat{\mu_t}(\pi) = \hat{\mu}_0(\pi)e^{tA\pi}$ for all $t \geq 0$ where A_π is a $d_\pi \times d_\pi$ matrix. Since $\mu_1 \in M_{c,s}(G)$ there exists $\lambda_\pi \in R$ such that

$$\hat{\mu}_1(\pi) = \hat{\mu}_0(\pi)e^{A\pi} = \lambda_\pi I_\pi \dots \dots (*) \quad \text{-----------------------------------(2)}$$

If $\lambda_\pi = 0,$ (2) with $\alpha_\pi = -\infty$ we assume that $\lambda_\pi \neq 0.$ Since $\mu_1 = \mu_1 * \mu_0$ we obtain the relation

$$\hat{\mu}_0(\pi)e^{A\pi}\hat{\mu}_0(\pi) = \lambda_\pi I_\pi$$

Also, multiplying both sides of (2) by $\hat{\mu}_0(\pi)$ we get

$$\hat{\mu}_0(\pi)e^{A\pi}\hat{\mu}_0(\pi) = \lambda_\pi\hat{\mu}_0(\pi) \quad \text{---(3)}$$

It thus follows that $\hat{\mu}_0(\pi) = I_\pi$ and hence $H = \{e\}$. Also $A_\pi = \alpha_\pi I_\pi$ where $\alpha_\pi \in R$ and $\lambda_\pi = e^{\alpha\pi}$. But $\hat{\mu}_1(\pi)$ is a contraction on V_π and hence $\alpha_\pi \leq 0.$ Hence the theorem is proved.

3. THEOREM

(i)   The measure $\mu_{\lambda\gamma}$, is central if and only if γ is Fourier transform

<div align="center">2</div>

(ii)   The measure $\mu_{\lambda\gamma}$, is symmetric if and only if γ is Fourier transform

Proof

Part (i) is trivial and derivable from the result due to S. Saud. Also, conversely if $\mu_{\lambda\gamma}$, is central then for all $g \in G, \pi \in \hat{G},$

$$\pi(g)\widehat{\mu_{\lambda\gamma}}(\pi)\pi(g^{-1}) = \widehat{\mu_{\lambda\gamma}}(\widehat{\mu_{\lambda\gamma}}) \quad \text{-----------------------------------(4)}$$

$$\widehat{\mu_{\lambda\gamma}}(\pi) = \exp\{\lambda(\pi(g)\hat{\gamma}(\pi)\pi(g^{-1}) - I_\pi)\}$$

By an appropriate application of unifqueness of Fourier transforms and injectivity of the exponential map o matrices, we obtain the relation

$$\pi(g)\,\hat{\gamma}(\pi)\,\pi(g^{-1}) = \hat{\gamma}(\pi) \text{ ---}(5)$$

for all $g \in G, \pi \in \hat{G}$. Hence the theorem is proved.

We thus find that a probability measure is symmetric if and only if its Fourier transform comprises self-adjoint matrices. We conclude that a central probability measure μ is a compound Poisson distribution if and in only if there exists $\lambda > 0$ and a central probability measure γ with $\hat{\gamma}(\pi) = b_\pi I_\pi$ for all $\pi \in \hat{G}$ such that

$$\hat{\mu}(\pi) = exp\,\{\lambda(b_\pi - 1)I_\pi\}. \text{ ---------------------------------------}(6)$$

We introduce here a class of central symmetric measures play significant role in deriving Laplace distribution and Poisson distribution function. Let ρ be a symmetric infinitely divisible probability measure on R. Then Levy-Khintchine formula we get

$$\int_R e^{iux}\rho(dx) = e^{-\eta(u)}$$

where

$$\eta(u) = \frac{1}{2}\sigma^2 u^2 + \int_{R-\{0\}}(1 - \cos(uy)v(dy)) \text{ -------------------}(7)$$

where $\sigma \geq 0$ and v is a symmetric Levy measure on $R - \{0\}$ i.e. a σ $-$finite Borel symmetric measure for which $\int R - \{0\} = \max\{1, |x|^2\}\,v(dx) < x$ as shown by   C. Berg. For each $\pi \in \hat{G}$, let K_π be the Casimir operator acting in V_π. $K_\pi = -k_\pi I_\pi$ where $k_\pi > 0$. We define a class of central symmetric probability measures on G as follows.

$$\hat{\mu}(\pi) = e^{-\eta\left(k_\pi^{\frac{1}{2}}\right)I_\pi}. \text{ ---}(8)$$

Lo-Ng criterion implies that a probability measure μ always exists with such a Fourier transform. In case μ satisfies the relation (8). μ is called a central symmetric probability measure on G induced by an infinitely divisible probability measure on R denoted by $\mu \in CID_R(G)$.

4. EXAMPLES

(i)   (Gaussian measure) let us take $v = 0$ and so $c_\pi = \exp\{-1/2\,\sigma^2 k_\pi\}$. Gaussian measure is embeddable into the Brownian motion given by $\hat{\mu}_t = \exp\{-1/2\,\sigma^2 k_\pi\}$ for $t \geq 0$ extensively studied by both analysts and probabilitsts.

(ii) (The Laplace distribution on G). We take $\sigma = 0$,

$$v(dx) = \frac{exp\{-\frac{|x|}{\beta}\}}{|x|} \text{ (with } \beta > 0) \text{ and } c_\pi = (1 + \beta^2 k_\pi)^{-1}\text{ k}$$

We consider a central symmetric compound Poisson distribution $\mu_{\lambda\gamma}$ and the conditions under which $\mu_{\lambda\gamma} \in CID_R(G)$. Let us take $\sigma = 0$ and v to be a finite symmetric measure in (7) where

$$\eta(u) = \lambda \int_{R-\{0\}}(1 - \cos(uy)\hat{v}(dy))$$

$\lambda = v(R - \{0\})$ and $\hat{v}(\cdot) = 1/\lambda \, v(\cdot)$. For $\mu_{\lambda\gamma} \in CID_R(G)$ with this value of λ for which $b_\pi = g\left(k_\pi^{\frac{1}{2}}\right)$ in (6)

where $g(u) = \int R \cos(ux)\,\hat{v}(dx)$.

(iii)   It include stable-type distributions where $\sigma = 0$ and $v(dx) = \frac{b}{|x|^{1+\alpha}}dx$ where $b > 0$ and $0 < \alpha < 2$.

In this case $C_\pi = exp\{-b^\alpha K_\pi^{\alpha/2}\}$.   We consider here the relativistic Schrodinger distribution for

$m > 0$ where $c_\pi = e^{-\left(\sqrt{m^2 + k_\pi} - m\right)}$. It again has $\sigma = 0$.

5. (Random – Nikodym derivative and its embedding theorem)

4

We assume here that g is compact semi-simple Lie group having Lie algebra g.   Also, $\mu \in M(G)$ has a density $k \in L^1(G, R)$ if μ is absolutely continuous with   respect to normalised Haar measure on G. We define k to be the Radon-Nikodym derivative $\frac{d\mu}{d\sigma}$.

If a density k exists for $\mu \in M_c(G)$ with $\hat{\mu}(\pi) = c_\pi I_\pi$ and $k \in L^2(G, R)$ then it is in the form

$$k(\sigma) = \sum_{\pi \in \hat{G}} d_\pi \overline{c_\pi} x_\pi(\sigma) \quad \text{--(9)}$$

Let $\{x_1, x_2, x_3, \ldots \ldots \ldots, x_d\}$ be a basis for the Lie algebra g of lef-invariant vector fields. We define the Sobolev space $H_p(G)$ as follows:

$$H_p(G) = \{f \in L^2(G); \; x_{i1,} \ldots \ldots \ldots x_{ik} f \in L^2(G); 1 \le k \le p, i_1 \ldots \ldots, i_k = 1, \ldots \ldots, d\}$$

It is a complex separable Hilbert space with associated norm

$$|||f|||_p^2 = \|f\|^2 + \sum_{i_1 \ldots \ldots, i_k}\left\|x_{i1,} \ldots \ldots \ldots x_{ik}f\right\|^2.$$

And its equivalent norm is given by

$$|||f|||_p^2 = \sum_{\pi \in \hat{G}} d_\pi (1 + k_\pi)^p \, tr\left(\hat{f}(\pi)\hat{f}(\pi)\right) \quad \text{--------------------------(10)}$$

where $\hat{f}(\pi) = \int G^\pi(\sigma^{-1})f(\sigma)d\sigma$ is the Fourier transform M. Ruzansky has shown that $H_p(G)$ coincides with the usual Sobolev space on a manifold constructed using partitions of unity. In particular the Sobolev embedding theorem extends to

$$C^\infty(G) = \bigcap_{k \in N} H_k(G). \quad \text{--(11)}$$

6. THEOREM

Let $\mu \in M_c(G)$ with $\hat{\mu}(\pi) = c_\pi I_\pi$ for all $\pi \in \hat{G}$.

(i)   The measure μ has a square-integrable density if and only if

$\sum_{\pi \in \hat{G}} d_\pi |c_\pi|^2 < \infty$ ------------------------------(12)

(ii)   The measure μ has a continuous density if

$\sum_{\pi \in \hat{G}} d_\pi^{3/2} |c_\pi|^2 < \infty.$ ------------------------------(13)

(iii)   The measure μ has a C^k density if

$\qquad \sum_{\pi \in \hat{G}} d_\pi^2 (1 + k_\pi)^p |c_\pi|^2 < \infty.$ ------------------------(14)

Where $2p > k + d/2$

Proof

Here μ has a non-trivial Gaussian component if η is such that $\sigma > 0$ in (7). We show that μ has a c^∞ −density for all $\sigma > 0$. Combine the relation (7), (11) and (14). Let us assume $\eta(u) \geq 1/2\,\sigma^2 u^2$ for all $u \in R$ to see that for all $k \in N$

$$\sum_{\pi \in \hat{G}} d_\pi^2 (1 + k_\pi)^k c_\pi^2 \leq \sum_{\pi \in \hat{G}} d_\pi^2 (1 + k_\pi)^k exp\{-\sigma^2 k_\pi\}$$

$$\leq M \sum_{\lambda \in P \cap D} |\lambda|^{2m} (1 + |\lambda|^2)^K exp\{-\sigma^2 k_\pi\}$$

$$\leq K_1 \sum_{n \in z^r} \|n\|^{2m} (1 + \|n\|^2)^K exp\{-k_2 \|n\|^2\}$$

$$= K_1 \sum_{j=0}^{\infty} a(j) j^m (1 + j)^k exp\{-K_{2j}\}$$

$$\leq K_1 \sum_{j=0}^{\infty} j^m (2\sqrt{j} + 1)^r (1 + j)^k exp\{-K_{2j}\} < \infty$$

where $M, K_1, K_2 > 0, a(j) = \#\{n \in Z^r; \|n\|^2 = j\}$

where $a(j) \leq (2\sqrt{j} + 1)^r$ for all $j \in N^2$.

