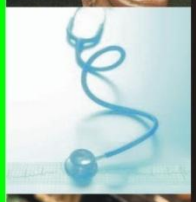
ISBN: 978-81-909047-9-7, p-ISSN:2249-2569, e-ISSN:2320-2955

"THE MAGMA"
DIGITAL EDITION

INTERNATIONAL RESEARCH JOURNAL OF HUMANITIES, ENGINEERING & PHARMACEUTICAL SCIENCES

(An International Registered Research Journal)

www.ijheps.org



1.963
IMPACT FACTOR

सर्वे भवन्तुः सुखिनः

"THINK BEYOND TO CREATE MIRACLES"

Promoted By: Association for Innovation, INDIA

(Under the Society Registration Act, 1860, a govt. registered organization with registration no. 2241)

"THE MAGMA EDITION"

IJHEPS/JUNE 2014

TABLE OF CONTENT

ARTICLE	TITLE/AUTHOR	CATEGORY
1	AN INNOVATIVE TECHNOLOGY FOR DETEVTION OF LEAKAGE IN PIPELINE CARRYING PETROLEUM & WATER	EN
2	HAND GESTURE BASED INTELLIGENT WHEELCHAIR WITH IMAGE SEGMENTATION AND SMOOTHENING TECHNIQUE	EN
3	GROWTH OF POWER GRID IN INDIA	EN
4	A CONCISE REVIEW ON TRANSUNGUAL: A NOVEL DRUG DELIVERY STRATEGRY ACROSS NAILS	PH
5	ROLE OF TOTAL PROTEIN IN PETAL SENESCENCE OF CHRYSANTHEMUM CORONARIUM L. UNCUT FLOWER PETALS	PH
6	ANTIBACTERIAL ACTIVITY OF DIFFERENT SOLVENT EXTRACTS OF GANDDERMA SINENSE AGAINST DIFFERENT BACTRIAL STRAINS	PH
7	DEVELOPMENT AND EVALUATION OF ANTIMICROBIAL HERBAL GEL FORMULATION OF JATROPHA CURCAS LINN. LEAVES	PH
8	A REVIEW ON PELLETS AS DRUG DELIVERY SYSTEM	PH
9	TRACHEIDS IN BULBS OF URGIENA INDICA KUNTH	PH
10	SCREENING, COMPARATIVE ANALYSIS AND EVALUATION OF IN VITRO IN VIVO PRODUCE MENTHA ARVENSIS L.	PH
11	THE ANALYSIS OF MUNICIPAL SERVICES ACCORDING TO URBAN LAND VALUE ADDED TAX IN IRAN (CASE STUDY: BABOL CITY)	HU
12	FISH DIVERSITY AND ANTHROPOGENIC STRESS ON GELA BEEL IN GOLAGHAT DISTRIC, ASSAM	HU
13	TENDENCY OF CRIME AMONG ADOLESCENTS AND ROLE OF SCHOOLS FOR ITS CONTROL	HU
14	SOCIO-ECONOMIC PROFILE OF DISPLACED AND LANDLESS POPULATION IN WEST BENGAL : A CASE STUDY	HU
15	IMBALANCE AND THEIR PLANING OF HEALTH CARE FACILITIES WITH THE HELP OF G.I.S. IN TRIBAL AREA OF WSTERN SATPURA MOUNTAIN, INDIA	HU
16	NEWS AS COMPROMISE- THE INDIAN NEWS MEDIA AND THE EVOLVING TREND OF PAID NEWS	HU
17	ECONOMIC ANALYSIS OF MILCH ANIMALS (COW & BUFFALO) IN DISTRIC ETAWAH INDIA	HU
18	THE ECONOMIC IMPACT OF COLONIAL RULE IN INDIA	HU
19	IMPACT OF SPORT PARTICIPATION ON ADAPTABILITY AND BOLONESS AMONG SPORTS PERSON AND NON SPORT PERSON	HU
20	A STUDY OF IMPACT OF PARANT-CHILD RELATIONSHIP ON SOCIAL MATURITY OF THE STUDENT OF HIGHER SECONDARY SCHOOLS OF DURG DISTRIC	HU
21	HUMAN RIGHTS AWARENESS AMONG SECONDARY SHOOL TEACHERS: AN INVESTIGATION	HU
22	EFFECT OF SELECTED EXERCISE PROGRAMME ON SYSTOLIC AND DIADTOLIC BLOOD PRESSURE OF OLD CITIZENS	HU
23	GENDER BASED ASPECTS OF PRINT ADVERTISING	HU
24	CLIMATE CHANGES- CAUSE, EFFECT AND MITIGATION MANAGEMENT STRATEGIES	HU
25	CHANGING SOCIALIST VALUE AND THE CONCEPT OF PERSONAL PARADISE: A STUDY OF ARNOLD WEAKER'S I'M TALKING ABOUT JERUSALEM	HU
26	BIOMECHANICAL ANALYSIS OF KICKING WITH INSTEP IN SOCCER	HU
27	GEOGRAPHICAL ANALYSIS OF TOURIST TRAVEL CIRCUITS IN KARANATAKA	HU
28	MGNREGP: ISSUE & PROSPECTS	HU
29	DEVELOPMENT AND PROBLEMS OF WINERIES IN NASHIK DISTRICT, MAHARASTRA	HU

ARTICLE

1

AN INNOVATIVE TECHNOLOGY FOR DETECTION OF LEAKAGE IN PIPELINE CARRYING PETROLEUM & WATER

Anupam Das
Department of Electronics & Instrumentation Engineering,
NIT, Agartala, INDIA

Abstract:
Detection of leakage has become increasingly critical part to the safe and reliable delivery of petroleum product worldwide. The most important part of the petroleum distribution system is the million miles long pipeline system spreaded throughout the world. With passage of time most of the petroleum distribution companies are finding that their pipelines are aging at a faster rate than they can be surveyed and repaired. The reason behind this is that the traditional flame-ionization leak-detection process is hard to keep pace with increasing demand for more frequent, accurate, and efficient surveys and repairs.

Introduction

Petroleum consumption is expected to increase by 50% within the next 25 years through over the world & at the same time; the infrastructure related to transmission of petroleum is rapidly aging. The largest component of the petroleum infrastructure is the thousand miles long delivery pipelines. So the reliable and timely detection of failure of any part of the pipeline is critical to ensure the safety of the petroleum infrastructure.

This report brings in view the current status of the technology for leakage detection of petroleum from pipelines through Ariel surveillance as leakage detection and location is one of the biggest concerns of pipeline operators all over the world. The timely evaluation and response to a leak, allows proper management of the consequences and an effective risk minimization, eventually resulting in huge amount of profit. In present there are many techniques of detection of petro leakage starting from direct human interface, satellite imaging, CCTV cameras etc. But these methods are very much costly. It is not possible for maintenance personals to walk around the whole distance of pipeline for surveillance. The satellite imaging system needs a lot of infrastructure which means a huge amount of investment & the CCTV cameras itself needs a lot of maintenance. But the aerial thermal imaging survey technique is very much helpful for surveying of the pipelines & its efficient, reliable & cost effective. As the surveying is going to be done from air with the help of gliders or light aircrafts so there is no risk of direct interference of the maintenance personals with the petro products, & it would take a lot less time. Much more surveying can also be done which would guarantee more safety. The main thing about the aerial thermal imaging technique is that it is very much accurate.

Methodology

Use of ultra-violet, near and long wave infra-red through aerial thermal imaging for leak detection is one of the techniques that has been tested with varying degrees of success. So called Modern thermal imaging equipment shows a new direction for leakage detection as modern day technology provides much higher spatial and thermal resolution. Modern computer science & its applications also contribute to more sophisticated post processing and analyzing the data.

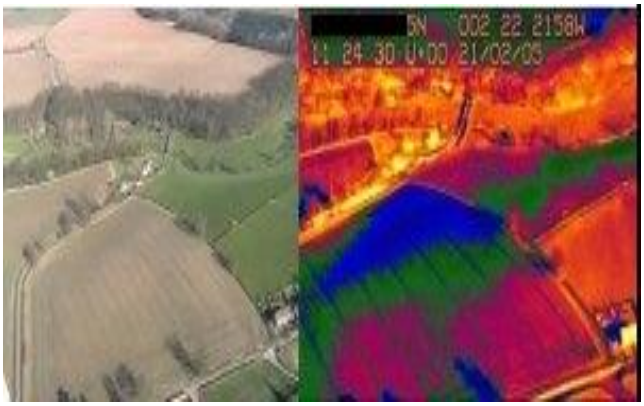
Taking the example of water that saturates surrounding the earth around a leaking pipe will in some cases provide a healthy temperature difference with respect to the surrounding dry earth. The contrast of temperature on a hot day will be greater. On such ideal conditions a highly specialized thermal imager will record the data that can in these circumstances be up to 2°C above or below ambient. On the other hand when dry ground temperature is near equilibrium with standing water and moist earth, new water ingress discrimination can be subtle especially from a long-range aerial perspective.

The recorded data is in monochrome because of higher resolution than pseudo colour. The human eye will only discriminate up to 30 grey tones (temperatures) in comparison to a computer which can discriminate 356. The images can be colorized if desirable for a specific application.

Thermal image below, showing a leak (blue/green) from a pipeline.

Fig 1.

Fig 2



Picture showing Thermal Image and the perspective of the same through naked eye.

Here Blue is the leak of high density water around the pipe .

Temperatures (colours) indicate a variation in density which is in relation with the colder water leaking out of the from the damaged pipe. The ‘density is slicing’ and characteristic shape of water leakage really helps in identifying the real seepage of water from normal or natural stagnant water.

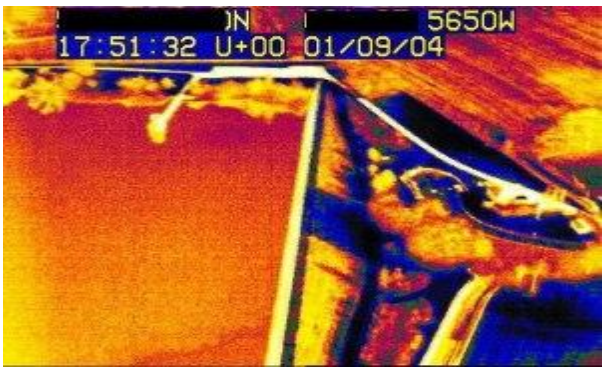
The ambient temperature variations are quicker in case of dry earth if we compare it with moist and wet areas. Evaporation at the surface lowers the surface temperature. This image is used to deeply illustrate how the temperature of saturated earth can vary differently to surrounding conditions.

Thermo graphic surveillance done through aerial mood of both surface reservoir banks and sub-surface reservoirs can show differences associated with leakage in fluid. The aerial point of view will provide an total view of the extent and path of a leakage of the fluid.

Fig 3.

Thermal Image of a underground reservoir showing high density moisture in one side

Fig 4.



The Thermal Image showing the Surface reservoir water path and collection that was invisible to naked eye.

Infrared equipment can scan the reservoir in a short time providing a clear picture of temperatures regarding the leaks from banks and dams. The collection of water in down the hill from a reservoir can be from a leak and not always linked with a ground perspective. Experience gained through many years of research in various types of pipeline surveying local areas are also scanned as part of the whole investigation..

Observations

Detection of difference in radiant energy emitted from the surface observed down to the equivalent of 0.17°C at constant high emissivity or with a temperature which remains unchanged to the equivalent of 0.004 emissivity variation by means of high resolution thermal imaging camera is very much possible a it gives a solution to accurate & reliable surveillance of pipelines.

So we can come to a conclusion that pipeline trenches can now even be detected to less than 1 metre as randomly colder or warmer than the surroundings – even though the pipelines has been under earth for many years. This aerial thermal imaging system used for surveillance of rural (green top) has been able to identify 72% of pipelines entranced below earth . Even this system has corrected clients’ inaccurate maps by finding the exact location of the

pipeline. Discontinuities associated can be noticed for example inspection hatches, washout chambers, cattle troughs, etc, if, these thing s are at the surface or above the detectable difference of minimum value (in °C or emissivity).

Conclusion

Petroleum companies should create a planned roadmap to address high-risk areas & should implement the modern techniques & methods for surveillance of pipelines to ensure safety . Further, they should be able to measure quantitative improvements in the pipeline system to ensure that the proper working of them.

Taking a overall view, it is being believed that the aerial thermal image surveillance method will speed up the leak-survey cycle, enabling petroleum companies or agencies to more frequently survey their pipeline systems to find and repair leaks, which will result in better asset condition information for pipeline integrity management and maintenance. Above all, the next-generation leak-detection technology will enable petroleum utilities to meet the increasing demand for petro products while setting better trade mark for public & property safety.

References

1. American Water Works Association (AWWA) Water Loss Control Committee Applying worldwide BMPs in water loss control.. J. Am. Water Works Assoc., 95(8), 65-79. (2003).
2. Cheong, L.C. Unaccounted for water and the economics of leak detection. Proceedings of the 18th International Water Supply Congress and Exhibition, 15-31 May 1991, Copenhagen, published in *Water Supply,* 9:3&4:IR1.1, (1991).
3. Environment Canada. (2006). http://www.ec.gc.ca/water/en/info/facts/e_intro.htm
4. Franklin G., Powell D., and Workman M., Digital Control of Dynamic Systems, Addison Wesley Publishing, (1990).
5. Hargesheimer E. E., .Identifying Water Main Leaks With Trihalomethane Tracers. American Water Works Association Journal. Vol 77, Pg 71-75. November (1985)
6. Geiger G, Werner T. Leak detection and location—a survey, in: PSIG Annual Meeting, Bern
7. Anderson, R., and Driscoll, D., 2000, “Pathways for Enhanced Integrity, Reliability and Deliverability,” *Report prepared for the U.S. Department of Energy*, Report No. DOE/NETL-2000/1130 (2000).
8. Klein W. R., 1993, “Acoustic leak detection”, *American Society of Mechanical Engineers, Petroleum Division*, 1993, vol.55, pp. 57-61
9. Kulp, T. J., Powers, P. E., and Kennedy, R., 1998, “Remote imaging of controlled gas releases using active and passive infrared imaging systems,” *Proceedings of Infrared Technology and Applications XXIII*, SPIE Vol. 3061, pp. 269-278.
10. Lehmann, F., Oertel, D., Richter, R., Strobl, S., Rothfuß, H., Mueller, A., Hausknecht, P., Tischler, S., Mueller R.,Beran, D., Fries, J., Boehl, R., and Obermeier, P., 1995, "The Digital Airborne Imaging Spectrometer DAIS 7915, Hyperspectral Applications with a New Sensor", *ISSSR*, Proc. CD-ROM , 1995
11. Liddiard, K. C., Ringh, U., and Jansson, C., 1996, “Status of uncooled focal plane detector arrays for smart IRsensors,” *Proceedings of the SPIE*, vol. 2746, pp.72-79.
12. Marinelli, W. J., and Green, B. D., 1995, “Infrared imaging volatile organic carbon field sensor” *Optical RemoteSensing for Environmental and Process Monitoring*,” vol. 55, 245-254
13. Sperl J. L., 1991, “System pinpoints leaks on Point Arguello offshore line”, *Oil and Gas Journal*, September Issue,pp. 47-52.
14.Turner N. C., 1991, “Hardware and software techniques for pipeline integrity and leak detection monitoring”*Proceedings of Offshore Europe 91*, Aberdeen, Scotland.
15. Zhang, J. Q., and Cheng, J. S., 1986, “Determination of the Temperature Profile of Axisymmetric Combustion, GasFlow from Infrared Spectral Measurements,” *Combustion and Flame*, vol. 66, pp. 163-176

THE END

ARTICLE

2

HAND GESTURE RECOGNITION BASED INTELLIGENT WHEELCHAIR WITH IMAGE SEGMENTATION AND SMOOTHENING TECHNIQUE

Bramah Hazela & Samreen Khan
Department of Computer Science & Engineering, Amity University, Lucknow, INDIA

Abstract:

Smart wheelchair is a significant solution for assisting people who are not able to perform their day to day exercises by typical controlled wheelchairs. For this purpose, this paper proposed an application based on communication modes of humans, mainly by vision to develop a man-machine interface. It would be very intuitive if modern wheel chairs have greater use of vision and speech recognition related control. The disabled user can control a wheel chair from the distance and without any physical contact with the computer. Instead of audio commands we have emphasized on visual system. Authors have designed an algorithm using single colour camera on the computer. Authors have applied image processing techniques for refining shape information for getting a robust comparison with a set of predefined real data to recognize the sign indicated by hand gesture. Our technique has given its contribution in developing hand gesture reorganization with higher speed and the process can be utilized to recognize 5 different hand gestures in same backgrounds for five movements of wheelchair.

Introduction

Since hundreds of years physically disabled persons were using manually controlled wheelchairs. With advancement of technology many input methods were added with these chairs such as electronic control, motor drive mechanism instead of hand propulsion and joystick to control directional movements.

Since last few decades innovative researches are going on for development of smart wheelchairs that can provide safer and more comfortable control options to the user. So classical wheel chair changed in to intelligent wheel chair. It has been always desired that while designing a wheelchair, that user must have less effort with least discomfort. But it has been found that the people who are unable to use these devices and have difficulty in proper handling cannot use these new development in wheel chairs. For such kind of situation we are focusing on the approach that can generate control signals from those human activities that require small and natural efforts. Hand gestures are one of the most common mode of non verbal communications used in our daily life in communicating with speech impaired people or controlling the traffic.

Related Work

Recently Concept of Intelligent Wheelchair is being developed with the introduction of new technologies. Nearly 90 Publications were found in the Institute of Electrical and Electronics Engineers Xplore Digital Library related to Intelligent Wheel Chair. Group of Madarasz proposed that intelligent wheelchair can be built using Microprocessors, Ultrasonic Rangefinder, camera and their goal was to develop vehicle which can operate without human muscular intervention in populated environment and without any collision with surrounding objects. Hoyer and Hlper proposed a design with modular control mechanism for omni directional wheel chair. In their work the developed structure takes the benefit of local intelligence of every attached unit to give the best level of independence from other.

Levine et al. describes Nav Chair with useful abilities such as automatic obstacle avoidance algorithm, mechanism of wall following and smooth doorway passing etc.

Miller developed a model named as Tin Man I which was further developed into Tin Man II. Basically the model had three modes of categories: human-guided to avoid obtacles, movement along heading direction and movement to a specific point (x, y). Tin Man was further converted to Tin Man II with new capabilities and controlling mechanism like Wall following, docking, doorway passing, backup, backtracking etc

Maid project is constructed by including some of the capabilities of Tin Man. It is designed to navigate in particularly tiresome and difficult conditions like crowded, narrow, cluttered environment.

Wellman et al. further proposed a hybrid wheelchair. They propose to equip the wheelchair with two legs in addition to the four wheels which a regular wheel chair has. By doing this it will have additional functionality to climb stairs and move over rough ground.

There are proposals for main input for mobile guidance using facial expression for people with tetraplegia. Other controlled wheelchairs are based on user "thoughts." This technology uses sensors that can measure the electromagnetic waves of the brain.
Self-governing, Cooperative, Collaborative Mobile is a model wheelchair that permits handicapped people to move securely in indoor situations A prototype system with simple autonomous, cooperative, and collaborative behaviours. Furthermore, other paramount undertakings present answers for most regular issues confronted by patients with physical wounds, for example, the savvy route framework talked about in this scenario (sensor Aided adroit wheelchair route) .

Although several models have been designed and many approaches have been proposed for intelligent wheelchairs, at this moment no platform enables easy development of low cost intelligent wheelchair. So by introducing new algorithm, traditional wheel chair changes into smart wheelchair by using artificial intelligence in economic condition suitable for each and every type of physically disabled person and aged people.

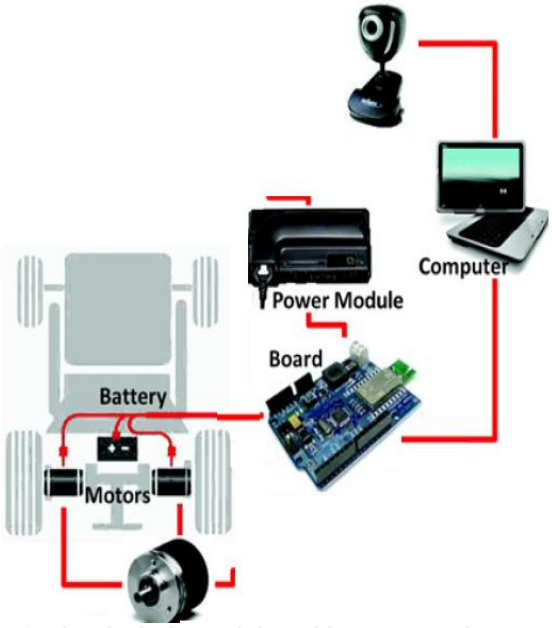


Figure 1:Block Diagram model of Wheel Chair Model working on Hand Gesture Recognition Related Signs.

Proposed Methodology

This work is based on designing and building a man-machine interface utilizing a camcorder to decipher the American gesture based communication letter set. The developed frameworks utilize a shaded Polaroid camera closed to yellow background beside the machine (see Figure 1). The result will be shown on the computer of the camera is displayed on the monitor. The handicapped person is obliged to wear green wrist band and then relate with intelligent machine through palm gesture using single coloured camera system. Information about the hand are accumulated and utilizes the recognition of skin and wrist band color. The form of data is then refined by using spatial information of the hand and wrist band. Our algorithm performs a curvature based hand gesture algorithm recognizing hand gesture using combination of hand shape contours. Thereafter the hand gesture geometry and the distance from centroid of hand to peak of fingertip (figure 2) are calculated for identifying the hand yaw.

After this histogram (figure 2 and 3) is generated for finding the peak or finger tips. Next this algorithm calculates angle between centroid of hand and centroid of band. These parameters are used to calculate the distance between two fingers and the angle between the dominant peak from the centroid space. In this way our algorithm calculates maximum parameters of the hand to get the maximum efficiency of recognition of gesture in hand image.

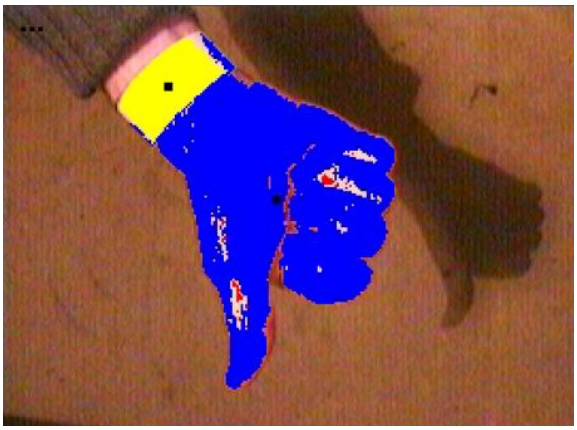


Figure 2:Image showing calculated hand and wrist band centroids.

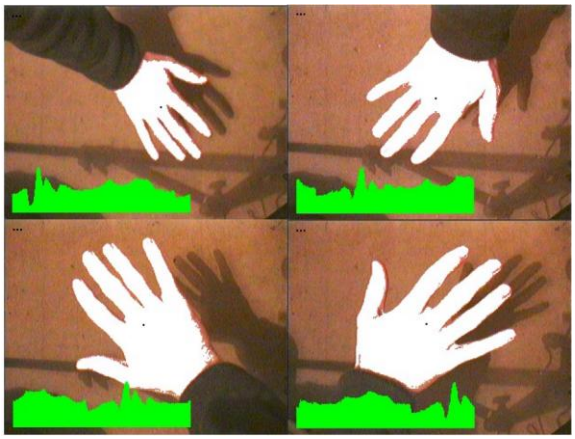


Figure 3: Open hand gesture in several different positions and yaw angles. The histograms are in the same shape but shifted dependent on the yaw of the hand.

Authors have five different gesture for performing five different code generation that are subsequently used by the microcontroller to energize the motor drive mechanism.

The hand gestures signs and their respective control signs are given below:
1. THUMB-wheel chair movement in left direction)
2. MIDDLE FINGER-forward direction
3. THUMB +FIRST FINGER-move in right direction
4. SMALL FINGER-move in back ward direction
5. WHEN HAND IS CLOSE-stop.

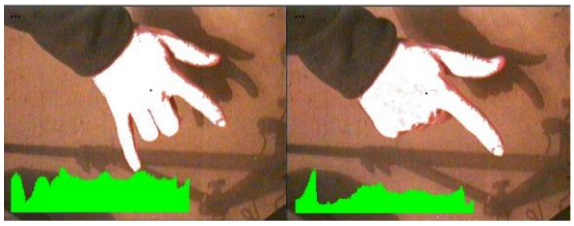


Figure 4: Images showing the histogram for two different hand gestures.

Results

Authors have attained that objective in two steps after capturing centroid focused hand and band picture. Our first step is to separate hand from the background. So we differentiate the skin pixel on the basis of light background which we illustrate on start of the running of algorithm. Then refine that result, as it is described and shown below:

(1) (2) (3)

Figure 5: (1) Image tracking,(2) palm gesture extraction and (3)refinement.

Figure 5(1) demonstrates the image acquisition step in which capturing image of front hand (back hand and band) from webcam video stream. The above image is shown (fig. 5(1)) after conversion from RGB to HSV format because human saturation value has less noise impact. Figure 5(2) shows the extracted palm after calculation of RGB values. Calculation of RGB cude that is the RGB index of hand and band. We have performed binarization of the image on the basis of RGB index calculated to get the hand plot (fig.6).

After this step histogram plotting (to define number of fingers) and calculation of the centroid of band and hand later used to remove the yaw of hand. The calculated value of the angle of each peak from the centre and the distance between the peaks are used to detect finger type. These values are stored finally for plotting the hand boundary (figure

5(2)).Envelope performance is performed to make boundary regular. Morphological operations to make the image more proper (figure 5(3)).

Figure 6.Different binarized hand gesture after refinement by morphological operations.

Same procedure is performed for matching image for five different gestures. Finally after the match, the number of finger and finger type is detected by the angle of each peak from the centre and the distance between the peaks. Figure 7 shows different refined hand gestures that are finally used to control five different movements of wheel chair and correspondingly

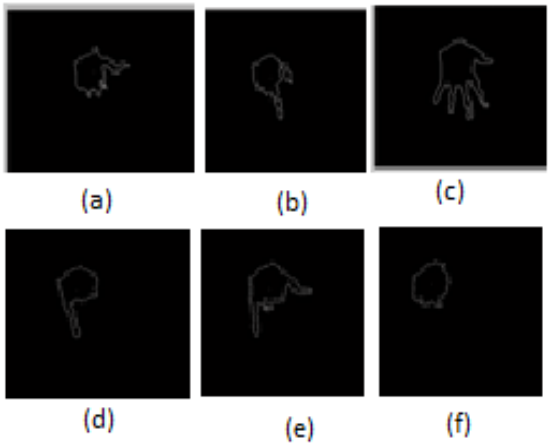


Figure 7:Different gesture of hand used for hardware control (a) 1 thumb (b) 1 large 3 (c) 5 open (d) 1 Large (e) 3 close 2(f) 1 small.

The detected output is configured by AVR microcontroller board (figure8) and commands are transferred for hardware control (figure 9).

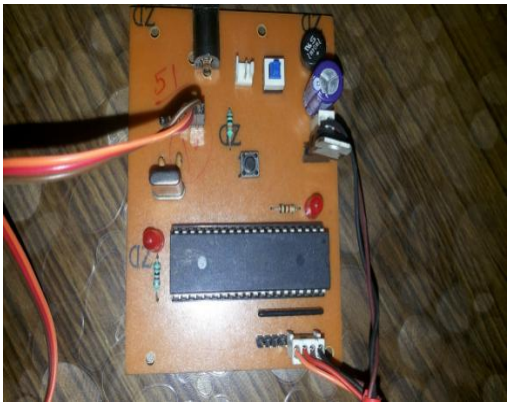


Figure 8:AVR controller Board.

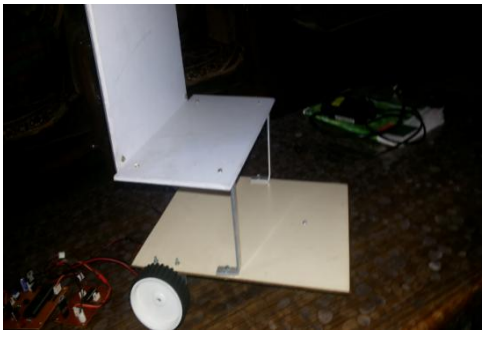


Figure 9:Wheel Chair Hardware Module.

Related to five gestures the wheel chair performs five different operation based control commands. These controls are GO STRAIGHT, LEFT, RIGHT, STOP and GO BACK.

The gestures authors have used for perfect controlling with minimum errors are:
1.THUMB: wheel chair can move in left direction.
2.MIDDLE FINGER: forward direction.
3.THUMB+FIRST FINGER: move in right direction.
4. SMALL FINGER: move in back ward direction.
5. WHEN HAND IS CLOSED: stop.

Conclusion

The above research work implementation has used a quick calculation for perceiving 5 diverse set of signals from hand images for a wheel chair control requisition. Authors have designed an AVR based system that has ATMEL microcontroller embedded environment for settled set of manual summons and a sensibly organized hand gestures, and develop a user interactive and powerful method for palm gesture recognition without any need of heady training and testing database.

Matlab based image processing approach are used for segmenting the hand area, placing the fingers, lastly characterizing the signal . The main features of this algorithm are that it is independent to interpretation, revolution, and scaling of the hand. Authors have checked the model control to exhibit the viability of the method on real time data base system.

In future, author finds that implementation of wheelchair control system can be utilized and functionally implemented on large scale by porting the software on small but powerful system like Raspberry Pi, it is a credit card sized computer system having its own processor, memory (SD card),VGA output, USB input etc, running on LINUX platform. It can run high level languages like Python, portable version of Mathematica and hence is very capable of implementing computer vision algorithm.

References

1. Simpson RC. Smart wheelchairs: A literature review. J Rehabil Res Dev. 2005;42(4):423-36. [PMID:16320139]OI:10.1682/JRRD.2004.08.0101.
2. Madarasz R, Heiny L, Cromp R, Mazur NM. The design of an autonomous vehicle for the disabled.IEEEJ Robot Autom. 1986;2(3):117-26.
3. Hoyer H, Hlper R. Open control architecture for an intelligent omnidirectional wheelchair. Proceedingsof the 1st TIDE Congress; 1993 Apr 6-7; Brussels, Belgium. Amsterdam (the Netherlands): IOS Press;1993. p. 93-97.
4. Levine SP, Bell DA, Jaros LA, Simpson RC, Koren Y, Borenstein J. The NavChair Assistive WheelchairNavigation System. IEEE Trans Rehabil Eng. 1999;7(4):443-51.
5. Miller D. Assistive robotics: An overview. Lect Notes Comput Sci. 1998;1458:126-36.
6. Prassler E, Scholz J, Fiorini P. A robotic wheelchair for crowded public environment.IEEE Robot Autom.2001; 8(1):38-45.
7. Wellman P, Krovi V, Kumar V. An adaptive mobility system for the disabled. Proceedings of the IEEEInternational Conferences on Robotics and Automation; 1994 May 8-13; San Diego, CA. Los Alamitos(CA): IEEE; 1994. p. 2006-11.
8. Jia P, Hu HH, Lu T, Yuan K. Head gesture recognition for hands-free control of an intelligent wheelchair. J Ind Robot. 2007;34(1):60-68.
9. Ng PC, De Silva LC. Head gestures recognition. Proceedings of the International Conference on ImageProcessing; 2001 Oct 7-10; Thessaloniki, Greece. Los Alamitos (CA): IEEE; 2001. p. 266-69.
10. Adachi Y, Kuno Y, Shimada N, Shirai Y. Intelligent wheelchair using visual information on humanfaces. Proceedings of the International Conference in Intelligent Robots and Systems; 1998 Oct 13-17; Victoria, Canada. Los Alamitos (CA): IEEE; 1998. p. 354-59.
11. Lakany H. Steering a wheelchair by thought. IEEE International Workshop on Intelligent Building Environments; 2005; Colchester, UK. Glasgow (UK): University of Strathclyde; 2009. p. 199-202.
12. Rebsamen B, Burdet E, Guan C, Zhang H, Teo CL, Zeng Q, Laugier C, Ang MH Jr. Controlling a wheelchair indoors using thought. IEEE Intell Syst. 2007;22(2):18-24.
13. Hamagami T, Hirata H. Development of intelligent wheelchair acquiring autonomous, cooperative, andcollaborative behavior. ConfProc IEEE IntConfSyst Man Cybern; 2004 Oct 10-13. Los Alamitos (CA);2004. p. 3525-30.
14. Katevas NL, Sgouros NM, Tzafestas SG , Papakonstantinou G , Beattie P, Bishop JM, Tsanakas P,Koutsouris D. The autonomous mobile robot SENARIO: A sensor aided intelligent navigation system forpowered wheelchairs. IEEE Robot Autom. 1997;4(4):60-70. DOI:10.1109/100.637806
15. Simpson R, LoPresti E, Hayashi S, Nourbakhsh I, Miller D. The smart wheelchair component system. JRehabil Res Dev. 2004;41(3B):429-42.
16. Recognizing Hand Gestures with CALI Ricardo Jota† Alfredo Ferreira‡ Mariana Cerejo José Santos Manuel J. Fonseca Joaquim A. Jorge Inteligent Multimodal Interfaces Group Department of Information Systems and Computer Science
17. OVERVIEW OF IMAGE PROCESSING, K.M.M. Rao*,DeputyDirector,NRSA,Hyderabad, 500 037
18. Enhancement of Image Resolution by BinarizationAroop Mukherjee SoumenKanrar Member IEEE Member IEE
19. Geometrical Feature Extraction of Human HandFatma Mohammed Computer Science and Engineering Green University of Bangladesh (GUB) ,Dhaka, Bangladesh Walid Mohammad A. S. M. Kayes Department of Information Technology
20. Object Extraction and Boundary Tracing Algorithms for Digital Image Processing: Comparative Analysis: A Review Rajwantkaur***** Sukhpreetkaur*Student Masters of Technology Assistant Professor Department of CSE Computer Science and Engineering*

21. Enhancement of Images Using Histogram Processing TechniquesKomalVij*, Yaduvir Singh & ME Student, Department of Electrical & Instrumentation EngineeringISSN:2229-6093
22. An Effective Method of Image Retrieval using Image Mining TechniquesThe International journal of Multimedia & Its Applications (IJMA) Vol.2, No.4, November 2010DOI : 10.5121/ijma.2010.2402 17A.Kannan1 Dr.V.Mohan2 Dr.N.Anbazhagan3
23. Content Based Image Retrieval for Semiconductor ManufacturingThomas P. Karnowskia, Kenneth W. Tobina, Regina K. Ferrella, and Fred LakhanibaImage Science and Machine Vision Group, Oak Ridge National Laboratory, Oak Ridge TN 37831bSEMATECH, Austin TX 78741-6499
24. Evaluation of image pre-processing techniques foreigenface based face recognitionThomas Heseltine1, Nick Pears and Jim AustinAdvanced Computer Architecture GroupDepartment of Computer ScienceThe University of York
25. Dynamic management of transactions in distributed real-time processing systemY. JayantaSingh1 ,YumnamSomananda Singh2, Ashok Gaikwad2 and S.C. Mehrotra31Faculty of Information Technology,7th October University, Misurata, Libyay_jayanta@yahoo.com
26. With J:Image Processing 1:Smoothing Filters Cliff ReiterMathematics Department Lafayette College,Easton PA 18042, USA reiterc@lafayette.edu
27. Parameter Estimation in Image Processing and Computer VisionChristoph S. Garbe and Bj¨ornOmmer
28. Parameter estimation in image processing-computing motion from image sequencesChristoph S. Garbe and KarstenStaackInterdisciplinary Center for Scientific Computing (IWR)University of Heidelberg.

THE END

ARTICLE

3

GROWTH OF POWER GRID IN INDIA

Archana Tamrakar & G R Kumrey
Department of Electrical Engineering, Govt. Rewa Engineering College, Rewa, India

Abstract:
The paper is based on Growth of Power Grid in India. The national Grid in India will be controlled from National Load Control Centre near Delhi. There will be five Regional Grids (Northern, Western, Southern, Eastern and North Eastern). Each will be controlled by respective Regional Load Control Centre. Tie lines between these regional grid will be either AC or HVDC depending upon the economic and technical requirement for the particular tie link. At present the majority of the links are of 220 KV AC or 400 KV AC lines.

Introduction

Power grid is known as interconnection of power system (transmission, distribution). The National grid of India with national control Centre (NLCC) in New Delhi has five Regional grids. (1) Northern (2) Western (3) Southern (4) Eastern and (5) North Eastern. Each region has regional Electricity Board with, Regional Load Dispatch Centre (RLCC). Each regional grid covers certain states. Each state's Electricity Boards has its own state Load dispatch Centre. The regional load dispatch centres are operated by power Grid Corporation of India, under overall from the Respective Regional Electricity Boards. Central Electricity Authority (CEA) is responsible for overall policy. Power sector planning and coordination of power sector on national level. The various Regional Power grids have been interred connected by 220 KV AC, 400 KV AC, tie lines or back to back HVDC coupling station. The Power grid cooperation ltd. (PGCL) formed during 1989. Has established strong network of transmission lines to form the regional grids and their interconnection.

Power from various Remote Power Plants and feed various regions. The transmission planning aims at collecting through the inter connected mega power network. . Since Aug 2006, the Indian Electricity System is divided into two grids, the integrated Northern, Eastern, Western and North Eastern regional grids (NEWNE) and the Southern Grid. The first four NEWNE out of five region grid are operating in a synchronous mode. The frequency, phase sequence and voltage are same in NEWNE.

The Southern region is interconnected with the rest of India grid through Asynchronous links. This implies that the quantum and direction power flow between Southern grid and rest of India grid need to be manually controlled.The Southern grid has also been planned to be synchronously operated with rest of all India Grid by early 12th plan (2012-2017) Presently Southern grid

What is Power Grid

The geographical area is covered by two or more independently controlled AC network. Each AC network has a load control centre, generating stations, transmission and distribution system and consumers. The frequency control the network is achieved by matching the generation with the load. The network operates at a certain prevailing frequency which is maintained within targeted limit (49 Hz-51 Hz) the regional load centre decided generation in the margin and the amount of Import / Export with the neighboring network. Neighboring independently controlled AC network is interconnected by system interconnections. System interconnection is either by EHVAC/HVAC/HVDC. The basic function of an interconnected is to transfer energy from surplus zone to deficit zone.

When neighboring AC network are connected by and AC interconnection they start operates synchronously at the same frequency AC interconnection is called synchronous tie. When neighboring AC network is interconnected by HVDC interconnection they can continuous to have their independent Load frequency control is called Asynchronous tie.

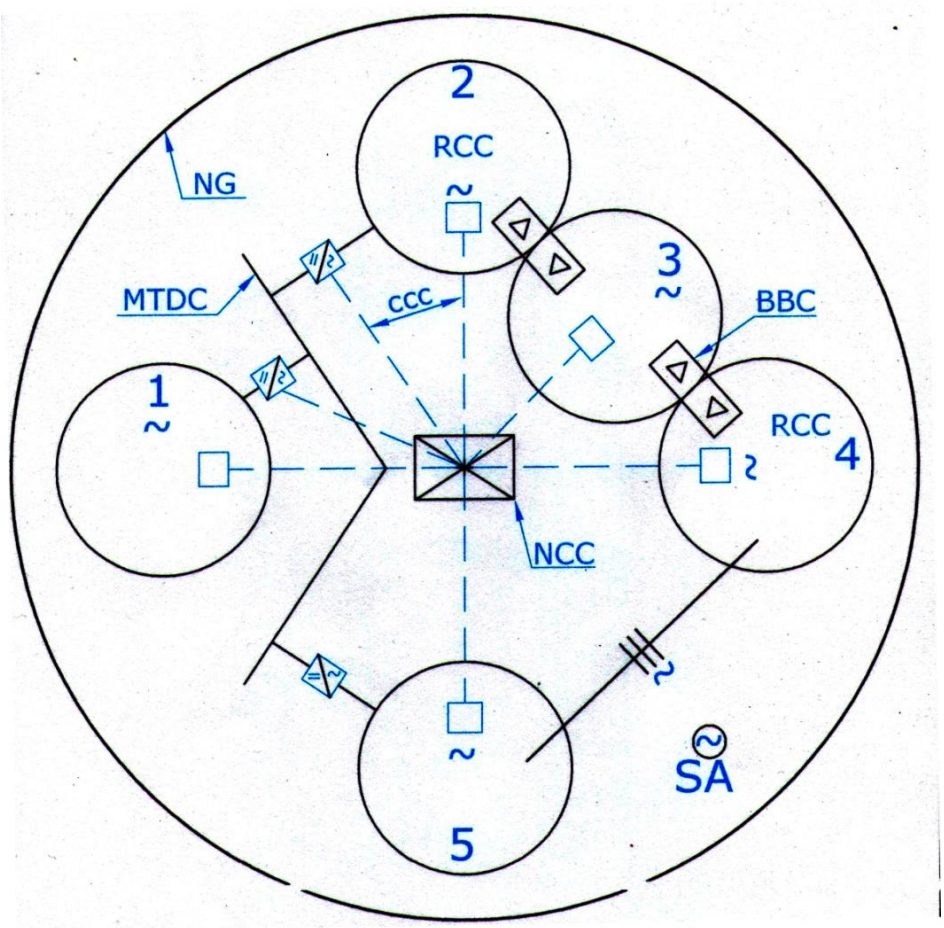
Chronology of the events in power grid

- Power Grid Corporation limited formed in 1989.
- Under the direction of Central Electricity Regulatory Commission (CERC) PGCIL, has prepared the draft of the Indian Electricity Grid Code (IEGC) in April 1999.
- In Jan 2000, the commission had approved the IEGC the IEGC (Indian Electricity grid code) was subsequently reviewed, revised and approved by the commission till 2002.
- The revised IEGC came into effect from April 1, 2002 and was in force till March 31, 2006.
- Further the electricity Act, 2007 requires the respective commission to specify the grid code for the sector under their jurisdiction, To account the additional grid standard specified by the Central Electricity Authority (CEA), CERC< decided to specify the code pending for revision and finalization of the grid standard by CEA finally, the revised IEGC came into effect on April 1, 2006Simply the IEGS insure that:-
- The distribution network should not be unacceptably affected by the generator.
- The quality of supply to customers should be maintained at all times.
- The generating equipment should not be damaged by the distribution system.

The generator should be able to operate the export power to the grid as intended and safety should be maintained at all times for the generator, distribution system and customers.

The back bone of AC network in India is of 400 KV AC lines. The first 400 KV AC line was introduced in India around 1947 and the the 400 KV AC lines are now well established in several parts of India. 760 KV AC lines are likely to be introduced by the year 2005.At present three HVDC links are in operation in India (1995). By the year 2000 AD about five back to back tie links and three long high power bipolar lines are likely to be commissioned. The Vindhyachal back to back HVDC station interconnects Western Grid with Northern Grid. Likewise other back to back schemes are envisaged between various regional / state Grids.

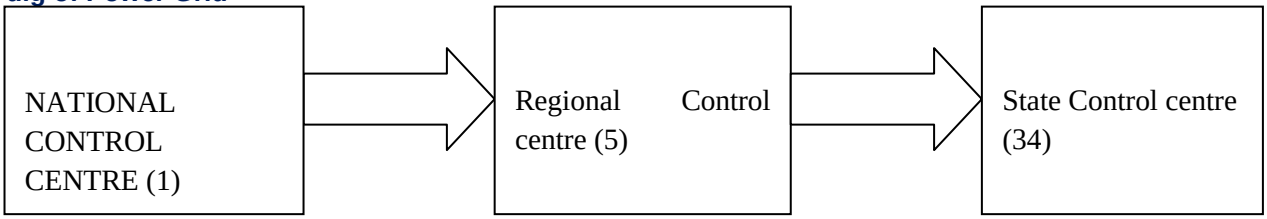
Diagram of Power Grid:



Here:-

NG – National grid
RG – 1, 2,3,4,5 Regional grids
SA – Stand alone power system (not connected to NG)
BBC – Back to back HVDC Coupling stations.
NCC – National Control Centre
RCC – Regional Control Centre
CCC – Carrier Communication Channels
2T- 2 terminal HVDC systems
MTDC- Multi terminal HVDC system interconnecting 1, 2, 5.

Flow dig of Power Grid



Grid in India

NORTHERN	EASTERN	WESTERN	NORTH ERN	SOUTHERN
Chandigarh	Bihar	Chhattisgarh	Arunachal Pradesh	Andhra Pradesh
Delhi	Jharkhand	Gujarat	Assam	Karnataka
Haryana	Orissa	Daman & Diu	Manipur	Kerala
Himachal Pradesh	West Bangal	Dabar & haveli	Meghalaya	Tamilnadu
Jammu & Kashmir	Sikkim	MP	Mizoram	Pondichery
Punjab	Andaman& Nicobar	Maharasthtra	Nagaland	Lakshydeep
Rajasthan		Goa	Tripura	
U.P.				
Uttarakhand				

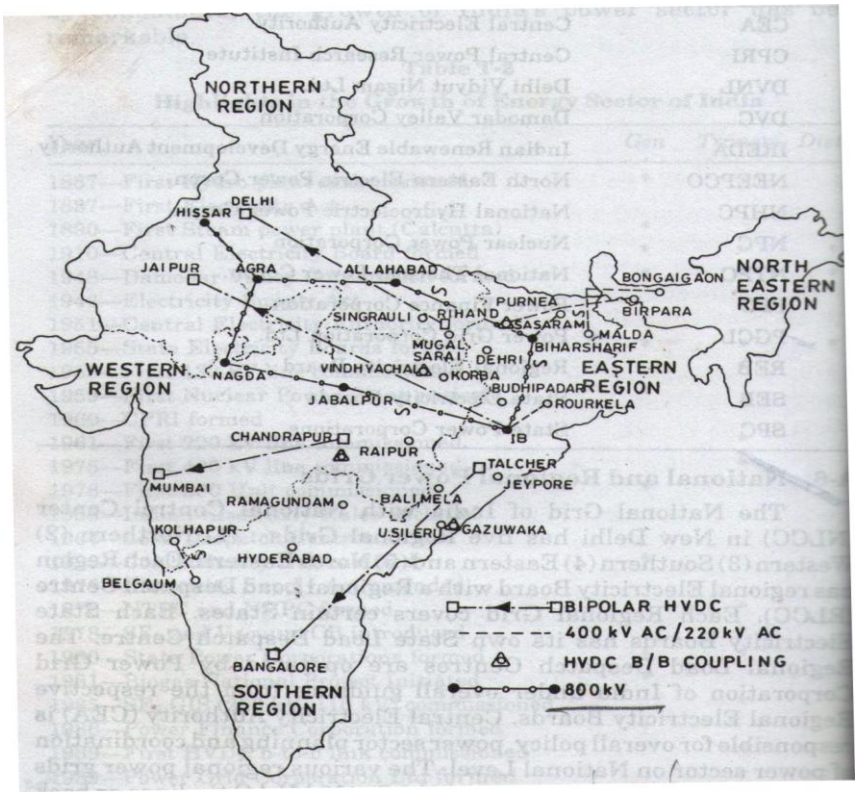
HVDC Back to Back Interconnecting Links in India

7th Five year plan		
Vindhyachal HVDC Back to Back	WR-NR	500MW
8th Five year plan		
Bhadravati HVDC Back to Back	WR-SR	1000 MW
9th Five year plan		
Visakhapatnam HVDC Back to Back	ER-SR	500 MW
Sasaram HVDC Back to Back	NR-ER	500 MW
Gazuwaka HVDC Back to Back	SR-ER	500 MW

Bipolar HVDC Systems in India

6th and 7th Five year plan	
Rihand Delhi Bipolar	Rihand (UP) Delhi 500 KV, 1500 MW , 820 KM
National Experimental HVDC	Lower Barsur (MP) Lower Sileru (AP) 100 KV, 200 MW, Bipole
8th and 9th Five year plan	
Chandrapur Padghe Bipole	Chandrapur (Maha.) Mumbai 500 KV, 150 MW,820 KM
10th and 11th Five year plan	
Talchar Banglore Bipole	Talcher (Orissa) – Banglore 500 KV,2000MW,825 KM
IB- Hyderabad Bipole	IB(Orissa)- Hydrabad 500 KV, 2500MW, 825 KM
IB- Jaipur Bipole	IB (Orissa) - Jaipur (Rajasthan) 500 KV, 3000MW,825 Km

Power Grid Map of India



Standard voltage limit of Indian Grid:-

All users RLDC, SLDC, state transmission utility (CTU) and NLDC will have to take all possible measures to ensure that the grid voltage remain within the following operating range .

S.No	Nominal system Voltage (KV)	Maximum KV (RMS)	Minimum KV (RMS)
1	765	800	728
2	400	420	380
3	220	245	198
4	132	145	122
5	110	121	99
6	66	72	60
7	33	36	30

Advantage

- Lesser overall Installed capacity to meet the peak load demand, lesser spinning reserver.
- Overall economic generation by optimum of high capacity economical generating plants.
- Better use of energy reserves such as hydrothermal, nuclear.
- Better system support to week network.
- Better system support to network to network having emergency due to outage of a planet or a line.
- Stronger grid with stable frequency.

Conclusion

The Power Grid planning aims at collecting Power From various remote power plants and feed various regions through the interconnected mega power network. The objectives of power grid to establish transmission system for evacuating power from various generating stations and convey the same to various receiving stations near the load centre. Power grid is useful for reliability of power, stability of system and mostly satisfaction for consumers.

References

1. Sunil S.Rao , EHVAC, HVDC, Transmission & Distribution Engineering. Khanna publisher , Third edition 2008
2. J.B.Gupta A course in Electrical Power,. S k Kataria & Sons, Revised edition 1996.
3. C.L.Wadhwa Electrical Power System , , New age International (p), publishers, Forth edition 2008
4. S.L.Uppal, Electrical Power, Khanna Publisher Delhi, Seventh edition 1979
5. George L.Kusic, Power System Analysis, Prentice Hall of India private Limited,2006

THE END

ARTICLE

4

A CONCISE REVIEW ON TRANSUNGUAL: A NOVEL DRUG DELIVERY STRATERGY ACROSS NAILS

Divyajit Patel*, Amee Jobanputra & Viral Shah
Dept. of Pharmaceutics, National Institute of Pharmaceutical Education and Research, Ahmedabad, Gujarat, India

Abstract
Fungus spores are widely distributed in the environment. Fungi can live on dead tissues like hairs and nails. Continuous exposure of nail to warm and moist conditions leads to nail infections. Human nail is an excellent barrier against the ingress of foreign material but as a consequence it also prevents effective topical treatment of ungal disorders. When infection resides in nail plate or nail bed or both, therapeutic concentrations of drug must be achieved in the nail bed for treatment to be effective. Topical nail preparations like nail lacquers are an integral part of today's beauty treatment. It not only protects the nail plate but also imparts color and luster to it. Recently medicated lacquers specially designed for nail disease have striked the formulation field as transungal drug delivery system. These nail lacquers are effective for localized action as monotherapy in treatment of superficial, distal and subungal disease where oral delivery would lead to adverse systemic events. The present article is an overview of detailed anatomy and physiology of nail, different nail disorders, ways to enhance the permeability across nail and formulation, characterization of nail lacquers for transungal drug delivery.

Introduction

The human nail, equivalent to claws and hooves in other mammals, evolved as our manual skills developed to protect the delicate tips of fingers and toes against trauma. The nail is also used for scratching and grooming, as a cosmetic organ and sometimes, to communicate one's social status. Topical therapy is a lucrative option, due to its non-invasiveness, drug targeting to the site of action, elimination of systemic adverse events and drug interactions, increased patient compliance and possibly reduced cost of treatment. "*Trans*" means "through" and "*Unguis*" means "Nail", So transungual drug delivery system is associated with drug delivery through the nail to achieve a targeted drug delivery for treating disorders of nail and nearby local areas.The hardness and impermeability of the nail makes transungual an unpromising route for drug delivery. However improvement in the topical delivery of compounds for the treatment of nail fungal diseases (onychomycosis and nail psoriasis) would reduce the need for systemic administration of drugs with its associated systemic side effects. In addition, it may reduce the length of time required for treatment and help prevent relapse. Medicated nail lacquers are the formulations that are used for transungual drug delivery for maximal antifungal efficacy now days.

The physiochemical properties of the nail, as evidenced in various experiments through several researchers indicated that nail behaves more like a hydrophilic gel membrane as opposed to lipophilic membrane, such as the stratum corneum. The human nail plate is the most visible part of the nail apparatus which is responsible for penetration of drug across it. The architecture and composition of the nail plate severely limits penetration of drugs.

The importance of nail permeability to topical therapeutics has been realized, primarily in the treatment of onychomycosis, which affects approximately 19% of the population. Recent advances in topical transungual delivery had come up with antifungal nail lacquers.

Architect of Human Nail

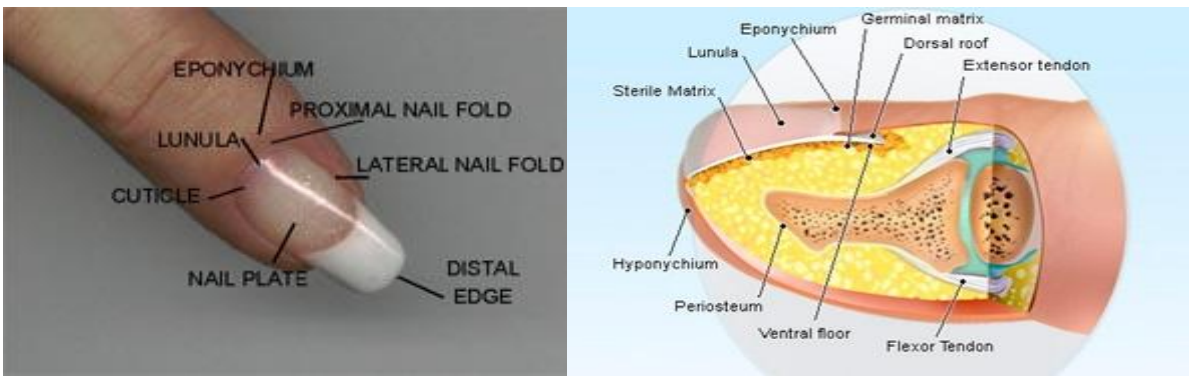


Fig. 1 Human nail anatomy.

Human nail consist of following parts:

The matrix (synonyms: *matrix unguis*, keratogenous membrane, nail matrix, onychostroma) is the tissue (or germinal matrix) upon which the nail rests, the part of the nail bed that extends beneath the nail root and contains nerves, lymph and blood vessels. The matrix is responsible for the production of the cells that become the nail plate. The width and thickness of the nail plate is determined by the size, length, and thickness of the matrix, while the shape of the fingertip itself determines if the nail plate is flat, arched, or hooked. The matrix will continue to grow as long as it receives nutrition and remains in a healthy condition. As new nail plate cells are incubated, they emerge from the matrix round and white to push older nail plate cells forward and in this way yet older cells become compressed, flat and translucent making the pink colour of the capillaries in the nail bed below visible.

The lunula (occasionally called simply "the moon") is the visible part of the matrix, the whitish crescent-shaped base of the visible nail. The lunula is largest in thumb and often absent in the little finger.

The nail bed is the skin beneath the nail plate. Like all skin, it is composed of two types of tissues: the deeper dermis, the living tissue fixed to the bone which contains capillaries and glands, and the superficial epidermis, the layer just beneath the nail plate which moves forward with the plate.

The nail sinus (*sinus unguis*) is the deep furrow into which the nail root is inserted.

The nail root (*radix unguis*) is the part of nail situated in the nail sinus, i.e. the base of the nail embedded underneath the skin. It originates from the actively growing tissue below, the matrix.

The nail plate or body of nail (*corpus unguis*) is the actual nail, and like hair and skin, made of translucent keratin protein made of amino acids. In the nail it forms a strong flexible material made of several layers of dead, flattened cells. The plate appears pink because of the underlying capillaries.

The free margin (*margo liber*) or **distal edge** is the anterior margin of the nail plate corresponding to the abrasive or cutting edge of the nail.

The hyponychium (informally known as the "quick") is the epithelium located beneath the nail plate at the junction between the free edge and the skin of the fingertip. It forms a seal that protects the nail bed.

The onychodermal band is the seal between the nail plate and the hyponychium. It is found just under the free edge where the nail bed ends and can be recognized by its glassy, greyish colour (in fair-skinned people).

The eponychium is the small band of epithelium that extends from the posterior nail wall onto the base of the nail. Often and erroneously called the "proximal fold" or "cuticle", the eponychium is the end of the proximal fold that folds back upon itself to shed an epidermal layer of skin onto the newly formed nail plate. This layer of non-living, almost invisible skin is the cuticle that "rides out" on the surface of the nail plate. Together, the eponychium and the cuticle form a protective seal. The cuticle on the nail plate is dead cells and is often removed during manicure, but the eponychium is living cells and should not be touched.

The perionyx is the projecting edge of the eponychium covering the proximal strip of the lunula.

The nail wall (*vallum unguis*) is the cutaneous fold overlapping the sides and proximal end of the nail.

The lateral margin (*margo lateralis*) is lying beneath the nail wall on the sides of the nail and the **nail groove or fold.**

The paronychium is the border tissue around the nail and paronychia is an infection in this area.

Nail Plate as a Barrier to Permeation:

The human nail plate is a highly ordered and dense epidermal structure composed of ~80% sulphur rich keratin and 0.1–1.0% lipids. Unlike stratum corneum, the nail plate is extremely hard and impermeable due to the physical and chemical stability of the disulfide and hydrogen bonds found in keratin. The sandwich orientation of the keratin fibers and presence of globular proteins in the nail glue the keratin fibers together to form the toughest barrier structure of human body, as it behaves more like a hydrogel than a lipophilic membrane. The transungual drug delivery is therefore a challenging task to the formulation development scientists. Drug transport across the nail plate is, however, influenced by thickness and hydration of nail plate, physicochemical properties of the drug molecule (molecular size, ionization, and partition coefficient), formulation characteristics (nature of the vehicle, pH of vehicle and drug concentration) and presence of permeation enhancers. The nail contains 10–30% water which imparts flexibility to it and also determines its barrier property for the drug molecules. Permeation enhancers by disrupting the keratin network of the nail plate weaken the barrier property and allow more amount of drug to permeate. Keratolytic agents like urea and salicylic acid destabilizes the hydrogen bonds and sulfhydryl compounds like cysteine cleaves the disulfide linkages in nail keratins and thereby alters the permeability of nail plates.