7. THEOREM

For each $\lambda > 0$, R_λ is a pseudo-differential operator having symbol $(\lambda - L_\pi)^{-1}$ at $\pi \in \hat{G}$. If G is a compact Lie group and $\mu_I \in CID_R(G)$ then for all $p \geq 2$, $H_p(G) \subseteq Dom(A)$ and A is a bounded linear operator form $H_p(G)$ to $H_{p-I}(G)$.

Proof

We consider that there exists $K > 0$ such that $|\eta(u)| \leq K(1 + |u|^2)$ for all $u \in R$. Hence for each $f \in DOM(A)$

$$\|Af\|_{p-1} = \sum_{\pi \in \hat{G}} d_\pi (1 + K_\pi)^{p-1} \left\| \mathcal{L}_\pi \hat{f}(\pi) \right\|_{hs}^2$$

$$= \sum_{\pi \in \hat{G}} d_\pi (1 + K_\pi)^{p-1} \left| \eta\left(K_\pi^{\frac{1}{2}} \right) \right|^2 \left\| \hat{f}(\pi) \right\|_{hs}^2$$

$$\leq K \sum_{\pi \in \hat{G}} d_\pi (1 + K_\pi)^p \left\| \hat{f}(\pi) \right\|_{hs}^2 \qquad 6$$

$$= K\|f\|_p$$

Hence the theorem is proved.

CONCLUSION

The main thrust is on to compute the trace in both L^2 −space and the subspace of central functions.

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THE VISCOUS INCOMPRESSIBLE FLOW BETWEEN TWO PARALLEL POROUS FLAT PLATES

Shanker Kumar[1] and Jalaj Kumar Kashyap[2]

[1]Dept. of Mathematics, T.M. Bhagalpur University, Bhagalpur,
[2]Dept. of Mathematics, T.M. Bhagalpur University, Bhagalpur.

ABSTRACT : In this paper we study the exact solution of Navier-Stokes equation for unsteady flow of a viscous incompressible flow through a channel bounded by two parallel porous flat plates, one in uniform motion and the other at rest with uniform suction at the lower plate and equal injection at the upper plate under the influence of pressure gradient expressed as a linear function of time.

Keywords: unsteady laminar flow, viscous incompressible flow, parallel porous flat plates, Navier-Stokes equation.

1. Equation of Motion

Let us consider the dimensional laminar flow of a viscous incompressible fluid between two parallel porous flat plate kept at a distance $2h$. Let a rectangular Cartesian system of co-ordinates axis be selected with the axis of X along the midway between the plates and Y axis perpendicular to it. In the present problem, the laminar flow of a viscous incompressible fluid confined between two parallel porous flat plates, one of which is at rest and other moving in its own plane with uniform velocity U. Let u, v be the velocity components along X and Y axis respectively. The Navier-Stokes equations for unsteady laminar flow of viscous incompressible fluid in absence of body forces are given by

$$\frac{\partial u}{\partial t} + u\frac{\partial u}{\partial x} + v\frac{\partial u}{\partial y} = -\frac{1}{\rho}\frac{\partial p}{\partial x} + \upsilon\left[\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2}\right] \tag{1}$$

$$\frac{\partial v}{\partial t} + u\frac{\partial v}{\partial x} + v\frac{\partial v}{\partial y} = -\frac{1}{\rho}\frac{\partial p}{\partial x} + \upsilon\left[\frac{\partial^2 v}{\partial x^2} + \frac{\partial^2 v}{\partial y^2}\right] \tag{2}$$

and equation of continuity is

$$\frac{\partial u}{\partial x} + \frac{\partial v}{\partial y} = 0 \tag{3}$$

when υ and ρ denotes the kinetic viscosity and density of the fluid.
Boundary conditions are

$$\left.\begin{array}{l}
t > 0, \qquad \text{for } y = 0 \\
u(0,t) = 0 \\
v(0,t) = v_0 < 0 \qquad\qquad \text{(suction)} \\
\text{for } y = -h \\
u(h,t) = U \\
v(h,t) = v_0 < 0 \qquad\qquad \text{(injection)}
\end{array}\right\} \tag{4}$$

where v_0 being constant and h is the distance between the plate.
It assumed that the longitudinal velocity is independent of x, so that

$$\frac{\partial u}{\partial x} = 0 \tag{5}$$

As the suction is uniform

$$\left.\begin{array}{l}
\dfrac{\partial v}{\partial t} = 0 \\[2mm]
\dfrac{\partial v}{\partial x} = 0 \\[2mm]
\text{and hence} \quad \dfrac{\partial^2 v}{\partial x^2} = 0
\end{array}\right\} \tag{6}$$

Thus using (5) equation (3) becomes

$$\left.\begin{array}{l}
\dfrac{\partial v}{\partial y} = 0 \\[2mm]
\dfrac{\partial^2 v}{\partial y^2} = 0
\end{array}\right\} \tag{7}$$

The pressure p is independent of y. Thus equation (1) becomes

$$\frac{\partial u}{\partial t} + v_0\frac{\partial u}{\partial y} = -\frac{1}{\rho}\frac{\partial p}{\partial x} + \upsilon\frac{\partial^2 u}{\partial y^2} \tag{8}$$

Now

$$\frac{\partial u}{\partial t} = \frac{U\upsilon}{h^2}\frac{\partial \bar{u}}{\partial \bar{t}}$$

$$\frac{\partial u}{\partial y} = \frac{U}{h}\frac{\partial \bar{u}}{\partial \eta}$$

$$\frac{\partial^2 u}{\partial y^2} = \frac{U}{h^2}\frac{\partial^2 \bar{u}}{\partial \eta^2}$$

$$\frac{\partial p}{\partial x} = \frac{\mu U}{h^2}\frac{\partial \bar{p}}{\partial \bar{x}}$$

(9)

The equation (8) with the help of (9) becomes

$$\frac{\partial \bar{u}}{\partial t} + \frac{\partial \bar{u}}{\partial \eta} = -\frac{\partial \bar{p}}{\partial x} + \frac{\partial^2 \bar{u}}{\partial \eta^2}$$

(10)

Where suction parameter $\sigma = \frac{v_0 h}{\upsilon}$.

Boundary condition (4) becomes

$$\bar{u}(0,\bar{t}) = 0, \qquad \eta = 0$$
$$\bar{u}(1,\bar{t}) = 1, \qquad \eta = 1$$

(11)

2. Method of Solution

The equation (10) can be written as

$$\frac{\partial \bar{u}}{\partial \bar{t}} + \sigma\frac{\partial \bar{u}}{\partial \eta} - \frac{\partial^2 \bar{u}}{\partial \eta^2} = -\frac{\partial \bar{p}}{\partial x}$$

(12)

Let

$$-\frac{\partial \bar{p}}{\partial x} = f(\bar{t})$$

(13)

and

$$\bar{u}(\eta,\bar{t}) = \bar{u}_0(\eta)f(\bar{t}) = \bar{u}_1(\eta,\bar{t}) = \bar{u}_1(\eta)f(\bar{t})$$

(14)

Now,

$$\frac{\partial u}{\partial t} = \bar{u}_0(\eta)f'(\bar{t}) - \bar{u}_1(\eta)f''(\bar{t})$$

$$\frac{\partial u}{\partial \eta} = \bar{u}_0(\eta)f(\bar{t}) - \bar{u}_1'(\eta)f'(\bar{t})$$

$$\frac{\partial^2 u}{\partial \eta^2} = \bar{u}_0''(\eta)f(\bar{t}) - \bar{u}_1''(\eta)f'(\bar{t})$$

(15)

From equation (13) and (15) in equation (10) we get

$$\bar{u}_1 f'' + f'\left(\sigma\bar{u}_1 - \bar{u}_0 - \bar{u}_1''\right) + f(1 - \sigma\bar{u}_0 + \bar{u}_0'') = 0$$

(16)

Thus we have

$$f''(\bar{t}) = 0 \qquad \text{(for all } \bar{t})$$

(17)

$$1 - \sigma\bar{u}_0' + \bar{u}_1'' = 0$$

(18)

and

$$\sigma\bar{u}_1' - \bar{u}_0 - \bar{u}_1'' = 0$$

(19)

$$f''(\bar{t}) = 0$$

From (17) which gives

$$f(\bar{t}) = A + B\bar{t}$$

(20)

Where A and B are dimensionless constant. Thus from (13) and (20)

$$\frac{\partial \bar{p}}{\partial x} = A + B\bar{t}$$

(21)

Again, (18)

$$\bar{u}_0''(\eta) - \sigma\bar{u}_0'(\eta) = -1$$

(22)

Boundary conditions are

$$\bar{u}_0(0) = 0 \qquad \text{for } \eta = 1$$
$$\bar{u}_0(1) = 1 \qquad \text{for } \eta = 1$$

(23)

From (22)

$$\frac{d^2 \bar{u}_0}{d\eta^2} - \sigma\frac{d\bar{u}_0}{d\eta} = -1$$

Put $\dfrac{d\bar{u}_0}{d\eta} = z$

The above differential equation assume the form

$$\frac{dz}{d\eta} = \sigma z = -1$$

(24)

Solution of (24) is given by

$$\frac{d\bar{u}_0}{d\eta}e^{-\sigma\eta} = K - \frac{e^{-\sigma\eta}}{\sigma} \tag{25}$$

The solution of differential equation (25) is given by

$$\bar{u}_0 = \frac{\eta}{\sigma} + \frac{K}{\sigma}e^{\sigma\eta} + L \tag{26}$$

where K and L are constant of integration using the boundary conditions, we have

$$\left.\begin{array}{l} K = -\dfrac{1}{e^{\sigma}-1} \\[3mm] L = -\dfrac{1}{\sigma(e^{\sigma}-1)} \end{array}\right\} \tag{27}$$

Thus the solution of differential equation (22) is given by

$$\bar{u}_0 = \frac{\eta}{\sigma} - \frac{1}{\sigma(e^{\sigma}-1)}e^{\sigma\eta} + \frac{1}{\sigma(e^{\sigma}-1)} \tag{28}$$

and it also becomes

$$\frac{d^2\bar{u}_1}{d\eta^2} - \sigma\frac{d\bar{u}_1}{d\eta} = -\frac{\eta}{\sigma} + \frac{1}{\sigma(e^{\sigma}-1)}e^{\sigma\eta} - \frac{1}{\sigma(e^{\sigma}-1)} \tag{29}$$

Boundary conditions are

$$\left.\begin{array}{ll} \bar{u}_0(0) = 0, & \eta = 0 \\[2mm] \bar{u}_0(1) = -\dfrac{1}{B}, & \eta = 0 \end{array}\right\} \tag{30}$$

The solution of (29) is given by

$$\bar{u}_1(\eta) = \frac{\eta^2}{2\sigma^2} + \frac{\eta}{\sigma^3} + \frac{\eta}{\sigma^2(e^{\sigma}-1)} + \frac{M}{\sigma}e^{\sigma\eta} + \frac{1}{\sigma(e^{\sigma}-1)}\left[\frac{\eta}{\sigma}e^{\sigma\eta} - \frac{1}{\sigma^2}e^{\sigma\eta}\right] + N \tag{31}$$

where

$$\begin{array}{l} M = \dfrac{\sigma}{B(e^{\sigma}-1)} - \dfrac{3e^{\sigma}+1}{2\sigma^2(e^{\sigma}-1)^2} \\[4mm] N = \dfrac{1}{\sigma^3(e^{\sigma}-1)} + \dfrac{\sigma}{B(e^{\sigma}-1)} + \dfrac{3e^{\sigma}+1}{2\sigma^2(e^{\sigma}-1)^2} \end{array} \tag{32}$$

From (31) and (32), we get

$$\bar{u}_1(\eta) = \frac{\eta^2}{2\sigma^2} + \frac{\eta}{\sigma^3} + \frac{\eta(e^{\sigma\eta}+1)}{\sigma^2(e^{\sigma}-1)} + \frac{e^{\sigma\eta}+1}{\sigma^3(e^{\sigma}-1)} + \frac{1}{B}\frac{e^{\sigma\eta}-1}{e^{\sigma}-1} - \frac{3e^{\sigma}+1}{2\sigma^2(e^{\sigma}-1)^2}(e^{\sigma\eta}-1) \tag{33}$$

Now substituting the value of $\bar{u}_0(\eta)$ and $\bar{u}_1(\eta)$ from (28) and (33) in (14) and using (20), we get

$$\bar{u}_1(\eta,\bar{t}) = \frac{(e^{\sigma}-1)\eta - e^{\sigma\eta}+1}{\sigma^2(e^{\sigma}-1)}(A+B\bar{t}) + \frac{e^{\sigma\eta}-1}{e^{\sigma}-1}$$
$$-B\left[\frac{\eta^2}{2\sigma^2} + \frac{\eta(e^{\sigma\eta}+1)}{\sigma^2(e^{\sigma}-1)} - \frac{(3e^{\sigma}+1)(e^{\sigma\eta}-1)}{2\sigma^2(e^{\sigma}-1)^2} + \frac{\eta(e^{\sigma}-1)-e^{\sigma\eta}+1}{\sigma^3(e^{\sigma}-1)}\right] \tag{34}$$

Thus (34) represents the complete solution for the longitudinal velocity in the present case when $\sigma \neq 0$, i.e. when the wall are porous.

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बौद्ध शिक्षा और ब्राह्मण शिक्षा का सामाजिक दर्शन एवं प्रभाव : भारतीय संदर्भ में एक अध्ययन

डॉ0 प्रियंका

दर्शनशास्त्र विभाग,

बी0 आर0 ए0 बिहार विश्वविद्यालय, मुजफ्फरपुर।

सारांश

सामाजिक, आर्थिक तथा राजनीतिक जीवन में बौद्ध शिक्षा की अनेक सन्दर्भों में बड़ी उपादेयता थी। जिस वैदिक समाज ने उत्पादन में लौहतकनीक के प्रयोग तथा प्रसार की महत्वपूर्ण भूमिका निभाई, उसी समाज की अनेक प्राचीन मान्यताएँ आर्थिक प्रगति के लिए अनुकूल नहीं थी। ब्राह्मण तथा क्षत्रिय वर्ग को व्यापार में संलग्न होने की मनाही थी। वैश्य वर्ग सम्मान की दृष्टि से समाज में तीसरी श्रेणी में आता था। अहिंसा मूलक बौद्ध धर्म की शिक्षाएँ सिद्धाँत रूप में साम्राज्यवादी युद्धों के विपरीत पड़ती थी। युद्ध की स्थिति में व्यापारियों की संपत्ति की सुरक्षा भी खतरे में पड़ जाती थी। इस काल में समाज के धनाढ्य वर्ग को ऐसे नियम तथा सिद्धाँतों की आवश्यकता थी जो व्यक्तिगत संपत्ति की सुरक्षा तथा संपत्ति का अधिकार को किसी—न—किसी रूप में मान्यता प्रदान करें। बौद्ध दर्शन की शिक्षाएं सर्वकालिक एवं सर्वदेशिक हैं। तृष्णा चाहे आज के मानव की हो अथवा आज से पहले के, वह सदैव विनाशकारी तथा सकल दुःखों की जननी है। पदार्थों की लिप्सा कभी शांत नही हो सकती है। आज भी उपभोक्ता मूलक संस्कृति का त्रासदी का कारण भी यही तृष्णा है। बोधि अथवा ज्ञान के द्वारा व्यक्ति समाज में चहुमुखी विकास कर सकता है। बुद्ध की शिक्षाएं समस्त मानव मात्रा के लिए थी, किसी विशेष वर्ग के लिए नहीं। इनमें स्त्री—पुरुष, धर्म आदि का कोई भेद स्वीकार्य न था।

शब्द कुंजी : अहिंसा, शिक्षा, तृष्णा, संस्कृति, वर्ग

भूमिका

प्राचीन काल की सामाजिक, आर्थिक तथा राजनीतिक जीवन में बौद्ध शिक्षा की अनेक सन्दर्भों में बड़ी उपादेयता थी। जिस वैदिक समाज ने उत्पादन में लौहतकनीक के प्रयोग तथा प्रसार की महत्वपूर्ण भूमिका निभाई, उसी समाज की अनेक प्राचीन मान्यताएँ आर्थिक प्रगति के लिए अनुकूल नहीं थी। ब्राह्मण तथा क्षत्रिय वर्ग को व्यापार में संलग्न होने की मनाही थी। वैश्य वर्ग सम्मान की दृष्टि से समाज में तीसरी श्रेणी में आता था। अहिंसा मूलक बौद्ध धर्म की शिक्षाएँ सिद्धाँत रूप में साम्राज्यवादी युद्धों के विपरीत पड़ती थी। युद्ध की स्थिति में व्यापारियों की संपत्ति की सुरक्षा भी खतरे में पड़ जाती थी। इस काल में समाज के धनाढ्य वर्ग को ऐसे नियम तथा सिद्धाँतों की आवश्यकता थी जो व्यक्तिगत संपत्ति की सुरक्षा तथा संपत्ति का अधिकार को किसी—न—किसी रूप में मान्यता प्रदान करें। बौद्ध धर्म की संपत्ति संग्रह न करने की शिक्षा केवल भिक्षुओं के लिए ही सार्थक हो सकती है जबकि अस्तेय संपत्ति के अधिकार को अप्रत्यक्ष रूप से समर्थन देता है। बौद्ध संघ में ऋणी व्यक्ति का प्रवेश वर्जित करना भी इसमें सहायक सिद्ध होता है। हाँलांकि संघ में रहने वाले भिक्षुओं के लिए बने नियम नवीन सामाजिक तथा आर्थिक परिवर्तनों के विरूद्ध प्राचीन जनजातीय मूल्यों—सामाजिक समानता, व्यक्तिगत संपत्ति का

अभाव आदि पर अधिक बल देते है। किंतु हम स्पष्ट रूप से देख चुके हैं कि बौद्ध धर्म की अनेक शिक्षाएँ नए सामाजिक–आर्थिक परिवर्तन के अनुकूल थी। मान्य इतिहासविद् रामशरण शर्मा के अनुसार बौद्ध धर्म के सिद्धाँत नई आर्थिक व्यवस्था तथा उपज के अधिशेष पर विकसित थे। बौद्ध धर्म का मूलाधार चार आर्य सत्य है। इस धर्म के सारे सिद्धाँत तथा बाद में विकसित विभिन्न दार्शनिकमत–वादों के ये ही आधार हैं। ये चार आर्यसत्य है :– दुःख, दुःख समुदाय, दुःख–निरोध तथा दुःख निरोध–गामिनी–प्रतिपदा अर्थात् अष्टांगिक मार्ग। बौद्ध धर्म मूलतः अनीश्वरवादी है। सृष्टि का कारण ईश्वर को नहीं माना गया है। तर्क यह है कि यदि ईश्वर को संसार का रचयिता माना जाए तो उसे दुःख को उत्पन्न करने वाला भी मानना होगा। वास्तव में बुद्ध ने ईश्वर के स्थान पर मानव प्रतिष्ठा को ही बल दिया। बुद्धका हृदय मानव प्रेम से पूर्णतः भरा हुआ था। मनुष्यों के नाना प्रकार के दुःखों को देखकर

उनका हृदय टूक–टूक हो जाता था। वे दूसरों के दुःखों में स्वयं दुःखी रहते थे। यही कारण है कि उन्होंने मानव दुःखा का नाश करना अपने जीवन का चरम लक्ष्य बनाया। मनुष्यों के दुःखों को दूर करने की औषधि पाने के लिए ही वे अनेक वर्षों तक जंगल में भटकते रहे और अंत में उसे प्राप्त कर ही विश्राम लिया। उन्होंने चार आर्य–सत्यों तथा अष्टांगिक मार्गों का अनुसंधान कर मनुष्यों के कलेश निवारण का उपाय बतलाया। उन्होंने घर छोड़ा, घरिनी छोड़ी, राज्य छोड़ा और सुख छोड़कर मानव दुःखों को दूर करने का परमौषध प्राप्त किया।

बुद्ध का सारा जीवन परोपकार का प्रतीक है, पर–सेवा का उदाहरण है तथा लोक–मंगल का ज्वलंत प्रमाण है। बौद्ध धर्म के उदय से भारत में एक नवीन दार्शनिक चिन्तन का विकास हुआ। बौद्ध धर्म के उदय के समय अनेक परस्पर विरोध वादों का जंजाल व्याप्त था। पर इन वादों में वैदिन चिंतन के समक्ष खड़े होने की सामर्थ्य न थी। गौतम बुद्ध ने अपने अन्त्तावाद या अनात्मवाद से परम्परागत वैदिक चिंतन या उपनिर्णायक आत्मवाद को झकझोर कर रख दिया। इस प्रकार भारतीय दर्शन को चिंतन की दो परस्पर विरोधी धराएं प्राप्त हुई–एक उपनिषदों का आत्मवाद तो दूसरा गौतम बुद्ध का अनात्मकता।