Factors Affecting Permeation Through Nail Plate:

The factors that affect partitioning and permeation of drugs into and through the nail plate includes:

A. Molecular size of compound/ diffusing species: The logarithm of the permeability coefficient decreases as the molecular weight increases. Thus for optimal ungual permeation, drug molecules must be small in size and carry no electric charge on them.

B. Degree of ionization: In general, the nail plate is less permeable to ionic compounds than to their non-charged equivalents studies reveal that permeability coefficients for lidocaine and benzoic acid reducing 10-fold when the molecule is ionized.

C. Nail plate hydration: The permeation of ketaconazole through excised human nails under different relative humidity (RH) from 15 to 100% showed a 3-fold improvement in the delivery of the radio labelled drug.

D. Presence of an intact dorsal layer: It is generally recognized that the very thin dorsal layer with its overlapping cells represents the greatest barrier to the drug penetration across the nail plate. If this layer is partially or totally removed e.g. by debridement or chemical etching with 30-40% phosphoric acid or use of keratinolytic enzymes, then drug permeability increases.

E. Binding of the drug to keratin and other nail constituents: Keratin is thought to have a isoelectric pH of around 5 and therefore is positively and negatively charged at pH below and above this respectively. It therefore may bind or repel molecules depending on their charge. This may be part of the reason for the lower nail permeability of ionic compounds.

F. Formulation effects: pH affects the degree of ionization of weak acids and bases which decreases their permeability through the nail plate. It affects their solubility in formulations, their ability to partition into the nail plate and their interactions with keratin. The nature of the solvent will affect nail hydration, drug solubility in the formulation and its partition in the nail plate.

G. Nail thickness and presence of disease: The thicker the nail the more difficult it will be for drugs to reach the nail bed.

Techniques for Enhancing Nail Penetration

Physical, chemical and mechanical methods have been used to decrease the nail barrier. Within each of these broad categories, many techniques exist to enhance penetration. Mechanical modes of penetration enhancement are typically straight forward, and have the most *in vivo* experience associated with them. In contrast, many of the chemical and physical methods discussed are still in the *in vitro* stages of development. The goal of topical therapy for nail disorders is drug penetration into deep nail stratums at amounts above the minimal inhibitory concentration (MIC). Effective penetration remains challenging as the nail is believed to be composed of approximately 25 layers of tightly bound keratinized cells, 100-fold thicker than the stratum corneum (SC). Mean nail plate thickness increases progressively along the entire length of the nail ranging between 590μm and 1080μm.

1) **Mechanical methods to enhance nail penetration**

Mechanical methods including nail abrasion and nail avulsion have been used by dermatologists and podiatrists for many years – with varying results. Additionally, they are invasive and potentially painful. Thus, current research focuses on less invasive chemical and physical modes of nail penetration enhancement.

I. NAIL ABRASION Simply involves sanding of the nail plate to reduce thickness or destroy it completely. Sandpaper number 150 or 180 can be utilized, depending on required intensity. Sanding must be done on nail edges. An efficient instrument for this procedure is a high-speed (350,000 rpm) sanding hand piece. Additionally, dentist's drills have been used to make small holes in the nail plate enhancing topical medication penetration. Nail abrasion thins the nail plate, exposing the infected nail bed to enhance the action of antifungal nail lacquer.

II. NAIL AVULSION Total and partial nail avulsion involve surgical removal of the entire nail plate or partial removal of the affected nail plate under local anaesthesia. Keratolytic agents such as urea and salicylic acid soften the nail plate for avulsion.

2) **Chemical methods to enhance nail penetration**

Studies examining the efficacy of chemical compounds with transungual penetration properties are currently underway. As would be expected, skin penetration enhancers do not usually have the same effect on nails. Thus only a few chemicals which enhance drug penetration into the nail plate have been described.

I. N-ACETYL-L-CYSTEINE AND MERCAPTAN COMPOUNDS

N-acetyl-l-cysteine and 2-mercaptoethanol, in combination enhance permeability of the antifungal drug to permeate into nail samples.

II.2-N-NONYL-1,3-DIOXOLANE

2-n-nonyl-1,3-dioxolane (SEPA®) enhances penetration of antifungal agent (from a lacquer formulation) into the human nail. It was demonstrated that econazole penetrates the nail six times more effectively in a lacquer containing 2-n-nonyl-1,3-dioxolane than in an identical lacquer without enhancer.

III.KERATOLYTIC ENHANCERS

Keratolytic agents like papain, urea, and salicylic acid when added to the formulation is reported to enhance the permeability of three imidazole antifungal drugs (miconazole, ketoconazole, and itraconazole) across the nail bed.

3) **Physical methods to enhance nail penetration**

Physical permeation enhancement may be superior to chemical methods in delivering hydrophilic and macromolecular agents.

I. IONTOPHORESIS

Iontophoresis involves delivery of a compound across a membrane using an electric field (electromotive force). The principle has been applied clinically for cutaneous anaesthesia, hyperhidrosis management, antibiotic penetration, and herpes simplex treatment. Drug diffusion through the hydrated keratin of a nail may be enhanced by iontophoresis. Several factors contribute to this enhancement: electrorepulsion/ electrophoresis, interaction between the electric field and the charge of the ionic permeant, electroosmosis, convective solvent flow in pre-existing and newly created charged pathways and permeabilization/electroporation, electric field-induced pore induction. While transport enhancement of neutral permeants relies on electroosmosis, transport enhancement of ionic permeants relies on electrophoresis and electroosmosis.

II. ETCHING

“Etching” results from surface-modifying chemical (e.g. phosphoric acid) exposure, resulting in formation of profuse microporosites. These microporosities increase wettability and surface area, and decrease contact angle. They provide an ideal surface for bonding material. Presence of microporosities improves “interpenetration and bonding of a polymeric delivery system and inter diffusion of a therapeutic agent”.

III. CARBON DIOXIDE LASER

CO_2 laser may result in positive but unpredictable results. One method involves avulsion of the affected nail portion followed by laser treatment at 5000W/cm^2 (power density). Thus, underlying tissue is exposed to direct laser therapy. Another method involves penetrating the nail plate with CO_2 laser beam, penetrating laser-induces puncture holes.

IV. HYDRATION AND OCCLUSION

Hydration may increase the pore size of nail matrix, enhancing transungual penetration. Additionally, hydrated nails are more elastic and permeable. Iontophoresis studies have utilized this property to further enhance penetration.

NAIL DISORDERS

Nails can suffer from a very wide range of disorders. The two most common diseases affecting the nail unit are onychomycosis (fungal infections of the nail plate and/or nail bed) and psoriasis of the nails.

Table no. 1 : Brief outline of various nail disorders

Disorder	Description	Treatment available	Images
Green-nail syndrome	Infection caused by Pseudomonas. It is noteworthy for its striking blue-green colour.	Patients should soak their affected nails twice a day for 10 min in 1% acetic acid solution or alcohol diluted 1:4 with water.	
Onycho-gryphosis	It is a nail dystrophy in which becomes thickened and curved.	Treatment consists of trimming the deformed nails	
Subungual hematoma and nail bed trauma	Subungual hematoma occurs when blood becomes trapped between the nail plate and nail bed, It causes significant pain and eventual separation of and temporary loss of the nail plate.	nail trephination (e.g. creating a hole in the nail plate using a cautery device, 18-gauge needle, or red-hot paperclip) can help relieve pain by draining accumulated blood.	

Onychomycosis	Fungal infection of the nail plate or nail bed.	Topical antifungal nail lacquer containing Ciclopirox or Amorolfine is rarely effective as primary treatment but can improve cure rate when used as an adjunct with oral drugs, like terbinafina and itraconazole.	
Psoriasis	Nails may have a number of changes, including irregular pits, oil spots.	Corticosteroids, salicylic acid, calcipotriol or Tazarotene help treat it. These may be given alone or in combination.	
Onychotillomania	In this disorder, patients pic and self-mutilate their nails, which can lead to parallel transverse grooves and ridges	---	
Pincer nail deformity	Pincer nail deformity is a transverse over-curvature of the nail plate. It can occur in patients with psoriasis, SLE, Kawasaki disease, cancer, end-stage renal disease, and some genetic syndromes.	---	

Onychomycosis

Onychomycosis responsible for up to 50% of nail disorders[is a very common problem, affecting 3–10% of the population in Europe, prevalence being higher in older people. Occurrence seems to be on the increase due to a growing elderly population, the spread of HIV infection and AIDS, a higher frequency of iatrogenic immunosuppressant due to the use of immunosuppressant drugs, lifestyle factors such as the wearing of tight-fitting clothing and shoes and the use of communal recreational facilities and health clubs, as well as improved detection and higher public awareness. Most (90–95%) of the infections are caused by dermatophytes, the rest being caused by yeasts and moulds. Toe nails are affected more than fingernails. Clinically, onychomycosis can be divided into categories depending on where the infection begins:

(i) DISTAL AND LATERAL SUBUNGUAL ONYCHOMYCOSIS (Fig. 2a): The fungal infection starts at the hyponychium and the distal or lateral nail bed.

(ii) SUPERFICIAL WHITE ONYCHOMYCOSIS (Fig. 2b): The nail plate is invaded directly by the causative organism and white chalky patches appear on the plate. The patches may coalesce to cover the whole plate whose surface may crumble.

(iii) PROXIMAL SUBUNGUAL ONYCHOMYCOSIS: The fungus invades via the proximal nail fold and penetrates the newly formed nail plate, producing a white discoloration in the area of the lunula.

(iv) TOTAL DYSTROPHIC ONYCHOMYCOSIS (Fig. 2c): This is the potential endpoint of all forms of onychomycosis and the entire nail plate and bed are invaded by the fungus.

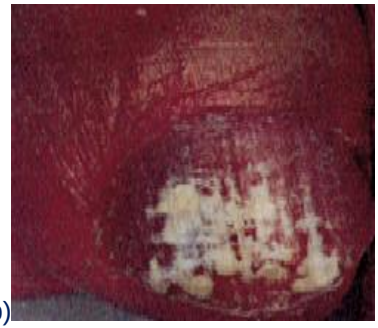
a) b)  c)

Fig. 2 Onychomycosis: (a) distal and lateral subungual onychomycosis; (b) superficial onychomycosis manifested as white spots; (c) total dystrophic onychomycosis. Reproduced from Ref. De Berker et al. (1995b).

In the past, diseased nails were surgically extracted and disease-free nails allowed to grow back. Surgical avulsion is however, extremely traumatic and has largely been consigned to history [30] Nowadays, diseased nails may be chemically removed using urea ointment. A disease-free nail may then grow back. Onychomycosis may also be treated systemically with new potent antifungal agents, such as terbinafine and itraconazole.
Following oral administration and absorption into the systemic circulation, the drugs diffuse from the blood vessels into the nail plate via the nail bed. Systemic therapy also has inherent disadvantages such as adverse events and drug interactions. For example, hepatic function tests are recommended for patients who use terbinafine continuously for more than 6 weeks. Topical therapy avoids the problems associated with systemic treatment. The most convenient topical preparations are the nail lacquers (nail varnish) containing the antifungal agents amorolfine (Loceryl ®) and ciclopirox (Penlac®, Loprox® in Canada).

Psoriasis

Psoriasis is an inflammatory disease of the skin and is characterised by epidermal thickening and scaling as a result of excessive cell division in the basal layers. It affects between 1 and 3% of most populations, but, is most common in Europe and North America. It is thought that 80% of patients with skin psoriasis also suffer from psoriasis of the nail.The nail matrix, nail bed and nail folds may all be affected. The psoriatic nail matrix results in pitting (presence of small shallow holes in the nail plate), nail fragility, crumbling or nail loss while nail bed involvement causes onycholysis (separation of the nail plate from the nail bed, which may be focal or distal), subungual hyperkeratosis and splinter haemorrhages. Psoriatic nail folds result in paronychia (inflamed and swollen nail folds) which leads to ridging of the nail plate.

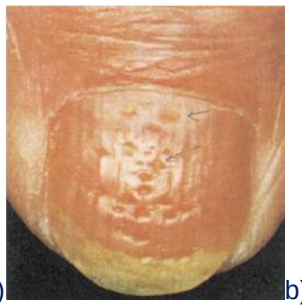
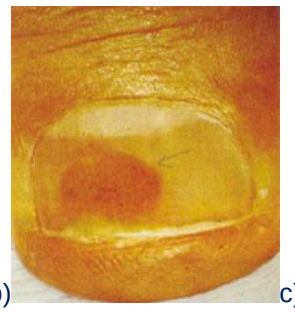
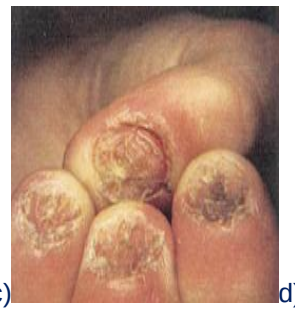
a)  b)  c)  d)

Fig.3 Nail psoriasis: (a) pitting; (b) 'oil drop' formation, a manifestation of focal onycholysis; (c) nail plate crumbling from matrix involvement; (d) hyperkeratosis. Fig. 4a and b have been reproduced from Ref. De Berker et al. (1995c), Fig. 4c and d have been reproduced from Ref. Del Rosso et al. (1997).

Like onychomycosis, nail psoriasis is a long term condition, is difficult to cure, relapse is common and therapy has to be maintained for very long durations. Injection of corticosteroids into the nail folds is the mainstay of therapy. Such injections are extremely painful and need to be repeated monthly for a total of 4–6 times. Topical therapy consists of debridement of the nail plate followed by the application of drugs such as steroids and 5-fluorouracil (5-FU). Oral agents such as, methotrexate, etretinate, cyclosporine, have been beneficial in some cases. The diseased nails may also be non-surgically extracted using urea, followed by the application of topical medication to the nail bed.

The drugs which are recently used for psoriasis treatment are topical agents namely Epsom salts, moisturizers, mineral oils etc. Ointments and cream containing coal tar, dithranol (anthralin®), Corticosteroids like desoximetasone (Topicort®) while some synthetic agents like Fumaric acid esters (FAE) (Fumaderm®) are used.

Topical/Ungual Therapy:

It is the recent emerging therapy for the treatment of fungal nail disorders. Dosage forms available for topical ungula therapy are creams, ointments, gels, solutions, lotions, foams, pastes etc are available but present trend is nail lacquers.

Nail lacqers

Medicated nail lacquers are the formulations that are used for transungual drug delivery system for maximal antifungal efficacy. After application, the solvent from the lacquer formulation evaporates leaving an occlusive film on which the drug concentration is higher than in the original formulation. This increases the diffusion gradient and permeation through dense keratinized nail plate occurs. It has been reported that the film on the nail surface acts as a drug “depot” that permits optimized and sustained diffusion across the nail and leads to continuous penetration of active principle to high tissue concentration required for the efficacy for the treatment of onychomycosis. Transungual drug delivery via nail lacquer is a major addition in the dermatologist’s therapeutic arsenal.

Advantages over conventional topical therapy :

a) It cannot be easily removed by rubbing, washing etc.
b) Depot formation.
c) In addition, the effect is long lasting. A single application of lacquer provides protection for 1 week.

Disadvantages :

a) Rash related adverse effects such as periungual erythema and erythema of proximal nail.
b) Other adverse effects such as shape change, irritation, ingrown toe nail and discoloration
c) It has to be applied regularly until all the affected nail tissue has grown out.

Table no. 2 : Formulation components of nail lacqer

	ients	**)les**
	rming agent	ellulose, Ethyl cellulose, Vinyl polymer etc.
	us substances	lphonamide -Formaldehyde etc.
	ving solvents	Ethyl acetate, Amyl acetate, Butyl acetate etc.
	vents	lcohol, Butyl alcohol etc.
	izing agent	l phthalate, n-butyl stearate etc.
	aneous substances	nding agent, perfumeries, penetration enhancers, hydrating .

Method of preparation and charectrization :

Nail lacquer is made by combining antifungal agent, polymer and plasticizers with colour pigments. The mixing is done in a "two-roll" differential speed mill, which grinds the pigment between a pair of rollers that are able to work with increasing speed as the pigment is ground down. Once the pigment mass is prepared, it is mixed with solvent in a stainless steel kettle. The kettle has a water jacket to facilitate cooling of the mixture.

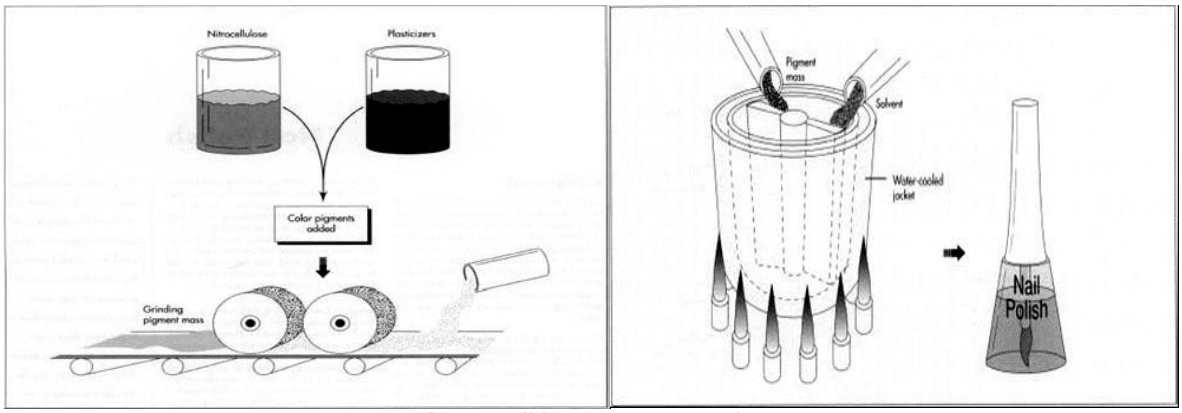


Fig 4. Nail lacquer preparation

Characterization of transungual formulation:-

Permeation study:

I. IN VIVO PERMEATION STUDY:

Drug is initially applied to the nail dorsal surface. Permeation is measured by sampling from the ventral nail plate at successive time points, and calculating drug flux through the nail.

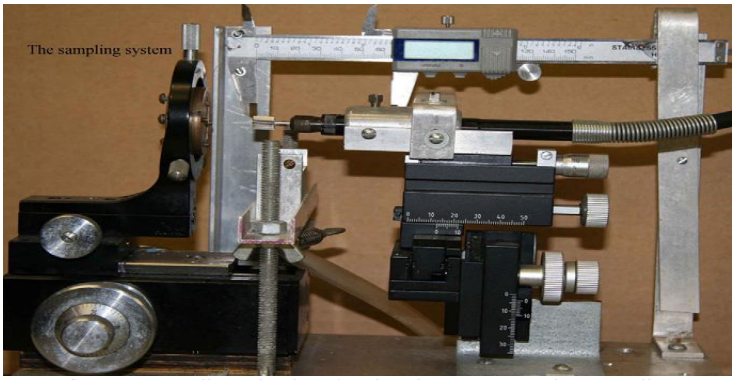


Fig. 5 Sampling device for *in vivo* permeation studies

This method relies on a drilling system which samples the nail core without disturbing its surface. This is achieved by the use of a micrometer-precision nail sampling instrument that enables finely controlled drilling into the nail with collection of the powder created by the drilling process. Drilling of the nail occurs through the ventral surface. The dorsal surface and ventrally-accessed nail core can be assayed separately.

II. IN VITRO PERMEATION STUDY:

Hooves from freshly slaughtered cattle, free of adhering connective and cartilaginous tissue, are soaked in distilled water for 24 h. Membranes of about 1 mm thickness are then cut from the distal part of hooves. *In vitro* permeation studies are carried out by using Franz diffusion cell (respective volume, 25 mL), the hoof membrane is placed carefully on the cell, and the surface area available for permeation was 1.23 cm². The test vehicle equivalent to 200 µg is applied evenly on the surface of the nail membrane. The receptor compartment is filled with solvent the whole assembly is maintained at 37°C with constant stirring (600 rpm).

Nail clippings have been previously used as a model for the human nail plate. It is easier to obtain nail clippings from healthy volunteers and use them for in vitro testing; this model however, is short of the nail bed so it might not be the best model for nail studies. This model needs to be validated and compared to the use of avulsed human cadaver nail plate's model so that we would be able to predict permeability through human nail with the use of data from animal hooves.

Fig.6 Nail support and incubation system: (a) Teflon one chamber diffusion cell components, (b) Teflon one-chamber diffusion cell top view, and (c) Teflon one chamber diffusion cell side view.

Surface tension and contact angle measurements:

For contact angle measurements, it is necessary to measure the surface tension of solutions. Formulations (nail lacquers) are freshly prepared, left for minimum 30 min in an equilibration room where the temperature is constant at 22°C. Wilhelmy plate method is applied, to determine the surface tension. A roughened platinum plate of known dimensions is connected with a sensitive balance. The force between the platinum plate and the formulation when they are in contact is noted and the surface tension is calculated according to the equation presented in **Fig. 7**. If the roughened platinum plate is optimally wetted by hexane, the contact angle is virtually 0° and the cosine therefore 1. The same method is applied for the contact angle measurements. Instead of platinum plate, human cadaver nails as flat as possible are used, since we are interested in the wetting properties of the examined formulations on the nail surface. Nail samples are used after overnight equilibration at room temperature of 22°C and subsequently mechanical cleaning from the remained skin.

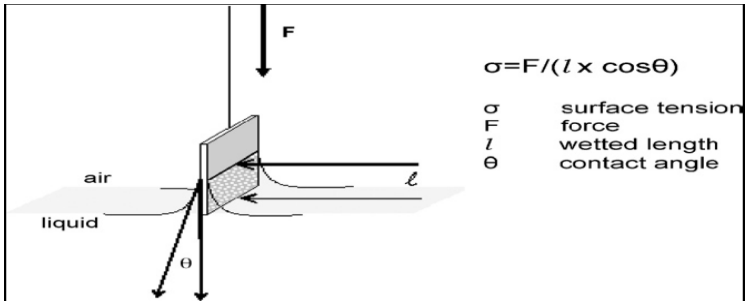


Fig. 7 Wilhelmy plate method for surface tension determination.

Milling test:
After the permeation experiment nails are milled in order to detect the amount of drug remained in the nail. The remaining formulation on the nail surface is gently removed with paper tissue before the milling step. The mill tube containing the nail sample is placed in a freezer at −70 ˚C for about half an hour before it is exposed to −196 ˚C, the temperature produced by liquid nitrogen in the Freezer/Mill apparatus. This step is essential to avoid the damage of mill tube by an abrupt temperature change. In the Freezer/Mill apparatus the sample is pre-cooled for 10 min and then milled for 2min. After wards, the mill's content is suspended in 25 ml of buffer. The drug inside the pulverized nail plate is extracted using an ultrasonic bath for 5min. Subsequently, samples are centrifuged for 5 min at 10000 rpm in order to measure drug concentrations in the supernatants. The amount of drug is presented as a percentage of the dry nail weight before the milling test.

Non volatile content:
Pre-determined weight of sample is taken in a glass petri dish. Samples are spread evenly with the help of tarred wire. The dish is placed in the oven at 105°C ± 2°C for 1 hr. After 1 hr the Petri dish is removed, cooled, and weighed. The difference in weight of sample after drying non volatile content is determined.

Drying time:
A film of sample is applied on a glass Petri dish with the help of brush. The time to form a dry-to-touch film is noted using a stopwatch.

Flow smoothness:
The sample is poured to approximately 1.5 inches and spread on a glass plate and made to rise vertically and smoothness of flow and uniformity of film formed is visualized.

Table no. 3: Marketed Transungual Formulations

Sr.No.	Product	Content	Uses/Indications	Company
1	Eco-Nail Nail lacquer	5% econazole +18% SEPA nail lacquer	Promotes the release of econazole from dried acquer film, to drive econazole into the deep nail plate. SEPA acts as a percutaneous penetration enhancer.	MacroChem Corporation
2	Loceryl nail Film	Antifungal drug, Amorolfine	A non-water-soluble nail film of amorolfine formed on the nail plate, and this film remains in place for 1 week. The film contains a high concentration of Amorlfine and forms a depot from which the drug is delivered.	Galderma Australia Pty Ltd.
3	Umecta	Urea 40%	A nail film used for psoriatic nails, brittle and thick nails, and calluses.	JSJ Pharmaceuticals
4	Tazorac	Tazarotene	Used in the treatment of fingernail psoriasis.	Allergan Inc
5	Zalain	Setaconazol Nitrate	Once-a-week nail patch for treatment of onychomycosis & onychodystrophy.	Labtec
6	Penlac	Ciclopirox	A broad-spectrum antifungal nail lacquer formulation.	Dermik Lab.Inc.

Conclusion:
The permeability of the compact, highly keratinized nail plate to topically applied drugs is poor and drug uptake into the nail apparatus is extremely low. Topical therapy is worth pursuing however, as local action is required in many nail disorders. Other few benefits of topical drug delivery are, first pass avoidance, convenience and sustained release. Following topical administration, the drug has to reach in significant amount to underlying tissues of the nail apparatus. Therefore, approaches which increase drug uptake rate into the nail are likely to be focused and considered. Transungual drug delivery is an emerging approach for effectively treating several nail disorders, this mode of drug delivery if properly designed would overcome all the associated side effects of systemic delivery of antifungal agents for nail disorders.

Acknowledgement
The authors are thankful to Project Director NIPER-Ahmedabad and to Director of mentor Institute, Shri. B.V. Patel PERD centre Ahmedabad, for constant support and motivation during the write up of the manuscript whose in house manuscript no. Is NIPERA390314.

References

1. Dawber RP, De Berker D, Baran R. Science of the nail apparatus. Diseases of the nails and their management, 2nd ed Oxford: Blackwell Scientific Publications. 1994:1-34.
2. Chapman R. Hair, wool, quill, nail, claw, hoof, and horn. Biology of the Integument: Springer; 1986:293-317.
3. Scher RK, Daniel CR. Nails: therapy, diagnosis, surgery: WB Saunders Company; 1997:12-31.
4. Baden HP, Goldsmith LA, Fleming B. A comparative study of the physicochemical properties of human keratinized tissues. Biochimica et Biophysica Acta (BBA)-Protein Structure. 1973;322(2):269-78.
5. Gupta AK, Scher RK. Oral antifungal agents for onychomycosis. The Lancet. 1998;351(9102):541-2.
6. Feneis H. Pocket Atlas of Human Anatomy.: Based on the International Nomenclature: Thieme; 2000:392-5.
7. Jordan C, Mirzabeigi E. Atlas of orthopaedic surgical exposures: Thieme; 2000:101.
8. Chouhan P, Saini T. Hydration of nail plate: A novel screening model for transungual drug permeation enhancers. International Journal of Pharmaceutics. 2012;436(1):179-82.
9. Gunt HB, Kasting GB. Effect of hydration on the permeation of ketoconazole through human nail plate in vitro. European Journal of pharmaceutical sciences. 2007;32(4):254-60.
10. Murdan S. Drug delivery to the nail following topical application. International Journal of Pharmaceutics. 2002;236(1):1-26.
11. Midgley G, Moore MK, Cook JC, Phan Q. Mycology of nail disorders. Journal of the American Academy of Dermatology. 1994;31(3):S68-S74.
12. Bohn M, Kraemer KT. Dermatopharmacology of ciclopirox nail lacquer topical solution 8% in the treatment of onychomycosis. Journal of the American Academy of Dermatology. 2000;43(4):S57-S69.
13. Chabasse D, Baran R, Feuilhade de Chauvin M. Les onychomycoses. I: Epidémiologie-étiologie. Journal de mycologie médicale. 2000;10(4):177-90.
14. Cohen PR, Scher RK. Topical and surgical treatment of onychomycosis. Journal of the American Academy of Dermatology. 1994;31(3):S74-S7.
15. Daniel III CR. The diagnosis of nail fungal infection. Archives of dermatology. 1991;127(10):1566.
16. Davies M, Marks R. Studies on the effect of salicylic acid on normal skin. British Journal of Dermatology. 1976;95(2):187-92.
17. De Berker D, Baran R, Dawber RP, De Berker D. Handbook of diseases of the nails and their management: Blackwell Science; 1995a:1-31.
18. Zaias N. The nail in health and disease: Appleton & Lange; 1990:1-255.
19. Piérard G. Onychomycosis and other superficial fungal infections of the foot in the elderly: a pan-European survey. Dermatology. 2001;202(3):220-4.
20. De Berker D, Baran R, Dawber RP, De Berker D. Handbook of diseases of the nails and their management: Blackwell Science; 1995c:64-84.
21. Gradišar H, Friedrich J, Križaj I, Jerala R. Similarities and specificities of fungal keratinolytic proteases: comparison of keratinases of Paecilomyces marquandii and Doratomyces microsporus to some known proteases. Applied and environmental microbiology. 2005;71(7):3420-6.
22. Grover C, Bansal S, Nanda S, Reddy B, Kumar V. Combination of surgical avulsion and topical therapy for single nail onychomycosis: a randomized controlled trial. British Journal of Dermatology. 2007;157(2):364-8.
23. Chen L-J, Meng Q-F, Chen Y-M, Smales RJ, Yip K-K. Effect of fluoride iontophoresis on the microtensile bond strength between dentin and two adhesive systems. Journal of dentistry. 2008;36(9):697-702.
24. Baran R, Dawber RPR, Tosti A, Haneke E. A text atlas of nail disorders: diagnosis and treatment: Martin Dunitz; 1996.
25. Ghannoum M, Hajjeh R, Scher R, Konnikov N, Gupta A, Summerbell R, et al. A large-scale North American study of fungal isolates from nails: the frequency of onychomycosis, fungal distribution, and antifungal susceptibility patterns. Journal of the American Academy of Dermatology. 2000;43(4):641-8.
26. Roberts D. Onychomycosis: current treatment and future challenges. British journal of dermatology-supplement-. 1999;141:1-4.
27. Einarson T, Oh P, Gupta A, Shear N. Multinational pharmacoeconomic analysis of topical and oral therapies for onychomycosis. Journal of Dermatological treatment. 1997;8(4):229-35.
28. Scher RK. Onychomycosis: a significant medical disorder. Journal of the American Academy of Dermatology. 1996;35(3):S2-S5.
29. Elewski, Charif, Scher RK, Daniel CR. Nails: therapy, diagnosis, surgery: WB Saunders Company; 1997:151-62.
30. Niewerth M, Korting HC. Management of onychomycoses. Drugs. 1999;58(2):283-96.
31. De Jong E, Bampa S, Gulinck M, Boezeman J, Van de Kerkhof P. Psoriasis of the nails associated with disability in a large number of patients: results of a recent interview with 1,728 patients. Dermatology. 1996;193(4):300-3.
32. Del Rosso J, Basuk P, Scher R, Ricci A, Daniel III C. Dermatologic diseases of the nail unit. Scher RK, Daniel III CR Nails Therapy-Diagnosis-Surgery 2nd ed Philadelphia: WB Saunders Company. 1997:172-200.
33. De Jong E, Menke H, Van Praag M, Van De Kerkhof P. Dystrophic psoriatic fingernails treated with 1% 5-fluorouracil in a nail penetration-enhancing vehicle: a double-blind study. Dermatology. 1999;199(4):313-8.
34. Geria AN, Scheinfeld NS. Pramiconazole, a triazole compound for the treatment of fungal infections. IDrugs: the investigational drugs journal. 2008;11(9):661-70.
35. Gupta A. Ciclopirox nail lacquer: a brush with onychomycosis. Cutis; cutaneous medicine for the practitioner. 2001;68(2 Suppl):13.
36. Bronaugh R, Maibach H. Percutaneous Absorption: Drugs, Cosmetics, Mechanisms. Methodology Taylor & Francis, Boca Raton. 2005.
37. Narasimha Murthy S, Wiskirchen DE, Paul Bowers C. Iontophoretic drug delivery across human nail. Journal of pharmaceutical sciences. 2007;96(2):305-11.
38. Mertin D, Lippold BC. In-vitro permeability of the human nail and of a keratin membrane from bovine hooves: Influence of the partition coefficient octanol/water and the water solubility of drugs on their permeability and maximum flux. Journal of pharmacy and pharmacology. 1997;49(1):30-34.

THE END

ARTICLE

5

ROLE OF TOTAL PROTEIN IN PETAL SENESCENCE OF *Chrysanthemum coronarium* L. UNCUT FLOWER PETALS

Ruby G Patel*, Yogeshkumar B Patel & Archana U Mankad
Department of Botany, University School of Sciences, Gujarat University, Ahmedabad, India

Abstract:

The God's gift to mankind is flower. They are integral part of human livings. In addition to serve as the reproductive organs of flowering plants, flowers have long been admired and used by humans mainly to make their environment beautiful with their pleasant aroma and diverse colours and even as a source of food. After flowering and during the production of seeds and fruits, annuals undergo senescence. Senescence refers to the final steps leading to the death of the organism. It comprises of a highly regulated series of cytological and biochemical events to co-ordinate the degradation of macromolecules and remobilization of nutrients from senescing tissue into reproductive and young organs as well as storage tissues. Protein plays an important role during senescence process. In these experiments it was observed that level of protein has been decreased significantly. Proteolysis plays an important role in protein degradation. As proteolysis become dominant, a decline in amount of protein has been found during senescence of *Chrysanthemum coronarium* L flower petals.

Introduction

Flowers are indeed nature's smile; they add color and beauty to life. Morphologically flower is considered as a highly condensed and modified shoot. Its function is reproduction. The branch of Horticulture dealing with the cultivation of flowering plants and use of flowers is known as floriculture. Research work on floriculture is being carried out at several research institutes under the Indian Council of Agriculture Research (ICAR) and Council of Scientific and Industrial Research (CSIR), in the horticulture/floriculture department of state. Agriculture University and under All India Co-ordination Floriculture Improvement Project (AICFP) with a network of about twenty centres. The crops which have received larger attention include *Rose,Gladiolus, Chrysanthemum, Orchid, Jasmine, Tuberose, Aster, Marigold* etc. In the present study, *Chrysanthemum coronarium* L. (Crown Daisy) plant is selected. It is a weed in cornfield in England.30-60 cm tall, with flowers having shades of yellow and ivory-white. The crown daisy is much branched plant with finely cut foliage reaching up to a height of 1m. Both single and double cultivars are available but single are common. *Chrysanthemum coronarium* L. is free flowering and grows in all types of soil in sunny situation, in beds and pots and is used as cut flowers.

Flowering is controlled by the developmental age of the plant and environmental signals, including photoperiod, vernalization, light quality, and the availability of water and nutrients (Bernier, 1988; Bernier *et al*., 1993). Senescence is a dynamic process that occurs naturally concurrent with age or is prematurely induced by a variety of biotic and abiotic factors. Senescence can broadly be defined as the combination of events that leads to the death of cells, tissues, or organs (Patel *et al.*, 2010). Plant senescence is known to consist of genetically driven degradative processes which lead to the death of cells, organs, and organisms (Patel *et al*., 2012) Senescence in plants is characterized by the breakdown of cell wall components and membrane, leading to the loss of tissue structure and cellular compartmentation and ultimately, homeostasis (Thimann, 1980; Thompson *et al*., 1987; Nooden, 1988). The degradative processes are accompanied by the decay of chlorophyll and the onset of proteolysis, which are also more rapid in darkness (Martin and Thimann, 1972; Trippi and DeLuca D'Oro, 1985; Kanazawa *et al*., 2000). Differential degradation of thylakoid proteins is responsible for the loss of photochemical activities during senescence (Roberts *et al*., 1987).

Material and Method:

In order to study the total protein status and the changes in it during the senescence period in uncut *Chrysanthemum coronarium* L. flower petals, biochemical estimation were done using dry flowers. The seeds were obtained from Anand Agricultural University (AAU), Anand. The plants grown in the experimental plots of the botanical garden of the department served as the source of the material.

Various stages identified: It was observed that the uncut flowers of *Chrysanthemum coronarium* L. remained fresh on the plant for 9 days with 10th day as the senescent day at which the petals started abscising. Data was recorded at the interval of 2 days. Thus, 5 stages were defined as follows:

Stage 1: After 48 hours of flower opening (Day 2)
Stage 2: After 96 hours (Day 4)
Stage 3: After 144 hours (Day 6)
Stage 4 After 192 hours (Day 8)
Stage 5 (Senescent stage): After 240 hours (Day 10)

Collection and preparation of material for biochemical estimations

In order to carry out the estimation from dry material, the ray florets were collected from every stage of flower starting from the day it opened till its senescence. Every day the field was surveyed in the morning and the flowers which had just opened were tagged. These flowers were considered as stage 0 (0 hr.) flowers. Ray florets from some of the stage 1 (after 48 hours) flowers were collected and packed separately with proper labels. Similarly, ray florets for stage 2 (96 hrs.), stage 3 (144 hrs.), stage 4 (192 hrs.), stage 5 (240 hrs.) (senescent stage) flowers were also collected. These ray florets were then placed in the oven at 80° C for drying.

In order to study the changes in the proteins, the biochemical estimations of total protein was done from the 100 mg dry material of all stages of *Chrysanthemum coronarium* L. Total protein activity was estimated by the method of Lowry *et al.,* (1951). The results were expressed as total protein mg/ g dry ray florets.

For statistical analysis, means were based on ten replicates for each stage and the standard error was computed. It was also statistically examined by One-way ANOVA calculated at 0.05% level of significance (Table-1).

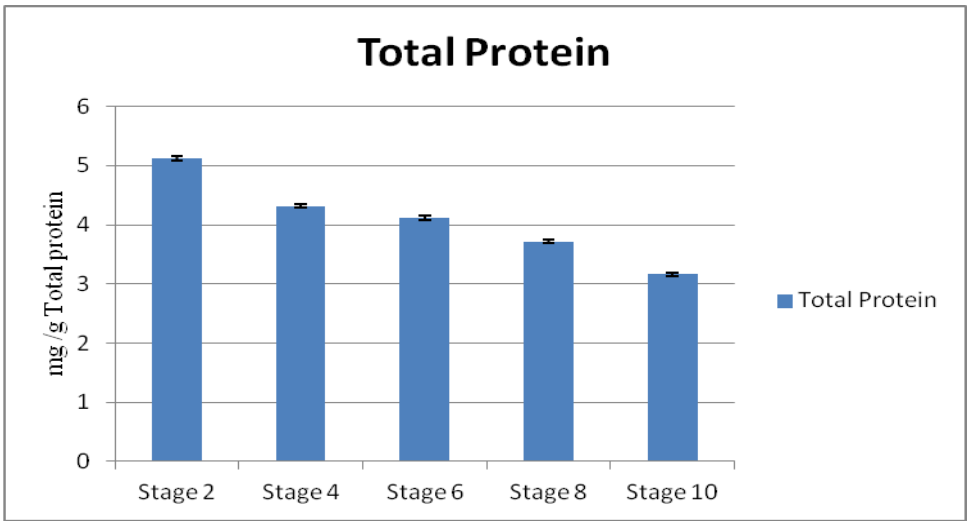
Source of Variation	Sum of Squares (SS)	Degree of Freedom (DF)	Mean Square (MS)	F ratio	Table value F*
Between Groups	6.434	4	1.609	551.167	3.5
Within Groups	.029	10	.003		
Total	6.464	14			

Result and Discussion:

Protein plays an important role during senescence process. In these experiments level of protein decreased. There was no significant difference between in stage-4 and stage-6. After that, level of total protein decreased till senescent stage (fig-1). Protein degradation may occur during senescence process to make free amino acids. By the process of proteolysis amount of free amino acids increases which may use in the respiration process. During the course of petal aging there is a drop in the level of macromolecules like proteins (Borochov *et al.,* 1976; Parups, 1971; Paulin, 1977).

Carfantan (1970) reported that in tulip petals, accumulation of proteins is rapid in initial stages and proteolysis becomes dominant even before opening of the flower. Decreasing trend of total protein in *Tithonia rotundifolia* Blake was reported (Patel *et al.*, 2012). Lay-Yee *et al.* (1992) reported that flower senescence was accompanied by a decline in the petal protein content as well as breakdown of specific proteins in petals. Treatment with compounds that inhibit translation or transcription delayed the visible symptoms of petal senescence, showing that protein synthesis is required (Xu *et al*., 2007). Van Doorn and Woltering (2007) have reported that a decrease in over all protein levels can be due to a decrease in synthesis as well as increase in degradation. Proteins are degraded to a mixture of smaller polypeptides and amino acids (Parups, 1971) and a significant increase in the level of ammonia was noted in senescing roses. A decrease in overall protein levels can be due to a decrease in synthesis as well as an increase in degradation. In *Ipomoea*, no upsurge of *in vitro* protease activity was detected during petal senescence (Winkenbach, 1970), but in other species, such as *Hemerocallis* (Stephenson and Rubinstein, 1998), *Iris* (Pak and van Doorn, 2005), and *Petunia* (Jones *et al*., 2005), a massive increase in protease activity was found.

Fig 1: Total Protein (mg/g dry petals) in uncut flower petals of *Chrysanthemum coronarium* L.



Conclusion:

The reduction in protein content involved degradation to a mixure of smaller polypeptides and amino acids. The total protein content of the corolla was declining indicating the requirement of protein synthesis for the onset of senescence. The onset of hydrolysis of structural cell components like proteins is initiated in response to depletion of the free sugars used as respirable metabolites in order to supply alternative substrates for respiration such as the carbon skeleton of amino acids. This supposition is supported by the fact that an exogenous supply of sugars delays the onset of excessive protein degradation.

References

1. Bernier G, (1988). The control of floral evocation and morphogenesis. *Annual Review of Plant Physiology and Plant Molecular Biology*. 39: 175–219.
2. Bernier G, Havelange A, Houssa C, Petitjean A, Lejeune P, (1993). Physiological signals that induce flowering. *The Plant Cell.* 5: 1147–1155.
3. Borochov, A.; Mayak S. and Halevy, A. H. (1976) : Combined effect of acid and sucrose on growth and senescence of rose flowers, *Physiol*. *Plant*. 36: 221-224.
4. Carfantan N, (1970). Observation preliminary studies in tulip protein during senescence, *Acta Hort*. 41: 31-43.
5. Jones M L, Chaffin G S, Eason J R, Clark D G, (2005). Ethylene-sensitivity regulates proteolytic activity and cysteine protease gene expression in *Petuniacorollas*. *Journal of Experimental Botany*. 56: 2733–2744.
6. Kanazawa S, Sano S, Koshiba T, Ushhimaru T, (2000). Changes in antioxidative enzymes in cucumber cotyledons during natural senescence: comparison with those during dark-induced senescence. *Physiol. Plant.* 109: 211–216.
7. Lay-Yee M, Stead A D and Reid M S, (1992). Flower senescence in Dayliliy (*Hemerocallis*). *Physiol. Plant*. 86: 308-314.
8. Lowry O H, Rosebrough N J, Farr A L, Randall R J, (1951), Protein measurement with the folin phenol reagent, *J. Biol. Chem.* 193: 265-275.
9. Martin C, Thimann K V, (1972). The role of protein synthesis in the senescence of leaves. I. The formation of protease. *Plant Physiol.* 49: 64–71.
10. Nooden L D, (1988). The phenomenon of senescence and aging. In: Senescence and Aging in Plants. Eds. L. D. Nooden and A. C. Leopold, Acad. Press, San Diego. pp-2–50.
11. Pak C, Van Doorn W G, (2005). Delay of *Iris* flower senescence by protease inhibitors. *New Phytologist.* 165: 473–480.
12. Parups E V, (1971) Disc electrophoresis of proteins of senescing and fresh leaves and petals of certain ornamental plants. *J.Am*. *Soc*. *Hortic*. *Sci*. 55: 775-781.
13. Patel R G, Desai R J, and Mankad A U, (2012). Sugar metabolism during ray florets Senescence in uncut flowers of *Tithonia rotundifolia* Blake, *Bioscience Guardian*, 2(2):191-195.
14. Paulin A., (1977). Metabolism glucidique et proteique sur les fleur d'oecillet alimenteeou nin avec une solution de saccharose, *ActaHort*., 71 : 241-257.
15. Roberts D R, Thompson J E, Dumbroff E B, Gepstein S and Mattoo A K, (1987). Differential changes in the synthesis and steady state levels of during thylakoid proteins during bean senescence. *Plant Mol. Biol*. 19: 343-353.
16. Stephenson P, Rubinstein B, (1998). Characterization of proteolytic activity during senescence in daylilies. *Physiologia Plantarum.* 104: 463–473.
17. Thimann K V, (1980). The senescence of leaves. In: Senescence of Plants. Ed. K. V. Thimann, CRC Press Inc., Boca Raton, Florida, 85–115.
18. Thompson J E, Legge R L, Barber R F, (1987). The role of free radicals in senescence and wounding. *New Phytol.* 105: 317–344.
19. Trippi V S, M De Luca d'Oro, (1985). The senescence process in oat leaves and its regulation by oxygen concentration and light irradiance. *Plant Cell Physiol.* 26: 1303–1311.
20. Van Doorn W G and Woltering E J, (2007) Physiology and molecular biology of petal senescence. *J. of Expt*. *Bot*. 59(3): 453-480.
21. Winkenbach F, (1970a). Zum Stoffwechsel der aufbluhenden und welkenden korolle der Prunkwinde *Ipomoeapurpurea* I. Beziehungen zwischer Getaltwande 1, Stofftransport, Atmung und Invertaseaktivitat. *BerichtederschweizerischenbotanischenGesellschaft* 80 : 391 - 406.
22. Xu X, Gookin T, Jiang C, Reid M S, (2007). Genes associated with opening and senescence of the ephemeral flowers of *Mirabilis jalapa*. *Journal of Experimental Botany*. 58: 2193–2201.

THE END

ARTICLE

6

ANTIBACTERIAL ACTIVITY OF DIFFERENT SOLVENT EXTRACTS OF *GANODERMA SINENSE* AGAINST DIFFERENT BACTERIAL STRAINS

Ashok Chittaragi* **& Raja Naika**
Department of P. G. Studies and Research in Applied Botany, Mycology Lab, Jnana Sahyadri, Kuvempu University, Shankaraghatta, Shimoga, Karnataka-India

Abstract:

The aim of my research was to screen qualitative phytochemical analysis and antibacterial activities of different solvent extracts of the *Ganoderma sinense* nine different bacterial strains were used *Agrobacterium tumefaciens*, *Pseudomonas syringae, Xanthomonas campestris*, *Streptomyces pneumoniae*, *Salmonella typhi*, *Pseudomonas aeuroginosa*, *Escherichia coli*, *Klebsiella pneumoniae* and *Staphylococcus aureus* by agar well diffusion method. Phytochemical screening of the extracts revealed the presence of alkaloids, saponins, tannins, phenolic compounds, glycosides and triterpenoids in the mushroom investigated. The mushroom extracts were found to be more effective in chloroform extract than petroleum ether and methanol. The bioassay has indicated that the inhibition effect of the extracts was proportional to the concentration. Phytochemical investigation results showed that the highest antibacterial potential of *Ganoderma sinense* may be attributed to flavonoids, phenolic compounds and triterpenoids.

Introduction

Ganoderma is a prolific producer of novel ‘‘mycochemicals’’. The quantity of information on the fungus in this respect is quite remarkable; hence this is an extensive review (Russell and Paterson, 2006). *Ganoderma* (Lingzhi in Chinese) is a genus of well-known medicinal mushrooms with multiple benefits to human health. So far, more than 120 species of *Ganoderma* have been reported in the world, 98 species of which could be found in China (Liu et al., 2009). *Ganoderma* is a medicinal mushroom contains large number of bioactive compounds posses medicinal properties like Anticancer, Antimalarial, and Antidiabetic etc. This mushroom is commonly used in the traditional Chinese medicine for various diseases. It is a well studied member of aphyllophorales and is known to possess various pharmacological properties and high commercial potential. The research has been restricted to few species like *G. lucidum, G. applanatum, G. tsugae, G. japonicum, G. capense, G. resinaceum G. annulare* and *G. pfeifferi* (Chang and Buswell, 1999; Ofodile et al., 2005; Moradali et al., 2008). The major bioactive components of *Ganoderma* are recognized to be triterpenes and polysaccharides while minor as sterols, nucleic acid derivatives, alkaloids, tannins etc (Huie and Di, 2004). An array of bioactivities, using crude and/or pure compounds from *G. lucidum* has been reported (Willard, 1990; Jong and Birmingham, 1992; Gao and Zhou, 2003; Huie and Di, 2004).

There are few reports of antimicrobial assay using various extracts from *Ganoderma*. The aqueous extracts of *G. lucidum* were screened against fifteen species of bacteria, *in vitro* (Yoon et al., 1994). Two farnesyl hydroquinones (Ganomycins A and B) were isolated and characterized from *Ganoderma pfeifferi* having antibacterial properties (Mothana et al., 2000). Methanolic extracts of seven *Ganoderma* species (unidentified) were screened against *Bacillus subtilis* [www.kyotan.com/lectures/lectures/Lecture12.html]. Eight compounds including sterols and triterpenes from *Ganoderma annulare* were reported to possess antifungal activity (Samania et al., 2003).

In India *Ganoderma* is reported to be used against cataract, asthma, hydrocele by the tribal people from central India (Harsh et al., 1993; Harsh et al., 1996). It has been regularly used as anti inflammatory and to cure tumors, while it is regularly found as an adulterant in another folk medicine called Phansomba (*Phellinus* species) in the western Maharashtra, India (Vaidya and Bhor, 1991; Vaidya and Rabba, 1993). The Indian species of *Ganoderma* have not been assessed for their bioactivities except a recent report on antibacterial activity of *Ganoderma lucidum, Navesporus floccosa, Phellinus rimosus* and prevention of nephrotoxicity, using crude extracts (Sheena et al., 2003). The present study, for the first time reports the antibacterial activity of different solvent extracts of *Ganoderma sinense* against different bacterial strains.

Material and Methods

a. Collection of Mushroom:

The *Ganoderma sinense* (Figure-1) were collected from evergreen forest region (13˚ 30' 11.29" N, 75˚ 05' 26.25" E) which is located in Agumbe, Thirthahalli taluk, Shimoga district, Karnataka, India, during the month of June to August 2012. The *G. sinense* of mushroom was picked from the litter and decaying wood surface, with help of forceps and then they were cleaned and air dried in an oven at 40˚C for 48 h. dried mushroom samples were powdered mechanically for further use. Identification was done by comparing their morphological, anatomical and physiological characteristics with the help of standard literatures like Zhao et al., 1979 and Steyaert, 1972. The voucher specimen (KUABARN-47) has been deposited at the herbarium of mycology laboratory, Department of Applied Botany, Kuvempu University, Jnana Sahyadri, Shimoga district, Karnataka, India.

b. Chemicals

All the solvents viz., petroleum ether, chloroform and methanol used in this study were purchased from HiMedia Laboratoris Pvt. Ltd, of analytical grade.

c. Preparation of crude extracts:
The dried and powdered by grinder (Bajaj Electrical Limited-Twister Mixer) mushroom material (200 g) was extracted successively with 2000 ml pet ether following 2000 ml of chloroform and methanol with a Soxhlet extractor for 48 h at temperature not exceeding the boiling point of the solvent (Lin et al., 1999). The extracts were concentrated in a vacuum at 40˚C using a rotary evaporator. For the entire analysis, compounds of extract were dissolved in dimethyl sulfoxide (DMSO). The yield of extracts obtained from pet ether was 3.78 gm, followed by chloroform 47.92 gm and methanol 22.66 gm (Table-1). Each extract was transferred to glass vials and kept at 4˚C before use.

d. Preliminary phytochemical screening:
Qualitative phytochemical analysis of *G. sinense* extracts (petroleum ether, chloroform and methanol) were carried out using standard methods (Tiwari et al., 2011). The extracts obtained in Soxhlet extractor were dissolved with their respective solvents.

Determination of the Antibacterial Activity

a. Selection of the Bacterial strains:
Nine different bacterial strains were used: *Agrobacterium tumefaciens*, *Pseudomonas syringae, Xanthomonas campestris*, *Streptomyces pneumoniae*, *Salmonella typhi*, *Pseudomonas aeuroginosa*, *Escherichia coli*, *Klebsiella pneumoniae* and *Staphylococcus aureus*. These organisms were received and authenticated from IMTECH, Chandigrah, India and the cultures were maintained at 4˚ C for further use.

b. Agar well diffusion method:
The agar well diffusion method has been employed for testing antibacterial activity of mushroom extracts. Test microorganisms were activated in Mueller Hinton Broth (37˚C, 24 h). 20 ml of sterilized Mueller Hinton Agar Media was poured uniformly in a sterilized petriplates and allowed to solidify and then 100µl of suspension of the test organisms was spread evenly on medium with sterilized L-shaped glass spreader to get a uniform lawn of bacteria. Later four wells were punched at the four corners of the plate (Efuntoye et al., 2010), with the help of sterilized cork borer of 6 mm diameter. The 100µl crude extracts preparation were loaded to the each well by micropipette in four different concentrations viz., 12.5 %, 25 %, 50 % and 100 % respectively which are prepared with DMSO (Manjunathan and Kaviyarasan, 2010). The standard drug tetracycline and ciprofloxacin were used as positive control and DMSO as negative control. The test was carried out by triplicates for each solvent extract against test organisms. All the plates were incubated at 37˚C for 24 hours in the bacteriological incubator to favor the complete growth of the test organisms. Antimicrobial activity was determined by measuring the radius of the clear inhibition zone around each well (Carron et al., 1987).

Result and Discussion

a. Qualitative phytochemical analysis:
Phytochemical characteristics of mushroom extracts of *Ganoderma sinense* in three different solvent tested are summarized (Table-2). The mushroom extracts in different solvents were screened for the presence of various bioactive phytochemical compounds. The analysis revealed presence of bioactive compounds such as alkaloids, saponins, glycosides, flavonoids and phenols in methanol fraction. The chloroform fraction contained alkaloids, saponins, glycosides and phenols also. The therapeutic qualities of this mushroom can be attributed to the presence of chemical compounds like triterpenoides, phenols, saponins and flavonoids.

b. Antibacterial activity:
The three different extracts of the Basdiocarps of wild mushroom were tested against nine different bacterial strains *A. tumefaciens*, *P. syringae, X. campestris*, *S. pneumoniae*, *S. typhi*, *P. aeuroginosa*, *E. coli*, *K. pneumoniae* and *S. aureus*. All the extracts showed different degree of antibacterial activity at 100, 50, 25 and 12.5 % as mentioned in the Table-3, of antibacterial activity by Agar well diffusion assay showing zone of inhibition are shown in figure-2, 3 and 4. Out of three solvent mushrooms extracts, the chloroform extract of *G. sinense* was found to be more activity against all of the Bacteria, however activity was found to be highest for, *S. typhi,* followed by *K. pneumoniae*, *E. coli,* and *P. syringae* at 100% concentration (figure-3). It even showed the moderate activity against, *A. tumefaciens, S. pneumoniae, E. coli* and *S. aureus* at 100% concentration in petroleum ether extract (figure-2) and very less activity against *P. aeroginosa, E. coli, X. campestris, A. tumefaciens* and *P. seudomonas* at lower concentration and no activity in all three different solvent mushroom extract except *S. aureus* (figure-4). The extract of *G. sinense* even was found to be active against all the bacterial strains but the activity was very less when compared to that of standard antibiotics. Smania et al., 1999 and Roberts, 2004 had reported the similar activity against Gram negative bacteria by *G. applanatum.* Barranco et al., 2010 also reported the similar activity by *G. pfeifferi*. Smania et al., 2007 however they had reported that the activity against Gram positive bacteria were more than Gram negative bacteria. Mothana et al., 2000 and Ishikawa et al., 2001 had documented greater resistance to Gram negative bacteria by *Ganoderma* species. This may be due to different extraction procedures followed. 5, 8-epidioxy-5a, 8a-ergosta-6, 22-dien-3b-ol reported by Lindequist, 1995 and 1998 isolated from *Ganoderma applanatum* (Pers.) proved to be active against a number of gram positive and gram negative microorganisms (Smania et al., 1999). However when compared with that of standard antibiotics the antibacterial activity of mushroom extract was found to be less (Table-3).

Conclusion:

In conclusion, our research suggests that, the different solvents extracts of fruiting bodies of *Ganoderma sinense,* chloroform extract was found to be effective against tested bacterial strains compared to petroleum ether and methanol, whereas, petroleum ether extract, was found to be moderate against tested bacterial strains compared to chloroform and methanol. Whole world is frantically in search of new antibiotics because of an alarmingly increase in bacterial resistance to existing antibiotics due to their inappropriate and indiscriminate use. Further studies on isolation and characterization and pharmacological activities of the active compounds from basidiomycetes may provide a better source for developing new therapeutic and pharmacological agents.

Acknowledgement

Authors are thankful to The Chairman, Department of Applied Botany, Jnana Sahyadri, Kuvempu University, Shankaraghatta, Shimoga (D), Karnataka, India, for providing laboratory facilities and the University Grant Commission (UGC), Government of India, for giving a research grant to carry out this study.

Figure: 1 Habitat of *Ganoderma sinense*

Table: 1 Total yield of the fruiting body of mushrooms extracts obtained in different organic solvents (200 gm in 2000 ml)

Mushroom species	Organic solvents	Yield of extract in gms	% of yield
Ganoderma sinense	Petroleum ether	3.78	1.89
	Chloroform	47.92	23.96
	Methanol	22.66	11.33

Table: 2 Preliminary phytochemical Screening of extracts of *Ganoderma sinense*

S. No	Tests	Petroleum ether	Chloroform	Methanol
1	**Alkaloids**			
	Mayer's test	-	-	+
	Wagner's test	+	+	+
2	**Steroids / Sterols**			
	Salkowaski's test	-	-	-
3	**Saponins**			
	Foam test	-	+	+
4	**Tannins**			
	Ferric chloride test	-	-	-
	Gelatin test	+	-	-
5	**Glycosides**			
	Keller-Killiani's test	-	+	-
	Legal's test	-	-	+
6	**Triterpenoides**			
	Salkowaski's test	-	+	-
7	**Flavonoides**			
	Ferric chloride test	-	-	-
	Shinoda test	-	-	-
	Zinc-Hydrochloric acid reduction test	-	-	-
	Alkaline reagent test	-	-	+
	Lead acetate solution test	-	-	-
8	**Phenols**			
	Test solution + 0.5 ml of ferric chloride solution	+	+	+
	Test solution + few drops of 5% glacial acetic acid & 5% sodium nitrate	-	-	-

Note: '+' is Present, '-' is Absent.