बुद्ध काल में अनेक दार्शनिक वादों का प्रादुर्भव हुआ। ब्राह्मण धर्म लोक धर्म बन चुका था और बौद्ध धर्म के प्रचार होने पर भी इसकी लोकप्रियता में कोई अंतर नहीं आया। बुद्ध का ध्येय बौद्ध दर्शन को लोकप्रिय बनाना था। अतः उन्होंने लोकमत को समुचित आदर प्रदान करते हुए अपने विचारों का प्रचार किया। लोक साहित्य पर भी गौतम बुद्ध के गंभीर व्यक्तित्व का व्यापक प्रभाव पड़ा। वैदिक ऋचाओं का विषय देवस्तुति मात्रा था एवं परवर्ती या उत्तर वैदिक साहित्य यज्ञ एवं कर्मकाण्ड से भरा पड़ा था। पर गौतम बुद्ध ने गाथाओं, जातक कथाओं और पिटकों के माध्यम से विषयों को अपनी वार्ता का विषय बनाया। शिक्षा के सिद्धांतों और प्रयोगों के संबंध में बौद्धों और हिंदुओं के दृष्टिकोण में कोई मौलिक अंतर नहीं था। बौद्ध धर्म का मूल मत था कि संसार दुःख से परिपूर्ण है। संसार का परित्याग करने से ही मोक्ष मिलेगा। अतः प्रारंभ में बौद्धों ने भिक्षुओं और भिक्षुणियों की शिक्षा पर ही ध्यान दिया तो उचित ही था। किन्तु कालान्तर में जब इन्होंने जन साधारण को शिक्षा देना स्वीकार कर लिया तो इनकी शिक्षा प्रणाली में हिंदुओं की शिक्षा प्रणाली में कोई अंतर नहीं था। दोनों पद्धतियों के आदर्श और ढंग समान थे। बुद्ध का यह अत्यन्त विवेक पूर्ण आदेश था कि प्रत्येक उपासक को विनय और धर्म की सम्यक् शिक्षा देनी चाहिए। बुद्ध के इस वचन के कारण ही बौद्ध विहारों ने शिक्षा कार्य अपने हाथ में लिया और उसका विकास किया। बौद्ध संघ में सम्मिलित होने के लिए दो संस्कार आवश्यक थे। प्रथम था प्रब्बज्जा तथा दूसरा उपसम्पदा। प्रब्बज्जा से उपासकत्व का प्रारंभ होता था। प्रब्बज्जा 8 साल से अधिक उम्र के किसी भी व्यक्ति को दी जा सकती थी। संरक्षक की अनुज्ञा आवश्यक थी। उपासक काल

के अंत में उपसम्पदा दी जाती थी। उपसम्पदा के समय उपासक की उम्र 20 वर्ष से कम न रहनी चाहिए। ऋणी,अशक्तया राज पुरुष को दीक्षा नहीं दी जा सकती थी। संपूर्ण संघ की स्वीकृति से ही दीक्षा दी जा सकती थी बौद्ध धर्म दीक्षित होने के लिए जात–पातका कोई भेद न था। उपासक को बौद्ध धर्म और संघ में विश्वास प्रकट करना पड़ता था तथा किसी विद्वान भिक्षुक को आचार्य चुनना पड़ता था। भिक्षु कोकड़ाई से संघ के नियमों का पालन करना पड़ता था। यदि वह कोई अक्षम्य गंभीर अपराध करता तो पूरे संघ की सभा उसे संघ से निष्कासित कर देती थी। हिन्दू ब्रह्मचारी की भांति उसे भी भोजन की भिक्षा मांगनी पड़ती थी। श्रावकों के निमंत्रण पर उसके घर पर ही वह भोजन कर सकता था। विहार के सभी छोटे–बड़े कार्य यथाफर्श और बर्तनों की सफाई, पानी भरना तथा भंडारों का निरीक्षण, उसे करने पड़ते थे। उपासक और आचार्य में पुत्र और पिता जैसा संबंध था। परस्पर आदर–विश्वास और प्रेम की भावना से वे एक हो जाते थे। हिन्दू ब्रह्मचारी की भांति बौद्ध उपासक को भी आचार्य के सहायतार्थ शारीरिक परिश्रम करना पड़ता था। वह आचार्य का आसन और चीवर का परिवहन करता, उन्हें जल दातौन देता, उनके भिक्षा–पात्र तथा बर्ताव की सफाई करता तथा भिक्षा ग्रहण या उपदेश के लिए आचार्य के नगर या ग्राम गमन के समय उनके सेवक के रूप में साथ–साथ जाता था। आचार्य उपासक को विनय के नियम बतलाता, उसका ध्यान ब्रह्मचर्य, अपरिग्रह तथा इंद्रिय संयम के व्रत की ओर आकर्षित करता तथा सन्ध्या कालों में अपने उपयोगी व्याख्यानों से उसकी बौद्धिक और आध्यात्मिक प्रगति में सहायता करता था।

भारत में संघ टितिशिक्षण संस्थाओं के उदय का श्रेय बौद्ध धर्म को ही मिलना चाहिए। यह स्वाभाविक ही था। संघों के रूप इसीलिए जब ये विहार शिक्षण संस्थाओं रूप में बदल गये तो इनका स्वरूप भी सामाजिक शिक्षण संस्थाओं का हो गया। बौद्ध विहार पाठशालाओं की प्रेरणा से ही हिन्दू मन्दिरों में भी पाठशालाएं खुलने लगीं। जिस काल में बौद्ध धर्म उन्नति के शिखर पर था देश के कोने–कोने में विहार का जाल बिछा हुआ था। लगभग 10 प्रतिशत विहारों में उच्च शिक्षा दी जाती थी। इसमें नालंदा, बलभी और विक्रमशिला जैसे विहार विश्वविद्यालयों की ख्यातिज्ञान के केंद्र के रूप में विश्व भर में थी। मध्य एशिया और पूर्वी एशिया में इन्होनें भारतीय शिक्षा की यश पताका स्थापित की थी। सुदूर जावा के एक राजा ने भी नांलदा में दान किया था। शिक्षा के इन केन्द्रों में अक्षय निधियों के दान में भारतीय राजे–महाराजों तथा सेठों में होड़ लगी हुई थी। बदले व निःशुल्क शिक्षा वितरित करते थे इतना ही नही, भिक्षुओं को भी निश्चित रूप से तथा अन्य छात्रों को भी संभवतः यहा ंसभोजन और वस्त्र भी मिलता था। बौद्ध विहार यातो स्वंतत्र नगर ही थे या नगरों और गांवों के उपान्त बसे हुए थे। अतः उनमें भी शांति विराजती थी। यद्यपि इन विहारों में चलने वाले विद्यालयों का प्रबंध बौद्ध करते थे। किंतु ये संस्थाएंन तो साम्प्रदायिक थी न इनमें केवल धर्मकी ही शिक्षा दी जाती थी। इनमें कोई संदेह नहीं कि इनके पाठयक्रम में बौद्ध दर्शन प्रमुख था किन्तु हिन्दुओं और जैनोंके विभिन्न सम्प्रदायों के धर्मों और दर्शनों के उदय के साथ–साथ अध्ययन का भी पर्याप्त प्रबंध था।

युवाड्.च्वाड् जितने दिनों भारत में रहा उसका दो बटे पांच समय उसने हिंदू धर्म और दर्शन के अध्ययन में लगाया था। इनमें पाठ्यक्रम धर्मशास्त्र, दर्शन और न्याय तक ही सीमित न थासंस्कृत साहित्य,ज्योतिष,आयुर्वेद,व्यवहार–शास्त्र,राजनीति और शासन प्रबंध की भी शिक्षा विद्यार्थियों को दी जाती थी ताकि वे सरकारी सेवा में प्रविष्ट हो सकें या अन्य उपयोगी या बुद्धिवादी पेशे अपना सकें। पुस्तकें उस काल में दुर्लभ और बहुमूल्य थी। अतः विद्यार्थियों को को महत्वपूर्ण ग्रंथों को कण्ठस्थ कर लेने के लिए उत्साहित किया जाता था। शास्त्रार्थों और वाद–विवादों में यहह बड़े काम का सिद्ध होता था। किन्तु बौद्ध शिक्षा पुस्तकें रटने से कोसों आगे थी।

बौद्ध शिक्षा प्रणाली में तर्क और विश्लेषण का महत्वपूर्ण स्थान था। युवाड्, च्चाड्, और इत्सिड्,जैसे तर्कशील विद्यार्थियों ने भारतीय आचार्यों की व्याख्या और स्पष्टीकरण की प्रणाली की भूरि—भूरि प्रशंसा की है। प्रत्येक छात्र की वैयक्तिक प्रगति पर ध्यान रखा जाता था। नालंदा में एक आचार्य के अंतर्गत दस से अधिक विद्यार्थी नहीं दिये जाते थे। ईसा की पांचवीं शताब्दी के बाद भारत में भिक्षुणी संघ नहीं रह गये। अतः जब बौद्ध विहार अंतर्राष्ट्रीय ख्याति के विद्यालयों के रूप में विकसित हुये उनमें वितरित होने वाली शिक्षा नारी जगत को कोई लाभ नहीं होता था। उस काल में बालिकाओं का विवाह भी अल्पवय में ही हो जाता था। पूर्वकाल में बौद्ध संघ में नारियों के प्रवेश की अनुमति मिल जाने के कारण नारी शिक्षा को विशेषतया उच्च सामंतों और श्रेष्ठियों के घरों को विशेष प्रोत्साहन मिला था। इन वर्गों की बहुत सी नारियां बौद्ध संघ में सम्मिलित हुई थी। उन्होंने धर्म और दर्शन के अध्ययन में अपना सारा जीवन उत्सर्ग कर दिया था। उनके अनुकरण पर साधारण घरों की नारियों में भी शिक्षा प्रसार में अप्रत्यक्ष रूप से पर्याप्त प्रोत्साहन मिला। इस बात के कोई प्रमाण नहीं मिलते कि प्रारंभिक काल में बौद्ध धर्म जन साधारण की शिक्षा में रूचि रखता था।

महायान के उदय के साथ—साथ के उदय के साथ—साथ बौद्ध—विहारों ने साधारण जनता को भी शिक्षित करने का कार्य प्रारंभ कर दिया। किन्तु चीनी यात्रियों के लेखों से ज्ञात होता है कि बौद्ध—विहारों में मुख्यतया उच्च शिक्षा की ही व्यवस्था थी। प्राचीन भारत में शिक्षा के प्रसार में अपनी देन पर बौद्ध धर्म पर गर्वकर सकता है। इसके विद्यालयों ने सभी जातियों और देशों के विद्यार्थियों के लिए अपने द्वार खोल दिये थे। बौद्ध धर्म के ही प्रभाव के कारण देश में संघटित पाठशालाओं का उदय हुआ। उच्च शिक्षा में अपनी कुशलता से इसने अंतर्राष्ट्रीय जगत में भारत का स्थान ऊंचे उठाया था। इसकी उच्च शिक्षा की पूर्णतः से आकर्षित होकर कोरिया, चीन, तिब्बत और जावा जैसे दूर—दूर के देशों के विद्यार्थी यहां अध्ययन करने आते थे।

आधुनिक काल में पूर्वी एशिया के देश भारत के प्रति जो सांस्कृतिक सहानुभूति रखते हैं उसका एकमात्र श्रेय प्राचीन भारत के बौद्ध विद्यालयों का ही है। यदि आज किसी लुप्त भारतीय ग्रंथ का चीनी भाषा में पता मिलता है या किसी बहुमूल्य संस्कृत पुस्तक का हस्तलिखित तिब्बत या चीन या मध्य एशिया में प्राप्त होता है तो इस का भी संपूर्ण श्रेय इन बौद्ध—विद्यालयों को ही है जहां चीनी विद्यार्थी इन पुस्तकों की प्रतिलिपि करके अपने देश ले जाते थे।

तुलनात्मक अध्ययन की नींव रखकर बौद्ध शिक्षा ने हिन्दू न्याय और दर्शन के विकास में भी योग दिया था। प्रारंभिक काल में बौद्धों ने मातृभाषा द्वारा शिक्षा देने का समर्थन दिया था किन्तु उत्तर काल में यह संस्कृत के आकर्षण और प्रभाव से अपने को अछूता न रख सके। अंततोगत्वा इन्होंने भी उसी भाषा के माध्यम से शिक्षा देना प्रारंभ कर दिया। जिस प्रकार से वैदिक काल की शिक्षा की अनेक विशेषताएं वर्तमान समय में भी प्रासंगिक है ठीक उसी प्रकार से बौद्ध काल की शिक्षा की अनेक विशेषताएं भी आधुनिक समय में उपादेय सिद्ध हो सकती है। यद्यपि बौद्ध कालीन शिक्षा का प्रमुख उद्देश्य बौद्ध धर्म का प्रचार व प्रसार करना था, तथापि बौद्ध शिक्षा के अन्य उद्देश्य जैसे नैतिक चरित्र का विकास, व्यक्तित्व का विकास तथा जीविका की तैयारी आज भी पूर्णतया प्रासंगिक है। वर्तमान शिक्षा व्यवस्था में इन उद्देश्यों को समाहित करके ही शिक्षा प्रणाली को पूर्ण बनाया जा सकता है। बौद्ध शिक्षा प्रणाली के 'दस सिक्खा पदानि' अर्थात् दस शिक्षा पद आज भी पूर्णतया उपयोगी तथा सार्थक है।

इन दस आदेशों का छात्रों के द्वारा यदि पालन किया जाएगा तो वर्तमान समय के साम्प्रदायिक वातावरण, भ्रष्ट आचरण, मादक पदार्थों का प्रचलन, झूठ बोलना, निन्दा आदि का स्वतः ही निवारण हो जाएगा। बौद्ध काल में प्रचलित छात्र—अध्यापक संबंधे को यदि पुनर्जीवित किया जाये तो वर्तमान शिक्षा

संस्थाओं में दिन–प्रतिदिन होने वाली हड़ताल, बंद उपद्रव, अध्यापकों के साथ होने वाली अभद्रता, छात्र दंगे आदि स्वतः ही बंद हो जाएंगे। निःसंदेह बौद्ध शिक्षा की कुछ विशेषताएं आज भी प्रासंगिक हैं। यद्यपि बौद्ध धर्म व गौतम बुद्ध के उपदेश बौद्ध कालीन शिक्षा प्रणाली के केंद्र बिन्दु थे परन्तु बौद्ध शिक्षा में निहित शांति, अहिंसा व वसुधैव कुटुम्बकम् के सिद्धांत, प्रजातांत्रिक संगठन की प्रवृत्ति, छात्रों व अध्यापकों का त्यागपूर्ण जीवन आदि अनेक ऐसे तत्व हैं जो आज भी उपयोगी सिद्ध हो सकते हैं। वैभव की चमक–दमक, हिंसा से युक्त परिवेश, धन व अधिकार की लालसा तथा घृणा व द्वेषों से परिपूर्ण वर्तमान जीवन में बौद्ध शिक्षा के ये तत्व सार्थक योगदान कर सकते हैं। आज हमारे देश में बौद्ध शिक्षा विलुप्त हो चुकी है फिर भी इसकी विशेषताएं आधुनिक भारतीय प्रणाली में सम्मिलित की जा सकती हैं।

आज के परिवेश में गौतम बुद्ध का शिक्षा दर्शन और भी प्रासंगिक हो गया है। उनके 'आत्म दीपो भव' का सिद्धांत आज के समाज के लिए और उपयोगी हो गया है। अगर व्यक्ति में समाज के प्रति सकारात्मक सोच (जो घटता जा रहा है) उत्पन्न करना है तो उनके सुझाए मार्ग को अविलम्ब अपनाना होगा। किसी भी शिक्षण का प्रमुख उद्देश्य व्यक्तित्व एवं चरित्र का सर्वांगीण विकास है। चूंकि बौद्ध दर्शन की शिक्षाएं कायिक, वाचिक एवं मानसिक विशुद्धि का लक्ष्य रखती हैं, अतः इनका उपयोग आधुनिक शिक्षण में भली–भांति किया जा सकता है। मूल्य परक शिक्षण प्रत्येक शिक्षा व्यवस्था का अंग रहा हैं। बौद्ध दर्शन के अंतर्गत सत्य, अहिंसा, अस्तेत, अपरिग्रह, प्रेम, करुणा, विश्व बंधुत्व सदृश अनेक शाश्वत् मूल्यों को जीवन में आत्मसात् करने पर बल दिया गया है। इन मूल्यों को आधुनिक शिक्षण से सम्बद्ध करके इसे मूल्य परक बनाया जा सकता है। बौद्ध दर्शन के अंतर्गत सदाचार पर विशेष बल दिया गया है। आज भी शिक्षा का एक प्रमुख लक्ष्य शिक्षार्थी को सदाचारी बनाना है, ताकि वह न केवल ज्ञानी बन सके अपितु सामाजिक व राष्ट्रीय जीवन में एक आदर्श भूमिका निभा सके। बौद्ध शिक्षा के अंतर्गत नारी शिक्षा पर भी विशेष बल दिया गया है। आधुनिक शिक्षा पद्धति में भी नारी शिक्षा के विकास एवं उत्थान पर विशेष बल दिया जा रहा है।

बौद्ध शिक्षण पद्धति में दूर–दूर से आए हुए भिक्षु अनुशासनबद्ध होकर शिक्षा ग्रहण करते थे। आज भी अनुशासन पालन शिक्षा का प्रमुख उद्देश्य है, क्योंकि अनुशासन के बिना किसी भी लक्ष्य की प्राप्ति नहीं की जा सकती। बौद्ध संघ में प्रविष्ट होने वाले भिक्षु स्वयं भिक्षार्जन करके ज्ञानार्जन करते थे। इस प्रकार बौद्ध शिक्षण विद्यार्थी को स्वावलंबी बनाना था। आज भारतीय शिक्षा के संबंध में स्ववित्तपोषित शिक्षा प्रणाली की बात की जा रही है जिसमें शिक्षार्थी का आत्मनिर्भर या स्वावलंबी बनना आवश्यक है।

ऋग्वेद में उल्लिखित उत्तरी भारत में आर्य–दस्यु संघर्ष के समान दक्षिणीऔर उत्तरी भारत के सांस्कृतिक संपर्क में संघर्ष के तत्व नहीं मिलते। संगम साहित्य सेज्ञात होता है कि तमिल देश में वैदिक संस्कृति का स्वागत किया गया। भारत के शैक्षिक इतिहास में वैदिक काल के पश्चात् बौद्ध काल में शिक्षा की दृष्टि से बहुत अंतर नहीं दिखाई देते है। ए० एस० अल्तेकर के अनुसार "जहाँ तक सामान्य शैक्षिक सिद्धाँत या प्रयोग की बात है, हिन्दुओं और बौद्धों में बहुत अंतर नहीं था। दोनों प्रणालियों के लगभग समान आदर्श थे और वे समान विधियों का अनुसरण करती थी। वस्तुतः वैदिक शिक्षा का अनुसरण करके ही बौद्ध शिक्षा प्रणाली का संगठन किया गया था। दोनों प्रणालियों में शिक्षा संबंधी धार्मिक संस्कारों को महत्व दिया गया था। ब्राह्मण शिक्षा में 'उपनयन' संस्कार के पश्चात् छात्र को ब्रह्मचारी कहा जाता था। उसी प्रकार बौद्ध शिक्षा प्रणाली में 'पबज्जा' संस्कार के पश्चात् छात्र को 'श्रमण' कहा जाता था। ब्राह्मण शिक्षा प्रणाली में उपनयन संस्कार के पश्चात् छात्र को अपने घर कोत्याग कर गुरु–गृह के लिए प्रस्थान करना पड़ता था। इसी प्रकार बौद्ध शिक्षा प्रणाली में पबज्जा संस्कार के बाद छात्र को माता–पिता से दूर गुरु के सानिध्य में रहना पड़ता था। ब्राह्मण शिक्षा में गुरु

का महत्व अत्यधिक था। गुरु को देवतुल्य माना गया है। गुरु सेवा को महत्व दिया गया है। गुरु और शिष्य के संबंध पिता–पुत्र जैसे थे। बौद्ध शिक्षा प्रणाली में भी गुरु को महत्व देते हुए उन्हें ब्रह्म के समान माना गया है और गुरु सेवा पर बल दिया गया है। वैदिक शिक्षा में शिक्षा प्रारम्भ बाल्यावस्था से ही करने पर बलदिया गया। शिक्षा प्रारम्भ करने की आयु विभिन्न वर्णों के लिए निश्चित थी। ब्राह्मणों के लिए आठ वर्ष, क्षत्रियों के लिए ग्यारह वर्ष तथा वैश्यों के लिए 12 वर्ष निश्चित की गई थी। बौद्ध काल में विद्यालय आरम्भ बाल्यावस्था में होता था। दोनों शिक्षा प्रणालियों में शिक्षण संस्थाओं की आय का मुख्य स्रोत दान और भिक्षा थी। दोनों शिक्षण प्रणालियों में शारीरिक दण्ड साधारण तया वर्जित था।