Table: 3 Antibacterial activities of *Ganoderma sinense* extract against plant and human pathogenic bacterial strains

Organisms	Diameter of zone of inhibition (in Mm)													
	Petroleum ether Extract (Conc.mg/ml)				Chloroform Extract (Conc.mg/ml)				Methanol Extract (Conc.mg/ml)				Control	Standard
	100 %	50 %	25 %	12.5 %	100 %	50 %	25 %	12.5 %	100 %	50 %	25 %	12.5 %	DMSO	
Tetracycline														
Agrobacterium tumefaciens	16	15	12	10	14	13	11	9	-	-	-	-	-	29
Pseudomonas syringae	11	-	-	-	17	13	12	11	-	-	-	-	-	33
Xanthomonas campestris	11	-	-	-	12	11	10	9	-	-	-	-	-	32
Ciprofloxacin														
Streptomyces pneumoniae	15	-	-	-	13	12	10	9	-	-	-	-	-	34
Salmonella typhi	-	-	-	-	19	14	11	9	-	-	-	-	-	30
Pseudomonas aeroginosa	-	-	-	-	13	11	10	9	-	-	-	-	-	32
Escherichia coli	14	-	-	-	18	14	12	9	-	-	-	-	-	38
Klebsiella pneumoniae	-	-	-	-	18	17	14	11	-	-	-	-	-	33
Staphylococcus aureus	13	12	11	9	14	13	12	11	12	11	9	8	-	30

Note: DMSO – Dimethyl sulfoxide, '-' – No activity.

Figure: 2 Antibacterial activity of Petroleum ether extracts of *Ganoderma sinense* against various strains

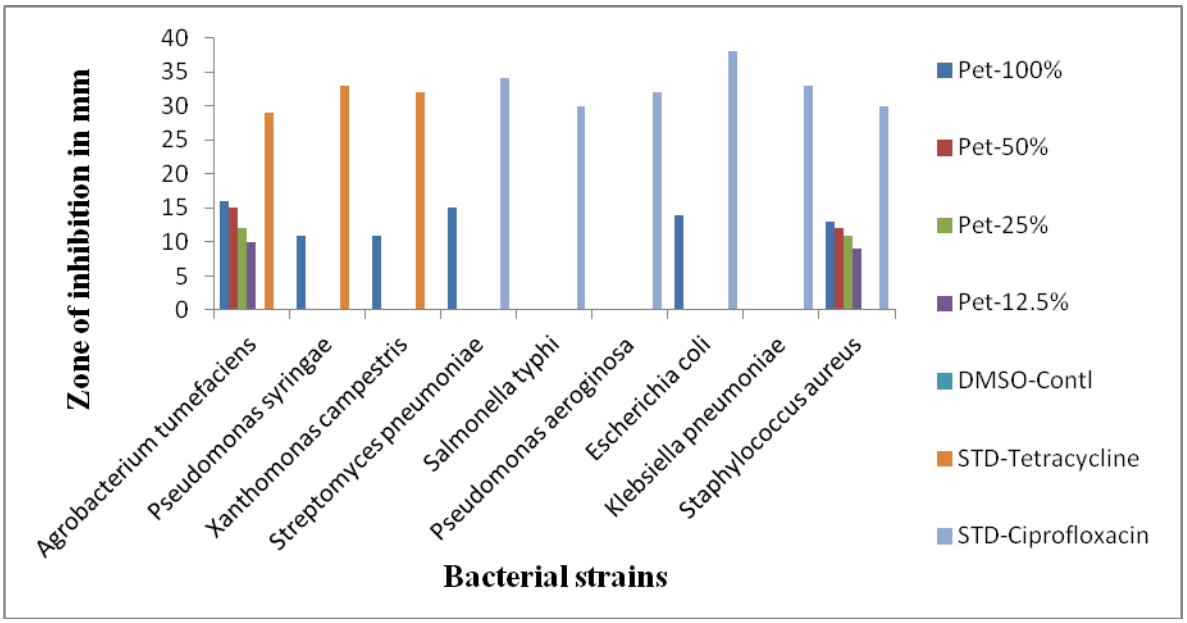


Figure: 3 Antibacterial activity of Chloroform extracts of *Ganoderma sinense* against various strains

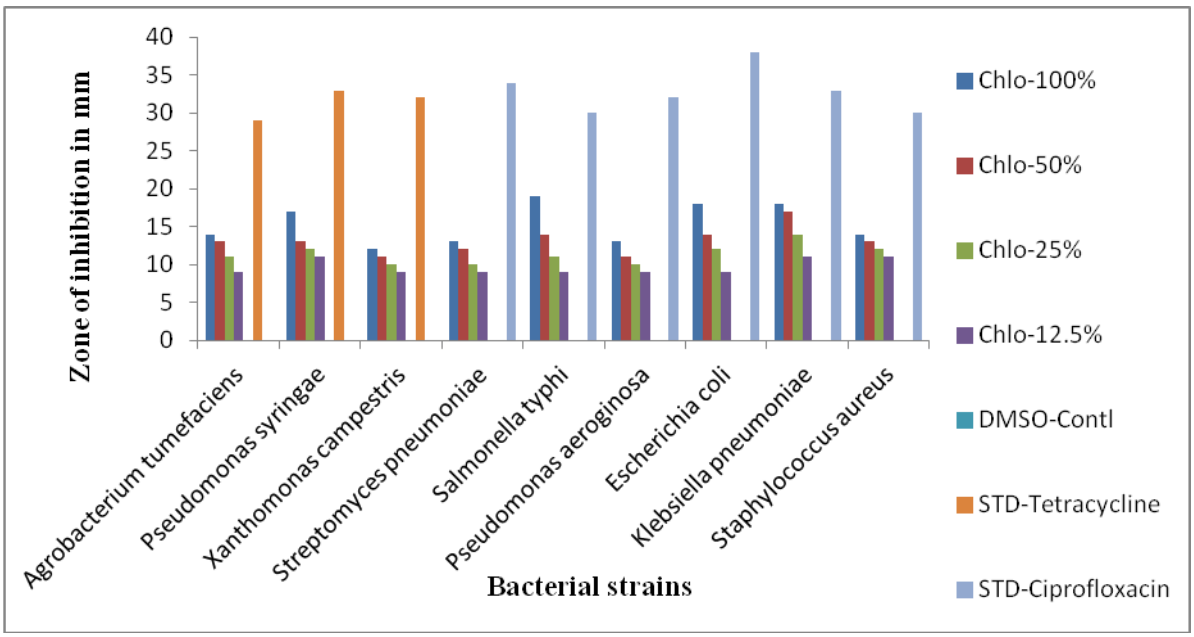
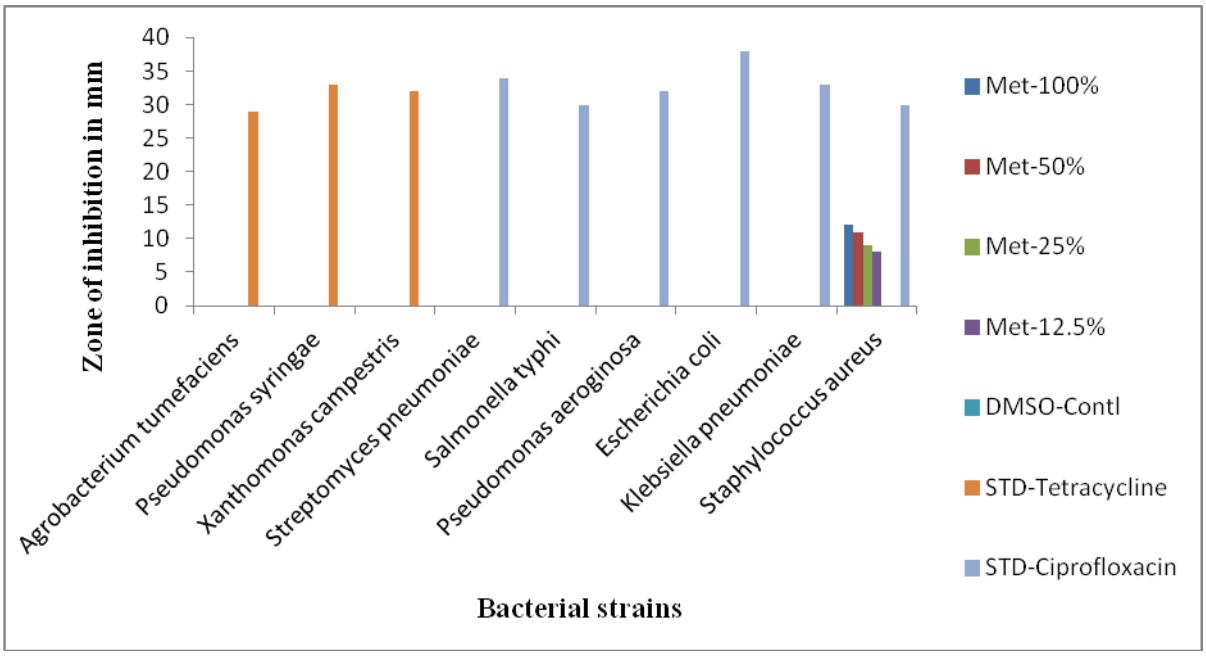


Figure: 4 Antibacterial activity of Methanol extracts of *Ganoderma sinense* against various strains



References

1. Barranco, P. G. Ocanus, L. G. Cabrerra, L. Mario, C. L. Carmona, S. Ocanas, F. G. Goniez, X. S. R and Rangel, R. L. 2010. Evaluation of antioxidant, immunomodulating cytotoxic and antimicrobial properties of different strains of Basidiomycetes from Northern eastern Maxico. Journal of Medicinal Plants Research, 4(17): 1762-1769.
2. Carron, R. A, Marran, J. M. Fernandozlago, M. L and Dominguez, A. A. 1987. Antimicrobial properties of some extracts obtained from some Mediterranean plants of medicinal value. Plants Medicinal set Phytotherapie, 21: 159-202.
3. Chang, S. T. and Buswell, J. A. 1999. *Ganoderma lucidum* (Curt: Fr.) P. Karst. (Aphyllophoromycetideae) –A mushrooming medicinal mushroom. Int. J. Med. Mush, 1: 139-146.
4. Efuntoye, M. O. Ayodele, A. E. Thomas, B. T and Ajayi, T. O. 2010. Does host plant affect the antibacterial activity of *Tapinanthus bangwensis* (Engl and K. Krause) Danser (Loranthaceae). Journal of Medicinal plants research, 4:13, 1281-1284.
5. Gao, Y and Zhou, S. 2003. Cancer prevention and treatment by *Ganoderma,* a mushroom with medicinal properties. Food Reviews International, 19 (3): 275-325.
6. Harsh, N. S. K. Rai, B. K and Tiwari, D. P. 1993. Use of *Ganoderma lucidum* in folk medicine. Indian Trop. Biod, 1: 324-326.
7. Harsh, N. S. K. Tiwari, C. K and Rai, B. K. 1996. Forest fungi in the aid of tribal woman of Madhya Pradesh. Sustainable Forestry, 1: 10-15.
8. Huie, C. W and Di, X. J. 2004. Chromatographic and electrophoretic methods for Ling zhi pharmacologically active components. Journal of Chromatography B, 812 (1-2): 241-257.
9. Ishikawa, N. K. Fukushi, Y. Yamaji, K. Tahara, S and Takahashi, K. 2001. Antimicrobialcuparene-type sesquiterpenes, enokipodins C and D, from a mycelial culture of *Flammulina velutipes*. J Nat Prod, 64: 932-934.

10. Jong, S. C and Birmingham, J. M. 1992. Medicinal benefits of the mushroom *Ganoderma*. Advances in Applied Microbiology, 37: 101-134.
11. Lin, J. Opak, W and Geheeb, K. M. 1999. Preliminary screening of some traditional Zulu medicinal plants for anti-inflammatory and antimicrobial activities. Journal of Ethnopharmacology, 68: 267-274.
12. Lindequist, U. 1995. Structure and biological activity of triterpenes, polysaccharides and other constituents of *Ganoderma lucidum*. In Proc 6th Int Symp Recent Adv *Ganoderma lucidum* Res (ed. B. K. Kim, I. H. Kim and Y. S. Kim), 61-91.
13. Lindequist, U. 1998. Ganoderma. In: Schneir G Hansel R, Blaschek W (eds). HAGERS. Hand buch der Pharma zeutichen Praxis Berlin, Heidelberg, Newyork: Spingerverlag, 750-61.
14. Liu, Y. W. Gao, J. L. Guan, J. Qian, Z. M. Feng, K and Li, S. P. 2009. Evaluation of antiproliferative activities and action mechanisms of extracts from two species of *Ganoderma* on tumor cell lines. J Agric Food Chem, 57: 3087-3093.
15. Manjunathan, J and Kaviyarasan, V. 2010. Solvent Based Effectiveness of Antibacterial Activity of Edible Mushroom *Lentinu stuberregium* (Fr.). Int. J. Pharm Tech Res, 2: 3, 1910-1912.
16. Moradali, M. F. Mostafavi, H. Ghods, S and Hejaroude, G. A. 2008. Investigation of Antimicrobial Fatty Acids from Medicinal Artist Conk Mushroom *Ganoderma applanatum* (Pers.) Pat. (Aphyllophoromycetideae) by TLC and Spectroscopic Detection. Int J of medicinal mushroom, 10: 149-154.
17. Mothana, R. A. A. Jansen, R. Julicb, W. D and Lindequist, U. 2000. Ganomycin A and B, new antimicrobial farnesyl hydroquiones from the basidiomycetes *Ganoderma pfeifferi*, Journal of Natural Products; 63: 416-8.
18. Mothana, R. A. Jansen, R. Julich, W. D and Lindequist, U. J. 2000. Ganomycins A and B, new farnesyl hydorquinones from the basidiomycete *Ganoderma pfeifferi*. J. Nat. Prod, 63 (3): 416-418.
19. Ofodile, L. N. Uma, N. U. Kokubun, T. Grayer, R. J. Ogundipe, O. T and Simmonds, M. S. J. 2005. Antimicrobial activity of some *Ganoderma* species from Nigeria. Phytotherapy research, 19(4): 310-313.
20. Roberts, L. M. 2004. Australian *Ganoderma*: Identification, Growth and Antibacterial properties.
21. Russell, R and Paterson, M. 2006. Review: *Ganoderma* – A therapeutic fungal biofactory. Phytochemistry, 67: 1985-2001.
22. Samania, E. F. A. Delle, F. Monache, A. Samania, Jr. Yunes, R. A and Cuneo, R. S. 2003. Antifungal activity of sterols and triterpenes isolated from *Ganoderma annulare*. Fitoterapia, 74: 375-377.
23. Sheena, N. Ajith, T. A. Mathew Thomas A and Janardhanan, K. K. 2003. Antibacterial Activity of Three Macrofungi, *Ganoderma lucidum*, *Navesporus floccosa* and *Phellinus rimosus* occurring in South India, Pharmaceutical Biology, 41(8): 564-567.
24. Smania, A.J., Delle Monache, F., Smania, E.F.A and Cuneo, R.S. 1999. Antibacterial activity of steroidal compounds isolated from *Ganoderma applanatum* (Pers.) Pat. (aphyllophoromycetideae) fruit body. Int J Med Mush 1: 325-330.
25. Smania, E. F. A. Delle, M. F. Yunes, R. A. Paulert, R and Smania, A (jr). 2007. Antimicrobial activity of methyl australate from *Ganoderma australe*. Brazilian journal of Pharmacognosy, 17(1):14-16.
26. Steyaert, R. L. 1972. Species of *Ganoderma* and related genera mainly of the Bogor and Leiden herbaria. Persoonia, 7: 55-118.
27. Tiwari, P. Kumar, B. Kaur, M. Kaur, G and Kaur, H. 2011. Phytochemical Screening and Extraction: A Review. Internationale Pharmaceutica Sciencia, 1(1): 98-106.
28. Vaidya, J. G and Bhor, G. L. 1991. Medicinal important wood rotting fungi with special emphasis on phansomba. Deerghayu Int, 7: 16-19.
29. Vaidya, J. G and Rabba, A. S. 1993. Fungi in Folk Medicine. The Mycologist, 7(3): 131-133.
30. Willard, T. 1990. Reishi Mushroom: Herb of Spiritual Potency and Medical Wonder. Sylvan Press. Issaquah, Washington, 168.
31. Yoon, S. Y. Eo, S. K. Kim, Y. S. Lee, C. K and Han, S. S. 1994. Antimicrobial activity of *Ganoderma lucidum* extract alone and in combination with some antibiotics. Arch. Pharm. Res, 17(6): 438-442.
32. Zhao, J. D. Hsu, L. W and Zhang, X. Q. 1979. *Ganoderma sinense* Acta microbiol. sin. 19(3): 272.

THE END

ARTICLE

7

DEVELOPMENT AND EVALUATION OF ANTIMICROBIAL HERBAL GEL FORMULATION OF *JATROPHA CURCAS* LINN. LEAVES

Navjit Kaur*, Richa Gupta & Abhishek Bhanot
ASBASJSM College of Pharmacy, Bela (Ropar), Punjab, INDIA

Abstract:

The aim of the study was to formulate and evaluate antimicrobial herbal gel formulation of methanol and chloroform extract of *Jatropha curcas* (Biodiesel plant) leaves. For this the leaf extracts were prepared by successive solvent extraction using Soxhlet apparatus and screened for antibacterial activity against *S. aureus*, *P. aeroginosa, B. subtilis* and antifungal activity against *C. albicans and Fusarium solani.* The activity was performed by Agar cup method. The methanol and chloroform extract of *Jatropha* leaves were selected for their better antimicrobial activity against three bacterial strains and two fungal strains. After that individual hydro gel formulation of both the extracts were prepared with different concentration of carbopol (5%) and screened for antimicrobial activity. An optimum concentration was selected and the release was also observed by using disc diffusion cell method. The gel formulations containing maximum release were combined to make a new formulation of both the extracts in different ratios. Furthermore, antimicrobial activity of gel formulations was investigated and concluded that the gel formulation of Methanol extract showed the most significant antimicrobial activity and it was comparable with standard drug.

Introduction

The selected plant consists of fresh leaves of *Jatropha curcas* Linn. belonging to family Euphorbiaceae and is thus closely related to other important cultivated plants like rubber tree and caster *etc*. *Jatropha curcas* Linn. is commonly called Biodiesel plant, Physic nut, Purging nut or Pig nut[1]**.** Previous studies have reported that the plant exhibits bioactive activities for fever, mouth infections, jaundice, guinea worm sores and joint rheumatism[2]**.** It was also investigated and reported that the water extract of the branches also strongly inhibited HIV induced cytopathic effects with low cytotoxicity[3]**.** Several studies have confirmed the antimicrobial efficacy of different *Jatropha* species; however, there is insufficient information regarding the antimicrobial activities of *J. curcas* Linn. Whatever limited information available on the medicinal properties of *J. curcas* is mostly on the leaf extracts of the plant. In this paper, the antimicrobial property of crude extracts of the leaf of *J. curcas* has been studied as part of the exploration for new and novel bio-active compounds. Hence the present study aim was to develop and evaluate antimicrobial herbal gel formulation of *Jatropha curcas* Linn. leaves.

Materials and Methods

Plant material

The leaves of *Jatropha curcas* Linn.were collected from “Panjab University Chandigarh” in the month of September, 2012 and were authenticated and identified by Dr. H.B. Singh, Scientist & Head, Raw materials, Herbarium & Museum, National Institute of Science Communication andInformation Resources (NISCAIR), New Delhi, (NISCAIR/RHMD/Consult/-2012-13/1260/64). Voucher sample was prepared and deposited in the Herbarium for reference. The voucher specimen (JC/NK/08/2012) has been deposited in Department of Pharmacognosy, ASBASJSM College of Pharmacy, Bela (Ropar), for future reference.

Preparation of extracts

The leaves of *Jatropha curcas* Linn. were shade dried and powdered. Powder material was passed through sieve no. 40 and used for extraction. A weighed quantity of leaf powder was extracted using petroleum ether, chloroform, methanol and water using Soxhlet apparatus for 16 h with twice the amount of solvent. All the extracts were evaporated to dryness at 40°C in rotary vacuum evaporator**.** Then kept in desiccators for cooling, weighed and calculated the yield of dried material. Phytochemical analysis of plant extracts were performed to know the presence of secondary metabolites like flavonoids, saponins, steroids, alkaloids and glycosides.

Test microorganisms

The test microorganisms used in this study were- Bacteria: *Staphylococcus aureus*, *Pseudomonas aeruginosa* and *Bacillus subtilis*; Fungi: *Fusariumsolani* and*Candida albicans*. All the strains of microorganism were obtained from MTCC, Institute of Microbial Technology, Chandigarh. The bacterial isolates were first subcultured in a nutrient broth (Oxoid) and incubated at 37°C for 18 h while the fungal isolates were subcultured on a Sabouraud dextrose agar (SDA) (Oxoid) for 72 h at 25°C.

Antibacterial activity

The agar cup method was adopted for determination of antibacterial activity of the prepared extracts. Standardized bacterial stock suspensions (1.2 ml) were thoroughly mixed with 120 ml of sterile Nutrient agar. The inoculated Nutrient agar (40 ml) was distributed into sterile Petri dishes. The agar was left to set and in each of these plates 4 cups, 4 mm in diameter, was cut using a sterile borer and the agar discs were removed. Alternate cups were filled with 0.1 ml of each extracts dissolving in DMSO (20 mg/ml) using microtiter-pipette and allowed to diffuse at room temperature for two hours. The plates were then incubated in the upright position at 37ºC for 18 h. After the incubation period formation of zones around the wells, confirms the antibacterial activity of the respective extracts. The same

procedure was followed for each strain and extract. Each experiment was carried out in triplicates. **Doxycycline** (20, 50, 75,100 µg/ml) was used as standard drug[5]**.**

Antifungal Activity

The same method as for bacteria was adopted to test antifungal activity. Instead of nutrient agar, Sabouraud dextrose agar was used. The inoculated medium was incubated at 25ºC for two days for the *Candida albicans* and *Fusarium solani.* **Fluconazole** (20, 50, 75, 100 µg/ml) was used as standard drug[5].

Minimum Inhibitory Concentration (MIC)

The Minimum Inhibitory Concentration of extract was determined by broth dilution method. The bacterial strains were grown in nutrient broth and fungal strains were grown in sabouraud media. 0.1 gram (100mg) of dried evaporated extract was dissolved in 100 ml of 70% methanol giving final concentration of 1 mg/ml. The microbial work was carried out in aseptic area. Nutrient broth was prepared. The medium was poured in the tubes which were then sterilized by autoclave using 15 lb pressure at 121ºC for 15 minutes. Using sterile pipettes 0.5ml amount of extract and 0.5ml of the standardized culture was inoculated to obtain a final volume of 10ml. The tubes were incubated at temperature 37°C for 48 hours. The tubes were observed for growth of microorganism by observing the turbidity produced. The test procedure was repeated three times to check the reproducibility of the results. The lowest concentration that inhibits the growth is the Minimum Inhibitory Concentration (MIC). Doxycycline for bacterial strain and Fluconazole for fungal strain was used as reference standard[6]**.**

Preparation of Hydrogel by Cold Method

Hydrogel formulations were prepared by cold dispersion method. Hydrogels were prepared by mixing of the water and gelling agent (Carbopol 940) in specified concentration under the mechanical stirrer. This homogenous dispersion was transferred to motor and amount of propylene glycol previously mixed with propyl paraben was added to the polymeric dispersion. Triethanolamine was added drop wise with continuous stirring until the homogenous hydrogel was formed. Solution of Chloroform extract and Methanol Extract of *Jatropha curcas* Linn.was prepared in ethanol. This solution was added in the hydrogel. The entrapment of air bubbles were removed by keeping the hydrogel in vacuum for 2 h[7]**.**

Evaluation of Hydrogel

Homogeneity and Grittiness

0.5 g of hydrogel was applied on the skin area 1 inch^2 and rubbed with uniform stress. Homogeneity of the hydrogel was observed. After 30 min, hydrogel was wash out by normal water tap.

Spreadability of Hydrogel

0.5 g test formulation was placed within a circle of 1 cm diameter pre-marked on a glass plate over which a second glass plate was placed. A weight of 500 g was allowed to rest on the upper glass plate for 5 min. The increase in the diameter due to spreading of the test formulation was noted[8]**.**

Measurement of pH

Digital pH meter was used. 1g of hydrogel was dissolved in 100 ml of distilled water (1% w/v). The instrument was standardized by using pH 4.0, pH 7.0 and pH 10.0 standard buffer solutions before use[9]**.**

Rheological Studies

Brookefield Viscometer (Model DV-E) with helipath stand was used for rheological studies. The sample (50 g) was placed in a beaker and was allowed to equilibrate for 5 min before measuring the digital reading using a spindle No. 63 at 10 rpm. At this speed, the corresponding reading on the viscometer was noted[10,11]**.**

Preparation of Combined Antimicrobial Gel Formulation

After evaluation of various antimicrobial gel formulations 1% carbopol 940 was taken as base for further gel formulation i.e. N1 (chloroform), N2 (methanol) individual extract studies and N3, N4 (combined extract studies). In all four gel formulations, concentration of Carbopol was kept constant (5% drug in 1% carbopol 940) and in N3 and N4 formulations the concentration of extract was taken in different ratios. All the formulations were subjected for the evaluation of antimicrobial activity. After this the antimicrobial activity was tested of all these formulations and the formulation having maximum antimicrobial activity was found out.

Results and Discussion

In **Pharmacognostic studies,** the study of morphological, microscopic and physicochemical parameters were performed to serve as a standard reference for identification and distinguishing the plants from its adulterants. The all parameters were found comparable with available standards. The phytochemical screening of methanol extract of (12.85% yield) and chloroform extract of (9.35% yield) revealed the presence of alkaloids, flavonoids, phenols and terpenoids which are responsible for their antimicrobial activity.

In-Vitro Antimicrobial Activity

All three extracts of the plant tested showed varying degree of antimicrobial activities against the test bacterial species. Antimicrobial activity of various extracts was determined by Agar Cup Method. Zone of inhibition were measured in mm (Including bore diameter 4mm). Most of the extracts have shown considerable antibacterial and antifungal activity against all microbial strains but JLME and JLCE showed maximum antimicrobial activity against tested species. JLME has shown higher activity than JLCE against all microbes. Results for zone of inhibition for *Jatropha curcas* Linn. leaf extracts against tested species have been shown in **Table 1**.

Minimum Inhibitory Concentration (mg/ml)

The minimum inhibitory concentration for different microbes ranged between 12 to 18 mg/ml for the chloroform extract and 10 to 18mg/ml for methanol extract which are shown in **Table 2**. Water extract was not active against any of the organism at 20 mg/ml which was the highest concentration tested. Generally, the methanol extract was more active than other extracts. This may be attributed to the presence of soluble phenolic and poly-phenolic compounds. The MIC of Doxycycline control ranged was between 0.065 and 0.5 mg/ml. The ability of the extracts to inhibit the growth of several bacterial and fungal species is an indication of the broad spectrum anti-microbial potential of *J. curcas*, which makes the plant a candidate for bio-prospecting of antibiotic and antifungal drugs.

Evaluation of hydrogel

Various gel formulations of JLCE and JLME were prepared by varying the concentration of Carbopol 940. The composition of these formulations was shown in **table 3**. All gel formulations were elegant in appearance. A thin and smooth film was formed on application to the skin and easily washable with water. The pH of all formulation lies between 8.27 to 8.76 which lies in the normal pH range of the skin *i.e.* the pH at which no irritation to the skin was observed. The viscosity using Brookfield Viscometer of all formulations lies between 9160 to 12020CPs. The result for spreadability lies between 4.4 to 6.4 cm. A comparative study of viscosity and spreadibility showed that as viscosity of formulation increases spreadability decreases and vice versa. Results were shown in **Table 4.**

IN VITRO TESTING OF INDIVIDUAL AND COMBINED GEL FORMULATIONS FOR ANTIMICROBIAL ACTIVITY

Antimicrobial activity of gel formulation was determined by Agar Cup Method. All the formulations were set for the antimicrobial activity. Zone of inhibitions were measured in mm

(Including bore diameter 4mm). The gel formulations F2, F6 were selected as individual formulation of JLCE and JLME respectively and named as N1 and N2 because these have shown optimum viscosity, consistency and drug release. The combined gel formulations were N3 and N4 (chloroform and methanol extract in 2.5:7.5 in N3 formulation and 7.5:2.5 in N4 formulation). The results are shown in **Table 5**.

Conclusion

It was concluded that individual antimicrobial gel formulations (N1 and N2) of *Jatropha curcas* showed maximum activity as compare to their combination (N3 and N4). In these N2 (Methanol) formulation was recorded as the best one formulation, it showed maximum antimicrobial activity against three strains of bacteria *i.e*. *S. aureus*, *B. subtilis, P. aeruginosa* and two strains of fungus *i.e. C. Albicans* and *F. solani*. Thus it was concluded that Methanol extract of *Jatropha curcas* Linn. leaf has broad spectrum antimicrobial activity and it is effective as antimicrobial gel formulation.

TABLES

Table 1: Antimicrobial Activity of *Jatropha curcas* Linn.by Agar Cup Method

Extract	***Candida albicans***							
	U1	**U2**	**U3**	**U4**	**S1**	**S2**	**S3**	**S4**
JLPE	10.66±0.40	11.33±1.08	15.33±0.81	16.66±1.08	14.33±1.31	14.66±0.47	17.33±1.24	20.33±1.44
JLCE	12.33±0.40	15.33±0.40	18.66±0.40	19.33±1.08	18.66±0.47	23.66±1.24	25.33±0.94	26.20±1.77
JLME	14.66±1.24	16.33±1.08	16.66±1.08	17.33±1.77	13.66±0.94	15.66±2.49	19.66±1.24	21.33±1.34
	Pseudomonas aeruginosa							
	U1	**U2**	**U3**	**U4**	**S1**	**S2**	**S3**	**S4**
JLPE	11.33±0.94	12.66±1.24	13.33±1.24	14.20±1.28	14.33±1.31	14.66±0.47	17.33±1.24	20.33±1.44
JLCE	13.66±0.47	15.66±0.94	16.33±0.47	17.33±1.69	18.66±0.47	23.66±1.24	25.33±0.94	26.20±1.77
JLME	14.33±1.24	15.33±1.24	16.33±2.49	17.33±0.94	13.66±0.94	15.66±2.49	19.66±1.24	21.33±1.34
	Bacillus subtilis							
	U1	**U2**	**U3**	**U4**	**S1**	**S2**	**S3**	**S4**
JLPE	10.66±1.24	11.66±1.24	12.33±1.29	14.33±1.30	14.66±0.47	1.73±1.24	19.66±0.94	22.66±2.49
JLCE	13.66±0.47	15.66±0.94	16.33±1.69	17.66±1.24	15.33±1.24	18.66±0.47	23.66±1.24	25.33±0.94
JLME	14.33±1.24	15.33±1.24	16.33±2.49	17.33±0.94	13.66±0.94	15.66±2.49	19.66±1.24	21.33±1.24
	Staphylococcus aureus							
	U1	**U2**	**U3**	**U4**	**S1**	**S2**	**S3**	**S4**
JLPE	8.33±0.40	9.66±0.48	12.33±0.81	13.66±1.77	14.33±0.81	15.66±1.08	19.66±1.08	21.66±1.63
JLCE	12.33±0.48	15.33±0.40	18.67±0.40	19.33±1.08	21.66±1.47	21.66±2.48	21.67±0.81	25.33±0.40
JLME	10.66±0.40	11.33±0.40	15.33±0.81	16.66±1.08	14.33±2.16	15.33±2.67	16.33±1.08	20.66±1.57

Expressed as the x ± S.D. mean diameter (mm) of growth inhibition zone(with bore diameter 4mm) ;JLPE: *Jatropha curcas* Linn. leaf Petroleum ether extract; JLCE: Chloroform extract; JLME: Methanol extract ; JLAE: Aqueous extract ;U1,U2,U3,U4:concentration of extract sample was 25, 50, 75, 100 mg/ml and S1,S2,S3,S4:concentration of Standard drug was 25,50, 75,100 µg/ml

Table 2: MIC (mg/ml) of *Jatropha curcas* Linn. extracts by Broth Dilution Method

S.No	Test microbe	JLCE	JLME
1	*Pseudomonas aeruginosa*	14	10
2	*Bacillus subtilis*	12	16
3	*Staphylococcus aureus*	18	18
4	*Candida albicans*	16	12

Table 3: Composition of various formulations of JLCE and JLME

Ingredients	Types of Formulation							
	F1	F2	F3	F4	F5	F6	F7	F8
JLCE (%w/w of *Jatropha* leaf Chloroform extract)	5	5	5	5	0	0	0	0
JLME (%w/w of *Jatropha* leaf methanol extract)	0	0	0	0	5	5	5	5
Carbopol 940 (%w/w)	0.5	1	1.5	2.0	0.5	1.0	1.5	2.0
Propylene glycol (ml)	10	10	10	10	10	10	10	10
Propylparaben (g)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Distilled Water (ml)	100	100	100	100	100	100	100	100
Triethanolamine	qs	Qs	qs	qs	qs	qs	qs	qs

* F1, F2, F3, F4 are the various formulations of JLCEand F5, F6, F7, F8 are the various formulations of JLME with 0.5; 1.0; 1.5 & 2%w/w carbopol concentration respectively

Table 4:EvaluationofPrepared hydrogel

S.No.	Parameter	FormulationCode							
		F1	F2	F3	F4	F5	F6	F7	F8
1.	Homogeneity	+	+	+	+	+	+	+	+
2.	Grittiness	-	-	-	-	-	-	-	-
3.	SkinIrritation	-	-	-	-	-	-	-	-
4.	Spreadability	6.4	6.1	5.5	5.0	6.4	5.9	5.2	4.4
5.	pH	8.76	8.57	8.45	8.27	8.74	8.52	8.48	8.32
6.	Viscosity (CPs)	9740	10780	11740	12000	9160	10570	11590	12020

(+)representgood; (-)representabsent

Table 5:AntimicrobialActivityofGelFormulations

S. No.	Microorganism	Gel Formulation				Standard
		N1	N2	N3	N4	
1	*B. subtilis*	16±0.0	20.93±0.0	16.2±0.84	15.4±1.32	25.01±0.95
2	*S. aureus*	19.0±0.0	23.6+0.1	19.56+1.23	16.0+0.0	26.67±1.32
3	*P.aeruginosa*	33.43±0.1	39.15±1.23	32.09±0.0	29±0.95	47.9±1.23
4	*Candida albicans*	18.0±0.84	22.24±0.95	15.04±0.1	16.4±0.8	27.04±0.0
5	*Fusariumsolani*	14.23±0.95	15.0±1.26	14.7±1.26	13.2±0.0	23.45±1.23

Values are mean inhibition zone (mm) ±SDofthreereplicates, Inhibitionzone including4mmborediameter

References

1. Aiyelaagbe O.O, Adeniyi B.A, Fatunsin O.F, Arimah B.D., (2007) In vitro Antimicrobial activity and photochemical analysis of *Jatropha curcas*roots,*Intern. J. Pharmacol*. Vol. 3(1): 106-110.
2. Fagbenro-Beyioku A.F, Oyibo W.A, Anuforom B.C., (1998)Disinfectant/antiparasitic activities of *Jatropha curcas*. *East Africa Med. J*. Vol. 75:508-511.
3. MatsuseT.I, Lim Y.A, Hattori M, Correa M, Gupta M.P., (1999)A search for anti-viral properties in Panamanian Medicinal Plants - The effect on HIV and essential enzymes. *J. Ethnopharmacol*. Vol. 64: 15-22.
4. Harborne J.B., (1998) Phytochemical Methods - A Guide to Modern Techniques of Plant Analysis. Chapman and Hall, London. pp. 182-190.
5. Kavanagh, F., (1972) Analytical Microbiological. F. Kavanagh (ED) *Academic press,* New York and London: 2:11
6. Wahi A.K., Singh A.K., (2011) Determination of minimum inhibitory concentarion of some novel triazole derivative. *Internationl Journal of research in Pharmacy* and Chemistry.Vol. 1(4): 2231-2781.
7. Muruthy G.K., Sai, K.V., (2008) Formulation and evaluation of transdermal gels of diltiazem hydrochloride,*Indian Journal Pharm Edu res.* Vol. 109: 547-551.
8. Sreenivasa R.M., Mutulik S., (2006) Preparation and evaluation of minoxidil gels for topical application,*Indian J Pharm Sci*.Vol. 68(4): 432-436.
9. Sankar V., Chandrasekaran A.K., Durga S., (2005) Formulation and stability evaluation of diclofenac sodium ophthalmic gel,*Indian J Pharm Sci.*Vol. 67(4):473-476.
10. Sonawane P.A., Hadker U.B., (1994) Membrane viscosity through diffusion studies,*Indian Drugs.*Vol. 32(7): 353-55.
11. Kima J.Y., Song J.Y., Lee E.J., Park S.J., (2003) Rheological properties and micro-structure of carbopol gel network system,*Collidal Polymer Sci.*Vol. 281:614-623.
12. Ghannoum M.A., Rice L.B., (1999) Antifungal Agents: Mode of Action, Mechanisms of Resistance, and Correlation of these Mechanisms with Bacterial resistance. *Clinical Microbiology Review*, 12: 501-517.
13. Prashanth K.V., Chauhan N.S., Padh, H., Rajani, M., (2006) Search for antibacterial and antifungal agents from selected Indian medicinal plants. *Journal of Ethnopharmacol*; 107: 182–188.
14. Saikia S.P., Bhau B.S., Rabha A.S., Dutta P., Choudhari R.K., Chetia M., Mishra B.P., Kanjilal, B., (2009) Study of accession source variation in Morpho-physiological parameters and growth performance of Jatropha curcas L. *Current science*; 96:12-25.
15. Baquero F., (1997) Gram-positive resistance: Challenges for the development of new antibiotics. *Journal of Antimicrobial Chemotherapy*; 39:1–6.
16. Abdullah N., Saad Wan Z., Rahman A., Hendra R., Yin W.H., (1984) Antioxidant, anti-inflammatory and anticancer activities of methanolic extracts from *Jatropha curcas* Linn. *Journal of Medicinal Plants Research*; 5(1): 49-57.
17. Lin C.C., Metters A.T., (2006) Hydrogels in controlled release formulations: Network design and mathematical modeling. *Advance Drug Delivery Review*; 58(12-13): 1379-1408.
18. Tekur U., (2007) Antimicrobial Agents: Antifungal and Antiviral Drugs. Maulana Azad Medical College, New Delhi, 1-21.
19. Singh D., Daharwal S.J., Rawat, M., (2008) Hydrogels a potent carter in wound healing. *Res J Pharm Tech*; 1(1): 6-12.
20. Ahirrao R.A., Patel M.R., Pokal J.K., Suryawanshi, H.P., (2011) Phytochemical screening of *Jatropha curcas* L. *International Journal of Research in Ayurveda and Pharmacy*; 2(4): 1324-1327.
21. Calixto J.B, Barz J., (2000) Efficacy, Safety, Quality control, Marketing and Regulatory Guidelines for Herbal medicines (Phytotherapeutic agents), *Med Biol Res*. Vol. 33: 179-189.

THE END

ARTICLE

8

A REVIEW ON PELLETS AS DRUG DELIVERY SYSTEM

Anubhav Nagal[1], Ajay Kumar Tiwari[2] & Dr. Ajay Gaur[3]
[1,2]School of Pharmaceutical Sciences, Jaipur National University, Near RTO office, Jagatpura , Jaipur, Rajasthan, INDIA
[3]Associate Professor,Pharmacy Wing, Lachoo Memorial College of Science and Technology (Autonomous), Jodhpur, Rajasthan, INDIA

Abstract:

Traditionally, the word "Pellet" has been used to describe a variety of systematically produced, geometrically defined agglomerates obtained from diverse starting materials utilizing different processing conditions. Pellets range in size, typically, between 0.5 – 1.5 mm, though other sizes could be prepared. Pellets are for pharmaceutical purposes and are produced primarily for the purpose of oral controlled-release dosage forms having gastro resistant or sustained-release properties or the capability of site-specific drug delivery. For such purposes, coated pellets are administered in the form of hard gelatin capsules or disintegrating tablets that quickly liberate their contents of pellets in the stomach. As drug-delivery systems become more sophisticated, the role of pellets in the design and development of dosage forms is increasing. Formulation of drugs in multiple-unit dosage forms, such as coated pellets filled in capsules or compressed into tablets, offers flexibility as to target-release properties. The safety and efficacy of the formulation is higher than that of other dosage forms.

Introduction

Multiparticulate drug delivery systems are the most extensively used dosage than unit dosageforms for their improved bioavailability because of increased surface area, reduced inter-subjectvariation, good distribution and transportation and reduced chances of dose dumping. One suchmultiparticulate drug delivery system is the Pelletization[1].

Pelletization is an agglomeration process that converts fine powders or granules of bulk drugs and excipients into small, free flowing, spherical or semi spherical units, referred to as pellets[1].Pellets are the multi-particulate drug delivery system with a high degree of flexibility during the design and development of oral dosage forms. They can be divided into desired dose strengths without formulation or process changes, and can also be blended to deliver incompatible bioactive agents simultaneously or particles with different release profiles at the same site or at different sites within the gastrointestinal tract. The size of pellets is from 0.5 – 1.5 mm[2][3].

Need for pelletization[4]

- To improve flow, dispersion, solubility, stability and compaction.
- To have less variation in transit time through the GIT than single-unit dosage forms like tablets prepared by granulation and compression.
- To produce pellets of uniform size with high drug loading capacity.
- To prevent segregation and dust.
- Pellets can be compressed into tablets called 'pelltabs' and can also be filled into capsules.

For the past two decades, pellets madetheir use promising for are ideal characteristics.[5] Due to free-flowing character of Pellets they are packed easily without any difficulties and hence flexibility in design and development a uniform solid dosage form. (Uniform weight of capsules and tablets)[6][7] The spherical shape and a low surface area-to-volume ratio of pellets made uniform film coating.[8]

Therapeutic Advantages of Multiple Units over Single Units[9][10][11]

When taken orally, multiple unit dosage forms

- Disperse freely in the gastro intestinal tract.
- Maximize drug absorption, reduce peak plasma fluctuations, minimize local irritation of the mucosa by certain irritant drugs and minimize potential side effects without appreciably lowering drug bioavailability.
- Offer reduced variation in gastric emptying rate and transit time which is less dependent on the state of nutrition.
- Provides less risk of dose dumping.
- Reduces localized concentration of irritative drugs.
- Improves safety and efficacy of a drug.
- Reduce inter and intra patient variability.
- More suitable for fabrication of formulations with acid-sensitive drugs.

Desirable Properties of Pellets

Uncoated pellets

- Uniform spherical shape and smooth surface.
- Optimum size, between 600 and 1000µm.

- Improved flow characteristics.
- High physical strength and integrity.
- Good hardness and low friability
- High bulk density.
- Ease and superior properties for coating.
- Reproducible packing of beds and columns.

Coated pellets

- Maintain all of the above properties.
- Contain as much as possible of the active ingredient to keep the size of the final dosage form within reasonable limits.

Factor Affecting Pelletization Technique

Moisture Content: It is one of the critical parameter for pellet growth in pelletization technique .Moisture in the wet mass bring cohesiveness to the powder so that the wet mass can be extracted and spheronize to give spherical shape. High moisture contents lead to agglomeration of pellets during the process of spheronizationwhich is one of the technique of pelletization due to excess of water in the surface of pellets and low moisture content lead to generation of fines with large variation in size distribution.[8]

Rheological characteristics: The Rheological condition of the wet mass determines the flow ability in extruder optimum Rheological condition leads to good flow ability in order to extrude the wet mass variation in rheology make improper and non uniform extrusion.[12]

Solubility of excipients and Drug in granulating fluid: A soluble drug get dissolve in a granulating liquid .Thus increasing the volume of liquid phase lead to over wetting of system of agglomeration of pellet sand increase in wetting liquid increases plasticity but induces sticky mass.[9]

***Composition of Granulating Fluid*:** Besides water, alcohol, water / alcohol mixture, Ethyl Ether, Dilute Acetic Acid, Isopropyl alcohol is also used as a granulating liquid. According to researcher like Millilland Schwartz, a minimum of 5 % of granulation liquid have to be water in order to produce pellets be water in order to produce pellets containing Avicel pH (101) and theophylline.[13] Some researchers used waterand dilute acetic acid in different powder to liquid ratio and concluded that mass fraction can be increased up to 100% by using dilute acetic acid for granulation step in place of demineralized water. Aqueous polymer dispersion containing Eudragit,Hydroxy Propyl Methylcellulose (HPMC), Poly vinyl pyrrilodine (PVP) and Gelatin is used in the moistening liquid.

***Physical Properties of Starting Material*:** Formulation variable such as type and content of starting material, type of filler and particle size of constituent have the effect on the pelletization process. Quality of pellets depends not only composition but also on different grades of the same product.[14] The swelling property of material used in pelletization technique decides the release rate of the drug in pellets.

Speed of the Spheronizer: The speed of the spheronizer affects the size, hardness, sphericity and density of pellets, high speed gives high sphericity, lower friability, smooth surface and higher crushing strength.[15]

Drying technique and drying temperature: It is important to get proper size, shape and flow of pellets and it must be reproducible and consistent in all the batches. Variation in pellet's size, shape and flow will lead to difference in physicochemical properties of final dosage form like weight variation, improper filling etc, which will further affect the therapeutic efficiency of the delivery system. Wider particle size distribution may lead to variation in the dose of drug delivery. Variation in shape may lead to variation in flow and compressibility.

Extrusion Screen: The quality of the extrudate/ pellets is greatly influenced by the characteristics of the orifice of the screen. An increase in orifice dimension resulted in increased mean pellet size. The increase in orifice depth decreased with the presence of water at the extrudate surface, increasing the extrusion force, and then had a negative effect on granulometricdistribution and on shape.[16]

Pelletization Techniques

Pelletization is an agglomerationprocess that converts fine powders or granules of bulk drugs and excipients into small, free-flowing, spherical or semi-spherical units referred to as pellets. The type of coating technique strongly affects the film microstructure and effect release mechanism and rate from pellets coated with polymer blends. There are several manufacturing techniques for production of spherical pellets.[17]

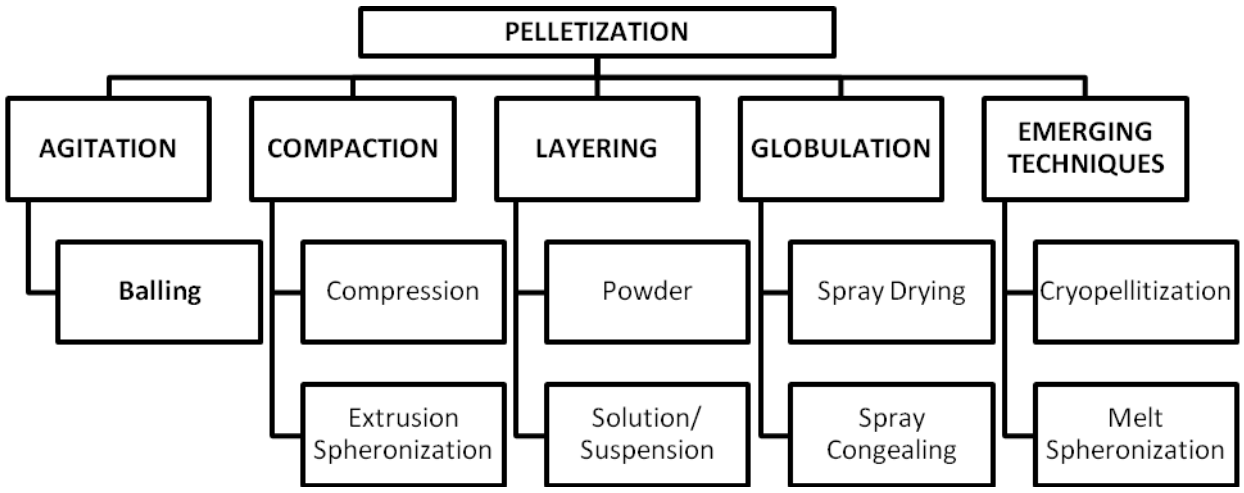


Fig. 3:Classification of pelletization processes

A. Agitation

- ***Balling:*** Finely divided particles are converted upon the addition of appropriate quantities of liquid, to spherical particles by a continuous rolling or tumbling motion. Pans, discs, drums, or mixers may be used to produce pellets by the balling.

B. Compaction

- ***Compression:*** Mixtures or blends of active ingredients and excipients are compacted under pressure to generate pellets of defined shape and size.
- ***Extrusion – Spheronization:*** It is a multistep process invented by Nakahara, in 1964. Extrusion spheronization follows mainly five steps that is mixing or blending, extrusion, spheronization, coating and finally drying, which can be explained/described as

- Dry mixing of ingredient to achieve homogenous powder dispersion.
- Wet massing to produce a sufficient plastic mass.
- Extrusion to form rod shaped particles of uniform diameter.
- Spheronization to round off these rod shaped particles into spherical particles with narrow size
- distribution.
- Drying to achieve desired final moisture content.
- And screening to obtain desired size of spheres/pellets.

It involves dry mixing of the active compound with excipients, granulation of wetted mass, extrusion of the mass, transfer of the mass to spheronizer to produce spherical shape, drying of the wetted mass in a dryer, and at the end screening to obtain required particle size.

C. Layering

In this process, drug is layered onto seed materials (generally, a coarse material or nonpareil) in powder, solution or suspension form and leads to heterogeneous pellets, which consist of an inner core region and an outer shell region of a different composition. This process is classified into three categories namely direct pelletization, solution or suspension layering and powder layering.

I. Direct Pelletization: A process that leads to formation of homogeneous pellets which have microscopically uniform structure and no core can be detected. Direct pelletization is mainly performed in high shear mixers and fluidized bed equipment.[18]

II. Powder Layering: Powder layering involves the deposition of successive layers of dry powder of drug or excipients or both, on preformed nuclei or cores with the help of a binding liquid. Equipment used is tangential spray/centrifugal/rotary fluidized bed granulator.[11]

III. Solution/Suspension Layering

- In the case of Solution/Suspension layering, growth of pellets involve deposition of successive layers of solution and/or suspension of drug substance and binders on existing nuclei, which may be inert seed, crystal or granule. The drug particles are dissolved or suspended in the binding liquid, with or without the binder. Droplets of the binding liquid spread on the surface of the nuclei. During drying, liquid evaporates and the dissolved substances crystallize out and capillary forces which are formed draw the particles towards each other and towards the inert seed, forming solid bridges. In suspension layering, particles have low solubility and are bonded by solid bridges formed from the hardening binder i.e., that higher concentration of binder might be necessary.
- In this process fines are produced as a result of attrition or spray drying, especially when the process is not optimized.
- The efficiency of the process and the quality of pellets produced are in part related to the type of the equipment used.
- As a starter seeds usually sugar spheres consisting of a sugar-starch mixture or recently microcrystalline cellulose pellets and the pure drug crystals are used.
- The most common configuration used is Wurster, bottom spray coater.
- This technology is applied to produce enteric coated Esomeprazole pellets for improving the stability in acidic media, due to the enhancement of the polymer film formation on the surface of the pellet. On the other hand enteric coating assures immediate release in alkali media at the site of the action.

D. Globulation

Globulation or droplet includes spray drying and spray congealing.

- ***Spray Drying:*** Drug entities in solution or in suspension form are sprayed, with or without excipients, into a hot air stream to generate dry and highly spherical particles. It is generally employed to improve the dissolution rates and hence, bioavailability of poorly soluble drugs.
- **Spray Congealing:** A process in which a drug is allowed to melt, disperse, or dissolve in hot melts of gums, waxes, fatty acids, etc., and is sprayed into an air chamber where the temperature is below the melting points of the formulation components, to provide spherical congealed pellets under appropriate processing conditions.

Evaluation of Pellets

Size Distribution

The sizing of pellets is necessary because it has significant influence on the release kinetics.[19] Particle size distribution, means ferret diameter, geometric mean diameter, means particle width and length, is the parameters by which size of pellets can be determined. In most of the cases particle size determination is carried out by simplesieve analysis using sieve shaker [19]reported the use of vernier calipers to determine the size of pellets.

Pellets Shape

Sphericity of the pellets is the most important characteristics and various methods have been used to determine it. The shape factor estimates the amount by which the projected image of particles deviate from a circle and it is calculated by means of the projected area of the pellets and its circumference.[20] For acceptable quality of pellets the roundness index/shape factor should be between 1 and 1.2. For perfectly circular projected image, the shape factor should be 1 while a value of 0.6 describes a particle of good sphericity. Visual inspection of pellets by microscope and stereomicroscope is another method to determine shape of pellets.[21] One plane critical stability, which an angle at which a plane has to be tilted before a particle begins to roll, is one of the important methods used for determining shape.[3] The angle of repose is an indirect indication of the circularity of pellets and is calculated by the ratio of double the pile height and pile radius by fixed funnel method measured after a certain amount of pellets are allowed to fall from a given height through a specific orifice.

Surface Morphology

Scanning electron microscopy is used to examine the surface morphology and cross section of pellets. Sood et al. in 2004 reported the use of optical microscopy to examine the microstructure of pellet surface.[22] Some researcher analyzed surface roughness of pellets by applying a noncontracting laser profile meter.[23]

Specific Surface Area

Surface area of pellets is directly related with size and shape of the pellets. Knowledge of the surface area is desirable especially if film coating is considered. Knowledge about the surface area is important even in case of uncoated pellets, since drug release is influenced by the surface area.[23] Specific surface area of pellets is determined by gas adsorption technique.[24]

Friability

The mechanical properties of pellets are important for processing. Pellets flake off during handling and coating process resulting in formation of dust. In the case of subsequent coating it is desirable to have pellets with low friability. Friability of pellets are determined by using Erkewa type tablet friabiliator[19]or turbula mixer for a fixed period of time combined with glass beads of certain diameter in order to generate abrasion. Friability can also be determined using fluidized bed with Wursterinsert by using stream of air.[25][26]

Conclusion

Today pelletization represents an efficient pathway for novel drug delivery in the scope for different oral immediate or controlled delivery systems. Because of its simple design, high efficiency of producing spherical pellets and fast processing, pelletization has found a special position in pharmaceutical industry and especially in case of production of multiparticulate oral controlled release dosage forms as compared to granulation. Pelletization technique produces more spherical pellets and offers more advantages than granulation process. In addition, hot-melt extrusion method has provided a new, wider platform to produce spherical pellets of drugs which are not stable or have compatibility problems in presence of solvents.

References

1. Ansel CH, Poppovich NG, “Pharmaceutical Dosage Forms and Drug Delivery Systems”. New Delhi,1995, B.I. Waverly Pvt.Ltd, 6, 213.
2. Bianchini R, Bruni G, Gazzaniga A, Vecchio C, “Influence of extrusion spheronization processing on the physical properties of d- ibuprofen pellets containing pH adjusters”, Drug Dev. Ind. Pharm, 1992,18: 1485-1503.
3. Pelletization an alternative to granulation. Pharma Times 2011; 43(01).
4. Alvarez L, Concheiro A, Gomez-Amoza, JL, Souto C, “Martinez-Pacheco R. Effect of microcrystalline cellulose grade.”, Drug DevInd Pharm 2002, 28: 451-456.
5. DigenisGA,“The In Vivo behavior of multiparticulate versus single unit dosage formulations. Multipaticulate Oral Drug Delivery. Marcel Dekker,1994, New York; Ghebre-Sellassie. I: 333-55.
6. Evdokia S. korakianiti, Dimitrios MK, Paraskevas PD, and Nikolaos HC, “Optimizationof the pellitization process in a Fluid-bed Rotor granulatorusing experimental design” Apps Pharm Sci Tech,2000, 1(4): 71-75.
7. Bataille B, Ligarski K, Jacob M, Thomas C, Duru C, “Study of the influence of spheronization and drying conditions on the physico-mechanical properties of neutral spheroids containing Avicel PH 101 and lactose” Drug DevInd Pharm,1993, 19: 653-71.
8. Fielden K.E., Newton J.M.,Rowe R.C.“The influence of moisture content on spheronization of extrudate processed by ram extruder” Int. J. Pharm., 1993, 97: 79-86.
9. Flament MP., Dupont G., Leterme P.,Farah N., Gayot A., “ Development of 400 µm pellets by extrusion-spheronization. Application with Gelucire 50/02 to produce a sprinkle form” Drug Dev. Ind. Pharm., 2004; 30: 43-51.
10. Follonier N, Doelker E, “Biopharmaceutical comparasion of oral multiple-unit and single unit sustained release dosage forms” STP Pharm Sci,1992, 2: 141-5.
11. Ghebre-Sellassie I, Knoch“A. Pelletization techniques Encyclopedia of Pharmaceutical Technology”Informa Healthcare.2002 3rd ed: 79-81.
12. Harrison PJ., Newton JM., Rowe RC. “The application of capillary rheometry to the extrusion of wet powder masses” Int. J.Pharm., 1987; 35: 235-42.
13. Millili GP., Schwartz JB. “The strength of microcrystalline cellulose pellets: The effect of granulating with water/ethanol mixtures” Drug Dev. Ind. Pharm., 1990; 16:1411-26.
14. Johansson B, Alderborn G. “Degree of pellet deformation during compaction and its relationship to the tensile strength of tablets formed of microcrystalline cellulose pellets”Int J Pharmaceut. 1996; 132(1-2): 207-20.
15. Johansson B, Nicklasson F, AlderbornG.”Effect of pellet size on degree of deformation and densification during compression and on compactability of microcrystalline cellulose pellets” Int J Pharmaceut. 1998; 163(1-2): 35-48.
16. Rahman A.M.,Ahuja A.,Baboota S.,Bhavna BaliV.,Saigal N., and Ali J. “Recent Advances in Pelletization Technique for Oral Drug Delivery:A Review” Current Drug Delivery, 2009; 6(1):122-129.
17. Lecomte F, Siepmann, J, Walther M, Macrae JR. “Polymer blends used for the coating of multiparticulates: Comparison of aqueous and organic coating techniques”Pharmaceut Res. 2004; 21.
18. Kleinebudde P, Knop K, “Direct pelletization of pharmaceutical pellets in fluid bed processes. Granulation” Elsevier. Seville. JPK.,2007, 5; 780-811.
19. Wiwattanapatapee R., Pengnoo A., Kanjanamaneesathian M., Matchavanich, L.,Janatharangsri, A. “Floating pellets containing bacterial antagonist for control sheath blight of rice formulations,viabilityandbacterial release studies” J. Control. Release, 2004, 95, 455-61.
20. Mezreb N., Charrueau C., Boy P.,Allain P.,Chaumeil J.C. “Productionof Carbopol 974P and Carbopol 971P pellets by extrusionspheronization.Optimization of the processing parameters and watercontent” Drug. Dev. Ind. Pharm., 2004; 30: 481-90.
21. Lian-Dong H., Yang L., Xing T., Qian Z. “Preparation and invitro/in vivo evaluation of sustained- release metformin hydrochloride pellets” Eur. J. Pharm. Biopharm., 2006; 64: 185-92.
22. Sood A.,Ashokraj Y.,Panchagnula R. “Multiunit matrix based particulate systems (MUMPS) for controlled delivery of nifedipine. Formulation development using extrusion-spheronization and in vitro evaluation” Pharm. Tech., 2004; 28: 62-71.
23. Santosh H.,Veiga F.,Pina M., Sousa J.J. “A study on the effectof drying techniques on the mechanical properties of pellets and compacted pellets” Eur. J. Pharm. Sci., 2004; 21: 119-29.
24. Husson I.,Leclerc B., Spenlehauer G.,Veillard M.,Puisieux F.,Couarraze G. “Influence of size polydispersity on drug release from coated pellets” Int. J. Pharm., 1992; 86:113-21.
25. Steckel H.,Mindermann-Nogly F. “Production of chitosan pelletsby extrusion spheronization.” Eur. J. Pharm. Biopharm., 2004; 57:107-13.
26. Vervaet C., Baert L., Remon J.P., 1995. Extrusion- spheronisation “A literature review” Int. J. Pharm, (116), 131-146

THE END

ARTICLE

9

TRACHEIDS IN BULBS OF *URGINEA INDICA* KUNTH

S.K.Hemalata, M.N. Shiva kameshwari & K.J. Tharasaraswathi
Department of Botany & Biotechnology, Bangalore University, Bangalore, INDIA

Abstract:

Urginea indica is called Indian Squill. It belongs to family Liliaceae. It consists of around 100 species. In India, it is found throughout the plains and in the dry hills of the lower Himalayas . It is found in remote and difficult terrain and in slopes. Its uses as medicine dates back to sixth century before Christ, e.g; Oxymel of Squill, used for coughs, was invented by Pythagoras. The usefule parts are bulbs. These are excellent source of medicine with biocidal applications such as it is used as anticancer drug, for infectious diseases, pains and inflammation, common ailments. In the present studies we found the presence of maximum and clear annular and spiral thickenings in bulbs of different populations of U. indica indicate the primitive nature of xylem in bulbs which we recorded in different populations of U.indica. Presence of mostly annular and spiral thickenings in bulbs of U.indica supports another fact that aerial leaves appear only during wet season and is short lived. As in Onions, the bulbs of Urginea also show the succulent leaves and bulbs conduct relatively slow but show conductive safety the presence of trachieds. Presence of primitive thickenings in xylem of bulbs of Urginea indica support the slow and low requirement of conducting elements and the development of trachieds help the bulbs , and its succulent leaves to survive in long dry periods. The maceration material of five different populations of Urginea indica is invariably showing spiral and annular thickenings with few scalariform thickenings. Thus in absence of foliage , flower and fruits the bulbs survive with their succulent storage leaves with minimum conduction in even dry seasons. Presence of primitive thickenings of trachids in bulbs indicate the survival of the succulent leaves during dry season and also maintain conduction with trachids.