निष्कर्ष : बौद्ध शिक्षण के अंतर्गत शिक्षार्थी के साथ विचार सम्प्रेषण हेतु जनभाषा या लोक भाषा का प्रयोग किया जाता था। आज भी यह अनुभव किया जा रहा है कि शिक्षा में विचार–विनिमय के माध्यम वे भाषाएं हो जिनके द्वारा सम्प्रेषण को अधिकाधिक प्रभावोत्पादक बनाया जा सके। बौद्ध दर्शन की शिक्षाएं सर्वकालिक एवं सर्वदेशिक हैं। तृष्णा चाहे आज के मानव की हो अथवा आज से पहले के, वह सदैव विनाशकारी तथा सकल दुःखों की जननी है। पदार्थों की लिप्सा कभी शांत नही हो सकती है। आज भी उपभोक्ता मूलक संस्कृति का त्रासदी का कारण भी यही तृष्णा है। बोधि अथवा ज्ञान के द्वारा व्यक्ति समाज में चहुमुखी विकास कर सकता है। बुद्ध की शिक्षाएं समस्त मानव मात्रा के लिए थी, किसी विशेष वर्ग के लिए नहीं। इनमें स्त्री–पुरुष, धर्म आदि का कोई भेद स्वीकार्य न था। बुद्ध न तो अंधविश्वासी थे और न ही वे अंध विश्वासों को बढ़ावा देने के पक्ष में थे। अतः उन्होंने इस बात पर बल दिया कि किसी भी विचार का अंधनुकरण न कर उसे तर्क की कसौटी पर कसा जाए और उसके खरा उतरने पर जींदो उसे स्वीकार किया जाए। बुद्ध का यह दर्शन व्यक्ति को प्रगतिशील बनने की प्रेरणा प्रदान करता है।

बौद्ध शिक्षा और ब्राह्मण शिक्षा दोनों ने सामाज कल्याण के दृष्टिकोण से कार्य किये, इसमें कुछ हद तक सफलता भी प्राप्त हुई है।

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PROPERTIES OF FUZZY UTILITY FUNCTIONS

Rani Begam

Univ. Dept. of Mathematics, T.M. Bhagalpur University, Bhagalpur.

Abstract : In this paper, we prove some theorems regarding the properties of a fuzzy utility function.

Keywords : fuzzy utility function, iso-membership, fuzzy utility indicator.

In this paper, we prove some theorems regarding the properties of a fuzzy utility function. For expositional purpose, we confine the analysis to a simple case of two commodities, labor service and wheat. Let X_1 represent the amount of labor supplied by a household and X_2 the amount of wheat available to the household.

Theorem 1: If every fuzzy utility indicator of a fuzzy utility relation is convex and normalized, the iso-membership grade surfaces (in Fig. 1) of the fuzzy utility relation are connective and never intersect each other.

Fig. 1. Part of fuzzy utility function and its iso-membership grade surfaces.

(a)   (b)   (c)

Fig. 2. Convexity and connectivity.
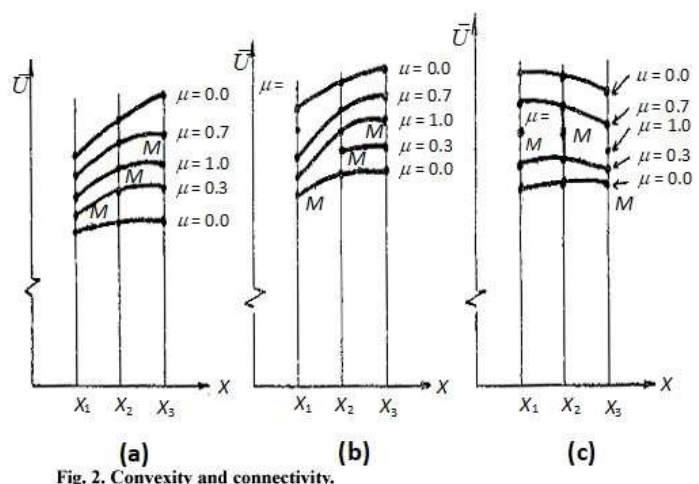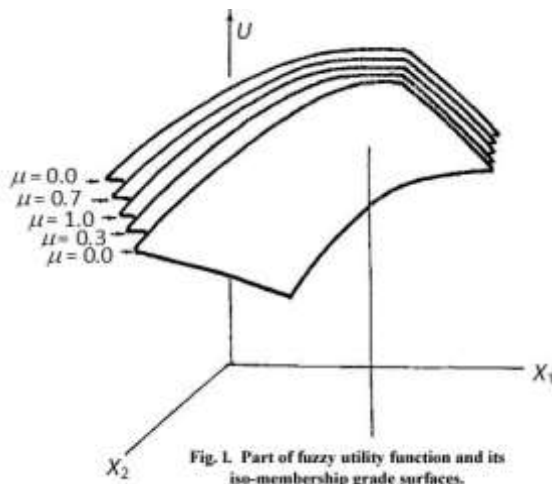
Proof : This theorem is apparent directly from the definition of convexity of fuzzy set. Several examples of iso-membership grade surfaces (here reduced to lines) for convex and normalized fuzzy utility indicators are shown in Figure 2(a). Figure 2(b) shows a case where one of the fuzzy utility indicators, M_1, is non-convex, and Figure 2(c) shows another case where one of them, M_2, is non-normalized. These cases lead to the existence of intersections between the iso-membership grade surfaces and/or the lack of connectiveness.

The lack of an intersection between the iso-membership grade surfaces in fuzzy utility relation further leads to the lack of intersections among the contours of α-cut in the fuzzy indifference set.

If the marginal utilities of every iso-membership grade surface of a fuzzy utility relation is diminishing, i.e., $\partial^2 f / \partial^2 x_i > 0$, then every contour of the α-cut of indifference set is concave in Figure 3. While diminishing marginal utilities or diminishing marginal rate of substitutions implies concavity of the indifference curve, diminishing marginal utility here implies convexity of iso-membership grade surface of a fuzzy utility relation. Figure 4 is used for the explanation of diminishing marginal rate of substitutions. Note that following the increase of x_1, the same increment Δ_{x_1} corresponds to a smaller increment Δ_{x_2}.
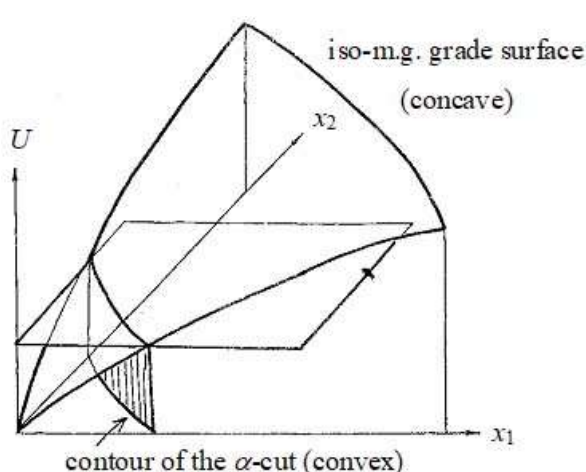

Fig. 3. Iso-membership grade surface and contour of the α-cut of an indifference set.
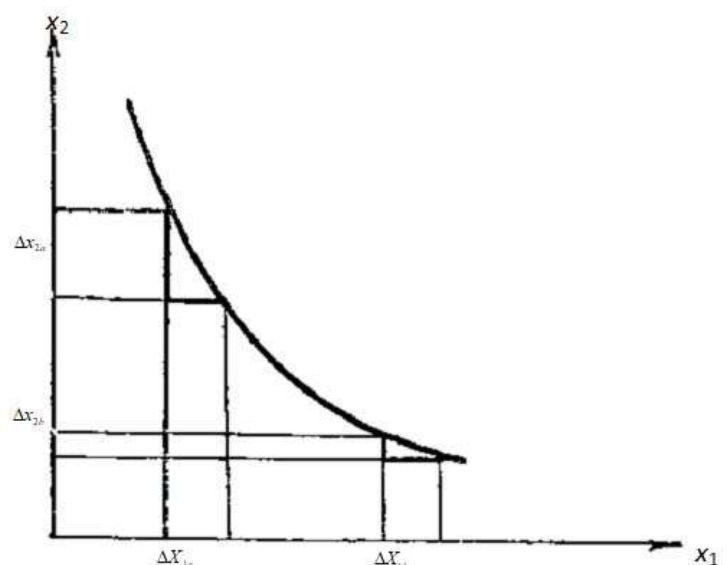

Fig. 4. Diminishing marginal rate of substitution.

Theorem 2: If every fuzzy utility indicator of a fuzzy utili ⟨...⟩ g marginal utilitie for every iso-membership grade surface of R_f then the weak M- preference set R_M, the weak u-preference set R_u

and the weak β-preference set R_β are all convex.

Proof : Since R_u and R_β are special cases of R_M, it suffices to prove the convexity of R_M. We delineate the procedure of constructing the weak preference set R_M first. According to Proposition 3, for obtaining the weak preference set, all we have to do is to make the composition operation between $1(M)$ and R_f^{-1}. The operations include the cylindrical extension operation of $1(M)$, the intersection operation between $l(M)$ and R_f^{-1} and the projection operation of intersection set to commodity space X.

In Fig. 5, we construct the section labelled F of a fuzzy utility relation R_f^{-1} in any plane vertical to X_2. Cutting F by a line with equal utility level u, we obtain fuzzy set A on X_l. We assume that $u_1 \in l(M)$ and its membership grade is $\mu_{1(M)}(u_1)$. The intersection of $\mu_A(x_l)$ and $\mu_{1(M)}(u_1)$ is a fuzzy set A'. We taking the union of all A' for all u_1 in the support set of $1(M)$, we obtain all commodity bundles and their membership function values of the weak preference set below this vertical plane. Repeating this process for all $x_2 \in X_2$ we get the entire weak preference set.

Now, let us focus our attention on point a. For $\forall x \mid x \ge a$, we can always find an $u_2 > u_1$, for which
$$\mu_{R_f}^{-1}(x, u_2)(x) = 1$$

Due to the convexity property of $1(M)$, we have $\mu_{1(M)}(u_2) > \mu_{1(M)}(u_1)$. Thus
$$\mu_{1(M)}(u_2) \vee \mu_{R_f}^{-1}(x, u_2)(x) = \mu_{1(M)}(u_2) \ge \mu_{1(M)}(u_1) \ge \mu_A(x).$$

It means that we can always find a fuzzy set B' which is the component of weak preference set and which covers one specific point in the lagging edge of A'. The union operation in the process of constructing weak preference set will delete this specific point in A'. The lagging edge of A' is a part of the lagging edge of A. Another part of the lagging edge of A has already lost its effect when the intersection operation between A and $\mu_{1(M)}(u_1)$ was performed. Thus, the entire lagging edge of fuzzy set A fails to make any contribution to the construction of the weak preference set.

Since this is true for every u, the membership grade of all the points in the consumption space under the surface in which the membership grade equals to 1 may be replaced by 1 without affecting the evaluation of the weak preference set.

Fig. 5. The procedure of constructing the weak preference set.

From this replacement, we obtain a new F_f^{-1} denoted by R_f^{-1}. It is convex if every utility indicator of the determinate commodity bundle is convex and the marginal utility of every iso-membership surface of fuzzy utility function is diminishing.

Suppose that $l(M)$ is assumed to be convex. Since the intersection of two convex fuzzy sets is convex, and the project of a convex fuzzy set is also convex.
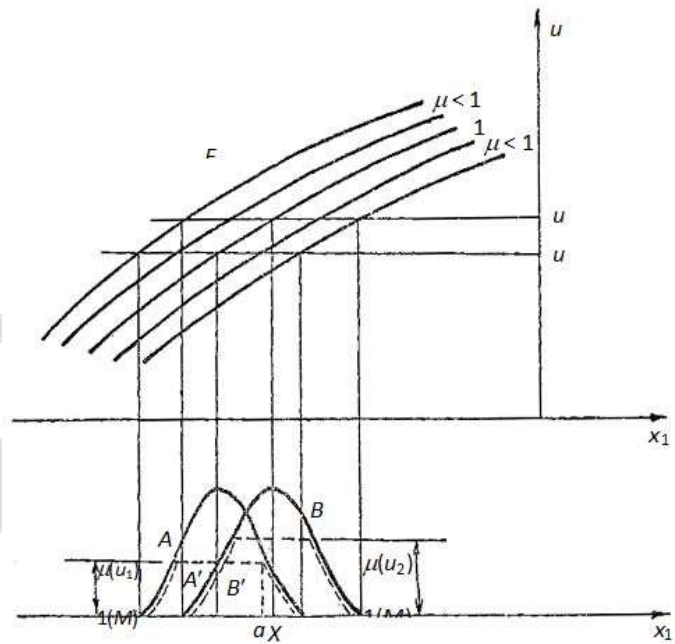
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AGRICULTURE DEVELOPMENT IN INDIA AND ITS EXPORTS AND POTENTIAL OF BIHAR

Arbind Kumar

Research Scholar,

Department of Commerce,

B.R.A.Bihar University, Muzaffarpur.

Abstract : Agriculture has been a way of life and continues to be the single most important livelihood of the masses. Agricultural policy focus in India across decades has been on self-sufficiency and self-reliance in foodgrains production. Considerable progress has been made on this front. Foodgrains production rose from 52 million tonnes in 1951-52 to 244.78 million tonnes in 2010-11. Indian agriculture has greatly contributed to foreign trade even in its traditional form Indian Agricultural products have been facing stiff competition from Asian countries for quite some times. Due to globalization and liberalisede regime, this competition is likely to increase further and new initiatives in agriculture development shall have to meet the emerging challenges. The performance of agriculture after integration with the world markets is linked to the success of exports. In its bid to increase overall exports, the government of India has decided to achieve this objective by giving a push to production and export of agricultural commodities. Agriculture has been a source of foreign exchange for India in the past. Most of the export earnings of agriculture came from the conventional items such as tea, cashew and spices.

Keywords : Agriculture, Asian countries, agriculture development, world markets.

I. INTRODUCTION

Agriculture plays a multifunctional role. Every 1% rise in agricultural productivity cuts poverty by 0.6%. World agricultural exports totaled US$ 494 bn in 2002 – 5.1% increase over 2001 and constituted a share of 7.4% in the global merchandise trade. Exports of processed agricultural products expanded faster than those of semi-processed and unprocessed agricultural products between 1990 and 2002 from US$ 150 bn to US$ 238bn. The share of processed product showed a clear upward trend throughout the 1990, rising from 41% in 1990 to 48% of global agricultural trade in 2002. According to World Bank simulations, reduction of trade barriers in agriculture world yield real income gains of US$ 358 bn in 201.5. Almost 70% of these gains would be reaped by developing countries. Globally, merchandise trade is projected to increase by about 10% (more than US$800bn), but exports from developing countries would rise by 20 % (nearly US$ 540bn). The largest percentage increase in trade (nearly 50%) would occur in processed foods while agricultural trade is expected trade rise by 32%.

Agriculture contributes more than one-fifth to India's GDP and provides livelihood support to about two-thirds of the population. India is the largest food grain producer in the world, second in production of fruits and vegetables. Export of agri-products from the country increased from US$ 3.3 bn in 1990-91 to US$ 7.4 bn in 2003-04. India's major agri-exports include rice, oil meals, wheat, cashew, tea and spices. The share of India's top 10 agri exports markets increased from 53% in 2001-02 to 56% in 2003-04, thereby indicating an increased concentration of markets. India is a marginal player in the global market when it come to agri exports, although its share in world agri exports at a little over 1% is better than its share in total world exports at less than 0.8%. Export orientation of the agriculture sector is one of the prime requirements for its success in global trade. This is sustained when complemented with sizeable processing industry and strong internal market. Value addition in India is low at 7% as against 23% in China. Further, the share of processed agri products in India's total agri exports increased only marginally from 18% to 19%

during the period between 1990-91 and 2001-02 as against the global share of 48% in 2002. There are certain emerging agri products that bold good potential as export products. These inter alia, include stevia plant, vanilla jatropha, scabuckthom and passion fruit.

II. AIMS AND OBJECTIVE:

Bihar is a major producer of fruits and vegetables (8.5% and 10.5% of India's total production, respectively). Analysis reveals that Bihar has potential for exports in lychee, guava, mango, banana, makhana. The state produces 73% of India's lychee with only 47% of total area coverage of the country, with higher concentration of production in Muzaffrpur and Vaishali. Considering that fruit exports from Bihar have to revolve around lychee, the focus of exports in terms of area should be these two districts. In case of other fruits, Bhagalpur has higher concentration in mango, East Champaran guava and lemon and Purnea in pineapple. The Government of Bihar has notified setting up of an Agri Export Zone focusing on lychee. Due to high levels of productivity in Bihar focus of the AEZ could be widened to include other important fruits and vegetables. Further, coverage of the AEZ could be expanded to include Patna, considering the importance of developing necessary handling facilities for swift movement of produce to the export markets. To enhance export orientation of mango and pineapple, a separate AEZ could be set up covering the districts of Bhagalpur and Purnea, In light of the fact that global demand of major tropical fruits (mangoes, 4.35% pineapple, papaya and avocados) is projected to grow at an annual average of 3% to 4.5%, exports of tropical fruits from Bihar holds immense potential.

III. CONCLUSION

Outward orientation would help farmers get benefits that in turn would encourage investment in the resource scarce agricultural sector. A five-pronged export strategy needsa to be adopted, viz,, product diversification into high value added products, market diversification, market promotion and development, value addition in the form of processed foods, and agri infrastructure up-gradation. Farmers also need to be given risk protection across various aspects like market risk protection and production risk protection.

Exim Bank is the apex institution responsible for financing, facilitation and promoting Indi's international trade. The Bank offers a wide range of lending programmes, tailored to meet the needs of different customer groups. In recent years, recognizing the tremendous export potential that India's agri sector holds, Exim Bank has increasingly been focusing its activities towards this sector. Accordingly, agri and allied sector has been identified as thrust sector in Exim Bank's medium term business strategy. Besides putting in place an 'Agri Business Group' which focuses on the agri sector, the Bank brings out a bimonthly newsletter titled 'Agri Export Advantage' in English, Hindi and ten regional languages. To augment its initiatives, Exim Bank has also set up an agri-portal, which is as IT initiative to promote knowledge-based agriculture enterprise. To establish a formal and operational frame work of co-operation in developing the food processing industry in country, Exim Bank has a Memorandum of Understanding with Ministry of Food Processing Industries. The Bank also has a tripartite MOU with NABABD and APEDA for synergizing efforts of these organizations to leverage their respective strengths with a view to augmenting agricultural exports from India.

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Calotropis procera : Larvicidal Effect against *Culex quinquefasciatus*

Dr.Krishna Mishra

SPC Government College Ajmer.

ABSTRACT

In present studty larvicidal activities of leaf extract of *Calotropis procera* against *Culex quinquefasciatus* investigated.This was monitored against 2nd ,3rd and 4th instar larvae of the mosquitoes species 24h post- treatment.the results shows that the leaf extract of *C.propera* possess remarkable larvicidal effect against *Cx. Quinquefasciatus* and might be used as natural biocides for mosquito control.

INTRODUCTION

The transmission of most important vector-borne diseases like malaria, lymphatic filariasis, Japanese encephalitis, and dengue as well as yellow fever and other forms of encephalitis is done by mosquitoes (WHO, 2006a). Malaria and filariasis rank amongst the world most prevalent tropical infectious diseases. According to the latest available data, about 3 .2 billion people were at risk of the disease in 97 countries, territories and areas in 2013, and an estimated 198 million cases occurred (range: 124 million–283 million) . In the same year, the disease killed about 584 000 people (range: 367 000–755 000), mostly children aged under 5 years in sub-Saharan Africa(WHO 2015) Lymphatic filariasis impairs the lymphatic system and can lead to the abnormal enlargement of body parts, causing pain, severe disability and social stigma. 893 million people in 49 countries worldwide remain threatened by lymphatic filariasis and require preventive chemotherapy to stop the spread of this parasitic infection. In 2010 over 500 million people were infected, with about 60 million disfigured and incapacitated by the disease. Lymphatic filariasis is a significant public health and economic problem in many tropical and subtropical regions of the world, including Sudan, (El setouhy and Ramzy, 2003) and (Aiah et al., 2005). One of the effective methods to control these diseases is to target the vectors for the interrupting disease transmission. The control effort can target all stages of the mosquito life cycle, but has focused almost on adult stage by using conventional insecticides based on indoor residual house spraying (Manzava et al., 1993) and (Curtis, 1994) or more recently, the use of insecticide treated bed nets or curtains. The control of mosquito at the larval stage is necessary and efficient in integrated mosquitos' management. During the immature stage, mosquitoes are relatively immobile; remaining more concentrated than they are in the adult stage (Rutledge et al., 2003). Larval control strategies against malaria vectors in sub-Saharan Africa could be highly effective, complementary to adult control interventions, and should be prioritized for further development, evaluation and implementation as an integral part of rolling back malaria (Killeen et al., 2002). Since the discovery of DDT, mosquito control approach has been almost completely based on synthetic organic insecticides, but the extensive use of synthetic organic insecticides resulted in environmental pollution and also in the development of physiological resistance in major vector species in addition to the increased costs of insecticides. This has necessitated the need for search and development of environmentally safer, low cost, indigenous methods for vector control. During the last decade, various studies on natural plant products against mosquito vectors indicate them as possible alternatives to synthetic chemical insecticides (Mittal and Subbarao, 2003), (Rajkumar and Jebanesan, 2005a), (Rajkumar and Jebanesan, 2005b) and (Promsiri et al., 2006). In addition to application as general toxicant against mosquito larvae, botanical insecticides also have potential uses as growth and reproduction inhibitors, repellents, ovicidal and oviposition deterrents (Prajapati et al., 2005), (Rajkumar and Jebanesan, 2005a), (Rajkumar and and Jebanesan, 2005b) and (Pushpanathan et al., 2006).