Introduction

The knowledge of the histological structure of the various organs of the plant containing the active principle is also very important. Anatomical characters constitute a help in the identification in morphological features of many plants (David et al., 2008). Like any other branch of botany, plant anatomy is amenable to good experimental design, with clear hypotheses, controlled comparisons, sophisticated statistical analysis, and it is thoughtful interpretation by William C. Dickison, Nancy G. Dengler, in *Integrative plant anatomy.* Anatomical characters can also help the identification when morphological features are indistinct(David et.al., 2008).

In present studies as a part of anatomy, xylem in bulbs of *Urginea indica* is studied.

Plant is useful in vitiated vata, kapha, cough, asthma, bronchitis, cardio myopathy, urinary retention, urinary calculi, worm infestation, skin disease, arthritis, and traumatic edema Systemic disorders, Organ-specific disorders are treated in Ayurveda and Unani by *Urginea indica.* Gebran N. karam (2004) in article Biomechanical Model of the Xylem Vessels in Vascular Plants quotes that herbaceous plants develop vessels, and annular thickenings of xylem develop first followed by spiral. scalariform thickenings show slight advanced .

There is a need to increase and refine our basic understanding of the internal structure of plants. In bulbous plants like onions vessels are found in roots only. Leaves and stems have no vessels. Such plants leaf out , flower and fruit very rapidly during the moist season, and they store water and photosynthates for the next year in the succulent leaves. Within the succulent leaves of Onion conduction is relatively slow, but to have conductive safety succulent leaves survive long dry periods – hence the conductive safety that tracheids confer. The outer scale leaves that does not completely collapse as a whole, but ceases functioning one tracheid as a time is optimal according to Sherwin Carlquist, (2012) in Plant discoveries. *Urginea indica* , kunth also is a bulbous herbaceous plant as Onion, with reference to the article given by Sherwin Carlquist we made an effort to observe the same character of succulent leaves of Onion that shows presence of tracheids in dry seasons for maintaining conductive safety.

There is not an inexorbable progression from primitive to speciallized xylem in monocotyledons, apparent accelerations or reversions are also possible. " Ecological iteration" (physical process) has occurred in some monocot lineages, so that early – departing branches in some cases may have more " specialized" xylem because of entry into xeric habitats, whereas nearby crown groups, which may have retained " primitive" xylem , probably represent long occupation of mesic habitat. (Monocot xylem revisited: New Information, New Paradigms- Sherwin Carlquist, (2012)

As the plant *U.indica* occupies various habitats its different populations may show some specialized xylem which indicate ecological iteration.

Tracheary elements of roots of Asteliaceae can be characterised as tracheids with some degree of transition to vessel elements. *Astelia* shows stages of transition between vessel elements and tracheids. This character expression relate to occupancy of moist habitats with steady availability of moisture during the year. (Origin and Nature of vessels in monocotyledons, Pit membrane micro-structure diversity in tracheary elements of *Astea*- 2009). The present work help to analyze any such transition of trachieds to vessels based on their thickenings.

Long, annular and spiral thickenings are considered to be Primitive and are prooved to be tracheids.
(Cheadle (1942) also offers some gradate phylogenetic progressions, in The Evolution of Xylem Elements.

Xylem of bulbs of different populations of *U. indica*, a monocot with relatively less specialized xylem, in its bulbs was examined to better understand structural conditions that make the bulb survive in dry seasons. Its trachieds and their primitive thickenings of annular and spiral types indicate the need for succulent leaves conduction and survival.

Materials and methods

Bulbs of different populations of *Urginea indica* were collected from different parts of karnataka. All the populations were grown in green house at The department of Botany, Bangalore University, Bangalore. For anatomical analysis bulbs were macerated in Schultze macerating fluid.
It consists of strong nitric acid and potassium chlorate. The pieces of bulbs were taken into a test-tube; just enough nitric acid is poured on it to cover it, and then added a few crystals of potassium chlorate. Heated it gently until bubbles are evolved, and allowed the reagent act until the material becomes white. (4-5 mimutes) . The contents were poured into a dish of water. After the material is thoroughly washed in water, it is teased with needles and mounted. After a thorough washing in water, the material is stained. The large tracheids of bulbs, dissociated in this way were stained in safranin to make beautiful preparations. The stained material was taken on a glass slide in a drop of glycerine and tease with the help of two needles to separate the cells with needles. Place a cover slip and observe under microscope. A light microscope was used to view the slides.

Results

Five different populations were selected to analyse the type of xylem thickenings in bulbs are, Shimoga, Pillali, Nagarahole, Nagamangala, Banganawadi
Tracheary elemental thickenings and their variations in different populations of *Urginea indica* have been observrd (Table 1)
Macerated materials of bulbs showed xylem elements with more annular and spiral thickenings. Bulb tracheary elements appear to be primitive with mostly annular and spiral thickenings.

Shimoga, Population 1 (Fig 1 - a, b)
It showed mostly annular and spiral xylem with tight coils. The trachieds showed mediam diameter but were lengthy.

Pillali, Population 2 (Fig 1 - c , d)
This showed more loosely held coils and spiral xylem , wide diameter of trachides were observed. Trachieds were long more primitive.

Nagarahole , Population 3 (Fig1 - e , f)
This population shows increased number of spiral thikenings, few annular and scalariform also seen. More compact arrangement of spiral coils. The diameter varied from narrow to median.

Nagamangala, Population 4 (Fig 1 – g, h)
It showed spreading of spiral coils and few annular xylem. Trachieds were shorter and wider in diameter.

Banganawadi, Population 5 (Fig 1- i , j)
This showes less spread xylem with highly narrow elements. Many annular and spiral bands were notieced. Trachieds again appear to be lengty.

Table – 1

Sl. No	Population	Width and length of trachea	Types of thickenings in trachea		
			Annular	Spiral	Scalariform
1	Shimoga	Median width, long	√	√	X
2	Pillaly	Wide , long	√	√	X
3	Nagarahole	Slight narrow to median, Long	√	√	√
4	Nagamangala	Wide, Short	√	√	X
5	Banganawadi	Very narrow, Long	√	√	X

Discussions

In this present studies of maceration material of *Urginea indica* in invariably showing spiral and annular thickenings with few scalariform thickenings.

Among five populations of *Urginea indica* following types of variations and similarities have been noted. Annular and spiral thickenings are common in all the populations , but in one population collected from Nagarahole, Scalariform thickenings are found which may be considered as a slight advanced feature among these. In population collected from Nagamangala very wide and short type of vessels are found whereas other populations showed medium or narrow diameter and long vessels.

There is a continuing need to increase and refine our basic understanding of the internal structure of plants. In bulbous plants like onions vessels are found in roots only. Leaves and stems have no vessels. Such plants leaf out , flower and fruit very rapidly during the moist season, and they store water and photosynthates for the next year in the succulent leaves. Within the succulent leaves of Onion conduction is relatively slow, but to have conductive safety succulent leaves survive long dry periods – hence the conductive safety that tracheids confer. The outer scale leaves that does not completely collapse as a whole, but ceases functioning one tracheid as a time is optimal. (Plant discoveries- Sherwin Carlquist, the Botanical review June 2012). Similar results obtained in *U.indica.* There is not an inexorbable progression from primitive to speciallized xylem in monocotyledons, apparent accelerations or reversions are also possible. " Ecological iteration" (physical process) has occurred in some monocot lineages, so that early – departing branches in some cases may have more " specialized" xylem because of entry into xeric habitats, whereas nearby crown groups, which may nave retained " primitive" xylem , probably represent long occupation of mesic habitat. (Sherwin Carlquist, June 2012) . *Urginea indica* occupies various habitats its different populations show some specialized xylem which indicate Ecological iteration as seen in Nagarahole population.

Long, annular and spiral thickenings are considered to be Primitive and are prooved to be tracheids. (Cheadle (1942) also offers some gradate phylogenetic progressions.

Xylem of bulbs of different populations of *U.indica*, with relatively less specialized xylem, in its bulbs was examined with microscopy to better understand structural conditions that make the bulb survive in dry seasons. Its trachieds and their primitive thickenings of annular and spiral types indicate the need for succulent leaves conduction and survival during dry seasons.

Thus in absence of foliage , flower and fruits the bulbs survive with their succulent storage leaves with minimum conduction even in dry seasons.

Legends:

Macerated xylem trachieds in populations of *Urginea indica*

Fig 1. a-b- Shimoga population showing annular and spiral thickenings.

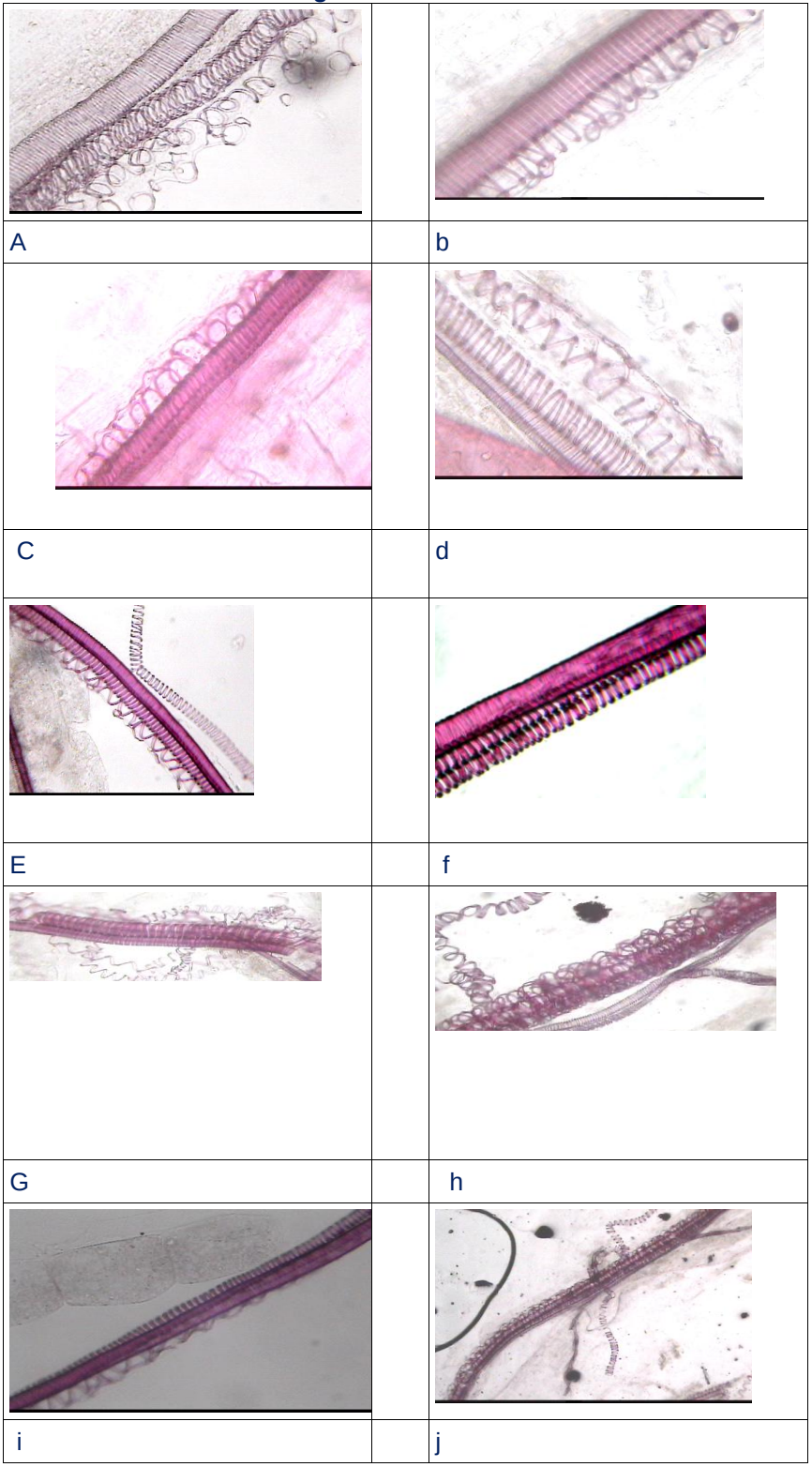
Fig 1. c-d – Pillali population showing annular and spiral thickenings

Fig 1. e-f - Nagarahole population showing annular, spiral and scalariform thickenings

Fig 1. g-h – Nagamangala population showing annular and spiral thickenings

Fig 1. i-j – Banganawadi population showing annular and spiral thickening

Figure - 1



Conclusion:

In *Urginea indica* populations collected from different localities exhibit diversity with respect to its xylem vessels in bulbs. Presence of more annular and spiral thickenings makes us to consider *Urginea* as a primitive bulbs as seen in all monocotyledons. But Nagarahole population shows even presence of few scalariform thickenings along with annular and spiral. Long vessels with greater diameter although indicate primitiveness in bulbs of *U. indica* that florishes well in dry zones.

Cell walls in the tracheary elements of *U. indica* the xylem have a variety of secondary wall thickenings. Different types appear in an onto genetic sequence with annular thickening occurring first, followed in order by helical and scalariform thickenings as quoted by Gerban . N . Karam – 2004.

References

1. Alexander J.D 1940 Plant microtechnique. Mc – Graw Hill. London – 101
2. Bailey I.W and WW Tupper 1918. Size variation in Tracheary cells. I.A Comparison between the secondary xylem of vascular cryptogams, gymnosperms and angiosperms. Proc, An art Sci soc 54: 149-204
3. Bruneton J (1999). Pharmacognosy, Phytochemistry, Medicinal plants. Intercept limited, p 1119.
4. Gebran .N. karam 2004. Biomechanical Model of the Xylem Vessels in Vascular Plants .
5. Peter v. Sengbusch – Impressum The Evolution of Xylem Elements
6. John S. Sperry. 2003. Int. J. Plant Sci. 164(3 Suppl.):S115–S127. 2003.
7. Zimmermann MH 1978 Hydraulic architecture of some diffuse porous trees. Can J Bot 56:2286–2295.-140
8. Tyree M.T and M. H Zimmermann 2002. Xylem structure and the ascent of sap. Springer, Berlin. 283 pp
9. Map of Life - "Xylem vessels in vascular plants" http://www.map of life.org/topics/topic_450_Xylem-vessels-in-vascular-plants/ October 08, 2013 . Convergent Evolution online
10. William C. Dickison Google book Published on March 24, 2000, (*Integrative plant anatomy.*. Harcourt/Academic Press. 2000. xvii + 533 pp., ISBN 0-12-215170-4.
11. "Xylem vessels in vascular plants"http://www.mapoflife.org/topics/topic_450_Xylem-vessels-in-vascular-plants/December 18, 2012
12. Sherwin Carlquest , 1997. 2007. Tracheary elements in ferns: new techniques, observations, and concepts. Amer. Fern Journal 97: 25-37 and Origins and nature of vessels in monocotyledons. 1. Acorus. Int. Jour. Plant Sci. 158:51-56 (with Edward L. Schneider). Book: Plant discoveries.

THE END

ARTICLE

10

SCREENING, COMPARATIVE ANALYSIS AND EVALUATION OF *IN VITRO* AND *IN VIVO* PRODUCED *MENTHA ARVENSIS* L.

Rashmi R. Bariya* & Himanshu A. Pandya
Department of Botany, University School of Sciences, Gujarat University
Ahmedabad, Gujarat, INDIA

Abstract:

Mentha arvensis L. (Corn mint) possesses a medicinally important and aromatic characteristic which is used in pharmaceuticals. The presence of active principle terpenoids, phenols and flavonoids it fetches good monetary return in industry. Chromatographic evaluation with various extract compatibility and solvent combination was performed as Thin Layer Chromatography (TLC) to analyse presence of the phytochemical compounds in *Mentha arvensis* L.Secondary plant products are of major interest because of their different functions and their biological activities. Phytochemical constituents with respect to the role of this plant in traditional medicine treatment have well been established.The constitutes generally identified in Corn mint are generally: Menthol, Menthone, isomenthone, limonene, neomenthol, methyl acetate, β-caryophyllene, piperitone, alpha and beta-pinene, tannin, camphene, carvone, Eucalyptol, piperitone oxide, di-hydrocarvone, Linalool, trans-caryopyllene, caryopyllene oxide, α-terpineol, α-phellandrene, L-menthol, thymol, eugenol, α-pinene, β-pinene, rosmarinic acid, methyl acetate, o-mentha-1(7)-8-dien-3-ol, 3-methyl cyclo-haxene, 3-octanol, pulegone, β-Bisabolene, β-cubenene. The screened phytochemicals were compared with standard and can be explored for separation and purification.

Introduction

Plant derived natural products are known to play an important role in drug discovery.*Mentha arvensis* L. (*Lamiaceae*), commonly known as cornmint is promising source of important phytochemicals. Secondary metabolites are present in all higher plants, usually in high structural diversity. They play an important role in plant defence against herbivores (Stamp, 2003) and other interspecies defences; according to their functions in plant metabolism. Many metabolites have been found to protect plants against viruses, bacteria, fungi, and importantly against herbivores. Essential oil obtained from natural sources is also important as raw materials in the perfumes and flavour industry. Corn mint is also widely used in production of confectionary, soaps, detergents, cosmetics, perfumery, mouth fresheners, cough drops, tobacco goods, medicated oil tooth pastes, analgesic balms, lotions, shampoos, chewing gums, candies and also used as cooling compound in flavours, oral care products and beverages (leffingwel, 2009).The extract from Corn mint have presented different activity *viz*., Anti-Candida activity **(**Holetz*et al.,* 2002 and Santos *et al* 2012)**,** Antimicrobial activity (Eidla *et al.,* 2009), Antiulcerogenic activity extracts of *Mentha arvensis* (Londonkar *et al*., 2009)**,** Antibiotic Activity **(**Coutinho *et al*, 2009)**,** Repellent activity (Koc *et al*, 2012))**,** prophylactic properties (Salin *et al*, 2011), Radioprotective activity (Jagetia *et al*., 2002)**,** fungitoxic and insecticidal activity (Kumar *et al*., 2009). Attempts have been made to screen and identify some important phytochemicals. The same has been explored for commercial use.

Materials and Methods:

Plant stock of required for tissue culture studies of *Mentha arvensis* L. were grown in Botanical Garden of Gujarat University, Ahmedabad campus. Sterile nodal explant was excised in to pieces of 1 to 2 cm and carefully inoculated on MS basal medium (Murashige and skoog's, 1962 revised) supplemented with different combination of BAP, NAA and IAA. The pH of the medium was adjusted to 5.8 before the addition of agar and autoclaved at 121^0C (1.06kg/cm^2) for 20 minutes. The cultures were incubated at 25±2^0C, 16-18 hours photoperiod under 2000 Lux white fluorescent lamp. Shoot initiation was observed on nodal segments within weeks of inoculation. Each treatment consisted of 5 replicates and was periodically carried out at 4 weeks interval for shoot multiplication. Regenerated shoots (more than 5 cm in length) will well developed roots were carefully removed without any traces of agar, transferred to plastic pots filled with sterile sand, soil and vermiculate (2:1:1). It was kept in the controlled atmosphere (26 ºc ± 2ºc, 55 ± 5% Humidity and 2000 Lux). These hardened plants were acclimatized in the green house and then finally transferred to earthen pots containing normal garden soil rite after one month.

Plant material and extraction:

Healthy growing leaf, shoot and root samples were collected from Corn mint. It was thoroughly washed under tap water and shade dried at room temperature in the laboratory. After one week of drying the plant material was extracted and dried successively using solvents ranging from non-polar to polar. 5 gm of dry powered was kept covered with 50 ml solvent petroleum ether in a conical flask for 30 minutes. Frequent shaking was done then the clear supernatant was decanted in to a 100 ml beaker and the extract was kept under a ceiling fan to concentrate gradually. When the extract was reduced to 5 ml, it was allowed to be spotted on pre-casted TLC plates for further analysis of terpenoids content as per the method of Daniel *et al.,* 1991.

TLC Plate and detecting reagent:

6 gm silica gel G was made into slurry with 15 ml D.W. The slurry was poured and spread on the clean, 2 mm thick and 20×20 cm, 20×10 cm sized pre-cast glass plate with the help of shaking or spreader. Thickness maintained for each plate was 1mm and the pore size was moderate. Detective reagent was sprayed gently on the TLC plate with the

help of Sprayer. After spraying the plate was heated in oven at 80 ± 2° C for 10-20 minutes and change in the colour was observed. Vanillin–Sulphuric acid reagent was used as spraying reagent for analysis and identification.

Results and Discussion

A regeneration protocol was optimized for more rapid propagation from nodal explants supplemented with NAA 0.4 mg/l and BAP 2.0 mg/l for shoot multiplication and IAA 1.0 mg/l for root production in Corn mint. The phytochemical investigation of petroleum ether extract of various plant parts like leaves, stem and roots which are highly concentrated within monoterpenoids, flavonoids, phenols and coumarins were observed (Plate-1 and Plate-2).TLC of petroleum ether extract of in vivo and in vitro leaves, stem and root revealed the presence of 8 and 6 compounds having Rf some promising values recorded to evaluate with standards (Table-1, 2, 3, Plate-1) respectively when a solvent phase of Chloroform: Benzene (1:1) was used. In Plate-2, results for fourteen bands with appropriate Rf value shown in Table 4 and 5 is recorded using Toluene: Ethylacetate (93:7) solvent system. The Rf values of 0.30, 0.36, 0.48, 0.55were present in both in vivo and in vitro leaf extracts which represents the essential oil components like menthol, piperitone, pulegone, Menthone. In vitro leaf extract showed additional valued drug Methyl acetate (wagner and Bladt, 2007). TLC profiling of all extracts gave promising results that directs towards the presence of number of phytochemicals with different solvent system. This variation in Rf of the phytochemicals provides very important clue and understanding their polarity and selection of appropriate solvent system for separation of pure compounds by column chromatography. Mixture of solvents with variable polarity in different ratio can be used for separation of pure compound from defined plant extracts. These chemicals can be identified with proper verification followed by separation and utilization for further explorations either in laboratory or industry purposes.

Conclusion:

The present investigation reported that the leaves, stem and root extract of *Mentha arvensis* L. contains highly medicinally important bioactive compounds and this justify the use of plant species as traditional medicine for treatment of various diseases. The plant screened for phytochemical constituents Seemed to have the potential to act as a source of useful drugs and also to improve the health status of the consumers as a result of the presence of various compounds that are vital for good health.

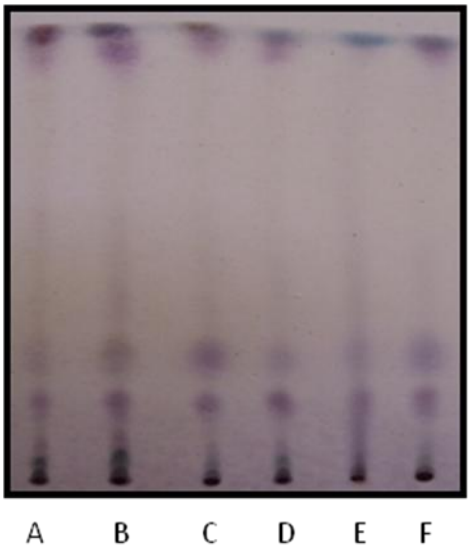


Plate-1: TLC interpretations:*In vivo* and *in vitro* leaves, stem and root extracts (Benzene:Chloroform) **A**-*In vivo* leaf extract, **B**-*In vitro* leaf extract, **C**-*In vivo* stem extract, **D**-*In vitro* stem extract, **E**-*In vivo* root extract, **F**-*In vitro* root extract

Plate-2: TLC interpretations: *In vivo and in vitro* leaf extract (Toluene: Ethyl acetate) **A**-*In vivo* leaf extract, **B**-*In vitro* leaf extract

Table-1 TLC analysis:*in vivo* and *in vitro* leaves extract (chloroform:Benzene)

Plant Material	Sample	Band	R_f value	Colour detection
In vivo produced leaf	Sample-1	1	0.02	Blue/unidentified
		2	0.05	Violet/unidentified
		3	0.10	Violet/unidentified
		4	0.25	Violet/unidentified
		5	0.30	Blue/menthol
		6	0.91	Blue/ unidentified
		7	0.94	Red/unidentified
In vitro producedleaf	Sample-2	1	0.02	Blue/unidentified
		2	0.06	Violet/unidentified
		3	0.15	Violet/unidentified
		4	0.23	Violet/unidentified
		5	0.30	Blue/menthol
		6	0.39	Blue/β-Caryophyllene
		7	0.91	Blue/unidentified
		8	0.95	Blue/unidentified

Table-2 TLC analysis: *in vivo* and *in vitro* stem extract (chloroform:Benzene)

Plant material	Sample	Band	R_f value	Colour Detection
In vivo produced stem	Sample-3	1	0.03	Blue/unidentified
		2	0.05	Violet/unidentified
		3	0.25	Violet/unidentified
		4	0.30	Blue/menthol
		5	0.92	Blue/ unidentified
		6	0.97	Blue/unidentified
In vitro produced stem	Sample-4	1	0.03	Blue/unidentified
		2	0.05	Violet/unidentified
		3	0.27	Violet/unidentified
		4	0.30	Blue/menthol
		5	0.91	Blue/ unidentified
		6	0.97	Blue/unidentified

Table-3 TLC analysis: *in vivo* and *in vitro* root extract (chloroform:Benzene)

Plant Material	Sample	Band	R_f value	Colour Detection
In vivo produced root	Sample-5	1	0.02	Blue/unidentified
		2	0.26	Violet/unidentified
		3	0.30	Blue/menthol
		4	0.38	Violet/unidentified
		5	0.46	Violet/unidentified
		6	0.91	Blue/ unidentified
In vitro produced root	Sample-6	1	0.02	Blue/unidentified
		2	0.04	Violet/unidentified
		3	0.08	Violet/unidentified
		4	0.30	Blue/menthol
		5	0.48	Violet/pulegone
		6	0.94	Blue/unidentified

Table-4 TLC analysis: *in vivo* leaves extract (Toluene:Ethylacetate)

Plant Material	Band	$R_f$value	Colour Detection
In vivo produced leaf	1	0.03	Blue/unidentified
	2	0.05	Brown//unidentified
	3	0.17	Brown/unidentified
	4	0.23	Blue/unidentified
	5	0.30	Blue/Menthol
	6	0.36	Blue/Piperitone
	7	0.40	Blue/β-Caryophyllene
	8	0.48	Violet/Pulegone
	9	0.55	Blue/Menthone
	10	0.58	Blue/unidentified
	11	0.65	Blue/unidentified
	12	0.76	violet/ unidentified
	13	0.90	Blue/unidentified

Table-5 TLC analysis:*in vitro*leaves extract (Toluene:Ethylacetate)

Plant Material	Band	$R_f$value	Colour Detection
In vitro produced leaf	1	0.10	Blue/unidentified
	2	0.20	Green/unidentified
	3	0.30	Blue/Menthol
	4	0.36	Blue/Piperitone
	5	0.40	Blue/β-Caryophyllene
	6	0.48	violet/pulegone
	7	0.50	Blue/unidentified
	8	0.55	Blue/Menthone
	9	0.62	Blue/unidentified
	10	0.65	Blue/unidentified
	11	0.70	Violet/unidentified
	12	074	Blue/unidentified
	13	0.80	Violet/methyl acetate
	14	0.94	Blue/un identified

References

1. Bariya R R and Pandya H A**.** Evaluation and establishment of promising large-scale *In vitro* production of corn mint. *International Journal of Recent Scientific Research*. 2014, **5** (2)509-512.
2. Coutinho HDM, Costa JGM, Falcao-Silva VS, Lima EO, Siqueira-Junior JP. Potentiating effect of *Mentha arvensis* and chlorpromazine in the resistance to aminoglycosides of methicillin-resistant Staphylococcus aureus. *In vivo*; 2009, 23: 287-90.
3. Daniel, M. Methods in Plant Chemistry and Economic Botany, Kalyani Publishers, New Delhi, Ludhiana. 1991.
4. Eidla N, Fabiola R, Adriana C, Jose C. Phytochemical prospection, toxicity and antimicrobial activity of *Mentha arvensis* (*Labiatae*) from Northeast of Brazil. *J. Pharmacogn*. 2009, 1(3): 210-212.
5. Fraenkel, G.S. The raison d'etre of secondary plant substances. Sci.,1959, 129: 1466-1470.
6. Holetz FB, Pessini GL, Sanches NR, Cortez DA, Nakamura CV, Filho BP. Screening of some plants used in the Brazilian folk medicine for the treatment of infectious diseases, 2002, 97(7): 1027-1031
7. Jagetia GC, Baliga MS. Influence of the leaf extract of *Mentha arvensis* Linn. (Mint) on the survival of mice exposed to different doses of gamma radiation, Radiat. Oncol., 2002, 178(2): 91-98.
8. Koc, S., Oz, E. and Cetin, H. Repellent activities of some *Labiatae* plant essential oils against the salt marsh mosquito Ochlerotatuscaspius (Pallas,1771) (Diptera: Culicidae). Parasitology Research, 2012, 110(6): 2205-2209.
9. Krishnaiah D, Sarbatly R, Bono A. Phytochemical antioxidants for health and medicine. A move towards nature.Biotechnol. Mol. Biol. Rev., 2007, 1(4): 097-104.
10. Kumar AS, Ravindra S, Priyanka S, Amit K, Nawal K. Use of essential oil from *Mentha arvensis* L. to control storage moulds and insects in stored chickpea. *J. Sci. Food Agric*.,2009, 89: 2519-2526.
11. Leffingwell, J. C. Cooling ingredients and their Mechanism of Action.Cosmetic Science and Technology, 2009.

12. Londonkar RL, Poddar PV. Studies on activity of various extracts of *Mentha arvensis* Linn.against drug induced gastric ulcer in mammals. *World J. Gastrointest. Oncol*., 2009, 15: 1(1): 82-88.
13. Murasingh, T. and Skoog, F. A revised medium for rapid growth and bioassays with tobacco Tissue Cultures. Physiol. Plant.,1962, 15:473-497.
14. Salin O, Törmäkangas L, Leinonen M, Saario E, Hagström M, Ketola RA, Saikku P, Vuorela H,Vuorela PM. Corn mint (*Mentha arvensis*) extract diminishes acute Chlamydia pneumonia infection *invitro* and *in vivo*. *J.Agri.Food chem*, 2011, 59(24):12836-42.
15. Santos, K.K., Matias, E. F., Souza, C. E., Tintino, S. R., Braga, M. F.,Guedes, G. M., Nogueira, L. F., Morais, E. C., Costa, J. G., Menezes, I. R., Coutinho, H. D. Anti-Candida activity of *Mentha arvensis* and *Turneraulmifolia*. *Journal of Medicinal Food.* 2012, 15, 3***: 322-324***
16. Stamp, N. Out of the quagmire of plant defense hypotheses. Q. Rev. Biol.,2003, 78:23-55.
17. Wagner, H. and Bladt, S. Plant Drug analysis- A thin layer Chromatography. Second edition, Springer International Edition.2007, ISBN-81-8128-136-5.

THE END

ARTICLE

11

THE ANALYSIS OF MUNICIPAL SERVICES ACCORDING TO URBAN LAND VALUE ADDED TAX IN IRAN (CASE STUDY: BABOL CITY)

Meysam Hassanzadeh* **& Reza lahmian**
*Master of Science in Geography and Urban Planning
Assistant and Faculty Member of Human Science, Payam Noor University of Mazandaran, Babol, Iran.

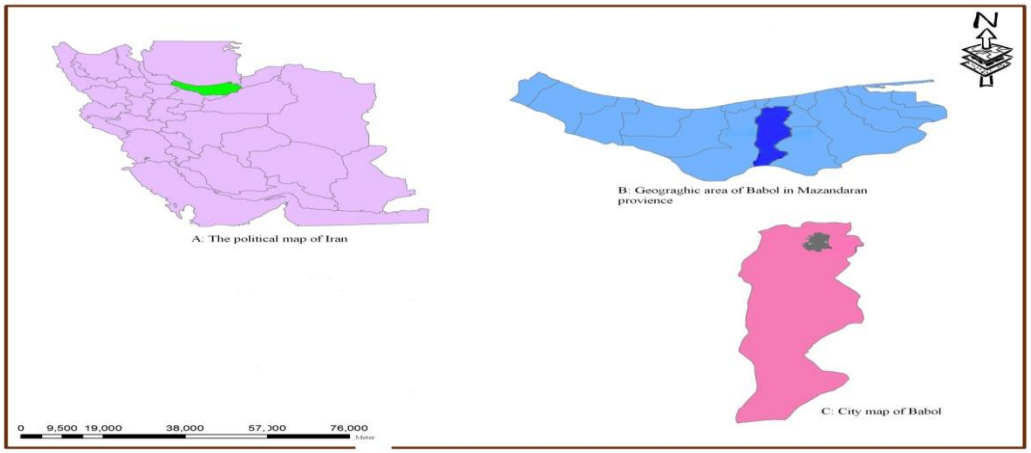
Abstract:

Population density increasing in cities caused an increase in urban land value. This trend affected dedication of municipal services in urban areas. This study investigates role of VAT in municipal service dedication in different area's of Babol, considering that this city is midtown city of Iran regarding its size. This study is analysis _applied and in order to verify conducted research, we used SPSS software and LIKERT scale measurement and meaningfulness test (Chi-Square). We observed meaningfulness differences in this index that the level of meaningfulness in this test is (0/001). The result indicates that residents of uptown area accepted this result and difference more than downtown areas and this difference verified by meaningfulness test. But result verified the hypothesis and rejected the null hypothesis.

Introduction

In recent years equitable allocation of sources and facilities among different areas of city is one of important subjects that social scientists concentrated on it. This results from realistic approach of all humanities disciplines to user processes in the world. If difference between poor and rich people become more, to the extent that they feel relative deprivation or distributive injustice and couldn't satisfy their steamy needs, in these cases ,socio-economic system and government will be destroyed soon or late (Rafie poor ,1997:11). These imbalance and inequalities, except for the inherent injuries, could disturb the performances and expectation of national economic (Smith, 2005:11). In recent century attention to cities high population and creation of new form of city revealed that urban geography and planning of urban spaces should concern new dimensions and this is one of new subjects in recent 20 years that caused scientists concentrate on social justice in urban issues which attaches the city to national and global policies (shakooyi, 1994:9). Domestic conditions results from socio-economical situation of countries and consequently these conditions defines the urban spaces quality and planning strategies.so, the basic requirement is investigation of social, cultural, economical values, in particular , social justice and as a result of analysis of this criteria that effective steps taken concerning realization of social justice in society. In order to fulfill needs of all the residents in a same way ,social justice come to fore that lack of attention to it has very bad consequences such as marginalization, over density of a region, development of a comprehensive urban, depopulation of some urban areas, land speculation and other issues. It means in regional justice, how to demand different political areas in negotiation and communication with a central authority which are under control, are important issues (Harvey, 2000: 139). So, "social justice" both geographically and spatially, is distribution of public resources with social and geographical policies and risks (Smith, 1994: 173). As a result, both expenditure and state apparatus should have fair equality. In other words, geographical justice is defined as distribution of revenues and costs according to needs and socio-economic features of people (boyne, 2002: 14). Inequality of the gap between poor and rich results when a society is descending economically. Status of all segments more or less getting worse. In this case not only inequality exists, but also poverty expands, even in the presence of rich people...! (Rafie poor, 1997: 37). Babol is one of most populated cities of Mazandaran. This city is located on circuit between 33° and 5" and 36 degree and 33 north latitude from the equator and 55 degree 41 minutes east of the Greenwich meridian (Census Center of Iran, 2011). This cities population in Iran's latest population and housing census was 201,335 people that concerning size, is among middle town cities (Census center of Iran, 2011).

Figure (1) Map of the political status of the city of Babol



Traced: by the authors 2014.

Problem statement:
Generally, urban development could locate in stable manner when provide specific strategies for fulfillers of residents need that because of segment attitude, weakness of urban management structure and lack of community participation ,civil service organizations couldn't distribute the space equitably (Mordie masihi varaz, 2005, 151). It seems conflict between local official programs and political leaders cause problems on the failure of municipal services fairly (Dillinger, 2000: 28). Lack of understanding of this problem that environmental justice results from fair treatment of people of all groups and classes to accept apply and implementation of laws and policies of city managers is somehow a crisis (Governors, 2005: 4). Inequality of second order threatens the current condition of Iran and it should be considered that poverty alone couldn't cause harm on society and its social system, but it is disparity that leads society to fall (Rafie poor, 1997: 42). The purpose of this study is to prove the hypothesis that in Babol there is significant differences between value of urban land and allocation of municipal services.

Basics of theory:
If thought of social justice and support for disadvantaged areas has not been successful in Iran, the major reason for that lies in strategies. If capital investment in disadvantaged areas with welfare moved toward creation of employment, perhaps the employment situation in the country today was quite different from what is (Papoli yazdi, 1996: 133). A Balance spatial distribution utility is one of main symptoms of social justice in cities. Social justice in the city is reservation of interest of different social groups based on the optimal expansion of the cities resource, revenues and expenses (Glay, 2002: 277). An important issue in equitable distribution and service capabilities between urban areas (Harvey, 2000: 97). System of land use became one of areas of justice in relation to the role played by the general rules on income redistribution in whole or in real and welfare quality and how they are being emphasized (Gharakhloo, 2004: 89). Unfortunately geographic research has social justice at global level is relatively low, particularly in Iran. However, the study in geo-spatial inequalities divided into two groups:

1) A group that investigates area inequalities with a number of equal indicators such as expenditure, rules, availabilities and … the result of such investigations is in equal distribution determination provision of asymmetrical map. Major flaw in this study is to investigate the distribution of resource, while some areas based on the criterion of "need "is accepted principle of social justice theory, should receive more services. It means, the distribution of resources should be based on justice, instead of equality.
2) Other category is investigations that have done resource distribution based on "need" criteria. Davis is the first person that has done this kind of research. In his view "social justice "observed when there is a high degree of correlation between the index of essential service and. economic and social condition. After that, Davis framework became basis of "spatial justice" research of Britain local experts (Boyne, 2002: 13).

Miller (1999) said that none of the standard requirement, eligibility and entitlement," which most theories have been put forward, has not enough value in the practical application. The most important factors in urban planning are use of spaces and proper distribution and to the full expression is spatial justice. In this regard applications and municipal services are effective and useful factors that meet the needs of population, public interest increasing and attention to eligibility and suitability of individuals can establish more equitable spatial, social and economic justice. So, disturbance of demographic balance that its root lies in suburban and intra immigration and crowding in certain areas can cause inconsistency of urban space with economic and social justice.

***In terms of creating an atmosphere of government local capital, there are two general conditions:**
1) The required fees must be equal to the geographic shape.
2) The taxes to be paid should have same shape geographically.

In other division, justice is divided into two "horizontal and vertical equity". Horizontal equity means dealing with people in unequal positions, for example, per capita food coupons and vertical equity means "unequal but proportional to deal with people in unequal positions. For example, imposing a progressive tax on income as income goes up, tax rate increases as well. Allocation of economic justice is vertical. But distributive justice can be vertical or horizontal (Masgeryoo 1994: 316). According to definitions of the justice, what is city spatial justice and how it will happen? According to David Harvey, social justice in city should be responsive to population needs. Regional allocation leads the resource so that people face with minimal gaps and protest toward their rights. So, social justice means" equal distribution through fair" (Harvey, 1996: 97). Justice in the city must respond to the following statements:

A) Appropriate and proportional allocation of facilities and services.
B) Use of actual and potential vigor.
C) Eliminate the gap between poor and rich in the city.
D) Prevent the rise of poverty in the urban slums.

Material and methods:

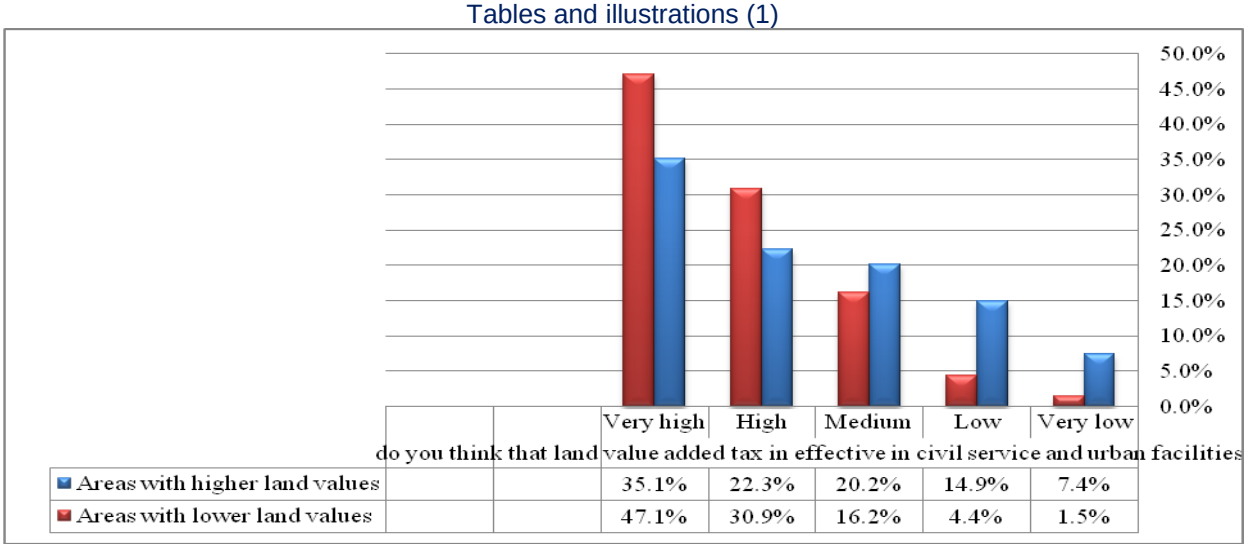
This study is survey and applied-analysis that first exploratory studies as library and preliminary visits were made and field studies were conducted using research tools. To prove the evidence we have used SPSS software and Lickert measure of satisfaction.

Research hypothesis test:

"There is a meaningfulness difference between land value added tax and allocation of municipal services in Babol".

Considering the fact that it is very clear that the value of land in Babol, especially in downtown areas is much smaller than uptown. Because lands of downtown area are applicable more in agriculture, so the texture is almost rural. However, we asked from residents of urban areas that organized according to their age that how they access their home ground toward urban areas with high land values? That this response also indicated a significant difference between areas. Then, to evaluate the hypothesis the respondents were asked if there is relationship between establishment of the municipal services and the value of land in their neighborhood? They answered to this question in two forms: the people living in area with good economic situation showed a positive approach to this question than downtown residents. It means, the residents of area with lower land value believed that this difference proved most likely proved by mean test. But the results of the study confirmed the hypothesis and assume that H0 is rejected (Tables and illustrations 1).

Tables and illustrations (1)

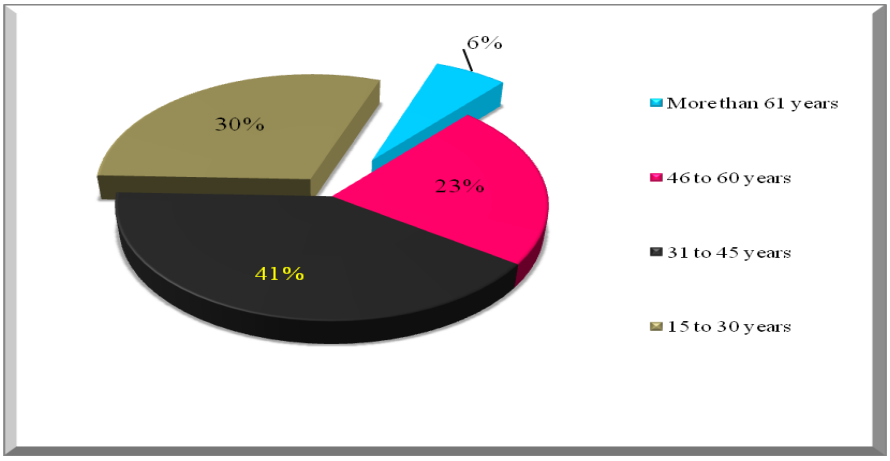


Traced: by the authors 2014.

Table (1) Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	**9.847[a]**	**4**	**.043**
Likelihood Ratio	**10.769**	**4**	**.029**
Linear-by-Linear Association	**8.257**	**1**	**.004**

Diagram (1)



Traced: by the authors 2014.

According too different age group that interviewed by ,and research findings from levels of localities and regions of Babol, indicates that most respondent to question had been in age group 31 to 45 and lowest be in age group above 67 years. Obtained numbers indicate that 35% of the residents of high land value and 47% of residents of low land value and this case shows that urban VAT was influential in allocation and efficiency of the utilities and about 22.3%, 30.9% high and 7.4% and 1.5% know as very low that shows awareness of people toward discrimination and lack of fair urban allocation from institutions and leader of Babol and this subject was emphasized by residents of Babol downtown area and numbers and items verifies this issue. The result shows difference in downtown and uptown value toward having urban facilities that shows sort of prejudice and inattention of managers to poor and rich areas concerning urban land value in Babol (Diagram1).

Results and recommendation of research:

According to conducted research and field studies of Babol sectors that one of them had been chosen from uptown and the other from downtown indicates that there is an effective relationship between land value and ownership of residents in enjoying from municipal services of city managers that necessitate reviewing by Babol managers, because this issue causes a class gap and makes polarity in city that filling of this gap not only is not possible in long-run, but also causes social, economic and cultural issues in city and prevents it from development. At the other hand, Babol is one of median cities of Iran and proceeding toward metropolitan zing, significant difference for the distribution and allocation of municipal resources between urban areas and the gap between them will increase. Consequently, the methods and result of this study would be effective in recognition of problems of other median cities of Iran and the results will be generalized to other median cities.

The recommendation of researcher for improvement of existing situation includes:

1) Preventing from exchanging and dealing of urban lands.

2) Increasing and equitable distribution of services and amenities in all neighborhoods within the city to prevent intra-urban migration.

3) Appropriate planning of managers and relevant institutions in order to create proper spaces away from any orientation to address urban problems of Babol.

4) division of Babol into different agricultural, industrial, cultural and social areas, that means convincing residents of the area to make it the hub of Babol regional agriculture and we will support you financially till don't abandon your residential area and in order to make improvement there.

5) Good urban management system is achievable through decision making and involvement of local people. It is recommended that urban management should be aware of demands, requirements, traditions, beliefs and uses inner resources and potentials to improve environmental conditions and it is necessary to build a proper institution before any action in the city of Babol.

6) Add variety and interest in the field of urban furniture in all parts of Babol such as luxury shopping malls, parks, and green spaces, library,…in order to fair share of urban population concentration in urban areas of in Babol to avoid the increase in urban land neighborhood of uptown argue in favor of low land value in urban areas.

References

1. Boyne, A., Georg, martin A. Powell, "territorial justice spatial justice and local concernment finance", university of Hertfordshire & university of Glam organ. 2002
2. Dillinger, W., Decentralization and its implication's for urban service delivery, Review 2000, p.28.
3. Gharakhloo, M & A, sharifi, create social and economic progress and status of cities board (case study: part 2, Ahvaz) journal of geographical research, 2004, pp. 87-101.
4. Governor's office of planning and Research, General plan guidelines chapter 2, sustainable Development and Environmental justice, 2005, p.4
5. Harvey, D., Social Justice and City, Translated by Mohammadreza Haeri & Behrooz Monadizadeh, Process and Urban Planning Press, 2000
6. Harvey, D., justice, nature and geography of difference", black well publishers Inc. first published. V.S.A. oxford ox jiff & heap er13, XXIV-XXV, 1996
7. Miller, D, Principles of Social Justice, Harvard College, USA1999.
8. Moradi Masihi Varaz, Strategic planning and its application in Urban planning and Urbanism (Sample case metropolis Tehran), Tehran, Publication processing, 2005, p.151.
9. Papoly Yazdi, MH, "Planning of the viewpoint of Islam and its geographical effects", Journal of Geographical Research, published by Astan Quds Razavi, Mashhad 1996
10. Rafie poor, F., development and conflict, shahid beheshti university press, first edition, Tehran1997
11. Richard, M., public finance in theory and practice, masood mohammadi translation, management and urban planning program publication 1993
12. Shakooyi, H., new perspective in city geographic, Samt publication _ Tehran, 1994
13. Smith, D., third world cities in global perspective_ political economy of uneven urbanization, publication 2005
14. Smith, David, "Geography and social justice", Blackwell, oxford, VK. Cambridge, VSA 1994
15. Statistical Centre of Iran, Census of population and Housing, Iran statistics center press 2011

Journals :

1. Meredith, P. A., Elliott, H. L., Clin. Pharmacokinet. 1992, 22, 22 31
2. Yamamoto, K., Hagino, M., Kotaki, H., Iga, T., J. Chromatogr. B 1998, 720, 251 255

Books:

1. Myers, R. H., Montgomery, D., Response Surface Methodology, Wiley, New York 1995

Chapter in a book:

2. Crowther, J. B., in: Ahuja, S., Scypinski, S. (Eds.), Handbook of Modern Pharmaceutical Analysis, Academic Press, New York 2001, pp. 415 443

THE END

ARTICLE

12

FISH DIVERSITY AND ANTHROPOGENIC STRESS ON *GELA BEEL* IN GOLAGHAT DISTRICT, ASSAM

Anamika Sarmah* & S. P. Biswas
Department of Life Sciences, Dibrugarh University, Assam, INDIA

Abstract:

Gela Beel, an oxbow lake in Golaghat District of Assam exhibits rich ichthyofaunal diversity. 58 species of fishes belonging to 41 genera, 19 families and 7 orders were recorded from the wetland in 2012-13. Cyprinids were the most dominant group represented by 21 species. As per CAMP report 26 species were found to be 'Lower risk near threatened, 6 species were Lower risk least concern, 4 species were Endangered, 9 species were Vulnerable and 13 species were under 'Not evaluated' category. Among the recorded species about 51.72 % has been categorized as common, 39.65 % as occasional and rare category comprised of only 8.62 %. Anthropogenic pressure in the form wanton fishing is the greatest threat of fish diversity which needs immediate attention.

Introduction

Biodiversity has remained as one of the central theme of ecology since many years. However, after the Rio's Earth Summit, it has become the main theme for not only ecologists, but the whole biological community, environmentalists, planners and administrators. Fish diversity refers to variety of fish species. This rich ichthyodiversity attracts many biologists all over the world. North Eastern region of India has already been recognized as global hotspots of freshwater fish diversity [Kottela & Whitten, 1996] and among the eight states of the north-east, Assam has the largest number of fishes with 200 species [Mahanta *et al,* 2001]. Recently a good number of new species have been reported from the states of North Eastern region [Sen & Biswas, 1994; Biswas, 1997; Menon *et al*, 2000; Vishwanath & Shanta, 2004] indicating the scope for exploring more on the rich ichthyological diversity of the region. North Eastern region in general and Assam in particular, is blessed with a number of wetlands locally called '*Beel'*, which alone constitute 81 % of the total lentic area in Assam [Dey,1981]. The wetlands of Assam were highly productive in terms of fish diversity and production. These *Beels* provide their natural resources directly or indirectly, for livelihood of the villagers located nearby. Unfortunately, wetlands are presently among the world's most threatened habitats [Tiner, 1984; William, 1990]. The livelihood and economic condition of the fisher community depends mainly on the fish catch from these wetlands. Over the last few decades, wetlands are under increasing stress due to the rapidly growing population, urbanisation and economic growth etc. Human threats come from over exploitation, encroachment, reclamation of vast wetland areas for agriculture. Therefore fish production from these wetlands is declining day by day. In the present study an attempt has been made to evaluate the causes of this decline so that fish production can be enhanced and the socio-economic condition of the fisher community improved.

Materials and Methods

Study area:

Gela Beel is an oxbow lake situated about 16 km north of Golaghat town ($94^{o}5^{/}$ $93^{.}$ $40^{/}$ E and $26^{o}45^{/}26^{.}$ $40^{/}$ N) in upper Assam, India. The *beel* (wetland), covers an area of 111 km^2, is formed by changing course of river Bhogdoi and finally unites with river Dhansiri at Mohuamukh near Bokakhat sub-division of Golaghat district. It is perennial wetland having a varying depth and current velocity, and also one of the prominent fishery resources in upper Assam.

Hydrobiological analysis of water:

Air and water temperature were measured by using mercury thermometer; pH values were measured by digital pH meter; alkalinity, dissolved O_2, free CO_2 were determined following Trivedy *et al*. [Trivedy & Goel, 1986]. Assessment of total hardness was done by following APHA [1998].

Study of biological parameter:

Diversity of fish fauna was monitored for one year in *Gela Beel*. A number of landing sites and market areas were also surveyed during this period. Assistance of local fishermen and Mahaldar were taken for collection of fishes. Collected fish samples were preserved in 6 % formaldehyde solution and stored in glass bottles for detailed examination. For taxonomic identification of the fishes, Talwar & Jhingran [1991] was followed while nomenclature was based on Fishbase [2009]. The conservation status of the fish species is based on CAMP [1998] and IUCN [2011]. In addition, the nearby fishermen communities have been interviewed and gears and methods used for capturing fishes were recorded.

Results and Discussion:

The physico-chemical parameters of *Gela beel* was given in Table 1. The water temperature ranged from 16.17 (Winter) to 32.66 ^{o}C (Monsoon) which is near ideal for fish growth [Sharma & Gupta, 1994]. The pH of the water was

found between 6.9 and 7.54 during monsoon and post-monsoon respectively. Fishes have their own tolerable limits for pH fluctuation, beyond which they cannot survive. The DO was higher during monsoon (10.03 mg/L) and found within permissible limit of BIS [1982.]. It might be due to high rainfall or due to higher photosynthetic activity in wet months. The alkalinity was found to be minimum (44.43 mg/L) in monsoon and that of maximum (89.09 mg/L) in winter months. These values are good enough for fish productivity. Hardness again, was recorded as lowest (69.42 mg/L) in monsoon and highest (91.24 mg/L) in pre-monsoon season. The values were found within the normal range and desirable for fish growth. Physiochemical parameters like pH, temperature, dissolved O_2, free CO_2, alkalinity etc. have greater influence on survivability of the fishes.

Table 1: Physico-chemical parameters of water of *Gela Beel*

Parameter	Pre-monsoon	Monsoon	Post-monsoon	Winter
pH	7.19	6.9	7.54	7.32
Water temperature (^oC)	24.57	32.66	27.94	16.17
DO (mg / L)	7.1	10.03	8.11	6.93
Free CO_2 (mg / L)	8.30	5.89	8.55	10.91
Total alkalinity (mg / L)	79.30	43.44	68.81	89.09
Total hardness (mg / L)	91.24	69.42	78.13	82.57

In the present study, a total of 58 species of fish belonging to 41 genera, under 19 families and 7 orders have been recorded (Table 2). Of the recorded species, 26 species were found in the category of 'Lower risk near threatened', 6 species were in 'Lower risk least concern', 4 species were 'Endangered' and 9 species were in 'Vulnerable' categories while 13 species were not evaluated so far. Among the species, 51.72 % has been categorized as common (13 LRnt, 2 LRlc, 3 VU, 9 NE and 1 EN), 39.65 % as occasional (11 LRnt, 3 LRlc, 6 VU, 3 NE and 3 EN) and rare category comprised of only 8.62 % only (2 LRnt, 1 LRlc, 1 NE). The conservation status and relative abundance of fish species of Gelabeel is presented in Figure 1.

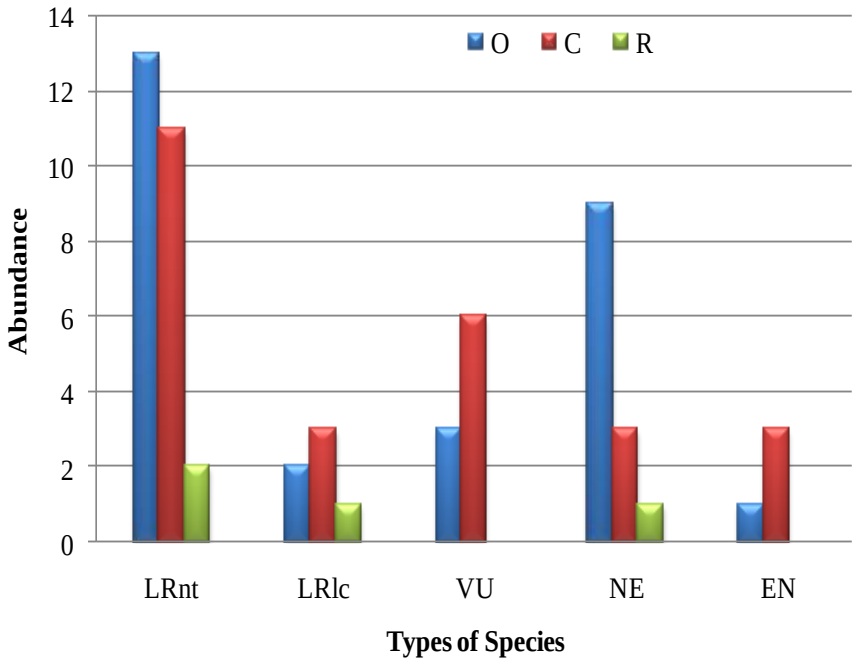


Fig. 1: The conservation status and relative abundance of fish species of Gelabeel.

Elsewhere in Assam, Dutta [2002] reported 64 species of fishes from an open *Beel* of Jorhat District of Assam and Yadava [1987] recorded 74 species belonging to 20 families in *Dhir Beel.* Recently Singh *et.al* [2009] too reported 54 species from *Maijan Beel* of upper Assam.

Table 2: Scientific name and conservation status of fish fauna recorded from *Gela Beel*.

Family	Scientific name	Abundance	Conservation status
Notopteridae	*Notopterus notopterus* (Pallas,1769) *Chitala chitala* (Hamilton,1822	O O	LRnt EN
Clupeidae	*Gudusia chapra* (Hamilton,1822)	O	LRlc
Cyprinidae	*Amblypharyngodon mola* (Hamilton,1822)	C	LRlc
	Aspidoparia jaya ((Hamilton,1822)	C	VU
	Aspidoparia morar (Hamilton,1822)	C	LRnt
	Barilius barila (Hamilton,1822)	C	LRnt
	Catla catla (Hamilton,1822)	O	LRnt
	Cirrhinus reba (Hamilton,1822)	O	VU
	Cirrhinus mrigala (Hamilton,1822)	O	LRnt
	Chela. laubuca (Hamilton,1822)	R	LRlc
	Ctenopharyngodon idellus (Valenciennes,1844)	O	NE
	Cyprinus carpio (Linnaeus, 1758)	O	NE
	Devario devario (Hamilton,1822)	R	NE
	Esomus danricus (Hamilton,1822)	C	LRlc
	Labeo bata (Hamilton,1822)	C	LRnt
	Labeo calbasu (Hamilton,1822)	O	LRnt
	Labeo gonius (Hamilton,1822)	C	LRnt
	Labeo rohita (Hamiltom,1822)	C	LRnt
	Parluciosoma doniconius (Hamilton,1822)	C	LRlc
	Puntius conchonius (Hamilton,1822)	O	VU
	Puntius sarana (Hamilton,1822)	C	VU
	Puntius sophore (Hamilton,1822)	C	LRnt
	Puntius ticto (Hamilton)	O	LRnt
	Salmophasia bacaila (Hamilton,1822)	O	LRnt
Cobitidae	*Acanthocobitis botia* (Hamilton,1822)	C	LRnt
	Botia dario (Hamilton,1822)	O	NE
	Lepidocephalichthys- guntea (Hamilton,1822)	O	NE
Bagridae	*Mystus bleekeri* (Day,1877)	C	VU
	Mystus cavasius (Hamilton,1822)	O	LRnt
	Mystus tengara (Hamilton,1822)	C	LRnt
	Rita rita(Hamilton,1822)	O	NE
	Sperata seenghala (Sykes,1839)	C	NE
Siluridae	*Ompok bimaculatus* (Bloach,1794)	C	EN
	Ompok pabda (Hamilton,1822)	C	EN
	Wallago attu (Bloach&Schneider,1801)	C	LRnt
Schilbeidae	*Neotropius atherinoides* (Bloach,1794)	C	EN
Clariidae	*Clarius batrachus* (Linnaeus,1758)	O	VU
Heteropneustidae	*Heteropneustes fossilis* (Bloch,1794)	C	VU
Belonidae	*Xenentodon cancil*a (Hamilton,1822)	C	LRnt
Synbranchidae	*Monopterus cuchia* (Hamilton,1822)	R	LRnt
Mastacembelidae	*Mastacembelus armatus* (Lacepede,1800)	C	NE
	Macrognathus pancalus (Hamilton,1822)	C	LRnt
	Macrognathus aral (Bloch & Schneider,1801)	C	LRnt
Chandidae	*Chanda nama* (Hamilton,1822) *Parambassis ranga* (Hamilton,1822)	C O	NE NE
Nandidae	*Badis badis* (Hamilton,1822)	R	NE
	Nandus nandus (Hamilton,1822)	O	LRnt
Gobiidae	*Glossogobius giuris* (Hamilton,1822)	O	LRnt
Anabantidae	*Anabas testudineus* (Bloch,1792)	C	VU
Belontidae	*Trichogaster fasciata* (Bloch & Schneider,1801)	C	LRnt
	Trichogaster chuna (Hamilton,1822)	C	NE
	Trichogaster lalius (Hamilton,1822)	O	NE
Channidae	*Channa punctatus* (Bloch,1793)	C	LRnt
	Channa marulius (Hamilton,1822)	O	LRnt
	Channa straitus (Bloch,1793)	O	LRlc
	Channa gachua (Hamilton,1822)	C	VU
Tetraodontidae	*Tetraodon cutcutia* (Hamilton,1822)	R	LRnt

Legend: EN-Endangered; VU-Vulnerable; LRnt-Lower risk near threatened; LRlc- Lower risk least concern; NE- Not evaluated; O-occasional; C-common; R-rare.

The present investigation reveals that the studied area exhibits rich ichthyofaunal diversity. But it has been facing several problems of anthropogenic influences for the last few years as summarized below:-

1. Wanton fishing of fry, fingerlings and gravid fishes ultimately leads to decline of the natural stock of some threatened species in their natural habitat.
2. During festival time fishes are caught in high scale using various conventional and non-conventional gears. Among them *katal* fishing or *jeng* is a highly destructive fishing technique which causes loss of sizeable number of brooders.
3. Use of artificial fertilizers, insecticides and pesticides in nearby paddy field has resulted in the accumulation of residue through surface run off leading to aquatic pollution, algal blooms and eutrophication, which effect survival of many species.
4. There are various legislations on fishing regarding the use of fishing gear, regulation of mesh size of nets, time of fishing and individual fish size. But these regulations are hardly followed in the *Gela Beel* area.

Conclusion:

These anthropogenic influences definitely impact on the study area and lead to reduce fish production and cause threats to biodiversity. Therefore mass awareness programme should be launched to educate the fishermen for conservation and sustainable development of fishery and other aquatic biota.

Acknowledgment:

The authors are grateful to the authority of the Dibrugarh University for their permission and encouragement to carry out the work. The authors also thank Mr. Jan Das, Mahaldar, for his help during field work.

References

1 Kottelat, M. & Whitten, T. The Freshwater Biodiversity in Asia with special reference to Fishes. World Bank, Washington, D C, 1996, 17- 22.
2 Mahanta, P. C., Tyagi, L. K., Kapoor, D. and Ponniah, A. G. Integration of fish biodiversity conservation and development of fisheries in North East region. Issues and approach. NBFGR publication, Lucknow, 2001, 1-18.
3 Sen, N. & Biswas, B. K. On a new species of nangra day (Pisces: Siluriformes; Sisoridae) from Assam. N. E. India with a note on comparative studies of other known species. Rec. Zool. Surv. India, 1994, 94 (2-4): 441-446.
4 Biswas, B. K.. First record of the rare interesting Assam loach Nemacheilus pavonaceus (McClelland) with comments on its systematic position. J. Inland Fish. Soc. India., 1997, 29(2): 40-45.
5 Menon, A. G. K., Rima, D. & Vishwanath, W. A new species of cyprinid fish of the genus Puntius (Hamilton-Buchanan) from Manipur, India. J. Bombay Nat. Hist. Soc., 2000, 97(2): 263-268.
6 Vishwanath, W. & Shanta, K. W. A new nemacheiline fish of the genus Schistura McClelland (Cyprinidae: Balitoridae) from Manipur, India. J. Bombay Nat. Hist. Soc., 2004,10(1): 138-140.
7 Dey, S. C. Studies on the hydrobiological conditions of some commercially important beels of Kamrup district of Assam and their bearing on fish production. Final technical report, N. E. C, 1981, pp.177.
8 Tiner, R. W. Wetlands of the United States: current status, recent trends, National Wetlands Inventory, U.S. Fish and Wildlife Service, Washington, D. C. 1984.
9 William, M. Wetlands: A threatened Landscape. Basil Blackwell Ltd., Oxford. 1990.
10 Trivedy, R. K. & P. K. Goel, Chemical and biological methods for water pollution studies, Environmental Publications, Karad, India,1986, 415 110, pp.244.
11 APHA. Standard methods for examination of water and waste water. (20 ed) American Public Health Association, Washington D. C. 1998.
12 Talwar, P. K. & Jhingran, A. G. Inland Fishes of India and Adjacent Countries Vol. I and II, Oxford I. B. H Publishing Company Pvt. Ltd., New Delhi. 1991.
13 Fishbase.. http://Fishbase.org. 2009.
14 CAMP report. Conservation Assessment and Management Plan (C.A.M.P) workshop, Freshwater fishes of India, NBFGR, Lucknow. 1998, pp. 156.
15 IUCN. Redlist of threatened species. 2011. http://www.iucnredlist.org/apps/redlist/search
16 Sharma, L. L. & Gupta, M.C. Some aspects of limnology of Awarchand reservoir, Rajasthan: Physical parameters. Pollut. Res., 1994, 13:16-179.
17 BIS-2296. Tolerance limits for inland surface waters subject to pollution. 1982.
18 .Dutta, P. K. A comparative study of the hydrobiology and fisheries of open and closed beel in Jorhat district, Assam. Ph.D Thesis. 2002, Dibrugarh University, Assam.
19 Yadava, Y. S. Studies on the limnology and productivity of an oxbow lake in Dhubri district of Assam (India). Ph.D Thesis, 1987, Gauhati University, Assam.
20 Singh, A. S., Dakua, S. & Biswas, S. P. Physicochemical parameters and fish enumeration of Maijan beel (wetland) of upper Assam. Geobios, 2009, 36:184-188

THE END

ARTICLE

13

TENDENCY OF CRIME AMONG ADOLESCENTS AND ROLE OF SCHOOLS FOR ITS CONTROL

Rachna Sharma
Assistant Professor, KIIT College of Education, Gurgaon, Haryana, India

Abstract:

The present study was undertaken to observe the tendency of crime among adolescent and role of schools for its control. A self- description survey developed by the investigator was used to collect the data. A sample of 40 adolescents was taken from a government and a public school of South – West zone of New Delhi. Collected data was statistically analyzed by using percentage technique. Results revealed that 85% students have bunked their classes, 37.5% students have use unfair means during examinations, 30% students have deliberately destroyed school's or any other's property, 22.5% students carries pocket knife, 45% students have stolen money or other valuables of their parents or others, 25% students have been involved in sexual activities, 37.5% students have consumed alcohol/ smoke at public places, 25% students have argued with their parents very often, 40% students visit adult / porn sites on internet. School, parents, community and other organizations should work together to be sensitized about the problems and needs of adolescents. Early identification and intervention strategies should be taken by the school authorities to control the crime among adolescent.

Introduction

Every society has passed laws for punishing individuals who violate these rules and regulations and the code of conduct laid down. They are viewed as anti- socials or criminals in the eyes of law. If such anti social behavior and crimes are noticed among teenagers or young men and women below the age of 16 or 18 these are called delinquent acts or delinquency. In our country any teen-ager who is found to be indulged in anti-social acts which are punishable under the existing law is called juvenile offences. Therefore, juvenile delinquents are criminals minor in age or "minors with major social problems".

Crime

Cloete and Stevens (1990:26) define crime as an unlawful act or omission which is either a prohibition or behaviour which is punishable by authorities. While according to Snyman (Cf. 2002) crime is unlawful, blameworthy conduct punishable by law.

Adolescence

Adolescence is a period of switch from childhood to adulthood. It is characterized by swift physical, biological and hormonal changes resulting in to psychosocial, behavioral and sexual maturation between the ages of 10-19 years in an individual. The experience of adolescents during teen years would differ noticeably according to the cultural and social values of the system of social identities in which they grow.

Juvenile Delinquency

"Juvenile Delinquency is defined as the violation of law that, if committed by an adult, would be a crime." -- Skinner
Every individual has certain needs to get satisfied. When he fails to satisfy his needs by socially accepted means due to his socio- economic condition or personal inadequacy, he tries to satisfy his needs by anti- social activities and we call it delinquency. Broadly, juvenile delinquency refers to the anti-social acts of children and of young people below 18 years. Such acts are specifically forbidden by law or may be lawfully interpreted as constituting delinquency or as requiring some form of official action (Vedder 1963:03).

Status Offence

The term status offence can be defined as behaviour that is unlawful for children, even though the same behaviour would be legal for adults. What transforms the conduct into public offence is the age of the actor. The most common status offences are truancy, running away from home, purchase or drinking of alcoholic beverages or various sexual and drug abuse acts (Kratcoski & Kratcoski 1982:05)

Review of Literature

Anika Doggett, attempted a survey to explain the effect of family structure on juvenile delinquency. Findings suggest that family structure does indeed both negatively and positively play a role in the production of juvenile delinquency.
Brent B. Benda & Robert Flynn Corwyn, *examined the relative effects of elements of control, strain, and social learning theories on violence among younger (< 16 years of age) and older (≥16 years of age) adolescents. Findings show that the effects of abuse by adults during childhood on violence are mediated by other study factors only among older adolescents. Attachments to female caregivers, self-esteem, and fathers' education have inverse relationships, while suicide attempts are positively related to violence only among adolescents 15 years of age or younger. Attachment to father, beliefs, and religiosity are inversely related to violence, whereas feelings of frustration and alienation are positively related to this outcome for both age groups.*

Cheung & Cheung (2007) have conducted a study to test the predicative power of self- control of theory for delinquency in a Chinese content, and to explain if social factors have effects on delinquency in the presence of self

control. Results reveals that it is the combination of self- control and social factors in the predication of delinquency that might be variant across cultures.

Dawkins MP. (1997) examined the extent to which alcohol and other drug use was related to violent and nonviolent criminal activity among adolescent males. The findings reveal that in comparison to marijuana and heroin, alcohol use is more strongly and consistently associated with both violent and nonviolent offenses.

Enoch Zenzile.(2008) has attempted an exploratory study to uncover the root causes of juvenile delinquency in the most rural and semi-urban areas of the Eastern Cape. Results indicate that the girls are more or less outnumbering their male counterparts with regard to many cross-correlated delinquent acts, for example dagga smoking, dealing in dagga with the aim of earning extra income, scratching of teachers' motor car, etc. The study reveals that over half of the respondents indicated that both their parents are economically inactive. Based on the statistic outcome it has been postulated that mothers play a more significant role in the socialisation process.The statistical results also reveal that 134 Mqanduli respondents compared to 93 Mthatha respondents bought liquor in the past twelve months without the knowledge of their parents.ean things on school desks in the past twelve months.

Hanson, Cindy L, *et al.*(1984) Collected demographic, psychometric and observational measures on 163 families with an adolescent son to determine their relationship to adolescent criminal activity. Stepwise multiple regression analyses showed that socialized-aggressive disorder, as rated by the parent(s), was the most consistent and powerful predictor of serious and repeated arrests among the male adolescents and their siblings. The adolescent's age at first arrest was the second most powerful predictor.

Krueger, Robert F, *et al.* (1994) investigated the relationship between personality and criminal behavior. Variable-centered analyses revealed that MPQ scales indexing negative emotionality and behavioral constraint were consistent predictors of delinquency across the 3 data sources. Person-centered analyses revealed that youths abstaining from delinquency were uniquely characterized by low interpersonal potency. Youths involved in extensive delinquency were uniquely characterized by feelings of alienation, lack of social closeness and risk taking.

Timothy, Robert & http://jod.sagepub.com/content/34/2/293.abstract - bio-2*Michael. have examined the factors associated with the severity of self-reported pretreatment offending of 178 adolescents entering outpatient substance abuse treatment in Baltimore County, Maryland. Results indicated that increased severity of crime was related to male gender, use of drugs other than alcohol and marijuana, bullying and being physically cruel to people, higher levels of deviant behavior among peers, school problems, and having sex without a barrier.*

Need of the Study

These days an increasing trend of crime among adolescents has been observed in schools. Students are indulging in anti social activities and ignoring their studies. Truancy, destruction of school property, attacking teachers, quarrelling and fighting with peers, teasing and bullying, sexual appeals to opposite sex and even raping, etc. may be found among such delinquents. As youth is the future of our nation who can lead the nation towards social and economic development, there is a need to pay attention towards them. This study has been undertaken to investigate the tendency of juvenile delinquency and to find out the role of schools in controlling it. The facts so gained, will be used to draw attention of all members of the society to eradicate the problem of crime among adolescents and save our future.

Objectives

1. To study the delinquent behavior of a child.
2. To study the role of schools towards controlling the crime among adolescents.

Research Questions

1. What are the delinquent behaviors of a child?
2. What is the role of schools towards controlling the crime among adolescents?

Method of the Study

The goal of every scientific research undertaken is based on the assumption that all behaviour and events are orderly and has discoverable facts (Van der Walt *et al.* 1982:168). Descriptive method i.e. survey method was undertaken personally by the investigator to collect data from senior secondary schools of New Delhi.

Population

All the students between the ages of 15-17 years studying in public and government schools in South-West Zone, New Delhi.

Sample

A sample of 40 adolescent students (both boys and girls) between the ages of 15-17 years; 20 from a public school and 20 from a government school was taken by using non-probability sampling procedures and exclusively purposive (judgmental) sampling method.

Tools
An instrument for collecting the data (self- description survey) has been developed according to strict scientific requirements to affirm validity of the data so collected.

Statistical Techniques
Percentage technique was used to analyze the collected data.

Analysis and Interprtation of Data

Objective 1: To study the delinquent behavior of a child.

Students were asked 17 behavioral questions included in self- description survey, in order to assess their involvement in aberrant activities.

1. Do you bunk your classes?

Table 1

S. No.	Opinion	No. of students	%age
1.	Yes	34	85%
2.	No	6	15%

Table 1 shows that 85% students have accepted that they bunk the classes and 15% students have not bunked the classes at school.

2. Do you practice unfair means during examinations?

Table 2

S. No.	Opinion	No. of students	%age
1.	Yes	15	37.5%
2.	No	25	62.5%

Table 2 reveals that 37.5% students have use unfair means during examinations and 62.5% students have not practiced the same.

3. Have you been involved to any gang/ group fight?

Table 3

S. No.	Opinion	No. of students	%age
1.	Yes	5	12.5%
2.	No	35	87.5%

Table 3 shows that 12.5% students have been involved in gang fights while 87.5% student are not involved in any group or gang fights

4. Have you ever deliberately destroyed school's or any other's property?

Table 4

S. No.	Opinion	No. of students	%age
1.	Yes	12	30%
2.	No	28	70%

Table 4 reveals that 30% students have accepted that they have deliberately destroyed school's or any other's property whereas 70% students have not done the same.

5. Have you ever lied about your age to get entry in cinema hall or to purchase liquor/ cigarettes, etc.?

Table 5

S. No.	Opinion	No. of students	%age
1.	Yes	8	20%
2.	No	32	80%

Table 5 shows that 20% students have lied about their age to get entry in cinema hall or to purchase liquor/ cigarettes, etc. whereas 80% students have not done the same.

6. Do you carry weapons like pocket knife etc.?

Table 6

S. No.	Opinion	No. of students	%age
1.	Yes	9	22.5%
2.	No	31	77.5%

Table 6 shows that 22.5% students carries pocket knife out of which 10% were girls who mentioned that they carry such weapons as their safety device and 77.5% students gave negative response for the same.

7. Have you ever attacked anyone with an intention to seriously harm or kill him or her?

Table 7

S. No.	Opinion	No. of students	%age
1.	Yes	5	12.5%
2.	No	35	87.5%

Table 7 shows that 12.5% students have attacked someone with an intention to seriously harm him/ her and 87.5% students have not did the same.

8. Have you ever stolen money or other valuables of your parents or others?

Table 8

S. No.	Opinion	No. of students	%age
1.	Yes	18	45%
2.	No	22	55%

Table 8 reveals that 45% students have stolen money or other valuables of your parents or others and 55% students have not done the same.

9. Have you ever been sexually involved with anyone?

Table 9

S. No.	Opinion	No. of students	%age
1.	Yes	10	25%
2.	No	30	75%

Above table reflects that 25% students have been sexually involved with anyone and 75% students were not involved in such activities.

10.Have you ever made obscene calls to someone?

Table 10

S. No.	Opinion	No. of students	%age
1.	Yes	5	15%
2.	No	34	85%

Table 10 shows that 15% students have made obscene calls to someone whereas 85% students have not did the same.

11.Do you consume alcohol / smoke at public places?

Table 11

S. No.	Opinion	No. of students	%age
1.	Yes	15	37.5%
2.	No	25	62.5%

Table 11 shows that 37.5% students have consume alcohol/ smoke at public places whereas 62.5% students have not done the same.

12. Do you attend late night parties with your friends?

Table 12

S. No.	Opinion	No. of students	%age
1.	Yes	8	20%
2.	No	32	80%

Table 12 shows that 20% students attend late night parties with their friends whereas 80% students have not attended such parties without their parents.

13. Have you ever been suspended from school?

Table 13

S. No.	Opinion	No. of students	%age
1.	Yes	5	12.5%
2.	No	35	87.5%

Table 13 shows that 12.5% students have been suspended from school as a disciplinary action and 87.5% students have never been suspended from school.

14. How often do you argue with your parents?

Table 14

S. No.	Opinion	No. of students	%age
1.	Very often	10	25%
2.	Sometimes	21	52.5%
3.	Never	9	22.5%

Table 14 shows that 25% students have argue with their parents very often, 52.5% sometimes and 22.5% have never argued with their parents.

15. Have you ever threatened anyone forcibly or with strong-arm?

Table 15

S. No.	Opinion	No. of students	%age
1.	Yes	7	17.5%
2.	No	33	82.5%

Table 15 shows that 17.5% students have threatened anyone with forcibly or with strong arms and 82.5% have not done the same.

16. Do you visit adult / porn sites on internet?

Table 16

S. No.	Opinion	No. of students	%age
1.	Yes	16	40%
2.	No	24	60%

Table 16 shows that 40% students visit adult / porn sites on internet whereas 60% students don't visit such sites.

Objective 2: To study the role of schools towards controlling the crime among adolescents.

1. Teachers should be acquainted with proper knowledge of adolescence psychology.
2. Moral and life skills education should be imparted to the students.
3. Students should be motivated to respect his identity and culture as well as respect and understand others' opinions also.
4. Sense of belongingness to the schools' and other's property should be developed among students.
5. School should provide appropriate environment and facilities for the all round personality development of a child through academic and vocational training.
6. Co-curricular activities should also be organized; especially for such children to channelize their energy in right direction.
7. Teachers should behave appropriately with adolescents according to the demand of time.
8. Sex education should be given in the school to educate the adolescents about the consequences of early and unsafe sex.
9. Proper guidance services regarding vocational training and employment opportunities should be provided in schools so that students may involve in any vocation of their choice or get employed. This will help in reducing the possibilities of their involvement in anti- social activities for getting money.
10. Counseling sessions should be organized at regular interval of time from elementary level itself to provide positive emotional support and to solve the psychological maladjustments of the students.
11. Teachers and other professionals should be equipped and trained to prevent and deal with alcohol, drug and other substance abuse by students.
12. Corporal punishment or any other harsh disciplinary action should not be taken against the students.
13. School, parents, community and other organizations should work together to be sensitized about the problems and needs of adolescents.
14. Schools should promote fair and just policies and rules. Students' representatives should be appointed in school policy formulating bodies, including policy on discipline and decision-making.
15. Early identification and intervention strategies should be taken by the school authorities to control the crime among adolescent.

Major Findings

On the basis of survey conducted, 85% students have accepted that they bunk the classes, 37.5% students have use unfair means during examinations, 12.5% students have been involved in gang fights, 30% students have accepted that they have deliberately destroyed school's or any other's property, 20% students have lied about their age to get entry in cinema hall or to purchase liquor/ cigarettes, etc., 22.5% students carries pocket knife out of which 10% were girls who mentioned that they carry such weapons as their safety device, 12.5% students have attacked someone with

an intention to seriously harm him/ her, 45% students have stolen money or other valuables of their parents or others, 25% students have been involved in sexual activities, 15% students have made obscene calls to someone, 37.5% students have consumed alcohol/ smoke at public places, 20% students attend late night parties with their friends, 12.5% students have been suspended from school as a disciplinary action, 25% students have argued with their parents very often, 52.5% sometimes and 22.5% have never argued with their parents, 17.5% students have threatened anyone with forcibly or with strong arms, 40% students visit adult / porn sites on internet.

Conclusion

Every society lays down certain moral code of conduct, rules and regulations for its members. It is also expected that every member will abide by these code of conduct, rules and regulations laid down by the society. At school, the teenagers meet other youngsters of their age or older than them who come from different backgrounds. They may indulge in juvenile delinquency due to a negative influence of the friends they choose. New norms and values of these friends that are introduced to them may be dissimilar to those that they are well acquainted with at home. Therefore, along with the family, it is the school's responsibility to assist them in associating themselves with deviant culture of their friends with whom they spend most of their time. This intervention is very important to control detrimental changes among adolescents.

References

1. Anika Doggett. Juvenile Delinquency and Family Structure. facstaff.elon.edu
2. Brent B. Benda & Robert Flynn Corwyn. The Effect of Abuse in Childhood and in Adolescence on Violence among Adolescents.
3. Dawkins MP. 1997. Drug use and violent crime among adolescents.
4. Adolescence, Vol 32(126), 1997, 395-405.
5. Enoch Zenzile. 2008. Juvenile delinquency among secondary school pupils in the Mthatha District of Education: A Self-Report Survey
6. Hanson, Cindy L, *et al.*1984. Demographic, individual, and family relationship correlates of serious and repeated crime among adolescents and their siblings. Journal of Consulting and Clinical Psychology, Vol 52(4), Aug 1984, 528-538.
7. International Youth Survey (IYS) www23.statcan.gc.c
8. Krueger, Robert F.; et al.1994. Personality traits are linked to crime among men and women: Evidence from a birth cohort. Journal of Abnormal Psychology, Vol 103(2), May 1994, 328-338.
9. Nicole W.T. Cheung & Yuet W. Cheung. 2007. Self- Control, Social Factors, and Delinquency: A Test of the General Theory of Crime among Adolescents in Hong Kong.
10. Timothy, Robert & http://jod.sagepub.com/content/34/2/293.abstract - bio-2Michael. Factors Associated with Criminal Severity among Adolescents Entering Substance Abuse Treatment.
11. http://www.psychology.iastate.edu/faculty/caa/Scales/Delinquency.pdf
12. www.surveymonkey.com
13. http://uzspace.uzulu.ac.za/bitstream/handle/10530/196/zenzileenoch.pdf?sequence=1uzspace.uzulu.ac.za

THE END

ARTICLE

14

SOCIO-ECONOMIC PROFILE OF DISPLACED AND LANDLESS POPULATION IN WEST BENGAL: A CASE STUDY

Dr. Rukhsana*, Asraful Alam[1] & Firdousi Parvin[2]
*Assistant Professor, [1]Research Scholar (Ph.D), & [2]M.Sc (Geography),
Department of Geography,
Aliah University, Kolkata, West Bengal, INDIA

Abstract:

Persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights, or natural o human-made disasters, and who have not crossed an internationally recognized state border (UN Secretary-General, 2004). The purpose of the present study was to examine the socio-economic condition of displaced and landless population and to find out their problems in Nawabpur Village of North 24 Parganas. The present study has been based on both primary and secondary sources of data. The results presented here rely on data collected from a random sample of 100 household in the study area, using well-structured questionnaire. It have been find out that Before the year of 2000 Nawabpur village is one of the most fertile areas of Rajarhat region perhaps North 24 parganas but after implication of land acquisition act in 2000 these area became a buildup area. The farmers are lost their agricultural land and they are not Satisfied because for this land acquisition act one class people are poorer and another richest. The percentage of expenditure of landless population was minimum in 2000 because in this time people get their basic food, fuel from land. In present time their income and expenditure both are high but saving is low.

Introduction

Persons or groups of persons who have been forced or obliged to flee or to leave their homes or places of habitual residence, in particular as a result of or in order to avoid the effects of armed conflict, situations of generalized violence, violations of human rights, or natural o human-made disasters, and who have not crossed an internationally recognized state border (UN Secretary-General, 2004). A displaced person may also be referred to as a forced migrant. If the displaced person has cross an intercontinental border and falls under one of the pertinent international legal instruments, they are considered a refugee. Displacement not only puts affected people to grave impoverishment risks, but also causes a setback to the entire poverty reduction effort. A study done in Madhya Pradesh in 1987, three years after work on the Sardar Sarovar dam commenced, showed that people did not know which villages would be submerged, when and how many of them would be displaced, whether they would be resettled or what compensation would be paid. This situation is not specific to Sardar Sarovar but true about most projects (Fernandes, 2000). Resettlement peoples at world level, who has shown that people who are displaced do not easily recover, much less improve their previous standards of living. From India's Rengali project, Ota (1996) reports that the percentage of landless families after relocation more than doubled-from 4.6 percent to 10.9 percent; while Reddy (1998) documents that in the coal mining displacements around Singrauli, the proportion of landless people skyrocketed from 20 percent before displacement to 72 percent after.

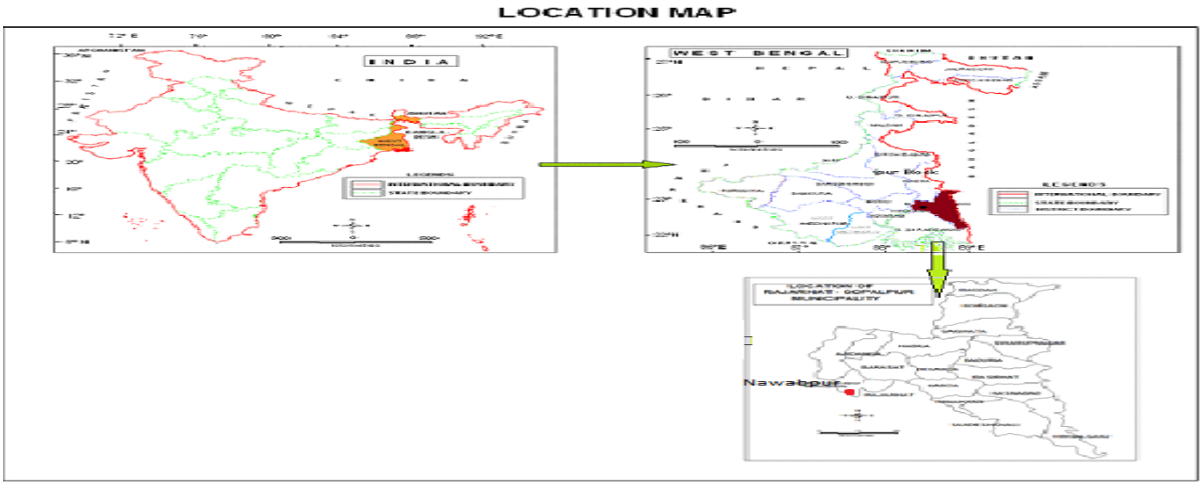
Location and Extent of the Study Area

Nawabpur village has been select for the study which lies in an administrative division of Barasat Sadar Subdivision of north 24 parganas district of West Bengal (Latitude 22º11'6" north to 23º15'2" north and from longitude 88º20' east to 89º5' east). It is fringe area of Kolkata city. For this causes when urban expansion of Kolkata is gradually increases and need a new town than government take land by Land Acquisition Act of Nawabpur village to create new town.

In Rajarhat area land acquisition start for development of hosing infrastructure and IT (Information and Technology) hub in the year of 2000 and many villages are gone under land acquisition. In Nawabpur village 45-50 households are displaced and almost all houses are landless because this village also falls under land acquisition.

Mostly people of Rajarhat was engaged in agricultural activity, some were small farmers or agricultural labourers and had been involved agricultural activities for generations. They were not well versed in any other alternative livelihoods. Therefore it is only natural to expect bitter resistance on their part against the land acquisition carried out by the government, a fight that would get more and more desperate. But according to official dogma nothing of that sort happened in Rajarhat.

Land acquisition process was start in Rajarhat area in the year 2000. At that time in Nawabpur village land were acquired. At first government notice the local people and had seen the demarcations of land acquisition and compensation value. People did not agree to give their land in that price.



Objectives of the study

This study conceptualizes the social- political problem in terms of socio-economic profile of Displaced and Landless population. The prime objective of this paper is to examine the socio-economic condition of the displaced and landless peoples in the Nawabpur village and to find out their problems and overcome to sort out the problems.

Database and methodology

The present study is based on both the secondary and primary source of data collected from various published and unpublished records of Government organizations; data related to review of available literature have collected to visit some libraries. Primary source of data: primary information has been collected through intensive field survey. In this study area 20 percent of the total number of household randomly selected. The total sample size consists of 100 households. Data have been categories into three groups Low (Rs. <5000), medium (Rs.5000- 15000), high (> 15000) income groups based on minimum and maximum income of the respondents. The survey was carried out during the months of February, 2013. The respondent has been interviewed according to a well prepared questionnaire.

Demography and Socio-Economic Analysis of Displaced and Landless People:

Table 1: Income group wise population distribution of selected study area in percentage:

Sl.No.	Income Group	Sample population	Male Population	Female Population
1	Low (below Rs.5000)	34.90	52.15	47.85
2	Medium (Rs.5000-15000)	42.40	52.50	47.50
3	High(Above Rs.15000)	22.70	50.94	49.06
4	Total	100	51.76	48.14

Source: Field survey, February, 2013

In the study area it has been find out that the percentage of male population have been reported more than female population (52.03 percent and 47.9 percent respectively). The maximum percentage of population observed in the medium income group (42.40 percent). The lowest percentage (22.70) of population has reported in high income group. It have been find out that percentage of male population (52.50) is found highest in medium income group and low in (50.94) high income group but the percentage of Female population (49.06) is high in higher income group and minimum population in low income group (47.50). It have been seen also that in high income group there the male and female difference are less due to the more consciousness and literacy among the people than other income group. It reveals that in the study area more populations are belongs in middle income group and rich populations are less.

Table 2: Distribution of Displaced and Landless population in percentage

Income groups	Displaced	Landless	Others	Total
Low	44.12	41.18	14.70	100
Medium	15.91	59.09	25.00	100
High	04.68	87.23	08.09	100
Average study area	20.01	66.76	13.23	100

Source: Field survey, February, 2013

The table 2 depicts the distributional pattern of distribution of displaced, landless & others population in percentage wise. The percentage of displaced households is maximum in low income group (44.12) and there are no displaced household in high income group. The percentage of landless household are maximum reported in high income group (87.23) and minimum (41.18) in low income group. And percentage of others population is maximum (25.00) in medium income group and no others house hold in above Rs.15000 income group.

Table 3: Income group wise Age Structure distribution of selected study area in percentage

Income groups	Age group			Total
	0-14	15-60	Above	
Low	32.72	63.64	3.64	100
Medium	23.24	68.18	8.08	100
High	22.86	64.76	12.38	100
Average study area	26.47	65.50	8.03	100

Source: Field survey, February, 2013

Table 3 depicts the income group wise distributional pattern of age structure which shows that the highest percentage of below 14 age group people (32.73) lies in low income group and low in high income group due to high birth in low income group (22.86 percent). The percentage of 15-60 age group population is very high (68.18) in medium income group and low in (63.64) low income group. The percentage of above 60, age group is high in high income group (12.38) but low (3.64) in low income group due to health and nutrition is good in high income group. In this area overall percentage of working population is more for this probability of development is increases.

Table 4: Income group wise distribution of Religion and literacy rate of sample population of study area in percentage

Income Groups	Muslim (Percentage)	Hindu (Percentage)	Literate	Illiterate
Low	91.17	08.83	78.91	21.09
Medium	84.19	15.91	81.05	18.95
High	96.55	03.45	95.69	4.31
Average study area	90.60	09.40	85.21	14.78

Source: Field survey on February, 2013

The table 4 show that the distributional pattern of religion which has been analyzed in percentage basis. The percentage of Muslim population (96.55) is high in high income group and low (84.09) in medium income group. The percentage of Hindu population is high (15.91) in medium income group and low in high income group. Muslim population is high in this area because the selected study area is dominated by Muslim population more than the Hindu population.

On the other hand this table also depicts the distributional pattern of literate and illiterate population which has been analyzed on percentage basis. The percentage of literate population (95.70) is recorded high in the high income group and low (78.91) in the low income group but percentage illiterate population is high (21.08) in low income group and low (4.30) in high income group. This distribution indicated that among the lower class illiterate population are more than the higher class people because the higher classes people the more conscious about education, facility of education than lower class people.

Table 5: Income group wise percentage distribution of Educational Status of sample population in the study area

Income Groups	Primary	Secondary	Higher secondary	Graduate	Post graduate	Total
Low	23.28	69.82	3.44	3.46	0	100
Medium	12.05	75.80	20.16	7.25	3.22	100
High	16.80	38.20	23.6	16.85	4.49	100
Total	17.41	56.27	14.73	9.19	2.40	100

Source: Field survey, February, 2013

The table 5 indicates that the percentage of primary level people is found high (23.28) in the low income group people and low (12.09) in the medium income group. While the highest percentage of secondary level people (75.81) is found in medium income group and low (38.20) in high income group. The percentage of Higher secondary level people is maximum (23.6) recorded in high income group and minimum (3.45) in low income group. The percentage of post Graduations level People is high (4.49) found in high income group and there are no people of Post graduate in below

low income group. It has been find out through the above discussion that the level of education is quiet good in the high income group than other income group.

Table 6: distribution of respondents who take money from Government

Income group	Percentage of money take		Total
	Money take	Money not take	
Low	100	00	100
Medium	95.3	04.7	100
High	91.01	09.99	100
Average study area	95.44	04.66	100

Source: Field survey, February, 2013

The tables 6 indicate the income group wise distributional pattern of money take pattern from Government. In this table shows that the percentage of money take is high in low income group and low in high income group. The percentage of low money take is high in high income group and in low income group all people take money. Whose are not take money they are not satisfy of exchange money and they case against government and another people take it for fear that after they may be not get money or land.

Table 7: Income group wise distribution of use of exchange money from land in percentage

Money use purpose	Low income group	Medium income group	High income group	Average study area
Business	19.51	32.73	30.51	27.58
Building	63.41	49.09	33.9	48.8
Investment	07.32	09.09	10.17	8.86
Land purpose	07.32	07.27	23.73	12.77
Others	02.44	01.82	01.69	01.98
Total	100	100	100	100

Source: Field survey, February, 2013

Table 7 shows the distributional pattern of money use that they get with the exchange of land which has been analyzed in percentage basis. The percentage of money use in Business is maximum (32.73) in medium income group and minimum in (19.51) low income group. The percentage of building use is maximum (63.41) in low income group and minimum (33.9) in high income group. The percentage of investment money is maximum (10.17) in high income group and minimum (07.32) low income group. The percentage of land purpose money use is maximum (23.73) in above high income group and minimum (07.32) in medium income group. The percentage of others money use is maximum in (02.44) low income group and minimum (01.69) in high income group. Over all it also indicate that the most of people money use in business and building purpose.

Table 8: Income group wise distribution of Situation of Present Land (2013)

Income Group	Home land	Others	Total
Low	89.29	10.71	100
Medium	80.00	20.00	100
High	54.55	45.45	100
Average study area	74.61	25.39	100

Source: Field survey, February, 2013

The table 8 shows that the income group wise distributional pattern of present having land which has been analyzed in percentage basis. In this table shows the percentage of dweller land have maximum (89.29) in low income group and minimum (54.55) in high income group and the percentage others land have maximum (45.45) in high income group and minimum (10.71) in low income group. Because the high income group buys some land another place or some people have little land in their village.

Table 9: Income group wises satisfy condition of the respondent after displacement and landless

Income Group	Satisfy condition		Total
	Yes	No	
Low	00	100	100
Medium	00	100	100
High	13.64	86.36	100
Average study area	04.55	95.45	100

Source: Field survey, February, 2013

Low and medium income group people told that they are not satisfy but few high income group people their income are became high after land acquisition by engaged in business that is good for them. It also indicate that it is economically, socially, mentally not suitable for major people.

Table 10: Income group wise distribution of land acquisition condition in percentage

Income Group	By Force	Voluntary	Total
Low	100	0	100
Medium	100	0	100
High	100	0	100
Average study area	100	0	100

Source: Field survey, February, 2013

The 100 percent population are not satisfied with land acquisition program because the Government take land from villagers by force they did not agree to give their land.

Conclusion and Recommendations

After the analysis of all it may be conclude that the socioeconomic condition of displaced and landless population of Nawabpur village are not good after land acquisition. Before the year of 2000 Nawabpur village was one of the most fertile areas of Rajarhat area perhaps North 24 parganas. Leaving aside some area used for habitation, most, if not all, of the land had been producing three to four crops per year. In these lands they used to grow Aman, Aush different kinds of Ravi and Kharif crops. Besides these, various kinds of seasonal crops along with many types of vegetables, fruits and flowers too were grown by the farmers here. So profuse was their production that even after satisfying the demands of the local markets they could satisfy 20 to 25% of the demands of Kolkata and its suburbs. Apart from this, during the monsoon months the poor of this region used to get their supply of fish from the local Wet land (fishing embankments).

The farmers from this area also had a rather valuable contribution to meeting Kolkata's demand for milk, which they supplied from their herds of cows and buffaloes. These animals were nurtured on the green grass on the grassy fields adjacent to the Wet Land. Farmers raised their cows almost free of cost, feasting them on nature's bounties. They get all basic needs (like food, fuel) from their land so in that time the expenditure of peoples are less and people saving the money relatively more than present.

In the year of 2000 Land Acquisition process was start in Rajarhat Area. At this time in Nawabpur village land were acquired. People do not agree to give their land because they protest against the land acquisition but it was not strong for fear of Government and Local political Leader.

In India, development projects will continue in the years to come. Hence, Indian government should frame a strategy so as to reduce if not eradicate the hardships of those displaced as a result of development projects. There is hardly any nation-wide framework on the issue of internal displacement. Here no equivalent rehabitation and compensation. They are not satisfied and fit in this situation. Now sometimes they complain Government for suitable compensation. Government promise to give them backs their land (where construction works are not started) and suitable compensation but practically not implicated this visual dialogue. We are known that land acquisition is important to develop a planning city or region. But we must conscious about the affect of people that who already leave this land.

References

1. Black, Maggie, 2002, *The No-Nonsense Guide to International Development*, New Internationalist Publictions Limited, Londan.
2. C. Michael, 1995, *Social Integration and Population Displacement: The Contribution of Social Sciences*, International Social Science Journal, XLIII, 1, 91-112.
3. D.K. Samir, B. Paula and K. Madhuresh, 2004, *People on Move: How Governments Manage Moving Populations*, Mahanirban Calcutta Research Group, Kolkata.

4. F. Walter, 2000, *Pawns in the Development*, in S. Parasuraman and P. V. Unnikrishnan(eds), India Disasters Report Human - Instigated Disasters, 276-279.
5. F. Walter, 2004, *Rehabilitation Policy for the Displaced,* Economic and Political Weekly,XXXVIV, XII, 1191-1193.
6. Jeanette Schade and Thomas Faist, 2011, *Working Papers – Center on Migration, Citizenship and Development*, Bad Salzuflen, Germany.
7. John O Oucho, 2005, *Internal displacement of population in the SADC region: an overview*, Gaborone, Botswana.
8. Internal Displacement Monitoring Centre (IDMC), 2007, India: Large Numbers of IDPs are
9. *Unassisted and in Need of Protection: A Profile of the Internal Displacement Situation,* www.internal-displacement.org, date accessed on 22 October 2010.
10. UN Secretary-General (RSG), 2004, *Guiding Principles on Internal Displacement*, OCHA/IDP/2004/01, United Nations OCHA.
11. Ota, A.B, 1996, *Countering the Impoverishment Risks: The Case of the Rengali Dam Project,* In A. B. Ota and A. Agnihotri, (eds.)*, Involuntary Displacement in Dam Projects*, pp. 150-178. New Delhi: Prachi Prakashan.
12. Reddy, I.U.B, 1998, *Involuntary Resettlement and Marginalization of Project-Affected- Persons: A Comparative Analysis of Singrauli and Rihand Power Projects*, In H.M. Mathur and D. Marsden, (eds.) *Development Projects and Impoverishment Risks: Resettlement Project-Affected People in India*, Delhi: Oxford U.P.

THE END

ARTICLE

15

IMBALANCE AND THEIR PLANNING OF HEALTH CARE FACILITIES WITH THE HELP OF G.I.S. IN TRIBAL AREA OF WESTERN SATPURA MOUNTAIN, INDIA

Dr. Suryawanshi Dnyaneshwar Shivaji * & Prof. Ahire Suresh Chintaman
*Vice Principal & Assistant Professor, Dept. of Geography, Vidyawardhini College, Dhule, INDIA
Assistant Professor, Dept. of Geography, Uttamrao Patil College, Dahivel, Dhule, INDIA

Abstract:

The tribal areas in India do not have any adequate health care facilities. Besides there is a large disparity regarding the availability of health care facilities in the tribal areas Even the available of health care facilities in these areas do not reaching properly. Hence there is a need for proper planning of health care delivery system with the help of GIS in tribal areas. Considering this problem in mind the present paper is an attempt to find out the regional imbalances in health care facilities and propose proper planning for their distribution. Western Satpura region is inhabited by the tribal population; it is sparring from non-availability and mal-distribution of health care facilities. Therefore, the present study has been under taken. It can be a representative study for investigation, the regional imbalances in health care facilities and their planning in the tribal area of the country. Considering, various norms, facts and use of GIS regarding the distribution of health care facilities. It becomes clear the western Satpura region as a whole is deficit as regards to the availability of health care facilities. It is therefore, needed to reorganized the existing health care infrastructure and to provide more efficient health care facilities in the tribal area of the study region.

Introduction

socio-economic problems. The occurrence of many epidemic incidences reveals that, the tribal areas have been the problem areas inspect of disease ecology and health care services. Even though there are large disparities in the availability of health care facilities, the health care services are not being provided properly through the tribal population. It is therefore, obvious to find out the regional disparities in the health care facilities and to propose health planning for removing such disparities in the tribal regions of the country with the help of GIS. The purpose of health planning is to improve the health services. The term health planning can be defined 'as the orderly process of defining community health problems, identifying unmet needs and surveying the resources to meet them, establishing priority goals, that are realistic and feasible and projecting administrative action to accomplish the purpose of the proposed programmed; **(W.H.O.-1984).**

The purpose of health planning is to meet the health needs and demands of the people. As health has been declaimed fundamental right, the states have a responsibility for the health of their people. It is, therefore, the central and state governments are striving to expand and improve their health care services. However, there is still a gap between health care facilities available and required in rural and urban areas. This gap is much wider in the tribal areas like in the study region. In connection with this, in the present paper an attempt has been made to assess the health care requirements of the western Sapura region by 2011 to 2031

Study Region:

The western Satpura region has been selected as the study region for the present investigation. The region under study is a peculiar region with distinct physical setting and socio-economic conditions. The western Satpura region is mountainous and in habited by the tribal. It stretches from the Ashirgarh hills or from Burahanpur- Khandwa gap in the east to the boundary of Gujrath in the west up to Rajpipla hills. It stretches and lines between Narmada Valley in the North and Tapi Valley in the South. This mountainous region is spread along the border of the State of Maharashtra and Madhya Pradesh. It comprises area of Nandurbar, Dhule, and Jalgaon districts of Maharashtra. And Khargaon and Badwani districts of Madhya Pradesh. The study region lies between 21 16’ N and 22 5’N latitudes and 73 45’E and 76 10’E longitudes. The total area of the region is 4,817 sq km. And according to 2011census, total population of the region was 20, 58,474 out of which 75% was tribal population. In light of this, the western satpura region can stand as a representative region for investigation health care facilities in the tribal area of the country.

Objectives:

The objectives of the present paper are as follows.

1 To assess the existing and required number of health care facilities in the study region.
2 To propose new health care facilities at different inadequately served locations in the Study area.
3 To project new health care facilities in relation to increasing future population.

Hypothesis:
According to tribal population norms health care facilities are inadequately available in the tribal area of the study region.

Material and Method:

The distributional pattern and disparities in health care facilities are considered on the basis of area and population in each tehsil. The entire western satpura region is divided into 18 tehsils. For the assessment of projected requirement of health care facilities, the projected population at tehsil level has been obtained by using the following formula.

Population projection for 2021

$$Pn = Po \times \left[\frac{2100 + ng}{2100 - ng} \right]$$

Where,

Pn = Projected population.
Po = Existing Population.
(Here for calculating projected population for year 2021 the projected population of the year 2011 has been assumed as the base population-Po).
n =No. Of years
g = decennial rate of growth.

Along with projected population various norms recommended by the National Health Plan are also considered in finding out the adequacy and inadequacy of health care facilities in the tribal area of the western Satpura region with the help of GIS.I have making GIS base maps of distributional patterns of health care system & other infrastructural facilities in the study area.

Table No. 1 Threshold population essential for each health care facility, suggested by NHP.

Sr. No.	**Healthcare facilities**	**Threshold population For each facilities in tribal area.**
1.	Rural Hospital or Community Health Center	80,000 or 4 P.H.C
2.	Primary Health Center	20,000 or 6 sub P.H.C.
3.	Primary Health Sub Center	3000
4.	Bed	1000

Source: Rural Health Statistics in India, March 2011

Results and Discussion:

Any long-term planning approach may not be realistic without any estimation of future population is known as population projection, (Agnihotri-1995). Following table presents the projected population for from 2011 to 2031 at tehsil level.

Table No. 2 Western Satpura Region, Tahsilwise projected population (2021 to 2031)

Sr. No.	**Tehsils**	**Existing Population 2011**	**Projected Population**	
			2021	**2031**
1.	Akkalkuwa	49099	778301	137962
2.	Akrani	227172	388551	785741
3.	Taloda	5421	6290	7328
4.	Badwani	321945	454595	676525
5.	Pansemal	37990	56855	92070
6.	Shahada	13038	17157	23232
7.	Niwali	146169	218768	354272
8.	Rajpur	44308	57053	75163
9.	Sendhwa	415392	633198	1054622
10	Shirpur	2702	3932	6108
11	Segaon	52693	65680	83147
12	Khargaon	123231	157579	205811
13	Bhagwanpura	289161	409521	611995
14	Chopda	16284	20142	25262
15	Yaval	33018	38501	45113
16	Raver	38289	47888	60871
17	Zirnya	208385	289516	421300
18	Bhikangaon	34167	41203	50162
	Region	**2058474**	**3684730**	**4716684**

Source: Census handbook of Dhule, Jalgaon, & Khargaon districts 2011 & computed by Author. 2013

As compared to the population of base year 2011, more than 150% population is estimated to rise within the period of next 20th years in study region. In the western high mountainous region, however estimated increase is much greater than that of the average for region as a whole. This region includes Akkalkuwa, Akrani, Badwani, Pansemal, and Niwali tehsil. While in the east only Zirnya tehsil has higher increase in population. The overall growth of the population during the period 2011 to 2031 is estimated from 79% in Taloda tehsil to 700% in Akrani tehsil. In the central & eastern part the estimated growth of population is less than 200%. The projected population makes it clear that there is a necessity of proposing planning for the healthcare facilities. It is, therefore, the present part of the study makes an attempt to find out the inadequacy of healthcare facilities in the western Satpura region. Similarly to fulfilled needs of increasing future population, new healthcare facilities are attempted to propose. For the fulfillment of the basic objectives of 'Alma-Ata' health for all and to remove regional disparities in the existing distribution of facilities, the improvement in existing health care system is there fore quite essential. At the same time, it is inevitable to propose new health care facilities for future growing population. Here planning for health care facilities are considered in terms of Planning for health care establishment.

Table No. 3- Western Satpura Region; Existing and required healthcare requirement

Sr. No.	Health Establishment	Requirement		
		2011	2021	2031
1.	R.H./C.H.C	27	40	58
2.	P.H.C.	105	150	238
3.	P.H.Cs.	686	995	1572
4.	Beds	2080	3023	4771

Source: Computed by Author, 2013

It becomes clear that the study region, as a whole is deficit as regards to the availability of health care facilities. It is therefore, needed to reorganize the existing healthcare infrastructure and to establish more health centers in the tribal area.

Rural Hospital or Community Health Centres:

According to Rural health statistic, one R.H. or C.H.C. is proposed to establish for 80,000. Population or covering the service area of four primary health centres in tribal area.

Table No. 4-Western Satpura Region: Tehsilwise existing and required no. of RH/CHC

Sr. No.	Tehsil	Existing 2011	Required		
			2011	2021	2031
1	Akkalkuwa	-	-	1	2
2	Akrani	2	3	5	10
3	Taloda	-	-	-	-
4	Badwani	3	4	6	8
5	Pansemal	1	1	1	1
6	Shahada	-	-	-	-
7	Niwali	1	2	3	4
8	Rajpur	-	-	1	1
9	Sendhwa	4	5	8	13
10	Shirpur	-	-	-	-
11	Segaon	1	1	1	1
12	Khargaon	1	2	2	3
13	Bhagwanpura	3	4	5	7
14	Chopada	-	-	-	-
15	Yawal	-	-	1	1
16	Raver	1	1	1	1
17	Zirnya	2	3	4	5
18	Bhikangaon	1	1	1	1
	Region	20	27	40	56

Source: Computed by author, 2013

Table no. 4.1: List of rural hospital or community health center newly suggested for 2011.

Sr No.	R.H/C.H.C	Sr. No.	R.H./C.H.C
21	Mandvi Bk,	22	Rosar
23	Jogwada	24	Zopali
25	Barud	26	Sirwel
27	Rayalbeda		

Source: Computed by author, 2013

Table no. 4.2: List of Rural Hospital or community center newly suggested for 2021

Sr.No.	R.H./C.H.C	Sr. No.	R.H/C.H.C
28	SonBk.	29	Khuntamodi
30	Gandhawal	31	Menimata
32	Chatli	33	Palsud
34	Valwadi	35	Varla
36	Keli	37	Mohana
38	Nahvi	39	Shivana
40	Kathi		

Source: Computed by author, 2013

In 2011, 20 rural hospitals or community health centers were existed in the study region. According to National health plan, there would have been 27^{h} R.H. or community health center in the year 2011 indicating a short fall or 07 more rural hospitals are community health centers in the entire region. While considering the projected population for the year 2031, the required number of rural hospitals community health centers would be 56 in the region. Spatial distribution of all existing and proposed rural hospitals or community health centre is shown in the Table no. 4..1 & 4.2, While proposing these centers their accessibility, size of population, availability of healthcare facilities, extend of their service areas, and their relative centrality are taken into the consideration.

Primary Health Centres:

The health planners in India have utilized the primary health centre and sub centre as the proper infrastructure to provide health services to the rural population. As per National Health Plant, each primary health centre renders its services to a population of 20,000 in tribal regions.

Table No. 5- Western Satpura Region Tehsilwise existing and required no of PHCs.

Sr. No.	Tehsils	Existing 2011	Required		
			2011	2021	2031
1	Akkalkuwa	2	3	4	7
2	Akrani	7	11	19	39
3	Taloda	1	1	1	1
4	Badwani	12	16	23	34
5	Pansemal	1	2	3	5
6	Shahada	1	1	1	1
7	Niwali	5	7	11	18
8	Rajpur	2	2	3	4
9	Sendhwa	15	21	32	53
10	Shirpur	1	1	1	1
11	Segaon	2	3	3	4
12	Khargaon	5	6	8	10
13	Bhagwanpura	11	14	20	31
14	Chopda	1	1	1	1
15	Yaval	1	2	2	2
16	Raver	1	2	2	3
17	Zirnya	8	10	14	21
18	Bhikangaon	1	2	2	3
	Region	**77**	**105**	**150**	**238**

Source: Computed by author, 2013

Application of this norm, about 77 primary health centers where required in 2011. However in reality there were 105 primary health centers were existed. This shows that there were 28 primary health centers are less than the required demand. Considering the in accessibility of this region the government might have not provided these 28 primary health centers to this region. After 2021, due to higher rate of population growth the numbers of required. Primary health centre are out to increase, from 150 primary health centers in 2021 to 238 primary health centers in 2031.

Table no. 5.1 -List of Primary Health canters newly suggested for 2011.

Sr. No.	Primary Health centres	Sr. No.	Primary Health centres
78	Borkhedi	92	Amabapuri
79	Roshmad	93	Manibeli
80	Roygaon	94	Valfalya
81	Vasvi	95	Chansaili
82	Panjria	96	Ghatali
83	Kamkheda	97	Chikhali
84	Dhavada	98	Borkhedi
85	Shivniya	99	Abodgar
86	Galkheda	100	Doklya
87	Godrya	101	Loansata
88	Panchmal	102	Dondvada
89	Malkheda	103	Bhurapani
90	Amlyapani	104	Dahigaon
91	Nehali	105	Malod

Source: Computed by author, 2013

Table no. 5.1 indicates the spatial distribution of existing and proposed primary Health centre. The actual locations of this centre are divided on the basis of relief, accessibility, size of population served extension of service area etc.