Calotropis procera R. Br. (Asclepiadaceae) is a plant widely distributed in tropical and subtropical regions of Africa and Asia with a long history of use in traditional medicine. A wide range of chemical compounds including cardiac glycosides, flavonoids, phenolic compounds, terpenoides have been isolated from this species (Mueen Ahmed et al., 2005). The bioactive constituents of these plants could be either a single substance or a mixture of substances. The separation of the mixture is neither practical nor advantageous in the insect economic control strategies. The aim of the current study is to investigate the activity of aqueous leaves extract of *C. procera* against the larval stages of *Culex quinquefasciatus*, the vector of filariasis (WHO, 2006a).

The larvicidal activity was monitored against 2nd, 3rd and 4th instar larvae 24h post-treatment.

It was found that, LC50-LC90 values calculated were 273.53 783.43, 366.44-1018.59 and 454.99–1224.62 ppm for 2nd, 3rd and 4th larval instars, respectively.. These results suggest that the Leave extract of *C. procera* possess remarkable larvicidal effect against *Cx. quinquefasciatus,* and might be used as natural biocides for mosquito control.

MATERIAL AND METHODS

Area of study, Pali is situated on the bank of river Bandi and is around 70 km south east of jodhpur. The city lies between 25° 77', N. latitude and 73°33´, E. longitude. Pali is the industrial dyeing and printing hub of Rajasthan state.

COLLECTION AND REARING OF MOSQUITOES

Larvae of the mosquito were collected from breeding sites within the study area, and reared under laboratory condition at 25-28 °C. The larvae were fed by adding finely ground powdered yeast on the surface of the water. Water was changed every day to avoid scum formation; which might create toxicity.

EXTRACTION OF PHYTOCHEMICALS USING DIFFERENT SOLVENTS

Leaves of the plant C. procera were collected, washed thoroughly in water, air dried in shade and powdered using a pulverizer and stored in plastic containers. The powdered material was weighed and extracted in crude methanol (40-60 %) as solvent in the ratio of 1:10 w/v using Soxhlet apparatus at 55°C. The crude methanol extract was filtered through a funnel using glass filter and evaporated using a rotary evaporator. The residue was re-dissolved in methanol and defatted in equal volume of petroleum ether in a separating funnel. The fractions were separated, dried in a rotary evaporator. The methanol fraction was further dissolved in ethyl acetate and insoluble derbies were removed by filtration. Water soluble materials from the ethyl acetate fraction were removed in a separating funnel using double distilled water. The fractions were collected separately and dried. Yields in relation to the initial weight of the powder of the different fractions were determined. One percent stock solutions of all the fractions in methanol were prepared from the residues obtained at each stage of the purification process and the fractions were tested at different concentrations.

PREPARATION OF EXTRACT

Leaves of the plant C. procera , (Family: Ascelpiadaceae), were collected from plants within the study area, during the flowering season, dried under shade and finely ground to powder. Five grams from leaves powder was soaked in separate bottle (500 ml) containing 250 ml distilled water. The solution was allowed to stand for 24 h with vigorous occasional shaking, the suspension was filtered with filter paper. The marc was washed several times with distilled water and filtered. The final volume was adjusted to 500 ml by adding distilled water to prepare stock solution of 1%. The stock solution was then serially diluted by add water to prepare the test concentrations required.

LARVICIDAL ACTIVITIES

Larvicidal activities of the extract were determined by following the WHO standard procedure (WHO, 2005b). Initially, mosquito larvae were exposed to a wide range of test concentrations and a control to find out the activity range of the aqueous extract of plant under test. After determining the mortality of larvae in this wide range of concentrations, a narrower range of 5-6 concentrations was used, to determine the lethal concentration of 50% (LC50) and the lethal concentration of 90% (LC90) values. Twenty-five laboratory reared 2nd, 3rd and 4th instars larvae of each mosquito species were transferred by means of dropper to the small test cups (250 ml), each containing 100 ml of de-chlorinated tap Water to which the required concentration were added. Four replicates were setup for each test concentration. In each replicate 25 larvae larvae were used, with four replicate of control. The experiment was performed under laboratory conditions at 25-28 °C.
Mortality in larvae was recorded 24 h post Treatment. If more than 10% of the control larvae pupate in the course of the experiment, the test is discarded and repeated. If the control mortality is between 5% and 20%, the mortalities of treated groups should be corrected according to Abbott (1925) formula.

RESULTS

The aqueous leaf extract of *C. procera* showed high level of toxicity against the larvae of mosquitoes *Cx. quinquefasciatus.* The results are presented in Table 1 . The 50% mortality (LC50 values) was shown at 187.93, 218.27 and 264.85 ppm for 2nd, 3rd and 4th instar larvae of *Cx. quinquefasciatus.*

Table

Larvicidal activity of leaves extract of C.*procera* against
2nd ,3rd and 4th instar larvae of *Cx. quinquefasciatus*

Mosquito Species	Larval instar	LC50 (ppm)	LC90 (ppm)	Regression equation	FL with 95%CL	r^2
Cx. quinquefasciatus	2nd	187.93	433.51	Y = 3.528X — 3.24	+2.372	O.973
	3rd	218.27	538.27	Y = 3.261X — 2.626	+2.675	O.984
	4th	264.85	769.13	Y = 2.77X — 1.713	+2.675	0.996

The LC90 values (90% mortality) were shown at 433.51, 538.27 and 769.13 ppm for 2nd, 3rd and 4th instar larvae, respectively of *Cx. quinquefasciatus.* From LC90 values it was evident that 2nd instars were more susceptible than 3rd instar and the later was more susceptible than 4th instar. Also the two species of selected mosquito larvae showed different susceptibility to the leaf extract of *C. procera. Cx. quinquefasciatus* was found more susceptible.

DISCUSSION

In this study it was observed that leave extract of *C. procera* has showed larvicidal activity against the mosquitoes *Cx. quinquefasciatus* The biological activity of this plant extract may be due to various compounds, including phenolics, terpenoides, flavonoids and alkaloids existing in plant, these compounds may jointly or independently contribute to produce larvicidal activity against mosquitoes. The obtained results agree with some previous studies. One plant species may possess substances with a wide range of activities, e.g. Neem (*Azadirachta indica*) products showed antifeedant, oviposition deterrence, repellency, growth disruption, sterility and larviedal action against insects ((Schmutterer, 1990) and Mulla and Su, 1999). The leaf extract of five species of Cucurbitaceous plants, *Momordica charnia, Trichosanthes anguina, Luffa acutangula, Benincasa cerifera and Crithis vulgaris* showed larvicidal activity " LC50 of 465.85, 567.81, 839.8I, 1189 30 and 1636.04 ppm, respectively after 24 h treatment) against the 3rd instar larvae of *Cx. quinquefasciatus* (Prabakar and Jebanesan, 2004). The leaf extract of *Pavonia zeylanica* and *Acacia ferruginea* showed larval mortality at LC50 of 2214.7 and 5362.6 ppm, respectively against the third larval instar of *Cx. quinquefasciatus* after 24 h treatment (Vahitha et al. 2002), also the results agree with the finding of Pushpanathan et al. (2006) who had reported that 2nd instar larvae of *Cx. Quinquefasciatus* was more susceptible than 3rd instar and the later more susceptible than 4th instar larvae to the essential oils extracted from *Cymbopogan citratus* plant, with 1090 1890 of 54-284.27 ppm, 165.70-31848 ppm and 184.18-35901 ppm for 2nd, 3rd and 4th larval instar, respectively. Also it was fond that *Cr. quinquefasciatus* was more susceptible to the Stem extract of *C. procera*. The varying susceptibility of the species of mosquitoes is probably due to differences in the physiological characteristics of mosquito. This agree with (Thekkevilayil et al., 2004) who had reported that the four mosquitoes *Cx tritaeniorhynchus*, *Aedes aegypti* and *C. quinquefasciatus* larvae showed different susceptibility to the oils extract of Ipomoea cairica Linn., higher concentration was required for *Cx. quinquefasciatus* followed by *Aedes. aegypti*, *Anopheles stphensi* and lower concentration for *Culex tritaeniorhynchus*, with the LC50-LC90 of 58.9-1616 ppm for *Cx. quinquefasciatus*, 22.3-92.7 ppm for *Ae. aegypti*, 14.9-109.9 ppm for *Anopheles stphensi*, and 14.8-78.3 ppm for *Culex tritaeniorhynchus*. The leaf extract of *C. procera* did not show any pupal mortality till higher concentration of (5000 ppm) against the two species of mosquitoes, suggesting that the effects of the extract on the pupal Stage appear after more than 24h exposure.

The whole latex of *C. procera* was shown to cause 100% mortality of 3rd instar larvae of *Ae, aegypti* within five minutes, and most of individual growing under experimental conditions died before reaching 2nd instars or stayed in 1st instars (Marcio et al., 2006). The effect of alkaloid extracts of *C. procera* leaves at the vegetative stageon the survival of 5th instar larvae and on ovarian growth of
Shistocerca gregaria have revealed that a mortality rate of 100% was reached in the hoppers on the 15th day after the beginning of the treatment. In the adult the arrest of ovarian growth in females and the absence of sexual maturity in males have been observed (Abbassi et al., 2004). In laboratory the leaf extract of *Solanum trilobatum* greatly reduced the number of eggs laid by gravid *Anopheles stephensi* at several concentrations. At the highest concentrations (1-

0,075%) the extract reduced eggs laying by 90 99%. Lower concentrations (0.01%) also had deterrent activity of 18.4% (Rajkumar and Jebanesan, 2005b). These findings prove that, mosquitoes are known to perceive visual, thermal and olfactory stimuli which enable them to detect light source, odour and several other volatile chemicals emanating from the skin, breath and waste products of their hosts (Takken, 1991) and (Davis and Bowen, 1994).

In conclusion, leave extract of *C. procera* can be suggested as a natural larvicidal for controlling mosquitoes in Rajasthan, Since it is considered environmentally safe, less expensive and economical, a well as practical in application with minimum care by individual and communities.

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Ref No : JETIR / Vol 4 / Issue 9 / 094

Confirmation Letter

To,
Sandhya Kumari
Published in   : Volume 4 | Issue 9 | 2017-09-12

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Impact Factor	: 7.95 (Calculate by Google Scholar)
DOI	: http://doi.one/10.1729/Journal.27727
Published in	: Volume 4	Issue 9	2017-09-12
Publication Date:	2017-09-12
Page No	: 653-656
Published URL	: http://www.jetir.org/view?paper=JETIR1709094
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