Primary Health Subcentres:

Taking the norm into consideration, it is proposed to establish one primary health sub centre for each group of 3,000 persons in the tribal areas, taking this norm into consideration.

Table No.6- Western Satpura Region: Tahsilwise existing and number of PHSCs.

Sr. No.	Tehsils	Existing 2011	Required		
			2011	2021	2031
1	Akkalkuwa	11	16	26	46
2	Akrani	48	76	129	262
3	Taloda	2	2	2	2
4	Badwani	79	107	152	225
5	Pansemal	9	13	19	31
6	Shahada	3	5	6	8
7	Niwali	34	49	73	118
8	Rajpur	12	15	19	25
9	Sendhwa	96	138	211	352
10	Shirpur	1	1	1	2
11	Segaon	14	18	22	28
12	Khargaon	33	41	53	69
13	Bhagwanpura	71	96	136	204
14	Chopda	4	5	7	8
15	Yaval	9	11	13	15
16	Raver	10	13	16	20
17	Zirnya	52	69	96	140
18	Bhikangaon	10	11	14	17
	Region	**508**	**686**	**1166**	**1572**

Source: Computed by author, 2013

In 2011 in all 686 primary healths sub centers were required. However actual 508 primary health sub centre were in existence. There was a shortfall of 178 primary health sub centre during this period. As accepted, due to rapid increase in population, the number required primary health sub center has been rapidly increasing. Considering the projected the population, the total requirement of primary health sub centre by 2031 will be 1572.

Beds

The efficiency of a primary health centre is judged by the number of indoor patients. Each indoor patient needs bed and thus, the availability of numbers of beds in the center, becomes an indicated of efficiency of that center. As per National Health Plant, per every 1000 population one bed is recommended.

Table No. 7 Western Satpura Region: Tehsil wise existing and require number of Beds.

Sr. No.	Tehsils	Existing 2011	Required		
			2011	2021	2031
1	Akkalkuwa	33	49	78	138

2	Akrani	143	227	389	786
3	Taloda	5	5	6	7
4	Badwani	237	322	455	677
5	Pansemal	27	38	57	92
6	Shahada	10	13	18	23
7	Niwali	103	146	219	354
8	Rajpur	35	44	57	75
9	Sendhwa	289	415	633	1055
10	Shirpur	19	27	39	61
11	Segaon	43	53	66	83
12	Khargaon	98	123	158	206
13	Bhagwanpura	212	289	410	612
14	Chopda	13	166	20	25
15	Yaval	28	33	39	45
16	Raver	31	38	48	61
17	Zirnya	155	208	290	421
18	Bhikangaon	29	34	41	50
	Region	**1510**	**2080**	**3023**	**4771**

Source: computed by author, 2013

According to this norm, in the year 2011 the total requirement of beds was 2080 in the study region. However, the actual number of beds available in the same years was 1510 beds. This clearly indicates the greater deficiency of beds in the region under study. Table No. 7 shows primary health center wise existing and required number of beds. It is very clear that Khetiya, pansemal, Niwali, Sendhwa, and Segaon primary health have greater number of beds than their actual requirement. These are tehsil head quarters and facilitated by community health centre. They are urban centre and comparatively developed. In other primary health centers the requirement of beds is far greater than that of available number of beds in the year of 2011. This deficiency will become more acute during the period of next 20yrs. It is, therefore, an urgent need to propose a comprehensive plant for the future.

Other Infrastructural Facilities

The other infrastructural facilities that are closely associated with medical institutions are the provisions of O.P.D, wards, X-ray & pathology labs, Operation Theatre, and medical store. The National Health Plan has not suggested any norms for these facilities in term population, because these facilities are necessary in every primary health centre. Every primary health center must be several by these facilities. This is really a serious condition. This entire primary health centre located in the interior parts. In fact, it is a dire need to have at least the provision of medical store. Other medical facilities like pathological lab, X-ray, and operation theatres are meagre in number.

Conclusions:

Considering various norms and facts regarding the distribution of health care facilities it becomes clear that the study region, as a whole is deficit as regards to the availability of healthcare facilities. It is, therefore, needed to reorganize the existing health care infrastructure and to provide more efficient health care facilities in the tribal area. In 2011, 20 community health centers were existed in the study region. According to National Health Plan there would have been 27 community health centers in the same year. While considering the projected population for the year 2031 the community health centre would be proposed as 56 in the region. The health planners in India have utilized primary health centre and sub centre as the proper infrastructure to provide health services to the rural population. By applying the National Health Plan norms, the study region should have 77 primary health centers whereas 105 centers exist till today. Considering the inaccessibility of this region, government might have not provided 28 less primary health centers. By considering projected population 508 primary health centers and 1572 primary health sub centre can be proposed for the period of coming 20 years. The other infrastructural facilities that are closely associated with medical institutions are the provision of O.P.D., ward, X-ray and pathological lab, operation theatre and medical stores. The availability of these facilities is inevitable in every medical institution. The National Health Plan, therefore, has not suggested any norm for these facilities in terms of population. But unfortunately infrastructural facilities are not sufficiently available, therefore it is suggested that all medical institutions should be provided with these facilities at present and also in future.

Acknowledgement:

The author is grateful to Director, American Science Foundation & Michigan state university, Michigan, U.S.A. for financial support under the scheme of travel grants awards. With a deep sense of gratitude, I sincerely acknowledge my indebtedness to all staff of Michigan state university, Michigan, U.S.A.

References

1. Agnihotri R C (1995) “Geo-medical Environment and Health care”. Rawat publications, Jaipur p-242.
2. Bulletin on rural health statistics in India (1995) e.g. Rural Health Division, New Delhi.
3. Park and park (1990): “Text book of preventive and social medicine”. Twelth edition M/s Banarsidas Bhanot, Jabalpur p-460.
4. Reddy A. Ranga (1995) “Health care service Management “. Delta publishing house Delhi p-5.
5. Singh N.K. (1983) “Planning Health care for all by 200 A.D “ Swasthhind, volume XXVII No10 P-241

6. Suryawanshi, D.S. (2005); Geographical Epidemiology (ISBN-81-89326-21-x) *Raj Publishing* House, Jaipur,India
7. Suryawanshi, D.S. (2007); Geography of Healthcare, **(**ISBN-81-89526-74-0) Raj Publication, Jaipur.India
8. W.H.O. (1978): Alma At 1978 “Primary Health care” H.E.A. Sr. No. 1
9. W.H.O. (1984): Health papers No 80.

THE END

ARTICLE

16

NEWS AS COMPROMISE!- THE INDIAN NEWS MEDIA AND THE EVOLVING TREND OF PAID NEWS

Dr. Sony Jalarajan Raj*, Rohini Sreekumar[1], & Nithin Kalorth[2]
*St. Thomas University, Miami, Florida, USA
[1]Monash University, Sunway Campus, Malaysia
[2]School of Social Sciences, Mahatma Gandhi University, Kerala, India

Abstract:

the nation's status as the world's largest democracy, India's news media have been criticized for their emphasis on entertainment values at the expense of critical, pro-social, and investigative forms of journalism. A related development has been the increasing influence of political parties in the news content development, a practice which is named 'paid news', an Indian version of 'manufacturing of consent'. This controversy came to the fore during the (April-May, 2009) Indian parliamentary elections when numerous overtly favorable articles and news reports emerged in the Indian media that contained no disclosure of the monetary transactions that facilitated their publication/broadcast. This development poses serious threats to the continued advancement of a vibrant Indian mediated public sphere, and instead represents a deliberate attempt to manufacture popular consensus. This article details these unethical news practices in Indian news media and argues that this form of contemporary Indian journalism is a violation of the core values of the profession and their relation to the democratic process. This research paper is a qualitative work relying mainly on textual and content analysis, which include analysis of interviews, newspaper articles and paid news contents.

Introduction

India's media market has emerged in recent years as one of the most competitive and profitable in the world which is said to be twice as profitable as its global counterparts (Press Council of India, 2008). Even though new media has influenced the decline of traditional media globally like print and television, these journalists are by and large honored and accepted as the moral guide in the Indian society (Thakuria, 2010). Apparently, while the newspapers in Europe and America are losing their readership each year, the Indian print media is gaining momentum in number, circulation figure and market revenue (Vaidyanathan, 2011). The media here prides itself for having sown terror among corrupt lawmakers through television sting operations and other exposes, as well as for having kept the spotlight on high-profile crime cases (Chakraborty, 2010). It has grown in range and sophistication and is now immensely powerful and even feared not only by the public but by the organs of state (Verghese, 2009). However despite the nation's status as the largest global democracy, India's news media has been criticized for its overt commercialism and emphasis on entertainment values. A demeaning trend identified recently in Indian print media is the overt influence of politicians/ political parties in the manufacture of news, which is referred to as 'paid news' by the Press Council of India. They defined it as 'any news or analysis appearing in any media (print or electronic) for a price in cash or kind as consideration' (Press Council Report, 2010). Media organizations in India have been criticized for providing coverage only to the political parties and politicians who had provided these companies with remuneration. This controversy came to the fore during the April-May 2009 Indian Parliamentary elections when numerous overtly favorable articles and news reports emerged in the Indian media. It came with no disclosure provided to viewers and readers with regards to the monetary transactions that took place between political candidates and media organizations. This form of 'paid news' is published/broadcasted in a manner that deliberately serves to mislead audiences in regards to the distinction between news and advertising.

This mortifying trend shook the media industry as well as the society mainly because newspapers were part of the reverend heritage of India, a tool used by the freedom fighters to unite, socialize, activate and arouse the Indian citizen against the British tyrannical rule. Moreover, the father of Indian nation Mahatma Gandhi initiated his movement with the moral power of active journalism. But after independence, it seemed to be in a quandary- whether to be an adversary or ally to the government. However, the First Indian Press Commission in 1952 recommended that the press should help secure and protect social order taking into consideration the importance of justice, in political, social and economic scenario (Kumar, 2001). Subsequently the democratic India began to consider media as the fourth important pillar after legislature, executive and judiciary set-up (Thakuria, 2010). Dispiriting practices like paid news poses serious threats to the continued development of a healthy Indian mediated public sphere, and instead represents a deliberate and conscious effort to manufacture popular consensus and mass consent. This article exposes these unethical news practices in India and argues that this contemporary Indian journalism is a violation of

the core values that have traditionally informed journalism and its relation to the democratic process in this rapidly developing country.

Paid News Syndrome – A Novel Concept

The media landscape of India was transformed in the 1990s under the impact of 'neo-liberal, market-oriented economic policies' (Thussu, 2000, p. 324), and so today, the Indian media is passing through a 'dramatic shift in favor of consumerism,' with a steady increase of advertising revenue from 30% in 1990 to 45-55% some ten years later (Sharma, 2002). Moreover, to stay unique in the cluttered newspaper market, most of the Indian newspaper had redesigned to include attention grabbing headlines with colorful supplements like *City Life* and *Sunday Magazine* which only contains entertainment and celebrity driven stories, gossips and fashion (Rao and Johal, 2006)

Precisely, the media industry in India and elsewhere has become increasingly difficult to regulate due to several reasons: technological developments, the globalization of media conglomerates and the trend of certain suppliers and creators of news (public relations practitioners, advertisers and interest groups) getting closely involved with the working of media organizations. In India, political news has historically dominated the content of news since newspapers itself flourished in India because of political causes and needs, the practice they inherited from the days of Indian independence struggle (Mishra, 2003; Reddi, 1989). Hence society, media and governance is so confusingly interlinked that it has become a complex phenomenon to form a public sphere.

One of the other outcome of the so called 'Murdochization of the Indian press' (Sonwalkar, 2002) is 'paid news', a new journalistic practice of producing news according to the payment developed during the fifteenth general elections to the Lok Sabha (April-May 2009). The trend was quite anticipated as globalization of the media has led to a dramatic rise in entertainment-oriented news agenda, commoditization of news, and rise in sensational journalism (McDowell, 1997; Shah, 1998; Thussu, 2002). The origin of paid content, lethal combination of three 'M', namely, the *media*, *money* and *mafia* (Thakurta, 2010), in India can be traced back to 2003, when *Times of India*, India's largest daily newspaper, started a division called 'Medianet', with a rate card for the sale of news. It was the first instance when the 'walls' that separate advertising, management and editorial in a newspaper organization was breached (Dalal, 2003). However, it was only over the last few years and since 2009 in particular, the phenomenon of paid news acquired a treacherous dimension by entering the sphere of political reporting on candidates contesting in elections. Numerous favorable or complimentary 'news' reports and feature articles on representatives of political parties, including candidates who have been contesting elections, have appeared in newspapers and television channels across the country in the run-up to the *Lok Sabha*[1] as well as state legislative assembly elections. In addition, owners of media organizations have financial relationships, including share-holdings, with advertisers, resulting in only favorable information about such advertisers getting disseminated and unfavorable information against them getting blacked out (Press Council Report, 2010). As the veteran journalist C.P Rajasekharan lamented, "News has become a commodity; and it may become propaganda at times" (As quoted in Nettikkara, 2009). For instance, Rahul Gandhi the scion of India's ruling political dynasty, campaigned in a Delhi constituency during the parliamentary elections for the candidate, Sandeep Dikshit, who is the son of the state's high-profile female chief minister, Sheila Dikshit. Many channels were not willing to telecast it unless, he is willing to pay the amount the channel demands (Rahman, 2010). "The channel even said they would arrange the crowds," the dubious Mr. Dikshit told Outlook magazine, which broke the story in their December issue. *Outlook* also quoted Haryana Chief Minister Bhupinder Singh Hooda's (who allegedly paid for favorable news during the assembly elections in October) similar situation.

When I noticed the leading paper of my state printing baseless reports on its front page day after day, I called them up and offered money to print the right picture. The paper in question apologized. They even returned the money taken from my rival to publish news items against me. I was aware that packages were offered to candidates from my party, but my state is small and people can see through sponsored reports… The journalists are not at fault here because fact-finding journalism has now become a commercialized activity with the present owners having turned newspapers into a business proposition.

Much of the media were reluctant to take up the issue of paid news to the public fearing the revelation of their own new managerial and financial arrangements (Ravi, 2010). An adversary to this attitude was the, The Hindu with their rural reporter, P. Sainath who raised the issue into some higher levels of exposition through bringing forth the scam of Maharashtra Chief Minister Ashok Chavan alleged to be using the media to further his political interests. Hence whether the Indian media likes to admit it or not, journalism is up for sale, the essence of which was completely implicit when a top management executive from *Punjab Kesri* (readership 1.04 crore) admits that the newspaper made anywhere between 10 crore and ` 12 crore during the assembly election season (Raman, 2009). Sushma Swaraj,

Member of Parliament belonging to the Bharatiya Janata Party, rightly commented that the “paid news” phenomenon had “started out as an aberration, went on to become a disease and is now an epidemic” (As quoted in Thakurtha, 2010). As former editor of *Hindustan Times* and *The Indian Express,* B.G. Verghese, who is a signatory to a complaint to the Press Council of India, puts it

> *This carries with it a corresponding responsibility imbued with a sense of trusteeship in providing the people what kind of information needed. It is in this regard that we must lament a disgraceful fall in standards as revealed by well documented stories of the sale of electoral coverage by sections of the news media through ‘packages’ relating to the kind of treatment sought with the kind of information needed for democratic participation, empowerment and informed choice. (Verghese, 2010)*

It was a meet of South Asia Free Media Association (India chapter) in Mumbai during the first week of December 2009 that the issue of paid news was officially discussed with serious concern, which was followed by the annual general meeting of the Editors' Guild of India during the fourth week of December, where most of the members expressed concern at the growing tendency of a section of media groups (both print and visual) to receive money for some 'non-advertorial' items in their media space (Thakuria, Nava; 2010). The editors' guild sent a letter to each of its member-editors throughout the country asking for pledges that his/her 'publication/TV channel will not carry any paid news as the practice 'violates and undermines the principles of free and fair journalism'. It opined that it had always stood for publication of news which is in public interest; news which has been gathered due to the professional efforts of journalists; and news which is not influenced by malice, bias, favouritism or monetary influence (Editors Guild of India, as quoted in CNN-IBN, 2009). A detailed discussion on the subject took place in the Rajya Sabha (Upper House of Indian Parliament) during which Information & Broadcasting Minister Ms. Ambika Soni stated that the government was actively considering the option of providing more powers to the Press Council of India to check this phenomenon which is undermining the credibility of the media and democratic processes (As quoted by Joshi, 2010).

Ethical Perspectives of *paying-for-the-news*

In a modern democracy, election campaigns have been considered as a three-player game- *politicians, public and media* (Covington, Kroeger, et al., 1993), the so called ‘Golden electoral triangle’, in which media forms the most critical corner of this triangle to fill the vacuum created by the declining influence of politicians upon the citizen (Patterson, 1994).

Ethically analyzing the paid news, three levels of fraudulence can be sieved out. First, the reader of the publication or the viewer of the television programme is deceived by putting them in dilemma, whether to take it as an advertisement or independently produced news content. If those stories were news, then how come the same news story appears in different newspapers? Same story about the ‘fine qualities as a leader’ Chief Minister of Maharashtra, Mr. Ashok Chawan (Sainath, 2009) appeared in three different newspapers (Marathi dailies *Lokmat*, *Maharashtra Times, Lokmat)* with only the differences in headlines. There is no mention of the word advertisement or sponsored feature next to the item in any of the newspapers, so supposed to be taken as news. P. Sainath, with his obtrusive quest for truth, did an ardent research into the issue and come up with glaring evidence to support his claim of paid news.

> *“…his “day to day accounts of election expenditures” do not reflect any real spending on ads. All candidates are required by law to submit their campaign expenses accounts to the district election officer within 30 days of the declaration of results. Mr. Chavan’s accounts, which are in* The Hindu*’s possession thanks to an RTI application to which the appropriate authorities responded with commendable speed, claim a total expenditure of just ` 11,379 on advertising. Indeed, he had a mere six advertisements in print and these cost a trifling ` 5,379. (The rest was spent on slots on cable television.) Moreover, all his print ads went to a single newspaper, Satyaprabha. That is a small daily in the district of Nanded. Yet Mr. Chavan was the focus of scores of full pages in very major dailies. If those had been ads, they would have cost crores of rupees…”* (Sainath, 2009)

The extraordinary coverage the Chief Minister received during the poll campaign cannot be called advertising since none of those full pages bears that word. Secondly, if it was advertorials, then, by not officially declaring the expenditure incurred on planting “paid news” items, the candidate standing for election violates the Conduct of Election Rules, 1961, which are meant to be enforced by the Election Commission of India under the Representation of the People Act, 1951 (Press Council Report, 2009). Finally, by not accounting for the money received from candidates, the concerned media company or its representatives are violating the provisions of the Companies Act, 1956 as well as the Income Tax Act, 1961 among other laws.

The modern communication mediums advance public interest by informing the public of the events and development that have taken place and thereby educating the voters, a role considered significant for the vibrant functioning of a democracy (Madhok, 2008). Apart from commercialization, the increasing marketization of news, has created a facade of media plurality when in fact it is 'contributing to a democratic deficit in the world's largest democracy' (Thussu, 2005). By the end of 19th century and early 20th century the media instead of being a vehicle for advancing freedom and democracy started becoming more and more a means of making money and propaganda for the new and powerful classes (Sridhara, 2003). The globalization has paved way for a commercialized society, where role and function of government has been altered by capitalized economy (Sridhara, 2003).

A prerequisite of democracy, therefore, is the democratization of communication, which in turn requires the empowerment of individual (Philip, 1995). The media facilitate this process by providing a pitch for public debate and construct public opinion. People should have free access to the knowledge and information they require, they should be able to discuss matters of public interest with their equals in order to influence actions taken. As (McChesney, 1998) posits media outputs are commodified and are designed to serve market needs, not citizenship needs. The 'commercial model' has its own serious limitations, which tends to erode the public sphere and to create a 'culture of entertainment' that is incompatible with democratic order (Sridhara, 2003). Public sphere is a realm where opinions particularly focusing on the needs of society are freely and openly exchanged between people, unconstrained by external pressures. (Habermas, 1991, p 176). Any discourse on citizenship is appropriate only in the background of democracy and civil society, because citizenship is regarded as a fundamental plank of democracy (Sridhara, 2003).

In today's world of ever-increasing mass global communication networks, the media in all its forms whilst far from ideal is widely regarded as the closest thing the world community has to the existence and further attainment of a public sphere (Dana, 2006). The public sphere generates opinions and attitudes (Soules, 2001) and is a foundation for "emancipatory social thought" (Holub, 1997). Ideally it is a mediator between society and state, the source of public opinion needed to affirm and guide the affairs of state (Soules, 2001). Habermas recognized that we should not "harbour any illusions about the condition of a public sphere in which commercialized mass media set the tone." (As quoted in McChesney, 1999). In the transactions in the public sphere, the media are not a neutral participant or an impassioned chronicler. Instead they are either a legitimizer of the status quo or an innovator of the existing social equilibrium (Panikkar, 2004). Biased reporting combined with factors like manipulative publicity and mass advertising have been described as "the colonization of the public sphere by systems of authority." (Soules, 2001).

Public opinion is very important for policy makers in their decision to go to war and in the lead up to war. Because of this many policy makers and elites in the government need to make their case to the public through the news media since there is almost no other way for the public to hear their message otherwise on a daily bases. Since the news media has natural organizational filters in how they give the public their news. Policy makers have to frame their message in a way in which they know will give the viewer the most impact of what they want them to hear. In reality mass media has moved away from positive expectations of civil society (Sridhara, 2003). George Gerbner argues that,

> *"Our children are born into homes in which the dominant story tellers are not those who have something to tell but a small group of global conglomerates that have something to sell.... Fewer sources fill more outlets more of the time with ever more standardized fare. Alternative perspectives vanish from the mainstream. Media coalesce into a seamless, pervasive, and increasingly homogenized cultural environment that has drifted out of democratic reach" (Gerbner, 2002)*

The Indian situation is not very different from what Gerbner has described. Both public and private media have failed the nation in creating well-informed and enlightened citizen. Except for the pre-independence nationalist press, the performance of privately owned print media, cinema and public broadcasting have not raised to the expectations of a growing democracy, but only aim at reinforcing the status quo (Gerbner et al., 1979; 1987). Media seems to have an agenda setting function and this agenda come to be perceived as an important element on the public agenda (McCombs, Shaw & Weaver, 1997).

(McCombs, 1997) argues that this agenda effect works in two dimensions – affective and substantive. In the former dimension, the qualities attributed to the candidates, whether it is positive or negative, influence the voter's perception about those candidates. In the second dimension, the attributes projected by the media influence the kinds of characteristics the voters think the candidates should have (McCombs, et al., 1997). Similar examples of compromise in news can be drawn from the Ranchi edition of *Dainik Jagran*, which published two "news" items on page 7, both relating to the *Chatra Lok Sabha* constituency. The first item was in favour of the Rashtriya Janata Dal (RJD) candidate Mr. Nagmani (one name) with the headline stating: "Nagmani is getting support from every class and

section" virtually declaring that he would become the undisputed winner. The same page had another "news" item claiming that Mr. Arun Kumar Yadav, a candidate belonging to Janata Dal (United), who contested from the same constituency, would emerge a "clear winner". Both the items do not carry any byline although the font used is different from the font used for other news articles in the publication. In both these dimensions, paid news have set certain agenda and become successful to greater extend.

Bourdieu says in the *Rules of Art* that fields are "social microcosms, separate and autonomous spaces in which works are generated". In Bourdieu's conception of field theory the activities and practices of the news media fall into the general field of cultural production (Bourdieu & Nice, 1980). Paid news became a greater ethical concern, since journalism with its populist subject matter and mass audiences is situated at the "heteronomous pole" of the field; that is, it is strongly dominated by the external pressure of economic power, which Bourdieu insists has a "powerful determinative effect… in the contemporary historical context" (according to Benson 1998, p 488). Adding to this (Benson & Neveu, 2005) said,

> *"Because fields are closely intertwined and because journalism in particular is such a crucial mediator among all fields, as the journalistic field has become more commercialized and thus more homologous with the economic field, it increases the power of the heteronomous pole within each of the fields, producing a convergence among all the fields and pulling them closer to the commercial pole in the larger field of power".*

News is meant to be objective, fair and neutral – this is what sets apart such information and opinion from advertisements that are paid for by corporate entities, governments, organizations or individuals. Journalism has often been understood as a set of practices described as ''doing news work'' including gathering, presenting, and dissemination of news (Zelizer, 2004,). According to Callahan (2003)

> *"Journalism is a practice and profession dedicated to truth and common good. It is now recognized as inevitably a moral enterprise, and there is a universal standard for journalism that applies cross-culturally and will apply in the future. The universality of ethical standards of journalism exists because ethics and morality are universal human enterprise based on the discovery of universal moral truths by human beings with a common human nature always and everywhere".*

Indian media, when compared to its global counterparts, enjoy comparatively more freedom under a democratic and secular government (Chakravarty, 2003; Ravindranath, 2004, Rao, & Johal; 2006). The independence of the media facilitates adherence to democratic norms. Article 19 of the Constitution of India confers the right to freedom of speech and expression to all citizens of the country and to the media as well. It is upon this right that paid news started flourishing. The government can impose restrictions on the right to telecast and broadcast only on grounds specified in Article 19 (2)[2] and not on any other ground. The paid news impinges on the people's right to know by dishing out the positive aspects of the contesting candidates andthe political parties. Half truths and untruths would become part of news and it would help to confuse and mislead the readers and viewers resulting in violation of the right of the people to know the truth (Indian Journalists Union Memorandum, 2009).

It can also be argued that the proliferation of the "paid news" phenomenon can be related directly to the diminution of the role and the status of editors in media organizations and the erosion of the freedom enjoyed by journalists under the Indian Working Journalists Act. As more and more senior journalists choose to work with their employers under fixed term contracts, they opted out of the protection that was accorded to them under the provisions of the Act. . With managers playing a more influential role in the selection and presentation of news, it was not surprising that the importance of the news started getting determined by the revenues that would be generated for the media company. News has become commerce. Managers have increasingly taken over from editors, some of whom have fallen prey to bloated salaries and perks. For instance, a four-page special on an independent candidate from Varanasi (in Uttar Pradesh), with the sponsored tag at the bottom of the last page in a leading Hindi newspaper, *Hindustan*, went against the rules set by then editor Mrinal Pande. She says,

> *"I had laid down specific guidelines for sponsored features during elections; these were flouted without even informing the editor in charge. Among other things, it was the paid-for news arrangement that made me put in my papers. In the end, it is important to keep one's integrity intact…"* (Raman, 2009)

Unless Press Registration Act get reviewed, the position and status of editors are in threat, since, the editor is even now responsible for everything published, including advertisements. At this juncture it is so important to remember that despite strict censorship and restrictions, India was home to some celebrated journalists like Mahatma Gandhi, Kuldip Nayar, B. G Varghese, Pothan Joseph, M. J Akbar, Arun Shourie, Vinod Mehta etc who not only made history, but helped convert pre-1947 missionary journalism into an organized industry, lending it strength and direction.

Press Council- Resolution and Committal?

The Press Council of India (PCI) was established in 1966, with funding from the State, as an autonomous, non-official, and statutory body comprised of political appointees, journalists, and editors (Sawant, 2003), which is intended to "preserve the freedom of press and to improve standards of newspapers and news agencies in the country" (PCI, 2005). Press Council of India established a committee to examine violations of the journalistic code of fair and objective reporting as the recommendation from Indian Election Commission to define what constitutes paid political news, so it can adopt appropriate guidelines. The report of the two-member sub-committee was originally scheduled to be released on April 26, 2010, but its release was then deferred and the report referred to a larger group of Council members who were to decide, within three months by July 31, 2010, on how it should be presented because "some council members argued that it would destroy the publishers' credibility and hurt their long term interest" (Outlook, 2010). July 30, 2010, the PCI came out with a much watered down version of the report without any of the specifics detailed in the original which explicitly named newspapers and channels — including some of the biggest groups in the country — seen as having indulged in the "paid news" practice.

> *"What it hides is that a 71-page document which describes in considerable detail how exactly the phenomenon of paid news operates, has been watered down to a 13-page non-controversial statement which gives four recommendations, all requiring action by the government by amend two existing laws, the Representation of the People Act, 1951, and the Press Council Act, 1978, giving the Press Council more powers."* (Chhokar, 2010)

The original report was reduced to a mere footnote, saying that it 'may remain on record of the Council as reference document' (Final Report by Press Council, 2010). But that possibility too is uncertain since the website bears no such reference documents. 'In the journalist Sainath's word, the PCI has simply buckled at the knees before the challenge of 'Paid News';

> *"A body entrusted with 'Preserving the freedom of the Press and improving the standards of Press in India' has set an appalling standard. The guardian of Press freedom stands as an arbitrary censor of truthful journalism. It has acted less like the 'watchdog of the Press' that its ideals call for. And more like the lapdog of the powerful media owners who stood to be exposed by the report of its own sub-committee."* (Sainath, 2009)

Chhokar, (2010) has somewhat similar concern or criticism about Press Council

> *"The other irony is that this body the stated objective of which is "to preserve the freedom of the Press" is, itself, and in effect, asking for more governmental interference! The Press Council Act was enacted in 1978, in the afterglow of the lifting the infamous Emergency, and one of its stated functions is "to concern itself with development such as concentration of or other aspects of ownership of newspapers and news agencies which may affect the independence of the Press." To what extent has it fulfilled this function is left to the judgment of the reader* (Chhokar, 2010).

Press Council in 1996, formulated norms of journalistic conduct in order to ensure high professional standard and ethical practice, which later on 2005 was updated 'on the basis of adjudications and other pronouncements and cover to a large extent almost every aspect of compulsions and compunctions in journalistic practice' (Press Council, 2005). In Part-B of this norms, under clause (e), it is clearly mentioned that the 'Press shall not accept any kind of inducement, financial or otherwise, to project a candidate/party… are not expected to indulge in unhealthy election campaigns, exaggerated reports about any candidate/party or incident during the elections'. In spite of codes formulated by the Press Council, individual firms have drawn their own charter of journalistic practice, but none came into practice. But self-regulation is not adequate for checking rampant malpractices and corruption that have assumed epidemic proportions in many sections of the print medium as well as the television medium. Despite these written codes, it is such a pity that some members of the PCI itself mainly those representing media owners worked to scuttle the explosive original report (made by two-member subcommittee comprising Paranjoy Guha Thakurta and K. Sreenivas Reddy) and all references to The Working Journalists Act. Out of the 24 of the full 30 member PCI, who

attended the July 30 meeting, 9 (including the chairman) were in favour of the report being *annexed* to the "final" report, 12 opposed it and 3 remained non-committal (Outlook,2010).
Congress MP Meenakshi Natarajan proposed in May 2012 the Print and Electronic Media Standards and Regulation Bill to impose a government appointed regulatory authority on the media, 'to impose certain crucial reasonable restrictions for the purpose of protecting national interest' (as quoted in Dasgupta, 2012). Even though the congress party (the national government) is distancing from such a bill, similar proposal had been made by the present Chairman of Press Council of India, Markandey Katju, however he preferred an independent statutory Board like Press Council can fulfill it provided it should enlarge its scope and authority.

Even the self-regulatory industry bodies like Press Council of India and Editors's Guild is in many ways not genuinely regulatory because of its limited legal power and bureaucracy. For instance Editor's Guild, an industry body with the same Editors of newspapers and television channels whose legitimacy is questioned, cannot do anything further other than condemning the practice and forming an ethical committee[3]. Correspondingly, Press Council of India, constituting by 20 media persons (out of 28 seats) are also not completely legally authoritative, but also is unwilling to utilize the little command they have in controlling the media, which is evident in watering down the report of the subcommittee. The absence of a regulatory body like SEBI (Securities and Exchange Board of India) or TRAI (Telecom Regulatory Authority of India) does not pose a challenge as, the constitution as well as the State has certain statutes guarding defamation, official secrecy, obscenity or even have the power to ban a newspaper or television channel which is not completely put to action. Hence, whether a regulatory board is set up or not, the main issue in India is how well they practice their power and authority.

Discussion and Conclusion

The central feature of the media globalization is larger cross border flows of media outputs, growth of media trans-national conglomerates, centralization of media control and spread and intensification of commercialization. Paid news is only one of the unconstructive trends of a modern journalistic activity, where earning profit has become the priority rather than social responsibility, while making the reader or the viewer unable to distinguish between news reports and advertisements/advertorials. It is at the utmost concern of Indian society as media had a very democratic and responsible role in the formation of a liberated society in India even before attaining independence. Commercialization and erosion of journalistic duties began to filtrate in Indian media with the outset of Liberalization policy of Indian government in 1991. From then journalism turned to be more concerned with survival of a business entity rather than a social service. Rao (2010) identified commercialization and regionalization as trend of contemporary newspaper industry in India. When newspaper and television channels began to emerge countlessly previously unseen by the market, there began a frantic competition to capture readers and viewers. Operating under a dual product market, media came under the overt influence and directive of advertisers. Hence soft news like entertainment, film reviews, lifestyle, fashion etc. captured the space of political news stories. Moreover, in order occupy the harrowing advertisers and to niche the audience, interest-specific supplements and pullouts born out like Times of India's *Times Wellness*, *Times Drive*, *Times Property*; Hindustan Times' *HT City*, *HT Café, Brunch*, *HT Education* etc.

Amidst these gimmicks by advertisers, media is again approached by political parties for their individual or party-specific goals. Even though politically oriented newspaper thrived during the pre-independence era, this recent trend is quite different as the former used to be laden with a sole cause of social activism and liberation. Rao (2010) calls this 'trans-institutional' character of present day journalism, where by journalism could not be separated from political institutions and practices. According to her, journalists are getting more and closer and personal with politicians, there by moving away from collecting factual information. Paid news comes at this juncture making the relation even more practical and mutually beneficial. The 'Nira Radia tape' scam, in which transcripts of some radio conversation between Radia (a political lobbyist) and some of the journalists and politicians to mediate in some misgivings between the Congress and Dravida Munnetra Kazhagam (Political Party of Tamil Nadu), actually took into mainstream the close alliance between journalists and politicians in making news. Even though the recording was done as part of the investigation of the 2G scam, it triggered concern regarding the integrity of politicians as well as journalists alike about the mutual lobbying that they practice.

Even after the uproar created by paid news in India, newspapers still are tranquilized by the financial fortune put forward by political parties; a recent example could be the one when Tamil Nadu Chief Minister, Jayalalitha celebrated her first year in office by buying the full front pages all the major English newspapers in India (on 16 May 2012) including The Hindu, Business Standard, Times of India, The Economic Times etc (Sahni, 2012).

Elections have become a very high stakes game as candidates and parties pour in huge sums of money to ensure a win. The golden electoral triangle of news media, politics and public, hence, turn to be a complex phenomenon, with media capturing the pivotal corner. The roots are, therefore, in the intense competition and complete commercialization of media and politics, and this was inevitable (Sastry, 2010). In India, it is a huge threat not only to democracy, but to the journalism practice, as Indian media market is rocketing unlike its counterpart, which in turn develops stiff competition and profit. Paid news is a threat to the formation of a healthy public sphere, particularly about political scene. Even though Press council of India is the apex body of media, particularly newspapers, its powers are often limited, particularly in taking action against management practices. Since paid news is not limited to national newspapers, but explicitly seen in regional media, it is not practical to have a centralized council to scrutinize the issue. The structural change of media from a profit-making one to a not-for-profit model, either as a society or trust, much like educational and religious organizations can make some changes in the grave practices of media (Sastry, 2010). Media industries must think about the possible options in which the fourth estate will serve as a legitimate guide of the society like making Ombudsmen a mandatory post in all industries serving as an impartial mediator between media, politics and readers.

References

1. Andrew, Vandenberg. (Eds.)2000. “Citizenship and Democracy in a Global Era.” New York: Mac Millan Press.
2. Bass & Gaynor 1996. “Habermas’ Public Sphere.” Georgetown. University, http://www.georgetown.edu/faculty/bassr/gaynor/publics.html.
3. Benson, Rodney. 1999. “Field Theory in Comparative Context: A New Paradigm for Media Studies.” Theory and Society 28: 463–98.
4. Benson, Rodney and Erik Neveu. Eds. 2005. “Bourdieu and the Journalistic Field.” Cambridge: Polity Press.
5. Bourdieu, Pierre. 1984/1979. “Distinction, trans. Richard Nice. Cambridge.” MA: Harvard University Press.
6. Bourdieu, Pierre. 1993. “The Field of Cultural Production.” Cambridge: Polity.
7. Bourdieu, Pierre. 1996/1992. “The Rules of Art: Genesis and Structure of the Literary Field.” trans. Susan Emanuel. Cambridge: Polity Press.
8. Bourdieu, Pierre. 1998/1996. “On Television and Journalism.” trans. Priscilla Parkhurst Ferguson. London: Pluto.
9. Bourdieu, Pierre. 2000/1999. “Pascalian Meditations.” trans. Richard Nice. Cambridge: Polity.
10. Bohman, James. 2004. “Expanding Dialogue: The Internet, the public sphere and prospects for transnational democracy.” In After Habermas, New Perspectives on the Public Sphere, eds. Grossley, Nick & Roberts, John Michael. Oxford: Blackwell Publishing.
11. Borjesson, Kristina. eds. 2004. “Into the Buzzsaw: Leading Journalists Expose the Myth of a Free Press.” New York : Prometheus Books .
12. Brown, Merrill, 2005. “Abandoning the News.” Carnegie Reporter, Vol 3 No 2 Spring 2005. New York: Carnegie Corporation of New York,.
13. Callahan, S. 2003. “New challenges of globalization for journalism.” Journal of Mass Media Ethics 18, 3–15.
14. Chakravarty, J. 2003. “Journalism: Changing society, emerging trends.” New Delhi, India: Authorspress.
15. Chakravarty, S. 1996. “Press and media: The global dimensions.” Delhi, India: Saad.
16. Chhokar, Jagdeep 2010. “Press Council report hides more than it reveals.” 19th October 2010. Retrieved from http://www.tribuneindia.com/2010/20101019/edit.htm on 20 December 2010.
17. CNN-IBN (2009). Editors Guild of India condemns 'paid news'. 23 December 2009. Retrieved from http://ibnlive.in.com/news/editors-guild-of-india-condemns-paid-news/107632-3.html on 19 February 2012
18. Couldry, Nick 2003. “Media Meta-capital: Extending the Range of Bourdieu’s Field Theory.” Theory and Society 32: 653–77.
19. Covington, C., Kroeger, K., Richardson, G., & Woodard, J. 1993. “Shaping a candidate’s image in the Press: Ronald Reagan and the 1980 presidential election.” Political Research Quarterly 46*, 783-798.*
20. Crossley, Nick. 2004. “On systematically distorted communication: Bourdieu and the socio-analysis of publics.” In After Habermas, New Perspectives on the Public Sphere, eds. Grossley, Nick & Roberts, John Michael, Oxford: Blackwell Publishing.
21. DALAL, SUCHETA 2003. “SELLING NEWS OR BUYING SILENCE?” 05 MARCH 2003, RETRIEVED FROM HTTP://WWW.REDIFF.COM/MONEY/2003/MAR/05DALAL.HTM ON 20 DECEMBER 2010.
22. Dasgupta, S (2012). The Media is already governed by law. *The Hindu*, 04 May 2012, p. 5
23. Deb, S. 2005. “The feelgood: India’s elite press is leaving a complicated nation behind.” Columbia Journalism Review 23(6), 38–43.
24. Deflem, Mathieu. Assistant Professor of Sociology, University of South Carolina, Scholarly online resources on the work of Jürgen Habermas, Habermas Online http://www.cas.sc.edu/socy/faculty/deflem/HabermasOnline/default.html.
25. Edward S.Herman, Robert W.McChensney, 1998. “The Global Media, New Missionaries of Corporate Capitalism.” New Delhi: Madhyam.
26. E-Parliament, Global Democracy in Action, http://www.e-parl.net/ Francis, Eric 2005, PlanetWaves, www.planetwaves.net.
27. Garnham, N. 1993. ‘The Media and the Public Sphere.” In Habermas and the Public Sphere, eds. Calhoun. London MIT Press.
28. George, T.J.S. 2010. “Man who Changed Indian Journalism.” 12 August 2010. Retrived from http://news.in.msn.com/national/article.aspx?cp-documentid=4260036 on 12 Dec 2010.
29. Gerbner, George. 2002. “Stories of Violence and the Public Interest.” 19 April 2002. Retrieved from http://www.asc.upenn.edu/gerbner/archive.aspx?sectionID=39&packageID=200 on 13 December 2010.
30. Gillwald, Alison. 1993. “The Public Sphere, the Media and Democracy.” Transformation. Vol. 21, pp 65-77. Retrieved from http://digital.lib.msu.edu/projects/africanjournals/pdfs/transformation/tran021/tran021005.pdf on 12 December 2010.

31. Gordon Marshal, Ed. 1994. “The Consice Oxford Dictionary of Sociology.” New York: Oxford University Press.
32. Gring-Pemble, Lisa. 1997. ‘The Public Sphere Problem’ in Contemporary Rhetorical Theory”. University of Maryland, http://www.wam.umd.edu/~jklumpp/comm652/unit3.html.
33. Habermas, Jurgen. 1991. “The Structural Transformation of the Public Sphere: An Inquiry into a category of Bourgeois Society.” Trans. Thomas Burger with Frederick. Lawrence. Cambridge, MA: MIT Press.
34. Holub, Robert C. Habermas, Jurgen.1997. “The Johns Hopkins Guide to Literary Theory & Criticism.” Eds by Michael Groden and Martin Kreiswirth, The Johns Hopkins University Press http://www.press.jhu.edu/books/hopkins_guide_to_literary_ theory/jurgen_habermas.html.
35. Howell, Landon. Eds 2005. “Who is Rupert Murdoch.” Juice News Daily, http://www.juiceenewsdaily.com/0405/news/ who_rupert.html.
36. James Curran and Michel Gurevitch Eds. 2000. “Mass Media and Society.” 2nd Edition. London: Arnold.
37. Jeffrey, Robin. 2000. “India’s Newspaper Revolution: capitalism, politics and the Indian language press.” New Delhi: Oxford University Press.
38. Joshi, S (2010). ‘Paid news': Centre plans to empower PCI. *The Hindu*, 5 March 2010
39. Lucian, W. Pye. 1963. “Communications and Political Developments.” New Delhi : Radhakrishna Publishers.
40. Lunt, Peter and Stenner, Paul, 2005. “The Jerry Springer Show as an Emotional Public Sphere.” Media, Culture & Society Journal, Vol 27, No 1 pp59-81 Sage Publications, London.
41. MacBride, Sean. 1980. “Many Voices One World.” UNESCO. London: Kogan Page
42. McChesney, R. W. 1999. “Rich Media Poor Democracy: Communication Politics in Dubious Times.” New York :University of Illinois Press.
43. Mcdowell, Stephen. 1997. ‘‘Globalization and Policy Choice: television and audiovisual services policies in India.’’ Media, Culture and Society 19, pp. 151_72.
44. McLaughlin, Lisa, 2004. “Feminism and the Political economy of transnational public space” In After Habermas, New Perspectives on the Public Sphere, eds Grossley. Nick, Roberts, John Michael. Oxford: Blackwell Publishing.
45. McQuail, Dennis. 2000. “Mass Communication Theory.” In India Another millennium? Eds Romila Thaper. New Delhi: Viking.
46. Miller, J. 2005. “News as Commodity + Pervasive Information Control = Loss of Democracy.” 29 April 2005. Retrieved from http://www.commondreams.org/views05/0429-29.htm on 13 December 2010.
47. Mishra, M. 2003. “Press and political socialization. New Delhi, India: Dominant.
48. McCombs, M, Shaw, D.L & Weaver, D. 1997. “Communication and democracy.” New Jersey : Lawrence Erlbaum Associates Inc.
49. Nettikkara, Samiha. 2009. “News media in the new era: An interview.” 07 April 2009. Retrieved from http://www.merinews.com/article/news-media-in-the-new-era-an-interview/15764643.shtml on 15 December 2010.
50. Ninan, Sevanti. 2007. “Headlines from the Heartland: reinventing the Hindi public sphere.” New Delhi: Sage Publication.
51. Norms of Journalistic conduct. From Press council Website http://presscouncil.nic.in/norms.htm. retrieved on 12 December 2010.
52. Patterson, T. E. 1994. “Out of order.” New York: Random House, Inc.
53. Press Council of India (2010). *Report on Paid news*. Retrieved from http://presscouncil.nic.in/Press%20Release_Paid_News.pdf on 13 November 2011
54. Press Council of India 2008. “State of newspaper scene 2007.” New Delhi: Centre for Media Studies.
55. Press Council of India. 2005. “Press Council of India’s norms of journalistic conduct.” Retrieved December 20, 2005, from http://www.presscouncil.nic.in/home.html.
56. Rao, S. 2009. “Glocalisation of Indian Journalism.” Journalism Studies Vol.10 (4), pp 474-488.
57. Rao, S & Johal, N.S 2006. “Ethics and News Making in the hanging Indian Mediascape.” Journal of Mass Media Ethics Vol. 21(4), pp 286-303.
58. Rao, U (2010). *News As Culture: Journalistic Practices and the Remaking of Indian Leadership Tradition*. New York: Berghahn Books.
59. Ravi, N. 2010. “Guest Contribution: India: Embarrassing Moments for the Media.” 10 December 2010. Retrieved from http://www.freemedia.at/press-room/public-statements/features/singleview/5239/ on 29 December 2010.
60. Ravindranath, P. K. 2004. “Press laws and ethics in journalism” New Delhi, India: Authorspress.
61. Ravindranath, P. K. 2005. “Regional journalism in India.” NewDelhi, India: Authorspress
62. Reddi, U. 1989. “Media and culture in Indian society: Conflict or cooperation?” Media, Culture and Society 11, 395–413.
63. Report Submitted by Indian Journalists Union and Andhra Pradesh Union of Working Journalists to the Subcommittee of Press Council (2010). Retrieved from http://apuwj.org/Magzine/report%20on%20paid%20news2.pdf on 20 December 2010.
64. Richard Gunther and Anthony Mugham. 2000. “Democracy and the Media.” Cambridge: Cambridge University Press.
65. Ritzer, George. 2006 ‘‘Island of the Living Dead: socialization of McDonalization.’’ In McDonaldization: The Reader. Ritzer George. 3rd edition. Thousand Oaks, CA: Pine Forge Press.
66. Romila, Thapar. Eds. 2000. “India Another Milliennium." New Delhi: Viking.
67. Rutherford, Paul. 2000. “Endless Propaganda: The Advertising of Public Goods.” Toronto:
68. University of Toronto Press.
69. Sahni, D (2012). Waking Up to ‘The Jayalalithaa Times’. *The Wall Street Journal Online edition*, 16 May 2012. Retrieved from http://blogs.wsj.com/indiarealtime/2012/05/16/waking-up-to-the-jayalalithaa-times/ on 19 July 2012
70. Sastry, Trilochan. 2010. “Paid news: The Scourge of Democracy.” 19 Oct 2010. Retrievedfrom http://www.tribuneindia.com/2010/20101019/edit.htm on 20 December 2010.
71. Sawant, P. B. 2003. “Accountability in journalism.” Journal ofMassMediaEthics, 18, 16–28.
72. Schultz, Julianne. 1989 “Failing the Public: The Media Marketplace” In Australian Communications and the Public Sphere eds. Wilson, Helen. Melbourne: MacMillan.
73. Sean MacBride, 1982, Many Politics, One World, UNESCO, Paris.
74. Sharma, J. K. 2002. “Ethics of Journalism in Transition.” New Delhi, India: Authorsprerss.
75. Shrivastava, K. M. 2005. “Media ethics: Veda to Gandhi and beyond”. Delhi, India: Government of India Publications Division.
76. Sonwalkar, Prasun. 2002. “Murdochization’ of the Indian Press: from by-line to bottom line.’’ Media, Culture and Society 24, pp. 821_34.

77. Soules, Marshal. 2001. “Jurgen Habermas and the Public Sphere.” http://www.mala.bc.ca/~soules/media301/habermas.htm.
78. Sridhara, B.A. 2003. “Media, Democracy and Citizenship.” 12 January 2003. retrieved from http://www.indiatogether.org/2003/jan/med-hoot0301.htm on 12 Dec. 2010.
79. Thakuria, N (2010). Paid news: A cancer in Indian Media. *The Epoch Times*, 03 February 2010. Retrieved from http://www.theepochtimes.com/n2/opinion/cancer-in-indian-media-29004.html on 17 February 2012
80. Thornton, Alinta, 2002. “Does the Internet create democracy?” Masters Thesis, MA in Journalism, University of Technology Sydney http://www.zip.com.au/~athornto/thesis2.htm.
81. Thussu, D. K. 1998 ‘‘Localizing the Global: Zee TV in India.’’, In Electronic Empires: global media and local resistance, eds. Daya Thussu. London: Arnold, pp. 272_94.
82. Thussu, D. K. 2002. ‘‘Managing the Media in an Era of Round-the-Clock News: notes from India’s first tele-war.’’ Journalism Studies 3, pp. 203_12.
83. Thussu, D.K. 2005. “Media plurality or democratic deficit? Private TV and the public sphere in India.” In Journalism and democracy in Asia, eds. A. Romano & M. Bromley. London: Taylor and Francis.
84. Thussu, D. K. 1999. “Privatizing the airwaves: The impact of globalization on broadcasting in India.” Media, Culture and Society 21. 125–131.
85. Thussu, D. K. 2000. “Development news versus globalized infotainment.” In The global dynamics of news: Studies in international news coverage and news agenda, eds. A. Malek & A. Kavoori. Stamford, CT: Ablex.
86. Vaidyanathan, R (2011). Newspapers : Why India’s newspaper industry is booming.
87. Wilson,R and Dissanayake, Wimal. 1996. ‘‘Introduction: tracking the global/local.’’ In Global/Local: cultural production and the transnational imaginary eds. Rob Wilson and Wimal Dissanayake. Durham: NC: Duke University Press.
88. Zelizer, Barbie. 2004. “Taking Journalism Seriously.” London: Sage Publication.

THE END

ARTICLE

17

ECONOMIC ANALYSIS OF MILCH ANIMALS (COW & BUFFALO) IN DISTRICT ETAWAH INDIA

Ashish Chandra*, Dr. A. K. Dubey[1] & Dr. Sachin Kumar Srivastava[1]
Research Scholar*, Associate Professor[1] & Sr. Lecturer[2]
*[1]Janta MahaVidyalaya Ajitmal, Auriya, & [2]Amity University, Lucknow, INDIA

Abstract:

This study covered 150 cooperative member milk producers and 150 non-member milk producers which were post- stratified into Landless, Marginal, small, medium and large herd size categories. In this study we calculated the per day maintenance cost with three variables i.e, Fodder, Concentrate and Miscellaneous was found to be higher for member group than that of non-member group. It was found to be higher in case of buffalo than that of cow. Per day cost of buffalo and cow milk production was observed to be higher for the non-member as compared to member group. Daily net return was found relatively higher in member group (Large Category) and in Non member group (Landless Category). In cost benefit ration analysis of cow medium category has maximum ratio in both group ie. Member and non member while in buffalo cost benefit ratio was high in small category in both group i.e., member and non member

Introduction

India's milk production rise by 4% i.e., 127.9 million tonnes in 2011-12 and per capita availability was 291 gms/day while in 2010-11 milk production was 121.8 million tones and per capita availability was 281 gms/day.*. In domestic market demand of milk and dairy products is increasing very high but the production processing facilities of milk in India is not up-to the mark.

As per an assessment made by the Planning Commission Report-2012, the domestic demand for the milk by 2020-21 is expected to be 172.20 million tons. India would have sufficient production to meet such demand. The international body on the farm sector in its latest 'Food Outlook' report also estimates global milk production in 2020 grow by 2% to 772million tones.

The main milk producing states in India in order of output are Uttar Pradesh, M.P., Rajasthan, Gujarat and Haryana, which supply more than 80 percent of the total milk production of the country but on the basis of per capita milk consumption Punjab ranks first followed by Haryana, Rajasthan, Gujarat, M.P., Uttar Pradesh, Andhra Pradesh, Tamilnadu, Maharastra and Bihar respectively though our country has the largest population of milch animals i.e. 19.1 crore cattle including 6.9 crore buffaloes (1982 ansus) but the milk production is very low being 157 kg per animal as compared to 7154 kg in USA, 3950 kg in UK and 3902 kg in Denmark.

The cost of milk production from dairying is an important aspect for producers, consumers and policy makers to provide effective linkage between the milk producer and consumers, so that the producer get remunerative price for their milk and consumers get milk and milk products at reasonable rate. Therefore, an attempt has been made to work out the economics of milk production among two groups of members and non-members families of dairy cooperatives from Etawah, Uttar Pradesh.

"Etawah" in Uttar Pradesh is famous for its Bhadawari breeds of buffalo and Jamunapari breed of goats. The said breed of buffalo were also known for consuming less fodder relative to production of high fat content milk. However, all the milch animals such as buffalo, cow and goats are grazed in the ravines and the forest area between Jamuna and Chambal rivers of Etawah district of U.P. The number of milch livestock of Etawah district during 2012 were reported as total number of female adult cows 1,10,825,total number of adult females buffaloes 92065 and total female adult goats were 2,41,61.

The trend shows that very soon Etawah district will get an important place in the future, map of "milk Grid" of India by producing on an average of 2.801 lakh liters per day during 1986-87 which was increased to 3.83 lakh litres per day during 2006-07 and now 2011-12 it will be increasing 5.20 lakh litres per day. There were 3020 cooperative milk producer- societies during 1986-87, which has increased to 4272 during 20011-12. Cooperative milk societies of Etawah produced 0.22 lacs liters/day in 1986-87 while they produced 2.53 lacs liters/day in 2006-07. Recently the latest production of milk in 2011 -12 was 3.86 lacs liters/day.*

Review of Literature

Attempts have been made to review briefly the specific and relevant literature, which has direct or indirect bearing on the objectives of the present study. Accordingly, relevant literature has been reviewed and presented in chronological order as follows.

Rao and Singh (1995) while studying the impact of operation flood programme on the economics of the buffalo milk production in Guntur district of Andhra Pradesh found that the gross cost of milk production was Rs.2,982.05, Rs.3,274.05, Rs.2,744.80, Rs.2,682.75 per annum on landless, small, medium and large categories in the case of the beneficiary households as against Rs.2,544.05, Rs.2,252.05, Rs.2,113.35 and Rs.2,314.10 per annum on landless,

small, medium and large categories for the non-member households. The average cost of milk production was Rs. 2.80 per litre on the beneficiary households as compared to Rs.3.75 per litre on the non-beneficiary households.

Shah *et al.* (1996) conducted a study on milk production, marketed surplus and marketing of milk in organized and unorganized milk marketing sector of Bullandshahar district. The results of the study revealed that the level of milk production was higher in villages covered by DUSS than those not covered under it NDUSS. On an average, the annual milk production per household was 4504 litres in DUSS and 3964 litres in NDUSS area. The milk production increased with the increase in herd size category in both areas. Milk production in DUSS area was 2378, 5225 and 8301 litres for small, medium and large herd size categories, respectively, whereas it was 2045, 4079 and 8094 litres for small, medium and large herd size categories in NDUSS area, respectively.

Koshta, A.K. & Chandrakar, R. (1999), explored the difference between members and non member of milk co-operative societies with regard to distribution pattern of dairy animals' productivity costs and returns of milk production and disposal pattern of fluid milk. Non member were observed to have higher operational costs per cow per day and lower cow productivity than member of milk co-operative societies. Returns are higher for non member as they obtain higher price than members. Cost benefit ratio is higher for buffalos than cow due to low operational cost of milk production

Singh, K. M. *et. al*., (2012), Dairy farming has emerged as an important source of livelihood, particularly on small holder households. The efficient management of dairy cooperative system has facilitated milk production and marketing in Bihar. An attempt was made to analyze the milk contribution to dairy co-operative, producers' share in consumer rupee and cost of milk production in Bihar. Per litre cost of milk production varied from Rs. 10.12 for crossbred cows to 13.90 and Rs. 13.57 for buffalo and local cows, respectively, which are higher than price paid by co-operatives for standard milk (fat-6% and SNF-21%). Herd size and type of milch animal along with parity had significant influence on cost of milk production. Production cost is likely to decrease with increase in size of unit and in production of crossbred cows in herd. More than two-third of milk produced by co-operative members is marketed through dairy co-operatives in Bihar. The producers' share in consumer rupee is about 58% for all categories of herd since all are marketing their milk through co-operatives only. Dairy farmers should also be advised for meeting the requirements of feed by providing desired nutrients through feeding of green fodder which not only reduces intake of concentrates but also helps in reducing the cost of production. Treatment of dry fodder with urea helps in improving its nutritive value, and such technologies may be popularized to make feeding balanced and cost effective.

Meena G. L. & D. K. Jain (2012), study covered 75 cooperative member milk producers and 75 non-member milk producers which were post-stratified into small, medium and large herd size categories. Per day net maintenance cost was found to be higher for member group than that of non-member group. It was found to be higher in case of buffalo than that of cow and also observed more in the summer season. Per litre cost of buffalo and cow milk production was observed to be higher for the non-member as compared to member group. Per litre cost of buffalo milk production decreased with increase in herd size categories across different seasons while same trend was not observed in case of cow milk production. Further, it was found higher in summer season. Daily net return was found relatively higher in member group as compared to non-member group and also found higher in winter season. Overall average daily milk production, consumption and marketed surplus of milk were found higher on the member group as compared to non-member group. The corresponding figures were recorded highest in the winter season in both the member and non-member group.

Tanwar P. S. et.al.(2012), study was conducted to estimate the economics of milk production among different categories of members and non-members families of dairy co-operatives based on personal interview method. An analysis of data from 240 families (120 household under each category) revealed that overall gross maintenance cost per animal per year was higher (Rs. 21532.81) in members families in comparison to non-members families (Rs. 19768.30). Maximum gross maintenance cost was on small farmers and minimum was on landless farmers in both the categories. The share of variable and fixed cost in total maintenance cost was (82.36% and 17.64%) in members families and almost same in case of non-members families (82.95% and 17.05%). The cost of feed, fodder and concentrate was main component in gross maintenance cost in both the categories. The overall cost per liter of milk was lower (Rs.10.47) in members families than non-members families (Rs.11.29). The size of land holding showed negative relationship with cost of milk production. Overall net return per animal per year was higher in members households in comparison to non-members households. Overall net profit per liter of milk was Rs. 4.73 for members households, while it was Rs. 2.01 on non-members households. The overall average income per rupee of investment was higher (Rs.1.45) in members families than non-members families (Rs. 1.18).

Research Methodology

District Etawah milk producers' cooperative union was purposively selected from state of Uttar Pradesh. Exhaustive lists of all the milk producers' cooperative societies in Etawah district milk producer's cooperative union were prepared. Researchers have selected randomly 150 non member of dairy cooperative society & 150 members of dairy cooperative society from 10 Villages of 2 blocks selected in district Etawah. All the milk producing households members and non members were classified into five categories, viz., Land less, Marginal, Small, Medium and Large farmers on the basis of land holding capability. Thus in all, 300 households were interviewed during the year 2008-09. The primary data were collected with help of well structured pre-tested schedule by personal enquiry method. The data collected were subjected to tabular analysis in order to study the comparative economics of milk production. The net

maintenance cost per milch animal per day was divided by the respective average milk yield per milch animal per day to arrive at per litre cost of milk production. Net return was computed by deducting gross cost from gross return. The total milk produced by the all milch animals in the household was reckoned as total milk production. The quantity of milk retained at home for consumption or conversion into milk products was taken as the per day milk consumption of household.

Maintenance Cost of per Milch Cow Per Day

The total overall average per day maintenance cost including (Fodder , Concentrates and others) for milch Cow for dairy cooperative members category was Rs 96 and for non members was Rs 93. According to the table no.1 the dairy cooperative member in the large category was invested maximum Rs 100 per day while Land less category members invested minimum Rs 82 per day and in Non member category was invested maximum Rs 99 per day in large category while Land less category invested minimum Rs 83 per day.

Maintenance Cost of per Milch Buffalo Per Day

The total overall average per day maintenance cost of per milch animal (Buffalo),including (Fodder , Concentrates and others) for dairy cooperative members category was Rs 107 and for non members was Rs 101. According to the table no.2 the dairy cooperative members in the large category was invested maximum Rs 112 per day while Land less category members invested minimum Rs 100 per day and in Non member category was invested maximum Rs 107 per day in medium category while Land less category invested minimum Rs 94 per day.

Maintenance Cost of per Milch Animal (COW) Per day (Rs.) TABLE - 1

Particulars		Non Member					Overall Average	Member					Overall Average
		Landless	Marginal	Small	Medium	Large		Landless	Marginal	Small	Medium	Large	
Fodder	Dry fodder	15	17	15	17	18	16	15	15	18	18	18	16
	Green fodder	12	14	15	16	16	14	12	15	15	16	16	16
	Total	27	31	30	33	34	30	27	30	33	34	34	32
Concentrates	Grain	15	19	20	20	22	20	15	20	20	22	23	22
	Khali	16	15	16	18	18	17	15	15	16	18	18	16
	Mineral material	05	05	05	05	05	5	05	05	05	05	05	5
	Chunni/choker	02	02	02	02	02	2	02	02	02	02	02	2
	Total	38	41	43	45	47	44	37	42	43	47	48	45
Others	Labour charge	10	10	10	10	10	10	10	10	10	10	10	10
	Miscellaneous ***	05	05	05	05	05	5	05	05	05	05	05	5
	Fixed cost **	03	03	03	03	03	3	03	03	03	03	03	3
	Total	18	18	18	18	18	18	18	18	18	18	18	18
Grand total		83	90	91	96	99	93	82	90	94	99	100	96

A. *Figures in parenthesis indicate percentage to total cost
B. **Fixed cost = Housing expenditure + Depreciation on machinery + Depreciation on milch animal value + Interest on animal value
C. ***Miscellaneous included veterinary charges etc.

Maintenance Cost of per Milch Animal (BUFFALO) per day in (Rs.) TABLE - 2

Particulars		Non Member					Overall Average	Member					Overall Average
		Landless	Marginal	Small	Medium	Large		Landless	Marginal	Small	Medium	Large	
Fodder	Dry fodder	20	22	22	24	22	22	23	22	23	23	23	22
	Green fodder	18	20	20	20	20	20	20	22	20	22	22	21
	Total	38	42	42	44	42	42	43	44	43	45	45	43
Concentrates	Grain	15	20	18	20	18	18	15	20	20	20	20	19
	Khali	16	15	16	18	18	17	15	18	18	19	20	18
	Mineral material	05	05	05	05	05	5	05	05	05	05	05	5
	Chunni/choker	02	02	02	02	02	2	02	02	02	02	02	2
	Total	38	42	41	45	43	41	37	45	45	46	47	44

Others	Labour charge	10	10	10	10	10	10	10	10	10	10	10	10
	Miscellaneous	06	06	06	06	06	6	05	05	05	05	05	5
	Fixed cost	05	05	05	05	05	5	05	05	05	05	05	5
	Total	18	18	18	18	18	18	20	20	20	20	20	20
Grand total		94	102	101	107	103	101	100	109	108	111	112	107

D. *Figures in parenthesis indicate percentage to total cost

E. **Fixed cost = Housing expenditure + Depreciation on machinery + Depreciation on milch animal value + Interest on animal value

***Miscellaneous included veterinary charges etc.

Total Costs and Returns of Milk per Milch Cow Per Day

Table no. 3 show that the total cost of milk production of milch cow per day in the case of member of dairy cooperative society ,the overall average total cost milk production per day was Rs 96.00 and in non member category was Rs 93.00 respectively.

In dairy cooperative members category the total cost of milk production was maximum Rs. 100.00 in large category and minimum Rs. 82.00 in land less category in comparison to non member category the maximum total cost of milk production by large category i.e. Rs 99.00 and minimum was by landless i.e. Rs. 83.00 per milch cow per day .

In gross return of milch cow per day in the case of member of dairy cooperative society ,the overall average gross return per day was Rs 192.00 and in non member category was Rs 135.22 .

In dairy cooperative members category the gross return of milch cow per day was maximum Rs. 209.00 in large and land less category and minimum Rs175.00 in marginal category in comparison to non member category the maximum gross return of milch cow per day by land less category i.e. Rs 209.00 and minimum was by large i.e. Rs. 146.61per milch cow per day .

The net profit per day was calculated by deducting the total costs from the gross returns per milch cow per day. On an average the net profit of milk production per milch cow per day was in the case of member of dairy cooperative society ,the overall average net profit per day was Rs 96.00 and in non member category was Rs 82.00 respectively.

In dairy cooperative members category the net profit of milch cow per day was maximum Rs127.00 in land less category and minimum Rs.85.00 in marginal category in comparison to non member category the maximum net profit per milch cow per day by land less category i.e. Rs 126.00 and minimum was by medium i.e. Rs. 79.00 per per day respectively.

In the case of cost benefit ratio of per milch cow per day was in the case of member of dairy cooperative society ,the overall cost benefit ratio was 1:1.0 in comparison to non member category was 1:1.13 respectively.

Total Costs and Returns of Milk per Milch Buffalo Per Day

Table no. 4 show that the total cost of milk production of milch buffalo per day in the case of member of dairy cooperative society ,the overall average total cost of milk production per day was Rs 107.00 and in non member category was Rs 101.00 respectively.

In dairy cooperative members category the total cost of milk production was maximum Rs. 112.00 in large category and minimum Rs100.00 in land less category in comparison to non member category the maximum total cost of milk production by medium category i.e. Rs 107.00 and minimum was by landless i.e. Rs. 94.00 per milch buffalo per day respectively.

In gross return of milch buffalo per day in the case of members of dairy cooperative society , the overall average gross return per day was Rs 160.00 and in non member category was Rs 152.00 respectively.

In dairy cooperative members category the gross return of milch buffalo per day was maximum Rs. 179.00 in large, medium and marginal category and minimum Rs160.00 in small category. In comparison to non member category the maximum gross return of milch buffalo per day by large and land less category i.e. Rs 170.00 and minimum was by small i.e. Rs. 121.94 per milch buffalo per day.

Total Costs and Returns of Milk per Milch Animal (Cow) Per Day TABLE - 3

Particulars	Non Member					Overall Average	Member					Overall Average
	Landless	Marginal	Small	Medium	Large		Landless	Marginal	Small	Medium	Large	
Total cost of production (Rs.)	83	90	91	96	99	93	82	90	94	99	100	96
Milk yield (litre)	12	10	10	10	11	10	12	10	11	11	12	11
Price of milk (Rs./litre)	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00	17.00

Value of young (Rs./day)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Value of dung (Rs./day)	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Gross return (Rs.)	209.00	175.00	175.00	175.00	146.61	135.22	209.00	175.00	192.00	192.00	209.00	192.00
Net profit (Rs.)	126.00	85.00	84.00	79.00	93.00	82.00	127.00	85.00	98.00	93	109.00	96.00
Cost benefit ratio	1:0.66	1:05	1:1.08	1:1.21	1:1.06	1:1.13	1:0.64	1:1.05	1:0.95	1:1.06	1:0.91	1:1

* Gross returns, included value of young and dung stock.

Total Costs and Returns of Milk per Milch Animal (Buffalo) Per Day TABLE - 4

Particulars	Non Member					Overall Average	Member					Overall Average
	Landless	Marginal	Small	Medium	Large		Landless	Marginal	Small	Medium	Large	
Total cost of production (Rs.)	94.00	102.00	101.00	107.00	103.00	101.00	100.00	109.00	108.00	111.00	112.00	107.00
Milk yield (litre)	9.00	8.00	7.00	8.00	9.00	8.00	8.00	9.00	8.00	9.00	9.00	8.00
Price of milk (Rs./litre)	18.00	18.00	18.00	18.00	18.00	18.00	19.00	19.00	19.00	19.00	19.00	19.00
Value of young (Rs./day)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00
Value of dung (Rs./day)	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00
Gross return (Rs.)	170.00	139.94	121.94	152.00	170.00	152.00	160.00	179.00	160.00	179.00	179.00	160.00
Net profit (Rs.)	76.00	50.00	33.00	45.00	67.00	51.00	60.00	70.00	52.00	68.00	67.00	53.00
Cost benefit ratio	1:1.23	1:2.04	1:3.06	1:2.37	1:1.53	1:1.98	1:1.66	1:1.55	1:2.07	1:1.62	1:1.67	1:2.01

The net profit per day was calculated by deducting the total costs from the gross returns per milch buffalo per day. On an average the net profit of milk production per milch buffalo per day was in the case of member of dairy cooperative society, the overall average net profit per day was Rs 53.00 and in non member category was Rs 51.00 respectively.
In dairy cooperative members category the net profit of milch buffalo per day was maximum Rs70.00 in marginal category and minimum Rs.52.00 in small category in comparison to non member category the maximum net profit per milch buffalo per day by land less category i.e. Rs 76.00 and minimum was by small i.e. Rs. 33.00 per per day respectively.
In the case of input-output ratio of per milch buffalo per day was in the case of member of dairy cooperative society ,the overall cost benefit ratio was 1:2.01 in comparison to non member category was 1:1.98 respectively.

Conclusion

It can be concluded that net return per cow and buffalo per year was higher in member families than non-member families. This reflect that the members of dairy cooperative societies not only kept superior breed of cow and buffaloes but also followed better feeding and management practices than their counterpart non-member families, which in turn, enhance their profit by way of higher productivity of buffaloes. Further the existence of dairy cooperatives, which offered high price of milk to the members, which subsequently increased the income of members. Finally, it is suggested that non-members should take the membership of dairy cooperatives, so that economic status of the milk producers can be improved.

References

1. Badal, P.S. and Dhaka, J.P. 1998. An Analysis of Feeding Pattern and Cost of Milk Production in Gopalganj District of Bihar. *Indian J. Dairy Sci*. 51(2):121-126.
2. Bhardwaj, A., Dixit,V.B. and Sethi, R.K. 2006 . Economics of Buffalo Milk Production in Hisar District of Haryana State. *Indian J. Dairy Sci*. 59(5):322-327.
3. G. L Meena., Jain, D. K. 2012. Economics of Milk Production in Alwar District (Rajasthan): A Comparative Analysis, *International Journal of Scientific and Research Publications,* Volume 2, Issue 8.

4. Singh,Krishna M. *et.al*.(2012), "An Economic Analysis of Milk Production in Bihar" *Indian Journal of Animal Sciences, 82(10):1233-1237, October 2012*
5. Tanwar P. S. ,Yogendra Kumar, Sankhala Gopal. 2012. Economics of Milk Production Among Member and Non- Member Families of Dairy Cooperatives in Jaipur (Rajasthan), *Indian J. Dairy Sci. 65(5).*
6. Rao, B. D. & Singh C.B., " Impact of operation flood program on the economics of buffalo milk production in Guntut Dist. Of AP" Indian dairyman, 1995, 18(4) ; 47 -50.
7. Sah, D, Jain D.K. & Sharma KNS, Impact of Dairy cooperative on marketing pattern of milk in bullandshahar, UP, Indian dairyman, 1996, 48(6) ; 37 -41.
8. Koshta A.K. & Chandra Shekhar M.R. 1998, Production and disposal of fluid milk by members and non members of milk producing cooperative society, Indian Journal of Agricultural Economics, Vol 53 no. 3 jul to sep pp400.

THE END

ARTICLE

18

THE ECONOMIC IMPACT OF COLONIAL RULE IN INDIA

Dr. Shuchismita Mishra
HOD, Department of History, VMV Commerce JMT Arts JJP Science College, Nagpur

Abstract:

The motive of British to establish political control in India was mainly aimed at exploitation of Indian economic through establishing a colonial market in India for British goods. The British rulers created new economic structure that was oriented colonial interests. Both nature and structure of Indian economy underwent profound changes and it served the British economic interests at the cost of India. The British colonialism changed the nature and structure of the economy of India and gave a new shape to it. In this paper an over view of the way the British restructured the economic system of India to suit their objective of maximum exploitation is attempted. Commercialization of agriculture, growth of money lending class, excessive drain of wealth and demolition of handicrafts and cottage industries from the country is some of the major impact on Indian economy.

Introduction

The colonization of India and transfer of wealth to Britain were vital to the success of the British Empire. The British established colonial economy, colonial society and even colonial ideology. Colonialism, by definition, is exploitative and oppressive, with the rulers enriching themselves at the expense of those they rule. Some historians argue that colonialism is one of the leading causes in income inequality among countries in present times. They cite patterns of European settlement as determinative forces in the type of institutions developed in colonized countries, considering them major factors in economic backwardness. British imperialism was more pragmatic than that of other colonial powers. Its motivation was economic, not evangelical.

British interests in India were of several kinds. The main purpose of Britain was to achieve a monopolistic trading position. Later it was felt that a regime of free trade would make India a major market for British goods and a source of raw materials, but British capitalists who invested in India, or who sold banking or shipping service there, continued effectively to enjoy monopolistic privileges. India also provided interesting and lucrative employment for a sizeable portion of the British upper middle class, and the remittances they sent home made an appreciable contribution to Britain's balance of payments and capacity to save. The English virtually monopolized the whole trade either by not paying any duty or by paying a nominal one to the Nawab.According to Peter J.Marshall prior to the acquisition of Diwani rights and the official transfer of power, Bengal was thrown into a series of financial crises, which paved the way for its takeover.

R.P.Dutt in 'India Today' analysed and gave theory of three successive phases of British exploitation of India. From 1757 to 1853 is the first Mercantilist phase was marked by direct plunder and the East India Company's monopoly trade. The industrial Revolution in Britain affected the whole pattern of trade and the years from 1813 to1858 witnessed the capitalist exploitation and converted India into a market for textiles and a source for raw materials and uprooted its traditional handicrafts. From the latter half of the nineteenth century onwards, finance – imperialism began to entrench itself in India through some export of capital. From 1870s onwards soon became the dominant theme of nationalist complaints-the 'drain of wealth'.

The process of 'drain of wealth' was simple and obvious. Indian goods were purchased with money acquired in India and the goods went out of the country. The East India Company started earning its own money through political and military exploits. Large amounts were employed by the company to purchase Indian goods for export. Thus, Indian goods were purchased with Indian money and sent outside for trade, the value and the profit of which went into the pockets of the English. The bulks of the goods going out of India did not fetch an equivalent return, whereas for the imports which India had to make, she had to pray. India did not receive proper value for her exports, though she paid adequate value for her imports. The Company spent the revenue collected from Indians to meet its administrative expenses. They utilized surplus revenue for trade purposes. Out of Indian revenues it met the home demands. Those demands were met mostly in the shape of exports from India.

Finally, control of India was a key element in the world power structure, in terms of geography, logistics and military manpower. The British were not averse to Indian economic development if it increased their markets but refused to help in areas where they felt there was conflict with their own economic interests or political security. Hence, they refused to give protection to the Indian textile industry until its main competitor became Japan rather than Manchester, and they did almost nothing to further technical education. They introduced some British concepts of property, but did not push them too far when they met vested interests.

Land revenue was known to be the main source of income. The dissolution of existing land revenue systems in India became inevitable with the foundation of British administration. They made land a commodity which could be freely bought or sold and introduced, which had shaken the stability and continuity of Indian villagers. The entire structure of rural society began to break up. The pressure of population on agriculture led to the inevitable sub-division and fragmentation of the peasant's holdings. The growth of population hastened this process. The number of landless labourers on the agriculture front increased rapidly into many millions. Even the degeneration of agriculture did not inspire the Government to initiate remedies. The Government did not take any initiative to educate Indian farmers about improved methods of agriculture, improved implements, better seeds, use of manure and many other things. Even they did not bother to bring cultivable lands which were not cultivated to divert the population pressure. The

Government did not provide adequate laws to save poor peasants from the oppressive activities of money lenders. These policies of British brought about the gradual degeneration of agriculture in India. The decline of agriculture became the most conspicuous economic evil.

The British maintained their monopoly on two more important articles in India which also proved as sources of revenue, they were salt and opium. Salt was also imported from Britain and Government levied duty on it. The Indian people paid higher prices for salt because of the duties imposed by the Government. The Indian salt producers suffered heavily and were driven out of the work. The monopoly of Government on opium was for the benefit of exchequer and Indian cultivators were denied any kind of profit from its cultivation and they were kept far away from a trade which was very profitable.

By the second half of the British rule in India, the poverty of the country had reached phenomenal depths. There was hardly any surplus stock of food grains to sustain the people against crop failure. Excessive rain, untimely rain and total failure of rain occurred at periodical intervals in different parts of the country causing immense hardships to people.They had no money in hand to purchase food at a higher price or from distant place.With nature remaining treacherous; the people had no reserve for bad times.

The British colonialism changed the nature and structure of the economy of India and gave a new shape to it. Traditional economic pattern was completely disrupted and its place was taken by a new one. The British replaced the wasteful warlord aristocracy of India by a bureaucratic-military establishment. The greater efficiency of government permitted a substantial reduction in the fiscal burden, and a bigger share of the national product was available for landlords, capitalists and the new professional classes. India was treated as a colony and Indian economy was subordinated to the economic interests of Britain. Throughout the British Rule resources of India were exploited and surplus revenue was carried away from India in various forms. Ultimately Indian economy served the requirements of the British trade and industry.

Both nature and structure of Indian economy underwent profound changes and it served the British economic interests at the cost of India. While the economy of Britain flourished, India was left amidst poverty and was found in such a state from which was impossible to recover. No doubt, development of transport and communication, those changes ruined Indian economy. This system would have continued under the British rule, if the British could have ruled India like all previous foreigners. Previously the political power changed from one person to other, but the economy continued as before. Neither the Afghans nor the Munhall intended to change the economic system of the country.

The pattern of economy continued as before and the peasants, the artisans and the traders contributed for continuance of the self sufficient village economy. They remained perpetual foreigners to India. They never accepted India as their home. India was treated as a colony and Indian economy was subordinated to the economic interests of Britain. Throughout the British Rule resources of India were exploited and surplus revenue was carried away from India in various forms. Ultimately Indian economy served the requirements of the British trade and industry.

The evil which hastened the growth of poverty was the continuous drain of wealth from India to England. By the second half of British rule in India, the poverty of the country had reached such phenomenal deaths that most people were living just at the subsistence level. There was hardly any surplus stock of food grains to sustain the people against crop failure. Nature played its natural uncertain role. Excessive rain, untimely rain and total failure of rain occurred at periodical intervals in different parts of the country causing immense hardship to the people. Any big natural calamity at once upset the economic norm. Famines and scarcities were the constant dread of the people at all times and when they visited, death and suffering assumed alarming positions. Some of the worst famines of Indian history occurred during latter half of the nineteenth century and the opening years of the twentieth.

If India had not had two centuries of British rule, the average standard of living might possibly have been a little higher because of the bigger upper class and the smaller drain of resources abroad. If India had had self-government from the 1880s, after a century and a quarter of British rule, it is likely that both income and population growth would have been accelerated. There would have been a smaller drain of investible funds abroad, greater tariff protection, more state enterprise and favours to local industry, more technical training - the sort of things which happened after 1947. The effect of a history of colonialism can last for a very long time, though it may eventually disappear. Jawaharlal Nehru put it: "India was under an industrial capitalist regime, but her economy was largely that of the pre- capitalist period, minus many of the wealth-producing elements of that pre- capitalist economy. She became a passive agent of modern industrial capitalism suffering all its ills and with hardly any of its advantages."

References

1. R.C.Dutt: Economic history Of India in the Victorian age (London, 1904)
2. Bipin Chandra: Rise and Growth of Economic Nationalism in India: Economic Policies of Indian National Leadership 1881-1915(New Delhi, 1966)
3. Bipin Chandra: Nationalism and Colonialism in Modern India (New Delhi, 1979)
4. B.N.Ganguli: Dada Bhai Naoroji and the drain Theory (Bombay, 1965)
5. Sumit Sarkar: Modern India 1885-1947 (New Delhi, 1983)
6. P.N.Chopra, B.N.Puri, M.N.Das: A Social, Cultural and Economic History of India, Volume III (New Delhi ,1974)

THE END

ARTICLE

19

IMPACT OF SPORTS PARTICIPATION ON ADAPTABILITY AND BOLDNESS AMONG SPORTS PERSON AND NON SPORTS PERSON

Dr. Megha Sahu
Assistant Professor, ASPESS, Amity University, Noida, INDIA

Abstract:

The purpose of study was to find out the impact of sports participation on adaptability and boldness among sports person and non-sports person. Total 200 students were selected for the study. The data was collected by using questionnaire. T-test was used to compare between the two groups. The result of the study revealed that participation in physical activity and sports have positive impact on adaptability and boldness traits which is an important dimension of personality index.

Introduction

Education can no longer be considered merely as a vast sea of mental acrobatics but has to in developing an individual who is physically fit, mentally sound, socially well adjusted, emotionally balanced and spiritually enlightened. The programs of physical education and sports that form of a part of the curriculum in school, colleges and universities should ensure balance among factors that contribute to wholesome development of the student.

There is mounting evidence that athletic participation has a positive effect on the lives of participating students, especially in an academic arena (Stegman & Stephens, 2003). Extracurricular activity participation has shown to be a positive factor in the development of students and has been associated with several positive student outcomes.

Aristotle said," The body is the temple of soul and to reach harmony of body, mind and spirit the body must be physically fit."

Sport, recreation and play are a fun way to develop sociological traits like adaptability, boldness, moral values, self esteem, guilt proneness etc. that will last for life time. They promote friendship and fair play. They teach team work, discipline, respect, and the coping skills necessary to ensure that children develop into caring individuals. They help prepare young people to meet the challenges they will face and to take leadership roles within their communities.

UNICEF recognizes the critical role of sport and physical play in children's lives. Added to this is the broad consensus that regular physical activity is essential for the physical, mental, psychological and social development of children and adolescents. Involvement in sport can boost children's health, improve academic performance and help reduce crime.

The purpose of the study was to find out the impact of Sports participation on adaptability and boldness among sports person and non sports person.

It is hypothesized that sports participation might having impact on adaptability and boldness of sports person.

Methodology

Total two hundred (200) students were selected randomly among hundred (100) sports participants and one hundred (100) non- sports participants the age ranged of the subject 16-19 from various schools of Delhi, NCR which are following CBSE curriculum. The selected variable for the study was adaptability and boldness. And Questionnaire: Multi-dimensional Assessment of Personality Series (MDAPS) was used to find out responses given by both the selected group. To describe the information or data contained in questionnaire mean and SD was used and to compare the impact of sports participation on adaptability and boldness between sports-person and non- sportsperson "t-test" was used. The level of significance was chosen at 0.05.

Findings

TABLE 1-MEAN DIFFERENCE OF ADAPTABILITY SCORES BETWEEN SPORTS PERSON AND NON SPORTS PERSON

	N	Mean	S.D.	df	t
Sports person	100	6.57	2.31	198	7.21*
Non sports person	100	4.52	1.64		

*Significant at 0.05

It is evident that t value of 7.21 is significant at 0.05. Table no. 1 revealed that mean score of adaptability between sports & non sports persons does differ significantly. There was significant difference in the mean score is accepted.

TABLE 2 MEAN DIFFERENCE OF BOLDNESS SCORES BETWEEN SPORTS PERSON AND NON SPORTS PERSON

	N	Mean	S.D.	df	t
Sports person	100	7.03	1.80		
Non sports person	100	6.02	2.39		
				198	3.37*

*significant at 0.05

It shows that t value of 3.37 is significant at 0.05. Table no. 2 revealed that mean score of boldness between sports & non sports persons does differ significantly.

Discussion and Conclusion

The result of the study revealed that participation in physical activity and sports have positive impact on adaptability and boldness traits which is an important dimension of personality index. Participation in sports can help student build discipline, develop confidence and courage to take decision, organize time, and teach children to cooperate with their team members as well as with opponents. Also develop adaptability to response to changed circumstances or environment.

References

1. Coakley Jay J., "Sports in Society 6th Edn." Published by Ed. Bartell (1998).
2. James Long, E. and Caudill, Steven B., "The Impact of Participation in Intercollegiate Athletics on Income and Graduation" Review of Economics and Statistics 73, 1991.
3. Ogilvie Bruce, "The Child Athlete: Psychological Implications of Participation in Sport" The ANNALS of the American Academy of Political and Social Science, **September 1979** vol. 445.
4. Thomas Fraser Jessica L., Jean Cote, Janice Deakin, "Youth sport programs: an avenue to foster positive youth development", Physical Education & Sport Pedagogy, Volume 10, Issue 1, 2005.
5. Uppal, A.K. Physical Fitness and wellness, Friends Publications (India), 2004.

THE END

ARTICLE

20

A STUDY OF IMPACT OF PARENT-CHILD RELATIONSHIP ON SOCIAL MATURITY OF THE STUDENTS OF HIGHER SECONDARY SCHOOLS OF DURG DISTRICT

Dr. Kavita Verma* & Mrs. Shabnam Khan
*Assistant Professor, Department of Education, Kalyan P.G College, Bhilai Nagar, INDIA
Assistant Professor, St.Thomas College, Ruwabandha, Bhilai Nagar, INDIA

Abstract:

The present study aimed to investigate the impact of parent-child relationship on social maturity of the students of higher secondary Schools of Durg district. Objective of the study was to study the correlation between parent-child relationship and self-confidence of government higher secondary school students. For the collection of data in respect of parent-child relationship, Parent-Child Relationship Scale (PCRS) constructed by Dr. Nalini Rao (revised version 2011) was used and for collection of data in respect of social maturity, Rao's Social Maturity Scale (RSMS) constructed by **Dr. Nalini Rao** (revised version 2011) was used. A total number of 753 XI class students comprised the sample for the study. i.e. 454 XI class students (223 male and 231 female) from rural area and 299 XI class students (154 male and 145 female) from urban area were selected for the study. 2 × 2 × 2 F.D. ANOVA was calculated for the analyses of data. Finding revealed that there exist significant effects of parent-child relationship on social maturity of the children.

Introduction

Just like with any relationship, building a positive relationship between parent and child is one that requires work and effort to make it strong and successful. Parenting is a tough job, and maintaining close relationships and open communications helps to ensure parents and their children stay connected through all ages of their upbringing.

"The parent-child relationship is one of the longest lasting social ties human beings establish," This tie is often highly positive and supportive but it also commonly includes feelings of irritation, tension and ambivalence."

Socialization is an important part of the parent-child relationship. Dimensions of the parent-child relationship are linked to the child's psychological development, specifically how responsive the parents are, and how demanding they are. Responsive parents are warm and accepting toward their children, enjoying them and trying to see things from their perspective. In contrast, nonresponsive parents are aloof, rejecting, or critical. They show little pleasure in their children and are often insensitive to their emotional needs. Some parents are demanding, while others are too tolerant. Children's healthy psychological development is facilitated when the parents are both responsive and moderately demanding.

Social maturity deals with how people will understand the nature of the social world they live within. It is very significant aspect of human development. It is development from dependence to independence, from lack of responsibility to a sense of responsibility and from incompetence to competence. Social maturity means acquisition of the ability to behave in accordance to the social expectations.

Social maturity implies on the one hand , well developed awareness, deep and clear understanding of the social heritage and appreciation of the value of social cautions, manners and more of the rules that govern social behavior of the rights of others and of his own responsibilities as a member of a social group. He understands the full import of a social organization in which he lives the desirability of rules and laws to govern group behavior and the overall objective and purpose of the social structure. Secondly, he develops pattern of behavior, habits, attitudes, manner and skills which will help him to fit into group living and contribute to the welfare of the group.

Objective of The Study

To study the effect of parent-child relationship, gender, locale and their interaction on social maturity of government higher secondary school students.

Hypothesis

There will be no significant effect of parent-child relationship, gender, locale and their interaction on social maturity of government higher secondary school students.

TOOLS

For the collection of data in respect of parent-child relationship, Parent-Child Relationship Scale (PCRS) constructed by Dr. Nalini Rao (revised version 2011) was used. The tool contains 100 items categorized into ten dimensions namely Protecting, Symbolic Punishment, Rejecting, Object Punishment, Demanding, Indifferent, Symbolic Reward, Loving, Object Reward and Neglecting.

For the collection of data in respect of social maturity, Rao's Social Maturity Scale (RSMS) constructed by **Dr. Nalini Rao** (revised version 2011) was used. The scale contains 90 items. Three dimensions of social maturity scale are Personal Adequacy, Interpersonal Adequacy and Social Adequacy.

Sample

Stratified Random Sampling technique was employed to select the sample for the study. All the government higher secondary schools, situated in Durg District were divided into two strata on the basis of their location i.e. rural area schools and urban area schools

Amongst these schools, 454 XI class students (223 male and 231 female) from rural area and 299 XI class students (154 male and 145 female) from urban area were selected for the study. In this way a total number of 753 students comprised the sample for the study.

Analysis & Interpretation

In order to find out the effect of parent-child relationship, gender, locale and their interaction on social maturity of government higher secondary school students 2× 2 ×2 F.D. ANOVA was employed between the scores of parent-child relationship and social maturity. The summary of the ANOVA has been presented in table 1 below:

Table 1: Summary of 2× 2 ×2 F.D. ANOVA for Social Maturity

Source	Type III Sum of Squares	df	Mean Square	F
PCRT	93846.249	1	93846.249	558.831**
GENDER	19985.870	1	19985.870	119.011**
LOCALE	3792.727	1	3792.727	22.585**
PCRT * GENDER	3893.551	1	3893.551	23.185**
PCRT * LOCALE	654.875	1	654.875	3.900*
GENDER * LOCALE	11425.400	1	11425.400	68.035**
PCRT * GENDER * LOCALE	721.075	1	721.075	4.294*
Error	125110.226	745	167.933	
Total	3.543E7	753		

** significant at .01 level. * significant at .05 level.

Table 1 depicts that the **F** value of 558.831 for parent-child relationship with df 1/752 for social maturity was found to be significant at .01 level. This shows that both the means differ significantly. Therefore null hypothesis stated as," The mean social maturity score of favorable and unfavorable parent-child relationship will not differ significantly," is rejected. This shows that mean social maturity score of students having favorable parent-child relationship differs from the mean social maturity score of students having unfavorable parent-child relationship. Further to find out whether the students having favorable parent-child relationship or the students having unfavorable parent-child relationship have higher level of social maturity mean between favorable and unfavorable parent-child relationship scores of students was calculated. The summary of this mean have been presented in table .

Table 2: Summary of Mean between Favorable and Unfavorable Parent-Child Relationship for Social Maturity.

PCRT	Mean
1. Favorable parent-child relationship	225.729
2. Unfavorable parent-child relationship	199.987

From the table 2 it can be observed that the mean of favorable parent-child relationship is 225.729 which is higher than the mean of unfavorable parent-child relationship i.e. 199.987. This shows that social maturity of the students having favorable parent-child relationship is higher than the social maturity of the students having unfavorable parent-child relationship.

Further, from the table 1 it can also be observed that the F- value for gender i.e. 119.011 for with df 1/752 for was found to be significant at .01 level. This shows that both the means differ significantly. Therefore null hypothesis stated as," The mean social maturity of male and female students will not differ significantly," is rejected. This shows that mean social maturity score of male students differ significantly from mean social maturity score of female students. Further to find out whether males or females have higher level of social maturity, mean between social maturity score of male and female students was calculated. The summary of means between social maturity score of males and females have been presented in table 3 below:

Table 3: Summary of Mean of Gender for Social Maturity.

GENDER	Mean
1. Male	218.798
2. Female	206.918

From the table 3 it can be inferred that the mean social maturity score of male students is 218.798 which is higher than the mean social maturity score of female students which is 206.918 this shows that social maturity of male students is higher than the social maturity of female students.

The F value of locale 22.585 for df 1/752 was found to be significant at .01 level for social maturity. This shows that both the means differ significantly. Therefore null hypothesis stated as, "The mean social maturity score of rural and urban area students do not differ significantly," is rejected. This reveals that the mean social maturity score of rural and urban area students differ significantly. Further to find out whether rural or urban area students have higher level of social maturity, mean between social maturity score of rural or urban area students was calculated. The summary of means between social maturities score of rural or urban area students have been presented in table 4 below:

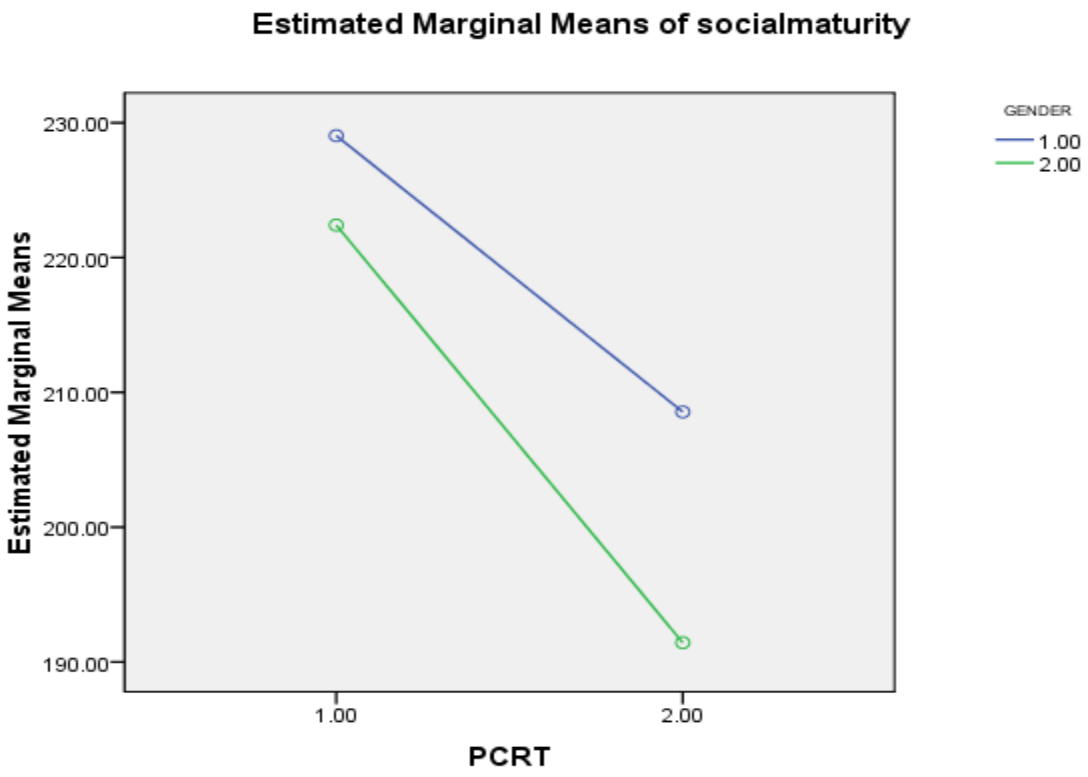
Table 4: Summary of Mean of Locale for Social Maturity.

LOCALE	Mean
1. Rural	215.445
2. Urban	210.271

From the table 4 it can be inferred that the mean social maturity score of students of rural area is 215.445 which is higher than the mean social maturity score of the students of urban area which is 210.271, this shows that social maturity of students of rural area is higher than the social maturity of the students of urban area.

The F value of 23.185 for df 2/752 for interaction between parent-child relationship and gender was found to be significant at .01 level, this reveals that there is a significant differential influence of interaction between parent-child relationship and gender. Hence the null hypothesis stated as," There is no significant effect of interaction between parent-child relationship and gender" is rejected. Further to study the interactional effect between parent-child relationship and gender graph 1 has been plotted.

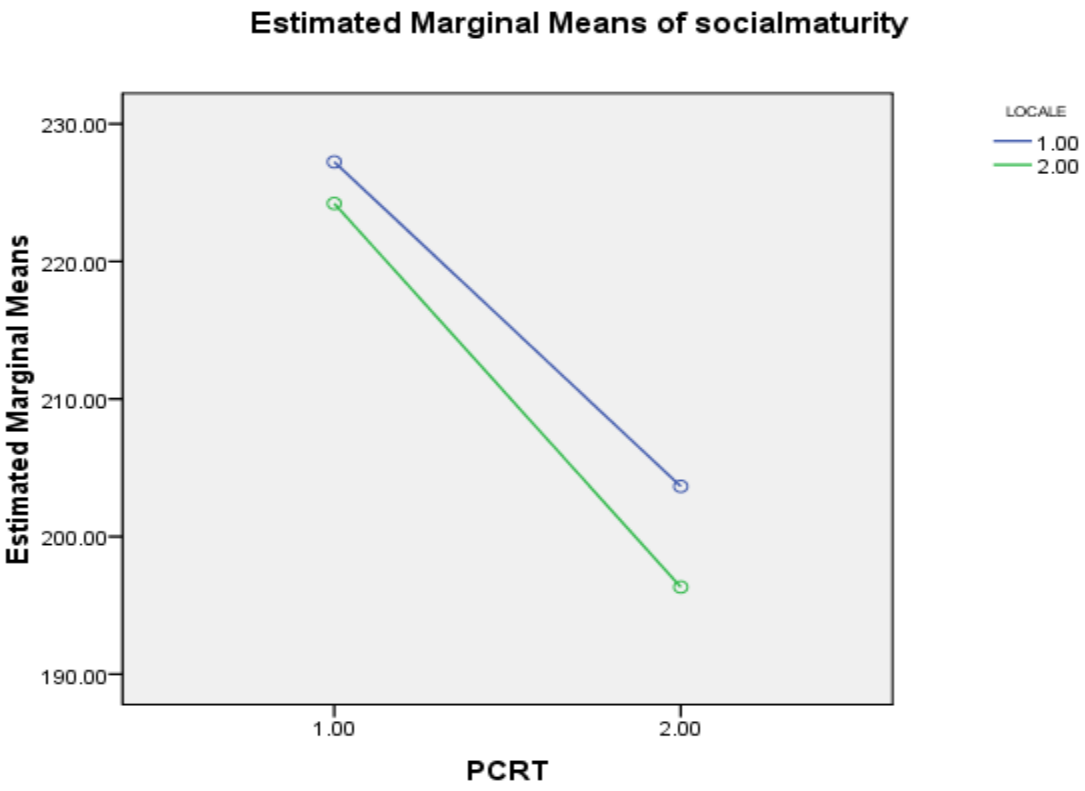
Graph: 1 Interaction between Parent-Child Relationship and Gender.



From Graph 1, it can be inferred that in case of both male as well as female students, as the parent-child relationship moves from favorable towards unfavorable, the social maturity of the students decreases sharply.

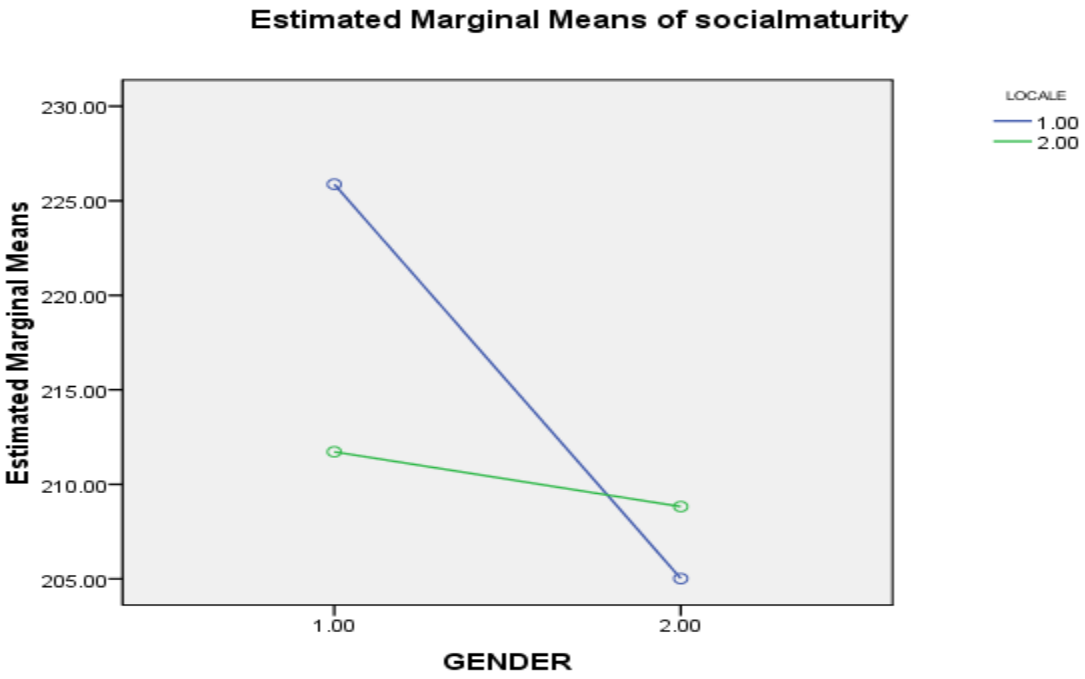
The F value of 3.9 for df 2/752 for interaction between parent-child relationship and locale was found to be significant at .05 level, this reveals that there is a significant differential influence of interaction between parent-child relationship and gender. Hence the null hypothesis stated as," There is no significant effect of interaction between parent-child relationship and locale". Is rejected. Further to study the interactional effect between parent-child relationship and gender graph 2 has been plotted.

Graph: 2 Interaction between Parent-Child Relationship and Locale.



From Graph 1, it can be inferred that the social maturity of the students belonging to rural area is higher than in case of both rural as well as urban area students, as the parent-child relationship moves from favorable towards unfavorable, the social maturity of the students decreases sharply.
The F value of 68.035 for df 2/752 for interaction between gender and locale was found to be significant at .01 level, this reveals that there is a significant differential influence of interaction between parent-child relationship and gender. Hence the null hypothesis stated as," There is no significant effect of interaction between gender and locale". is rejected. Further to study the interactional effect between gender and locale graph 3 has been plotted.

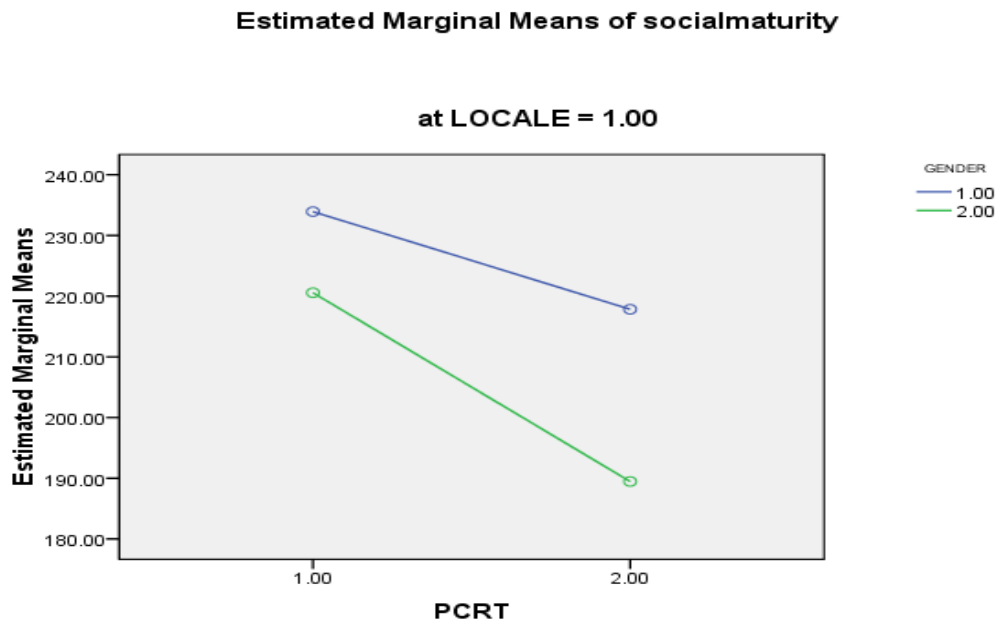
Graph: 3 Interaction between Gender and Locale .



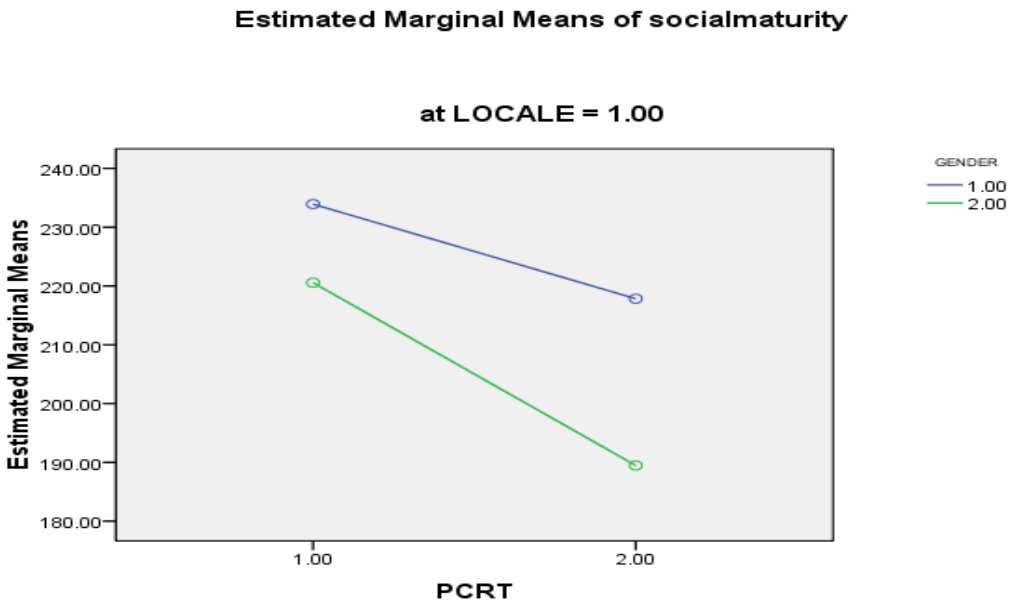
From Graph 3, it can be inferred that in case of rural area, the male students posses high social maturity in comparison to their female counterparts. While in case of urban area, though the male and female students differ with respect of social maturity, but the difference is very slight.

The F value of 4.294 for df 2/752 for interaction between parent-child relationship, gender and locale was found to be significant at .01 level, this reveals that there is a significant differential influence of interaction between parent-child relationship and gender. Hence the null hypothesis stated as," There is no significant effect of interaction between parent-child relationship, gender and locale" is rejected. Further to study the interactional effect between parent-child relationship and gender graph 4 and 5 has been plotted.

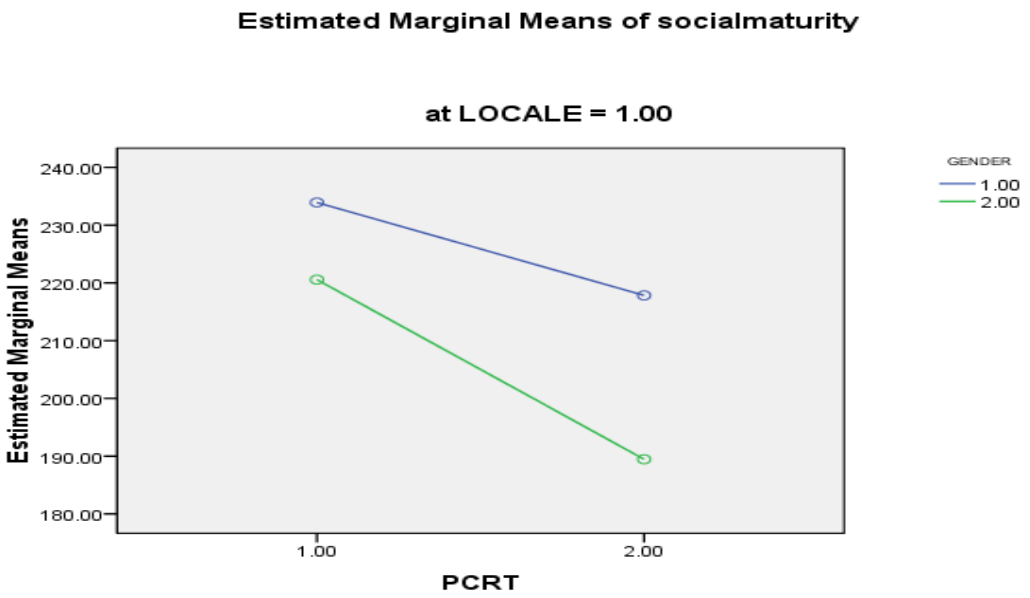
Graph: 4 Interaction between Parent-Child Relationship Gender and Locale of Rural area.

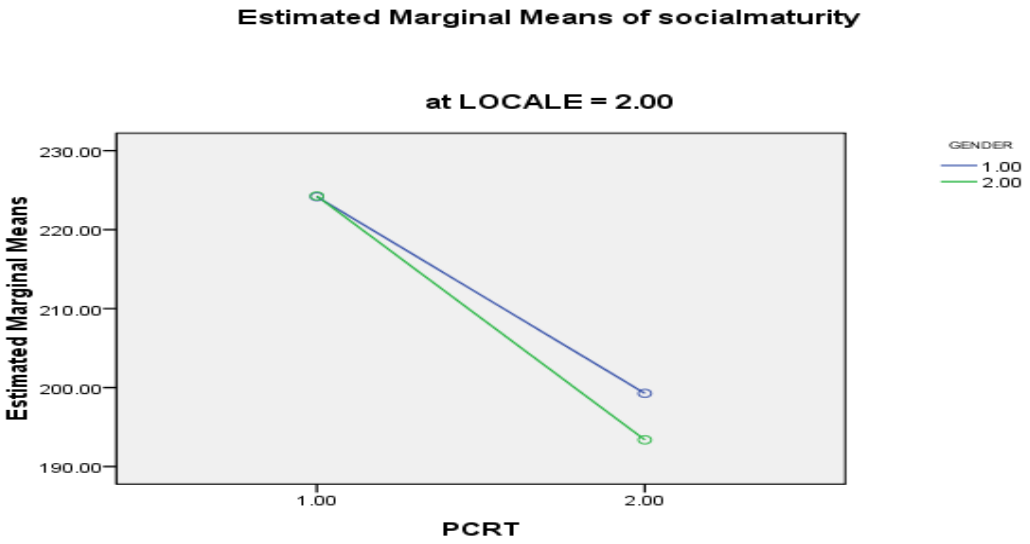


Graph 4 helps the investigator to conclude that in case of rural area, the social maturity of male students is noticeably higher than the social maturity of female students. Further, in case of both, the male and female students, as parent-child relationship moves from favourable towards unfavourable, there is a sharp decline in the level of social maturity.
Graph: 4 Interaction between Parent-Child Relationship Gender and Locale of Rural area.

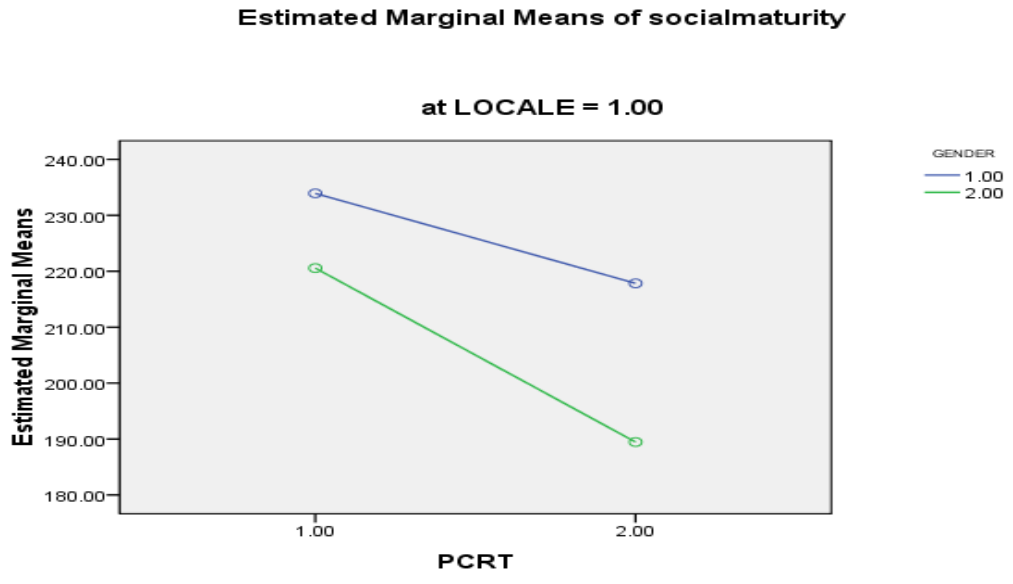


Graph: 5 Interaction between Parent-Child Relationship Gender and Locale of Rural area.





Graph:6 Interaction between Parent-Child Relationship Gender and Locale of Urban area.



Graph 5 helps the investigator to conclude that in case of urban area, the social maturity of male students is higher than the social maturity of female students. Further, in case of both, the male and female students, as parent-child relationship moves from favourable towards unfavourable, there is a sharp decline in the level of social maturity.

Finding

Finding revealed that there exists a significant effect of parent-child relationship on social maturity of the children.

Discussion

Parenting is not an easy task. Becoming a parent is the easiest part, whereas, being a conscious and positive parent is a momentous task. Effective parenting enables children to build and develop positive behaviors and good, solid self-concepts that are important to functioning fully as a healthy adult. Parenting, as such, is greatly dependent on intra-familial issues that play a significant role in parental performance. However, parenting skills can be strengthened if parents learn about themselves as a 'parent' and about child development. Learning about the stages of human development helps parents understand about their ever, changing roles in the lives of their children and also what is expected of a parent at each stage. Finally, a father's love and influence is as important as a mother's in the life of a child.

References

1. Agarwal, S.C. and Mishra, A. K. (2005). Impact of parent-child relationship on social maturity. Indian journal of Psychometry and education, Patna, 2005, 36 (2), 146-152.
2. Athanimath, J. S. and Yenagi, G. (2011). Social maturity and depression levels among II PUC science students. Karnataka J. Agric. Sci., 24 (4), 510-512.
3. Borawski, E. (2006). Cognitive Social Maturity, Life Change Events, and Health Risk Behaviors among Adolescents: Development of a Structural Equation Model. Journal of Clinical Psychology in Medical Settings, June 2006, Volume 13, Issue 2, 107-116
4. Lalfamkima, et. al. (2005). Intelligence and academic achievement in relation to Parent- child relationship. Indian journal of Psychometry and education, Patna, 2005, 36 (1), 21-27.
5. Matheen, W. (2011). Parent-Child Relationship and Emotional Maturity of City College Girls. Golden Research Thoughts, Vol.1,Issue.I/July 11,1-4.
6. Peterson, C. C. et. al. (2007). Social maturity and theory of mind in typically developing children and those on the autism spectrum. The Journal of Child Psychology and Psychiatry and Allied Disciplines, Vol: 48, Issue: 12, 1243-1250.
7. Puar, S. S. and Thukral, P. (2012). Relationship of Social Maturity in Academic Achievement of High School Students. International Journal of Educational and Psychological Research (IJEPR), Vol 1, Issue 1, 6-11.
8. Ramalingam, P. and Mani, P. (2009). Social maturity of elementary pupil teachers. Psycho-lingua, 39(2), 168-170.
9. Shrivastava , P.K. and Sumanlata (2005) Social maturity of high and low achievers. Psycho-lingua 2005, 35 (1), 42-45.
10. Stattin, H. et.al. (2007) Parent-child relationships, partner relationships, and emotional adjustment: a birth-to-maturity prospective study. Developmental Psychology. Vol: 43, Issue: 2, 429-437.
11. Venkatlakshmi, H. and Sridevi (2009). Parents attitude towards parent-child relationship. Journal of community Guidance and Research Vol 26 (1), 11-17.

THE END

ARTICLE

21

HUMAN RIGHTS AWARENESS AMONG SECONDARY SCHOOL TEACHERS: AN INVESTIGATION

Ms. Kanchan Khatreja
*Assistant Professor, KIIT College of Education, Gurgaon, INDIA

Abstract

This study was undertaken to evaluate awareness level of secondary school teachers about human rights, who are supposed to practice them inside their classrooms. A sample of 60 teachers was selected from secondary schools of Gurgaon District, Haryana for this study. A Human Rights Awareness Test was used for data collection. This test measures the level of awareness of individuals with regard to concepts and principles of human rights as well as awareness with regard to situations involving human rights violations. The data were analyzed employing t-test. The obtained results indicated that there is no significant difference in the awareness of Secondary Government and private teachers towards human rights. It concluded that both Government and private Secondary teachers are aware about human rights.

Introduction

Human rights are a 20th century term for what had been traditionally known as "Natural Rights" or 'Rights of Man'. The idea behind the paper is to study awareness of human rights and educate people about their basic rights, including food, shelter and clothing, health and hygiene, education and right to live with dignity, and also inspire them to achieve these. "Every state is known by the rights that it maintains our method of judging its character lies, above all in the contribution that it makes to the substance of man's happiness." Human rights, being the birthright, are therefore inherent in all human beings irrespective of their caste, religion, nationality. These are also sometimes referred to as 'fundamental rights', 'basic rights', 'natural rights' and 'birth rights. The idea of human rights is bound up with the idea of human dignity. The general assembly of the United Nations unanimously adopted the universal declaration of human rights on December 10, 1948. India enacted the protection of the human rights act in the year 1993.Human rights are moral principles that set out certain standards of human behavior. The universal declaration of Human Rights was adopted by the United Nations general assembly in 1948. Many people are not aware even about the term human rights. 60% of Indians live in rural areas and 80% people are ignorant about their rights. Our constitution has separate amendment on human rights. We ignore awareness and lack of proper education; we have to tolerate violation of human rights everyday in our life. Even with urbanization, there are many instances where human rights have been compromised. Child abuse, sexual harassment, humiliation, loss of self esteem is common these days. Government of India has recognized 65% of school going children is inflicted with corporal punishment, At home, their parents try to correct them thinking that they are arrogant, rude, immature or incompetent. When children hear such criticism, they feel rejected. Children due to fear are often silent and submit to violence without questioning. When a teacher uses violence on students it is an outburst of his/her personal frustration. Corporal punishments affect the emotional behavior and performance of a child. It also leads to reduction in self esteem and dignity of a child. Therefore, teachers should be taught about human rights and they should implement these rights in their life too. Children should be aware about all rights as well. They are even driven to commit suicide. A child of class X was slapped by the school principal for refusing to participate in a drama rehearsal, a mathematics teacher hits a student on the head repeatedly for nudging him accidentally, all these instances reek of gross violation of rights to human dignity. These growing incidences of violations by the teachers are a cause of serious concern for all educationists. The constitution of India has abolished corporal punishment in schools across the country. However, this failed to bring in any law to punish the teachers who indulge in such behaviour. The spread of knowledge will automatically bring awareness to the people. Human rights education should be included in the curriculum of schools, colleges and universities. Debates, open discussions, seminars, workshops and public awareness meetings should be organized to educate the people about human rights. It is very important to sensitize the about the perils of corporal punishment that includes not only dismissal but also prosecution by criminal law, which doesn't exist in India at present. Teacher training and sensitization, public internship programmers, community mobilization, educating children on the rights etc. can play an important role to change attitudes. This study is an attempt at measuring the awareness of teachers of various issues and concepts related to human rights.

Objectives of the Study:

The following objectives had been formulated related to the study:

1. To study the awareness regarding human rights among Government Secondary school teachers.
2. To study the awareness regarding human rights among Private Secondary school teachers.

Hypothesis of the study:

Keeping in view the above objectives of the study, the following hypotheses had been framed:

1. There is no significant difference between human rights awareness among Private and Government Secondary School teachers.

Research Design
A research design is indispensable for a research plan. It specifies the methodology and techniques which are to be adopted for achieving the objectives. It consists of the blue print for collection, measurement and analysis of data.

Method
The investigator used the survey method under descriptive method of research in the present study. In this study data regarding the awareness of secondary school teachers was gathered randomly in order to make comparison between govt. and private school teachers. In view of the above all secondary school teachers of district Gurgaon of Haryana constituted the population of the study. The sample consisted of 60 secondary school teachers (30 govt and 30 private secondary school teachers). To collect the data, awareness test was used. A strong rapport was established with the teachers to get their free and correct opinions on various dimensions pertaining to human rights awareness.

Tool
A Human Rights Awareness Test by Dr. Vishal Sood and Dr. (Mrs.) Arti Anand was used to check the awareness.

STATISTICAL TECHNIQUE:
In the present study following statistical techniques were employed:
1. Mean

2. Standard Deviation

3. t-test

Operational Definition of Key Terms:

Rights: Rights are those conditions of social life without which man can not be at his best. They are essential for development of his personality and are external conditions for the possible development of the capabilities of an individual.

Human Rights: They are natural rights of a human being which means the right to guarantee dignity as a person. They refer to fundamental freedoms and basic liberties without which men, women and children cannot live with respect and dignity.

Awareness: It is defined as “Perception and Cognitive reaction to an event” or, more specifically, Human Rights awareness refers to the ability to perceive, to feel or be conscious about human rights, its concepts and principles, norms and regulations related to human rights violations and their protection as well as promotion.”

Secondary School Teachers
The Secondary Education serves as a bridge between primary and higher education is expected to prepare young person between the age group 14 to 18 in the world of work and entry into higher education. The Secondary School teacher teaches 9^{th} and 10^{th} leading to higher secondary classes 11^{th} and 12^{th}.

Analysis and Interpretation:
There is no significant difference between human rights awareness among private and t secondary school teachers. The t-value was calculated between human rights awareness among private and govt secondary school teachers. The t-value found was 2.26 which is insignificant at 0.01and 0.05 level of significance.

Table-1 Showing Human Rights Awareness among Private and Government Secondary School Teachers.

Group	N	M	S.D	t- ratio	Remarks
Govt School Teachers	30	72.56	9.26	2.26	Not Significant
Private School Teachers	30	71.30	9.64		

Since, the derived t-value was found to be 2.26 which is not significant at both 0.01 level and 0.05 level. Thus the null hypothesis that “There is no significant difference between human rights awareness among private and govt. secondary school teachers” is accepted.

Conclusion
The present study was undertaken to find out the human rights awareness among private and government Secondary school teachers. The analysis of data revealed that there is no significant difference between human rights awareness

among private and govt. Secondary school teachers. They are aware about human rights. In- service and pre-service teacher education programme should focus on inculcating an awareness of human rights amongst teachers and pupil teachers.

References

1. Agarwal, R.S. Human Rights in the Modern World, New Delhi Chetana Publications, 1979
2. Kapoor, S .K. Human Rights under International Law and law, 2nd ed. Allahabad: Central Law Agency, 2001
3. Shajimon K. Mathews (2005) Human Rights in India: With Special Reference to the Role of the Kerela State Human Rights Commission
4. National Council of Educational Research and Training. 1996. *Human Rights. A Source Book*, New Delhi, NCERT.
5. Official Documents and Reports
6. Protection of Human Rights Act, 1993
7. The constitution of India
8. Universal Declaration of Human Rights
9. Newspapers
10. The Times of India
11. The HindustanTimes

THE END

ARTICLE

22

EFFECT OF SELECTED EXERCISE PROGRAMME ON SYSTOLIC AND DIASTOLIC BLOOD PRESSURE OF OLD CITIZENS

Dr. Poonam Singh
Assistant Professor, ASPESS, Amity University, Noida, INDIA

Abstract:

The purpose of the present study was to investigate the effect of structured exercise programme on systolic and diastolic blood pressure of old citizens. In the present study the subjects were seventy old aged people of Gautam Budh Nagar, Uttar Pradesh. The age of subjects ranged between 60 to 72 years. For the purpose of the present study systolic and diastolic blood pressure was the variable to be experimented. In the present study, pre test, post test randomized group design which consisted of experimental group and control group was used. Blood Pressure was recorded in mmHg for both systolic and diastolic blood pressure with the help of sphygamanometer and stethoscope.The training for experimental group was administered at the community centre of Sec.37 of Gautam Budh Nagar . The experimental group met thrice in a week for a period of twelve weeks (May 1st 2009 to July 30 2009). Each experimental session commenced with one week of general physical conditioning for the experimental group, so that the subjects were ready physically and mentally to take on the specific work for the purpose of the study. Since, the group consisted of senior citizens so the research scholar had taken special care to maintain their motivational level throughout the training programme by introducing recreational games which the older citizens could enjoy. After one week of conditioning the training was administered to the experimental group, thrice a week i.e. Monday, Wednesday and Friday. A weekly schedule was repeated to the next proceeding week and the load was adjusted progressively. A pre test and post test of the subjects was conducted within an interval of 12 weeks exercise programme to check the effects of structured exercise programme on systolic and diastolic blood pressure of old citizens. The tests were conducted in 70 old aged people of Gautam Budh Nagar The data was analyzed by applying ANCOVA.After analyzing data it was concluded that selected exercise programme effect systolic and diastolic blood pressure of old citizens.

Introduction

Since times immemorial, older persons in India have been accorded a place of honor and importance in the family and community. Ancient literature in India is replete with reverent references to the elderly. Long life was cherished, old age was viewed with defense and the elderly played an important role of advisors and counselors. On the other hand, the family and community looked after them regardless of their productive capacity[i]Thus, the current senior generation is actually learning to be more active. Many contemporary seniors prefer low-impact activities, such as walking or water aerobics, which are designed to minimize the stressful impact of exercise on aging joints. Others, however, work out in much the same way that young adults do, using exercise machines or cycling. Many senior-citizen centers now offer fitness facilities to their clients. These fit seniors also provide excellent role models for their younger counter-parts. The generations that follow them, who grew up in the current climate of knowledge about support for sport and fitness as lifetime endeavors, are likely to alter further our perceptions of what is possible for the senior citizen.[4]Through exercise, proper care, and regular check-ups, people are now living longer and more productive lives. Individuals who are worried about the gradual decline in their health and physical capabilities typically associated with the aging process need to become more active! Reports have indicated that athletically and nutritionally fit individuals can be as many as 10 to 20 biological years younger than their true chronological age. Anti-aging gimmicks are prevalent in the U.S. Unfortunately there is no fountain of youth or magic anti-aging pill. However, exercise appears to be the closest thing to an anti-aging pill known. Current exercise guidelines encourage older individuals to participate in exercise that strengthens and improves not only the cardiovascular system, but also the musculoskeletal system. How the society has to face the challenge? A strategy is the need of the hour. Strategy could be new process of policy and strategy formulation, focus on primary health care, age friendly health system, strong participation of the older population in society, research surveys and studies for establishment of a database for evidence based care and raising the awareness of the population to active aging.

Objective of The Study:

To study overall effectiveness of structured exercise programme on systolic and diastolic blood pressure of old citizens

Methodology

The subjects were 75 elderly individuals aged 60 to 72 of Noida, Uttar Pradesh. Participants were predominantly male and retired. All individuals resided in the same facility, which served to be a control factor for extraneous variables concerning location and living conditions. All the subjects were examined carefully to be certified that they were fit to undergo training programme and only those who were recommended by him were selected for the purpose of the study. Out of the recommended list, 70 elderly persons were selected and were divided into two groups' i.e. experimental group and control group. The treatment was assigned randomly. For the present study Pre-test, Post-test randomized group design which consisted of experimental group and control group was used to compare the

effect of structured exercise programme on systolic and diastolic blood pressure of old citizens. Seventy subjects were assigned randomly to experimental and control group. The experimental treatment was given to experimental group and no such treatment was given to the control group.

Administration of Training Programme:

The training for experimental group was administered at the community centre of Sec.37 of Gautam Budh Nagar. The experimental group met thrice in a week for a period of twelve week (May 1st 2009 to July 30 2009). Each experimental session was commenced with one week of general physical conditioning for the experimental group, so that the subjects were ready physically and mentally to take on the specific work for the purpose of the study. Since, the group consisted of older citizens so the research scholar had taken a special care to maintain their motivational level throughout the training programme by introducing recreational games in which the older citizens could enjoy. After one week of conditioning the training was administered to the experimental group, thrice a week i.e. Monday, Wednesday and Friday. A weekly schedule was repeated to the next proceeding week and the load was adjusted progressively. A pre test and post test of the subjects were taken within an interval of 12 weeks exercise programme to check the effect of exercise programme on systolic and diastolic blood pressure of old citizens . All above mentioned test were administered to collect data. The tests were conducted in 70 old aged people of Gautam- Budh Nagar. The data was analyzed by applying ANCOVA test to find out the effect of selected exercise programme on systolic and diastolic blood pressure of old citizens.

Collection of Data:

A pre-test and post test of subjects was conducted with an interval of 12 weeks exercise programme, to check the effect of exercise programme on systolic and diastolic blood pressure of old citizens living .

Findings of the Study :

The results pertaining to analysis of co-variance between Experimental group and Control group on systolic and diastolic blood pressure of old citizens living in Noida for pre and post test respectively have been presented in tables below:

Table-1 ANCOVA FOR THE DATA ON SYSTOLIC BLOOD PRESSURE SCORES BETWEEN EXPERIMENTAL AND CONTROL GROUP OF OLD AGE PEOPLE LIVING IN OLD AGE COMMUNITY HOMES

Score Systolic Blood Pressure	Source of Variation	Sum of Squares	df	Mean Square	F ratio	P-value
Adjusted Post Test	Between Group	217.964	1	217.964	6.885	.011
	Within Group	2121.129	67	31.659		
	Total	2339.093	68			

*tab $F_{0.05}(1,67) = 3.98$

Table No. 1 clearly indicated that the obtained 'F' value of 6.885 was found to be highly significant at 0.05 level with 1,67 degree of freedom as the tabulated value of 3.98 was required to be significant at 0.05 level with 1,67 degree of freedom. The same table also indicated that there was a significant difference in adjusted final means of systolic blood pressure of older citizens living in old age community homes.

The graphical representation of mean value of pre and post test of systolic blood pressure of experimental group of old citizens living in old age community homes is presented in figure 1.

Fig. -1 COMPARISON OF ADJUSTED FINAL MEANS OF SYSTOLIC BETWEEN EXPERIMENTAL GROUP AND CONTROL GROUP OF OLD CITIZENS LIVING IN OLD AGE COMMUNITY HOMES

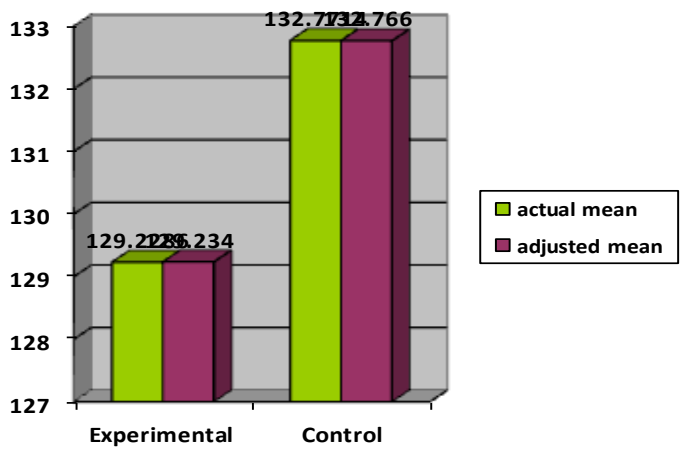


Table-2 ANCOVA FOR THE DATA ON DIASTOLIC BLOOD PRESSURE SCORES BETWEEN EXPERIMENTAL AND CONTROL GROUP OF OLD AGE PEOPLE LIVING IN OLD AGE COMMUNITY HOMES

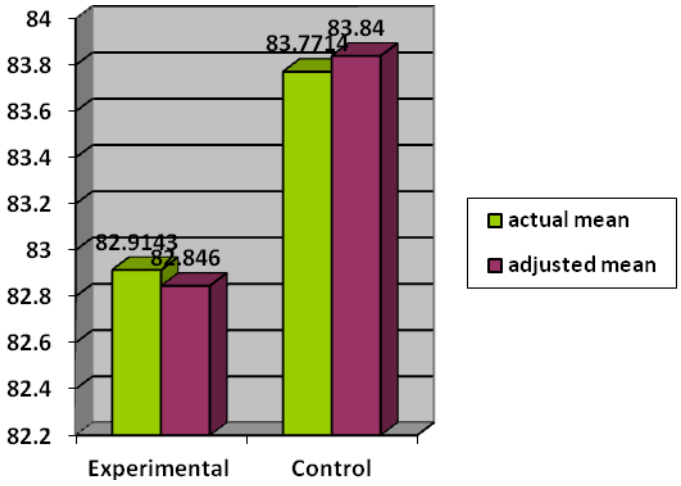
Score Diastolic Blood Pressure	Source of Variation	Sum of Squares	Df	Mean Square	F ratio	P-value
Adjusted Post Test	Between Group	16.917	1	16.917	4.699	.034
	Within Group	241.217	67	3.600		
	Total	258.134	68			

*tab $F_{0.05}$ (1,67) = 3.98

Table no. 2 clearly indicated that the obtained 'F' value of 4.699 was found to be significant at 0.05 level with 1,67 degree of freedom as the tabulated value of 3.98 was required to be significant at 0.05 level with 1,67 degree of freedom. The same table also indicated that there was a significant difference in adjusted final means of Diastolic Blood Pressure of older citizens living in old age community homes.

The graphical representation of mean value of pre and post test of diastolic blood pressure of experimental group of old citizens living in old age community homes is presented in figure 2.

Fig. -2 COMPARISON OF ADJUSTED FINAL MEANS OF DIASTOLIC BETWEEN EXPERIMENTAL GROUP AND CONTROL GROUP OF OLD CITIZENS LIVING IN OLD AGE COMMUNITY HOMES



Conclusions

On the basis of the findings of the study, the following conclusions have been drawn:-.

1. Exercise programme proved to be advantageous for the experimental group than the control group in bringing the change in form of reduction in systolic blood pressure among old citizens.
2. Exercise programme proved to be superior for the experimental group than the control group in bringing the changes in slight reduction in diastolic blood pressure among old citizens .

Recommendations

In the light of the conclusions drawn; the following recommendations are made:

- Similar study may be undertaken to find out the effect of selected exercises on other variables of old citizens .
- A study may be undertaken to find out the effect of selected exercises on Psychological and Physiological variables on a larger sample of old age people .
- A study can be undertaken in which the capsule of exercises can be altered like changing the selected exercises to Yogic exercise, Aerobics, Weight Training, Circuit training etc.
- It is recommended that the study can be based on other variables like-anthropometrical and biomechanical etc.

References

1. Abrahams Adolphe, "Exercise; its function Varieties & Application" (London William Heinemain Medical Books Ltd., 1930).
2. Aluzo Anthony D., A Handbook of Heart Disease ,Blood Pressure and Strokes (New York: College Books, 1962).
3. Astrand and Rodahl Kaare, "Textbook of Work Physiology", (McGraw Hill, Kogakusha, New Delhi, 1970).
4. Daryl Siedentop, "Introduction to Physical Education, Fitness and Sports" Fourth Edition, Mc Graw Hill, 2001.
5. Evelyn Pearce, "Anatomy and Physiology for Nurses", 16 Ed, Jaypee Brothers, Delhi, India.
6. Encyclopedia American, 1966 ed. S.V. "Frustration Tolerance".

THE END

ARTICLE

23

GENDER BASED ASPECTS OF PRINT ADVERTISING

Gaurav Mishra* & Ravi Kant Pandey
*College of Art & Craft, University of Lucknow, Lucknow, U.P., INDIA

Abstract:

The most important task in advertising a product is to create an advertising idea that is effective in market place. Since men and women act differently as consumers it is very important to consider gender when designing advertisements. This paper aims to provide a better understanding of gender based print advertising. Our primary focus is on elements and Colours used in print advertising. Qualitative content analysis of advertisements in popular magazines and newspapers was performed for duration of ten months. The general result of the study is that advertisements are designed differently depending on the gender of the target audience. Layout and colour preferences of advertisements targeted at men are different from those advertisements which are designed primarily for women audience.

Introduction

Every company has goals before starting to drive a business. The most significant objectives of the companies are to make a profit and to sell their products successfully. Nowadays, there is a competition among marketers to grab the consumer attention thus advertising value has increased dramatically in recent years and it is observed that advertised products generally find more favour in consumer's eyes than unadvertised ones. Advertisements are designed to make the target audience aware of the product and encourage them to purchase the advertised product. Basically advertising message is the information such as the thought, idea, attitude or image that the advertising professional wishes to communicate to the intended audience. (Moriarty et al.) When developing advertisement, advertising professionals have to choose the right language, the right nuance, the right tone of voice, the right appeal and the right gesture, such that these elements work together and create the intended effect. (Moriarty et al). Obviously, the main purpose of advertisements is to get the consumer to purchase the product advertised, the message within the advertisement has to be as persuasive as possible and ensure that certain emotions, feelings and values are awakened in the target audience. The message is relayed to the target audience through various advertising media available to the marketers. Some traditional media of advertising are television, radio, print, outdoor. Two dominant media currently used by most advertisers are print and television. Print media such as local and national newspaper, magazines have become the primary focus of many organization's advertising efforts (Brassington and Pettitt). Television advertisements can demonstrate the product or service in motion using many elements offered by the media (Jobber). Designing the television commercial with the correct combination of those elements gives the message a strong chance to grab the attention of target audience.

Background

Gender is an important criterion in identifying the target audience. In certain key aspects of behaviour, men and women are so different that it could be argued that they are entirely different species. That these behaviour patterns are so different is due to fundamental differences in how members of each gender perceive themselves, what they aspire to, and how they want to be perceived by members of their own and the opposite sex. These particular attitudes and beliefs can give rise to strong motivational impulses, which can also be triggered to influence purchasing behaviour. Tuning in to these attitudes and values therefore lies at the very heart of the way in which advertisers carefully construct their appeal. An emotional response is by far the most powerful reason for making decisions. Emotional and rational thoughts are interdependent, as the ability to decide rationally is determined by issues that drive the emotions.

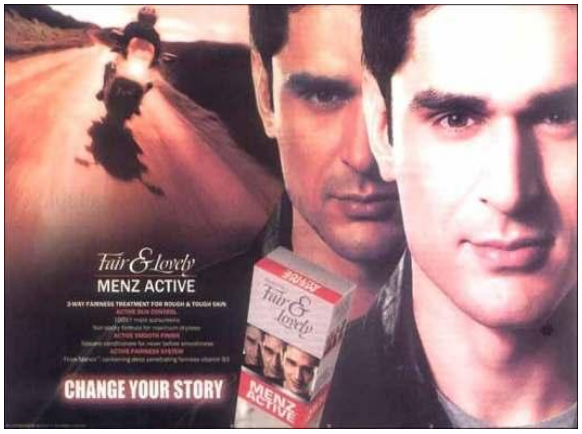
Literature Survey

Researches in this area have indicated that women are comprehensive information processors who assimilate every available cue; men on the other hand are selective information processors who assimilate only prominent cues (Wolin 2003). Research suggests that in women, the two spheres of their brains communicate better than do men's (Prakash 1992). Studies show that women pull in information from both halves. This allows women to give a more sophisticated emotional response. Thus, women are better at talking about their emotions and reading hidden messages. For women, ads often are more detailed since women appreciate very fine distinctions. Take for example shampoo ads, for women there are many different variations of shampoo e. g. for falling hair, normal hair, oily hair, dry hair, etc. For men, by contrast, shampoo ads focus on a single product. Men are likely to pick up on one or two very salient and obvious kinds of cues like dandruff and hair fall. Men think in a more macro way, and need to be shown the big picture. Also, men are less likely to process complex metaphors, that is why when advertisers wish to target women they should use complex, appearance related emotional appeals such as using science to 'prove' the benefits of a certain shampoo. Conversely, when advertisers target men, they should use simple, ego gratification emotional appeals.

Frequently Published Advertisements Designed for women

Fig 1.Advert designed in personalized format

Frequently Published Advertisements Designed for Men



For advertisements in print, the use of colour, text and layout are all key factors in ensuring a successful Advertisement. We will therefore focus on these elements used in print advertisements.

Layout

Layout is defined as the plan for arrangement and relationship of all the elements in a print advertisement (Moriarty, 1991). A layout begins with a collection of various elements such as head line, copy, complete with sub-heads, one or more pieces of art, captions, brand signature and sometimes may include a slogan or a tagline. Advertising creation involves arranging these elements in such a manner that they make sense and draw attention of consumers.

Colour

Colour is defined as the aspect of things that is caused by differing qualities of the light reflected by them in terms of observer of the light. Colour has three independent properties namely HUE, CHROMA & VALUE. Hue refers to the pigment of colour which is created from the spectrum of light which can be seen by splitting a beam of light through a prism (Gorn et al 1997). Chroma is the relative purity or the strength of the colour & may be altered by changing the shade or tint. Value of the colour is the degree of darkness & lightness of the colour relative to the natural scale that extends from black to white (Gorn et al 1997 & Moriarty 1991). These elements of colour are adjusted in an advertisement in order to affect the consumer's feelings and attitude.

Knowledge of consumer's preference for a particular colour is essential in order to recognize the most attractive colour for a specific advertisement. This realization has also triggered a growing interest among researches to better understand the significance and characteristics of the colour and its effect on consumer choices.

Conclusion

This paper explores the gender based aspects of print advertising. The primary objective of the study is to understand the effect of gender on advertising appeal. Conclusions are drawn based on the analysis of data collected and previous research .One of the Key research issue analyzed in print advertising to men and women is the identification of the kind of layout that can be used successfully for men and women respectively. Based on the data collected it was found that choice of layout is affected by the gender of the target audience. Advertisements designed for women were found to be generally designed in picture window layout while preferred layout for men was found to be all art.

Another important criterion analysed is the identification of theme , general tone scheme, construction and color combination that attracts the attention of men and women respectively.It was found that for targeting women primarily female models were used and advertisements designed for men mostly had male models .Observing the colour associations used in the advertisements it was found that the advertisements for women were mostly designed with white black red and blue while advertisements toward men mostly used colours white black blue and green, thus white and black were used in most of the advertisements to create contrast. Further it was observed colours used in advertisements for men were predominantly green , grey, beige and brown while for women advertisements most dominant colours are red, pink, violet, orange.
Some other signifacant observations are

Advertisements aimed for women are designed in personalized format while advertisements aimed at men are designed in product centred format.

Amount of information included is independent of gender of target audience.

Advertisements designed for women usually have a single person advertising the product while those designed for men have more than on model.

References

1 Vestergaard, Torben & Kim Schroder (1985): The Language of Advertising. Oxford:
2 Basil Blackwell Williamson, Judith (1978): Decoding Advertisements, Marion Boyars Publishers Limited
3 Ivy, D.K., & Backlund, P. (2004). Gender Speak: Personal Effectiveness In Gender Communication, McGraw-Hill.

4 Lips, H.M. (2005). Sex and Gender: An Introduction (5th Edition) , McGraw-Hill.
5 Anderson, G., 1993. Fundamentals of Educational Research. Falmer Press, Saunders, M., Lewis, P. & Thornhill, A, (2001), “Research Methods for Business students”. Second edition, Pearson Education Limited,
6 Sing, Ravindra; Mangat, Naurang Singh (1996) Elements of Survey Sampling , Kluwer Academic Publication
7 Kumar, Ranjit (2005) Research Methodology : A Step by step guide for beginners 2 nd Edition , Pearson Education
8 Moriarty S , Advertising principles and practice 5 th edition ,Prentice Hall Inc.
9 Brassington, F. and Pettitt , S. (2000) Principles of Advertising , Pearson Education
10 Jobber, J. and Fahy, J. Foundations of marketing , Mc Graw Hill publication
11 Alexander, Alison, Louise M. Benjamin, Keisha Hoerrner, and Darrell Roe (1998),""We'll Be Back In a Moment": A Content Analysis of Advertisements in Children's Television in the 1950s," Journal of Advertising, 27 (3), 1-8
12 Brown, A. (2004), “ The ethics of marketing to children”, speech at the Marketing Society in the North West, 18 February, available at: www.adassoc.org.uk.speeches
13 Hartwig, Frederick, Dearing, Brian E (1979); Exploratory Data Analysis , Sage Publications.
14 Panwar, J.S; and Agnihotri, Milan,(2006) Advertising message processing amongst urban children, An Indian experience – with special reference to TV advertising, Emerald Group Publishing Limited
15 Advertising blunders (2000, March 15-21). The Spectator (Columbus, OH), 11. Accessed at http://www.spectatoronline.com
16 Rafi M. M. I Chodhury, Adam Finn, and G. Douglas Olsen (2007) “ Investigating the Simultaneous Presentation of Advertising and TV Programming “ Journal of advertising
17 Guilford, J. P. & Smith, P. C. (1959). A system of color-preferences. The American Journal of Psychology, 73(4), 487-502.
18 McInnis, J. H. & Shearer, J. K. (1964). Relationship between color choices and selected preferences for the individual. Journal of Home Economics, 56,181-187.
19 Green, R. I., Cunningham, W. H., & Cunningham, I. C. M. (1975). The effectiveness of standardized global advertising. Journal of Advertising, 4(3), 25-30.
20 Case Study, A Strategic Research Methodology Khairul Baharein Mohd Noor, (2008)
21 American Journal of Applied Sciences 5 (11) ,1546-9239

THE END

ARTICLE

24

CLIMATE CHANGE: - CAUSE, EFFECT AND MITIGATION MANAGEMENT STRATEGIES

Dr. Surya Bhushan Tiwari

Head of Department, Faculty of Management & Business Studies,Dr. K.N. Modi University, Newai Rajasthan, INDIA

Abstract:

Climate word is originated from Ancient Greek word klima, meaning inclination is commonly defined as the weather averaged over a long period. Climate is a measure of the average pattern of variation in temperature, humidity, atmospheric pressure, wind, precipitation, atmospheric particle count and other meteorological variables in a given region over long periods of time. Climate is different than weather, in that weather only describes the short-term conditions of these variables in a given region. Climate change is the variation in global or regional climates over time. It reflects changes in the variability or average state of the atmosphere over time scales ranging from decades to millions of years. These changes can be caused by processes internal to the Earth, external forces or more recently, human activities. Factors of climate change are Plate tectonics, Orbital variations, Volcanism , Ocean variability, Human influences. Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation Management is a total solution for environmental mitigation needs. Mitigation Management Strategies are Renewable energy, Carbon intensity of fossil fuels, urban planning, building design, eliminating waste methane, geo-engineering and green- engineering.

Introduction

Climate change is a long-term change in the statistical distribution of weather patterns over periods of time that range from decades to millions of years. It may be a change in the average weather conditions or a change in the distribution of weather events with respect to an average, for example, greater or fewer extreme weather events. Climate change may be limited to a specific region, or may occur across the whole Earth.

In other words the climate change problem is related to changes in the concentration of the greenhouse gases (water vapor, CO2, CH4, N2O, and CFCs), which trap infrared radiation from the Earth's surface and thus cause the greenhouse effect. This effect is a natural phenomenon, which helps maintain a stable temperature and climate on Earth. Human activities, such as fossil fuel combustion, deforestation, and some industrial processes have led to an increase in greenhouse gases concentration. Consequently, more infrared radiation has been captured in the atmosphere, which causes changes in the air temperature, precipitation patterns, sea-level rise, and melting of glaciers.

Causes of Climate Change

Factors that can shape climate are climate forcing. These include such processes as variations in solar radiation, deviations in the Earth's orbit, mountain-building and continental drift, and changes in greenhouse gas concentrations. There are a variety of climate change feedbacks that can either amplify or diminish the initial forcing. Some parts of the climate system, such as the oceans and ice caps, respond slowly in reaction to climate forcing because of their large mass. Therefore, the climate system can take centuries or longer to fully respond to new external forcing.

Plate tectonics

Over the course of millions of years, the motion of tectonic plates reconfigures global land and ocean areas and generates topography. This can affect both global and local patterns of climate and atmosphere-ocean circulation. The position of the continents determines the geometry of the oceans and therefore influences patterns of ocean circulation. The locations of the seas are important in controlling the transfer of heat and moisture across the globe, and therefore, in determining global climate. A recent example of tectonic control on ocean circulation is the formation of the Isthmus of Panama about 5 million years ago, which shut off direct mixing between the Atlantic and Pacific Oceans. This strongly affected the ocean dynamics of what is now the Gulf Stream and may have led to Northern Hemisphere ice cover. During the Carboniferous period, about 300 to 360 million years ago, plate tectonics may have triggered large-scale storage of carbon and increased glaciations. Geologic evidence points to a "mega monsoonal" circulation pattern during the time of the supercontinent Pangaea, and climate modeling suggests that the existence of the supercontinent was conducive to the establishment of monsoons. The size of continents is also important. Because of the stabilizing effect of the oceans on temperature, yearly temperature variations are generally lower in coastal areas than they are inland. A larger supercontinent will therefore have more area in which climate is strongly seasonal than will several smaller continents or islands.

Solar output

The sun is the predominant source for energy input to the Earth. Both long- and short-term variations in solar intensity are known to affect global climate. Three the sun emitted only 70% as much power as it does today. If the atmospheric composition had been the same as today, liquid water should not have existed on Earth. However, there is evidence for the presence of water on the early Earth, in the Hadean and Archeaneons, leading to what is known as the faint young sun paradox. Hypothesized solutions to this paradox include a vastly different atmosphere, with much higher concentrations of greenhouse gases than currently existOver the following approximately 4 billion years, the energy

output of the sun increased and atmospheric composition changed, with the oxygenation of the atmosphere around 2.4 billion years ago being the most notable alteration. These changes in luminosity, and the sun's ultimate death as it becomes a red giant and then a white dwarf, will have large effects on climate, with the red giant phase possibly ending life on Earth. Solar output also varies on shorter time scales, including the 11-year solar cycle and longer-term modulations. Solar intensity variations are considered to have been influential in triggering the Little Ice Age, and some of the warming observed from 1900 to 1950. The cyclical nature of the sun's energy output is not yet fully understood; it differs from the very slow change that is happening within the sun as it ages and evolves. While most research indicates solar variability has induced a small cooling effect from 1750 to the present, a few studies point toward solar radiation increases from cyclical sunspot activity affecting global warming.

Orbital variations

Slight variations in Earth's orbit lead to changes in the seasonal distribution of sunlight reaching the Earth's surface and how it is distributed across the globe. There is very little change to the area-averaged annually averaged sunshine; but there can be strong changes in the geographical and seasonal distribution. The three types of orbital variations are variations in Earth's eccentricity, changes in the tilt angle of Earth's axis of rotation, and precession of Earth's axis. Combined together, these produce Milankovitch cycles which have a large impact on climate and are notable for their correlation to glacial and interglacial periods, their correlation with the advance and retreat of the Sahara, and for their appearance in the stratigraphic record.

Volcanism

Volcanism is a process of conveying material from the crust and mantle of the Earth to its surface. Volcanic eruptions, geysers, and hot springs, are examples of volcanic processes which release gases and/or particulates into the atmosphere. Eruptions large enough to affect climate occur on average several times per century, and cause cooling (by partially blocking the transmission of solar radiation to the Earth's surface) for a period of a few years. The eruption of Mount Pinatubo in 1991, the second largest terrestrial eruption of the 20th century (after the 1912 eruption of Novarupta) affected the climate substantially. Global temperatures decreased by about 0.5 °C (0.9 °F). The eruption of Mount Tambora in 1815 caused the Year without a summer. Much larger eruptions, known as large igneous provinces, occur only a few times every hundred million years, but may cause global warming and mass extinctions. Volcanoes are also part of the extended carbon cycle. Over very long (geological) time periods, they release carbon dioxide from the Earth's crust and mantle, counteracting the uptake by sedimentary rocks and other geological carbon dioxide sinks. According to the US Geological Survey, however, estimates are that human activities generate more than 130 times the amount of carbon dioxide emitted by volcanoes.

Ocean variability

The Ocean is a fundamental part of the climate system. Short-term fluctuations (years to a few decades) such as the El Niño–Southern Oscillation, the Pacific decadal oscillation, the North Atlantic oscillation, and the Arctic oscillation, represent climate variability rather than climate change. On longer time scales, alterations to ocean processes such as thermohaline circulation play a key role in redistributing heat by carrying out a very slow and extremely deep movement of water, and the long-term redistribution of heat in the world's oceans.

Human influences

In the context of climate variation, anthropogenic factors are human activities that change the environment. In some cases the chain of causality of human influence on the climate is direct and unambiguous, while in other instances it is less clear. Various hypotheses for human-induced climate change have been argued for many years. Presently the scientific consensus on climate change is that human activity is very likely the cause for the rapid increase in global average temperatures over the past several decades. Consequently, the debate has largely shifted onto ways to reduce further human impact and to find ways to adapt to change that has already occurred. Of most concern in these anthropogenic factors is the increase in CO_2 levels due to emissions from fossil fuel combustion, followed by aerosols and cement manufacture. Other factors, including land use, ozone depletion, animal agriculture and deforestation, are also of concern in the roles they play - both separately and in conjunction with other factors - in affecting climate, microclimate, and measures of climate variables.

EVIDENCE FOR CLIMATIC CHANGE

Physical evidence for climatic change

Evidence for climatic change is taken from a variety of sources that can be used to reconstruct past climates. Reasonably complete global records of surface temperature are available beginning from the mid-late 19th century. For earlier periods, most of the evidence is indirect—climatic changes are inferred from changes in proxies, indicators that reflect climate, such as vegetation, ice cores, dendrochronology, sea level change, and glacial geology.

Historical and archaeological evidence

Climate change in the recent past may be detected by corresponding changes in settlement and agricultural patterns. Archaeological evidence, oral history and historical documents can offer insights into past changes in the climate. Climate change effects have been linked to the collapse of various civilizations.

Glaciers
Glaciers are considered among the most sensitive indicators of climate change, advancing when climate cools and retreating when climate warms. Glaciers grow and shrink, both contributing to natural variability and amplifying externally forced changes. A world glacier inventory has been compiled since the 1970s, initially based mainly on aerial photographs and maps but now relying more on satellites. This compilation tracks more than 100,000 glaciers covering a total area of approximately 240,000 km^2, and preliminary estimates indicate that the remaining ice cover is around 445,000 km^2. The World Glacier Monitoring Service collects data annually on glacier retreat and glacier mass balance From this data, glaciers worldwide have been found to be shrinking significantly, with strong glacier retreats in the 1940s, stable or growing conditions during the 1920s and 1970s, and again retreating from the mid-1980s to present.

Vegetation
A change in the type, distribution and coverage of vegetation may occur given a change in the climate; this much is obvious. In any given scenario, a mild change in climate may result in increased precipitation and warmth, resulting in improved plant growth and the subsequent sequestration of airborne CO_2. Larger, faster or more radical changes, however, may well result in vegetation stress, rapid plant loss and desertification in certain circumstances.

Ice cores
Analysis of ice in a core drilled from ice sheet such as the Antarctic ice sheet, can be used to show a link between temperature and global sea level variations. The air trapped in bubbles in the ice can also reveal the CO_2 variations of the atmosphere from the distant past, well before modern environmental influences. The study of these ice cores has been a significant indicator of the changes in CO_2 over many millennia, and continues to provide valuable information about the differences between ancient and modern atmospheric conditions.

Dendroclimatology
Dendroclimatology is the analysis of tree ring growth patterns to determine past climate variations. Wide and thick rings indicate a fertile, well-watered growing period, whilst thin, narrow rings indicate a time of lower rainfall and less-than-ideal growing conditions.

Pollen analysis
Palynology is the study of contemporary and fossil palynomorphs, including pollen. Palynology is used to infer the geographical distribution of plant species, which vary under different climate conditions. Different groups of plants have pollen with distinctive shapes and surface textures, and since the outer surface of pollen is composed of a very resilient material, they resist decay. Changes in the type of pollen found in different layers of sediment in lakes, bogs, or river deltas indicate changes in plant communities. These changes are often a sign of a changing climate. As an example, palynological studies have been used to track changing vegetation patterns throughout the Quaternary glaciations and especially since the last glacial maximum.

Insects
Remains of beetles are common in freshwater and land sediments. Different species of beetles tend to be found under different climatic conditions. Given the extensive lineage of beetles whose genetic makeup has not altered significantly over the millennia, knowledge of the present climatic range of the different species, and the age of the sediments in which remains are found, past climatic conditions may be inferred.

Sea level change
Global sea level change for much of the last century has generally been estimated using tide gauge measurements collated over long periods of time to give a long-term average. More recently, altimeter measurements — in combination with accurately determined satellite orbits — have provided an improved measurement of global sea level change. To measure sea levels prior to instrumental measurements, scientists have dated coral reefs that grow near the surface of the ocean, coastal sediments, and marine terraces. The predominant dating methods used are uranium series and radiocarbon, with Cosmo genic radionuclides being sometimes used to date terraces that have experienced relative sea level fall.

Impacts on Health
To assess the potential impacts of climate change on health, it is necessary to consider both the sensitivity and vulnerability of populations for specific health outcomes to changes in temperature, rainfall, humidity, storminess, and so on. Vulnerability is a function both of the changes to exposure in climate and of the ability to adapt to that exposure.Science classically operates empirically, via observation, interpretation, and replication. However, having initiated a global experiment, it would not be advisable to wait decades for sufficient empirical evidence to describe the health consequences. It is important to distinguish between "climate and health" relationships and "weather and health" relationships. Climate variability occurs on many time scales. Weather events occur at daily time scale and are associated with many health impacts. Climate variability at other time scales also affects health. In particular, the El Niño Southern Oscillation has been shown to influence interannual variability in malaria, dengue, and other mosquito-borne diseases. Climate change is the long-term change in the average weather conditions for a particular location. Climate change will become apparent as a change in annual, seasonal, or monthly means. Thus, incremental climate change will be superimposed upon the natural variability of climate in time and space.

Natural Disasters
Climate change will increase the risk of both floods and droughts. Ninety percent of disaster victims worldwide live in developing countries, where poverty and population pressures force growing numbers of people to live in harm's way—on flood plains and on unstable hillsides. Unsafe buildings compound the risks. The vulnerability of those living in risk-prone areas is perhaps the single most important cause of disaster casualties and damage.

Heat Waves and Milder Winters
Heat stress is a direct result of exposure to high temperatures. Stressful hot weather episodes (heat waves) cause deaths in the elderly, as well as heat related illnesses such as heat stroke and heat exhaustion. A change in world climate, including an increase in the frequency and severity of heat waves, would affect the quality of life in many urban centers. Heat waves are responsible for a significant proportion of disease-related mortality in developed counties such as the United States and Australia, where the impact of weather disasters has been significantly reduced. Milder winters under climate change would reduce the excess morbidity and mortality, such as the United Kingdom, the beneficial impact may outweigh the detrimental.

Air Pollution
The air is full of particles and gases that may affect human health, such as pollen, fungal spores, and pollutants from fossil fuel emissions. Weather conditions influence air pollution via pollutant (or pollutant precursor) transport and/or formation. Exposures to air pollutants have serious public health consequences. Climate change, by changing pollen production, may affect timing and duration of seasonal allergies.

Social Dislocation
The growth in the number of refugees and displaced persons has increased markedly. Refugees represent a very vulnerable population with significant health problems. Large-scale migration is likely in response to flooding, drought, and other natural disasters. Both the local ecological disturbance caused by the extreme event and the circumstances of population displacement and resettlement would affect the risk of infectious disease outbreaks. Even displacement due to long-term cumulative environmental deterioration, including sea level rise, is associated with such health impacts.

Infectious Diseases
Vector-borne diseases are transmitted by insects (e.g., mosquitoes) and ticks that are sensitive to temperature, humidity, and rainfall. Climate change may alter the distribution of important vector species, and this may increase the risk of introducing disease into new areas. Temperature can also influence the reproduction and survival of the infective agent within the vector, thereby further influencing disease transmission in areas where the vector is already present. However, the ecology and transmission dynamics of vector-borne diseases are complex. The climate factors that could critically influence transmission need to be identified before the potential impact of a changing climate can be assessed. Malaria is on the increase in the world at large, but particularly in Africa.

Mitigation Management
Mitigation is the effort to reduce loss of life and property by lessening the impact of disasters. Mitigation is taking action *now*—before the next disaster—to reduce human and financial consequences later. Effective mitigation requires that we *all* understand local risks, address the hard choices, and invest in long-term community well-being. Without mitigation actions, we jeopardize our safety, financial security, and self-reliance. **Mitigation Management is a total solution for environmental mitigation needs .Climate change mitigation** is action to decrease the intensity of radioactive forcing in order to reduce the potential effects of global warming. Mitigation is distinguished from adaptation to global warming, which involves acting to tolerate the effects of global warming. Most often, climate change mitigation scenarios involve reductions in the concentrations of greenhouse gases, either by reducing their sources or by increasing their sinks. Scientific, together with the precautionary principle and the fear of abrupt climate change[3] is leading to increased effort to develop new technologies and sciences and carefully manage others in an attempt to mitigate global warming. Most means of mitigation appear effective only for preventing further warming, not at reversing existing warming. The Stern Review identifies several ways of mitigating climate change. These include reducing demand for emissions-intensive goods and services, increasing efficiency gains, increasing use and development of low-carbon technologies, and reducing non-fossil fuel emissions. The energy policy of the European Union has set a target of limiting the global temperature rise to 2 °C [3.6 °F] compared to preindustrial levels, of which 0.8 °C has already taken place and another 0.5-0.7 °C is already committed.

Mitigation Management Strategies –

Nuclear power
Nuclear power currently produces over 15% of the world's electricity. Due to its low remittance of greenhouse gases and reliability it is seen as a possible alternative to fossil fuels, but is controversial for reasons of capital cost and possible environmental impacts. Also, there are countries. The bulk of CO_2 emission from nuclear power plants can be eliminated if nuclear power plants themselves generate the electricity required during the uranium enrichment process. There are a number of alternative nuclear fission technologies, such as breeder reactors, which could vastly extend fuel supplies if successfully developed and utilized. Lower-risk thorium cycles have been demonstrated in the past.

Nuclear fusion is another variant of providing nuclear energy, but it will not provide any immediate mitigation to global warming as the time horizon for its commercial deployment is expected to be after 2050.

Carbon intensity of fossil fuels

Natural gas produces less greenhouses gases per energy unit gained than oil which in turn produces less than coal, principally because coal has a larger ratio of carbon to hydrogen. The combustion of natural gas emits almost 30 percent less carbon dioxide than oil, and just under 45 percent less carbon dioxide than coal. In addition, there are also other environmental benefits. A study performed by the Environmental Protection Agency and the Gas Research Institute in 1997 sought to discover whether the reduction in carbon dioxide emissions from increased natural gas use would be offset by a possible increased level of methane emissions from sources such as leaks and emissions. The study concluded that the reduction in emissions from increased natural gas use strongly outweighs the detrimental effects of increased methane emissions. Thus the increased use of natural gas in the place of other, dirtier fossil fuels can serve to lessen the emission of greenhouse gases in the United States. Most mitigation proposals imply — rather than directly state — an eventual reduction in global fossil fuel production. Also proposed are direct quotas on global fossil fuel production.

Energy efficiency and conservation

Reducing fuel use by improvements in efficiency provides environmental benefits and as well as net cost savings to the energy user. Building insulation, fluorescent lighting, and public transportation are some of the most effective means of conserving energy, and by extension, the environment. However, Jevons paradox poses a challenge to the goal of reducing overall energy use by energy conservation methods. Improved efficiency lowers cost, which in turn increases demand. To ensure that increases in efficiency actually reduce energy use, a tax must be imposed to remove any cost savings from improved efficiency. Energy conservation is the practice of increasing the efficiency of use of energy in order to achieve higher useful output for the same energy consumption. This may result in increase of national security, personal security, financial capital, human comfort and environmental value. Individuals and organizations that are direct consumers of energy may want to conserve energy in order to reduce energy costs and promote environmental values. Industrial and commercial users may want to increase efficiency and maximize profit. On a larger scale, energy conservation is an element of energy policy. The need to increase the available supply of energy is lessened if societal demand for energy can be reduced, or if growth in demand can be slowed. This makes energy conservation an important part of the debate over climate change and the replacement of non-renewable resources with renewable energy. Encouraging energy conservation among consumers is often advocated as a cheaper or more environmentally sensitive alternative to increased energy production.

Urban planning

Urban planning also has an effect on energy use. Between 1982 and 1997, the amount of land consumed for urban development in the United States increased by 47 percent while the nation's population grew by only 17 percent.[29] Inefficient land use development practices have increased infrastructure costs as well as the amount of energy needed for transportation, community services, and buildings. At the same time, a growing number of citizens and government officials have begun advocating a smarter approach to land use planning. These smart growth practices include compact community development, multiple transportation choices, mixed land uses, and practices to conserve green space. These programs offer environmental, economic, and quality-of-life benefits; and they also serve to reduce energy usage and greenhouse gas emissions. Approaches such as New Urbanism and Transit-oriented development seek to reduce distances travelled, especially by private vehicles, encourage public transit and make walking and cycling more attractive options. This is achieved through medium-density, mixed-use planning and the concentration of housing within walking distance of town centers and transport nodes. Smarter growth land use policies have both a direct and indirect effect on energy consuming behavior. For example, transportation energy usage, the number one user of petroleum fuels, could be significantly reduced through more compact and mixed use land development patterns, which in turn could be served by a greater variety of non-automotive based transportation choices.

Building design:

Emissions from housing are substantial, and government-supported energy efficiency programmes can make a difference. New buildings can be constructed using passive solar building design, low-energy building, or zero-energy building techniques, using renewable heat sources. Existing buildings can be made more efficient through the use of insulation, high-efficiency appliances (particularly hot water heaters and furnaces), double- or triple-glazed gas-filled windows, external window shades, and building orientation and siting. Renewable heat sources such as shallow geothermal and passive solar energy reduce the amount of greenhouse gasses emitted. This saves energy because it cools buildings and reduces the urban heat island effect thus reducing the use of air conditioning. Further significant savings from other non-energy-related-emissions could be gained through cuts to agricultural emissions, fugitive emissions, waste emissions, and emissions from various industrial processes.

Eliminating waste methane

Methane is a significantly more powerful greenhouse gas than carbon dioxide. Burning one molecule of methane generates one molecule of carbon dioxide. Accordingly, burning methane which would otherwise be released into the atmosphere (such as at oil wells, landfills, coal mines, waste treatment plants, etc.) provides a net greenhouse gas emissions benefit. However, reducing the amount of waste methane produced in the first place has an even greater beneficial impact, as might other approaches to productive use of otherwise-wasted methane. In terms of prevention,

vaccines are in the works in Australia to reduce significant global warming contributions from methane released by livestock via flatulence and eructation.

Geo-engineering

Geo-engineering it is also called geological engineering, engineering geology or geotechnical engineering. It deals with the discovery, development, and production and use of subsurface earth resources, as well as the design and construction of earth works. Geo- engineering is the application of geosciences, where mechanics, mathematics, physics, chemistry, and geology are used to understand and shape our interaction with the earth. Geo- engineers work in areas of mining, including surface and subsurface excavations, and rock burst mitigation; energy, including hydraulic fracturing and drilling for exploration and production of water, oil, or gas; infrastructure, including underground transportation systems and isolation of nuclear and hazardous wastes; and environment, including groundwater flow, contaminant transport and remediation, and hydraulic structures. Geo- engineering is seen by some as an alternative to mitigation and adaptation, but by others as an entirely separate response to climate change.

Green engineering

Green engineering is the design, commercialization, and use of processes and products, which are feasible and economical while minimizing the generation of pollution at the source and risk to human health and the environment. Green engineering embraces the concept that decisions to protect human health and the environment can have the greatest impact and cost effectiveness when applied early to the design and development phase of a process or product.

Main Principles of Green Engineering are as follows

- Create engineering solutions beyond current or dominant technologies; improve, innovate, and invent to achieve sustainability.
- Strive to prevent waste.
- Engineer processes and products holistically, use systems analysis, and integrate environmental impact assessment tools.
- Conserve and improve natural ecosystems while protecting human health and well-being.
- Use life-cycle thinking in all engineering activities.
- Actively engage communities and stakeholders in development of engineering solutions.
- Ensure that all material and energy inputs and outputs are as inherently safe and benign as possible.
- Minimize depletion of natural resources.
- Develop and apply engineering solutions, while being cognizant of local geography, aspirations, and cultures.

References

1. "Aviation groups set targets to limit their environmental impact publisher=FT.com". http://news.ft.com/cms/s/747d20ea-e1ff-11d9-bf18-00000e2511c8.html.
2. "Bureau of Economic Geology Receives $38 Million for First Large-Scale U.S. Test Storing Carbon Dioxide Underground"
3. "CARBON FOOTPRINT OF ELECTRICITY GENERATION". Parliamentary Office of Science and Technology (UK). October 2006. http://www.parliament.uk/documents/upload/postpn268.pdf. Retrieved 2009-04-14.
4. "Climate change 'ruining' Everest". Heatisonline.org. 2004-11-17. http://www.heatisonline.org/contentserver/objecthandlers/index.cfm?id=4950&method=full. Retrieved 2010-08-26.
5. "Climate Control: a proposal for controlling global greenhouse gas emissions" (PDF). Sustento Institute. http://sustento.org.nz/wp-content/uploads/2007/06/climate-control.pdf. Retrieved 2007-12-10.
6. "Clinton Hails Global Warming Pact". *All Politics* (CNN). 1997-12-11. http://www.cnn.com/ALLPOLITICS/1997/12/11/kyoto/. Retrieved 2006-11-05.
7. "Energy Saving Trust: Home and the environment". Est.org.uk. http://www.est.org.uk/myhome/climatechange/stats/homeenvironment/. Retrieved 2010-08-26.
8. "EU climate change target "unfeasible"". EurActiv.com. 2006-02-01. http://www.euractiv.com/Article?tcmuri=tcm:29-152154-16&type=News. Retrieved 2007-02-21.
9. "Green Electric? GE unveils eco-strategy publisher=MSNBC". http://www.msnbc.msn.com/id/7791657/.
10. "GreenFuel Technologies Closing Down : Greentech Media". Greentechmedia.com. 2009-05-13. http://www.greentechmedia.com/articles/read/greenfuel-technologies-closing-down-4670/. Retrieved 2010-08-26.
11. "How the White House Worked to Scuttle California's Climate Law", San Francisco Chronicle, September 25, 2007
12. "Industrial Technologies Program: BestPractices". Eere.energy.gov. http://www.eere.energy.gov/industry/bestpractices/index.html. Retrieved 2010-08-26.
13. "IPCC Glossary Working Group III, p. 818" (PDF). http://www.ipcc.ch/pdf/glossary/ar4-wg3.pdf. Retrieved 2010-08-26.
14. "Methane to Markets Partnership". USAID.gov. http://www.usaid.gov/our_work/global_partnerships/gda/methanetomarkets.htm.[*dead link*]
15. "MIT Energy Research Council : Research Spotlight". Web.mit.edu. http://web.mit.edu/erc/spotlights/alg-all.html. Retrieved 2010-08-26.
16. "US-led emissions pact seen as Kyoto rival". NewScientist.com. http://www.newscientist.com/article.ns?id=dn7744.
17. [|Scherer, Ron] (2003-01-23). "Oil supplies fall as nation shivers". *The Christian Science Monitor*. http://www.csmonitor.com/2003/0123/p01s02-usec.html?related.[*dead link*]
18. [a] [b] [c] Banuri, T. *et al*. (1996) (PDF). *Equity and Social Considerations. In: Climate Change 1995: Economic and Social Dimensions of Climate Change. Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change (J.P. Bruce* et al*. Eds.)*. This version: Printed by Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. PDF version: IPCC website. doi:10.2277/0521568544. ISBN 9780521568548. http://www.ipcc.ch/ipccreports/sar/wg_III/ipcc_sar_wg_III_full_report.pdf.

19. [a b c d e f] Stern, N. (2007). *Stern Review on the Economics of Climate Change: Part III: The Economics of Stabilisation.* HM Treasury, London: http://hm-treasury.gov.uk/sternreview_index.htm
20. [a b c d] Jessica Brown, Neil Bird and Liane Schalatek (2010) Climate finance additionality: emerging definitions and their implications Overseas Development Institute
21. [a b c] Robinson, Simon (2010-01-22). "How to Reduce Carbon Emissions: Capture and Store it?". Time.com. http://www.time.com/time/specials/packages/article/0,28804,1954176_1954175,00.html. Retrieved 2010-08-26.
22. [a b] Goldemberg, J. *et al*. (1996) (PDF). *Introduction: scope of the assessment. In: Climate Change 1995: Economic and Social Dimensions of Climate Change. Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change (J.P. Bruce* et al*. Eds.)*. This version: Printed by Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. Web version: IPCC website. doi:10.2277/0521568544. ISBN 9780521568548. http://www.ipcc.ch/ipccreports/sar/wg_III/ipcc_sar_wg_III_full_report.pdf.
23. [a b] Jacobson, M.Z. (2009) "Review of solutions to global warming, air pollution, and energy security" *Energy and Environmental Science* **2**:148-73 doi 10.1039/b809990c (review.)
24. [a b] Jacobson, M.Z.; Delucchi, M.A. (2009). "A Plan to Power 100 Percent of the Planet with Renewables" (originally published as "A Path to Sustainable Energy by 2030")". *Scientific American* **301** (5): 58–65. PMID 19873905. http://www.stanford.edu/group/efmh/jacobson/susenergy2030.html.
25. [a b] Lowe, J. A.; Huntingford, C.; Raper, S. C. B.; Jones, C. D.; Liddicoat, S. K.; Gohar, L. K. (2009). "How difficult is it to recover from dangerous levels of global warming?". *Environmental Research Letters* **4**: 014012. doi:10.1088/1748-9326/4/1/014012. edit
26. [a b] Molina, M.; Zaelke, D.; Sarmac, K. M.; Andersen, S. O.; Ramanathane, V.; Kaniaruf, D. (2009). "Tipping Elements in Earth Systems Special Feature: Reducing abrupt climate change risk using the Montreal Protocol and other regulatory actions to complement cuts in CO_2 emissions". *Proceedings of the National Academy of Sciences* **106** (49): 20616. doi:10.1073/pnas.0902568106. PMID 19822751. PMC 2791591. http://www.pnas.org/content/early/2009/10/19/0902568106.full.pdf. edit
27. [a b] Natural Gas and the Environment from *www.naturalgas.org*
28. [a b] Policy Implications of Greenhouse Warming: Mitigation, Adaptation, and the Science Base (1992), Committee on Science, Engineering, and Public Policy (COSEPUP)
29. [a b] Reuters, January 30, 2007, free archived version at http://www.commondreams.org/headlines07/0130-10.htm, last visited Jan. 30, '07
30. [a b] The Royal Society, (2009) "Geoengineering the climate: science, governance and uncertainty". Retrieved 2009-09-12.
31. Adam, David (14 April 2009). "World will not meet 2C warming target, climate change experts agree". Guardian News and Media Limited. http://www.guardian.co.uk/environment/2009/apr/14/global-warming-target-2c. Retrieved 2009-04-14.
32. Adam, David (14 April 2009). "World will not meet 2C warming target, climate change experts agree". Guardian News and Media Limited. http://www.guardian.co.uk/environment/2009/apr/14/global-warming-target-2c. Retrieved 2009-04-14. "The poll comes as UN negotiations to agree a new global treaty to regulate carbon pollution gather pace in advance of a key meeting in Copenhagen in December. Officials will try to agree a successor to the Kyoto protocol, the first phase of which expires in 2012."
33. Adam, David (25 March 2009). "Why the Copenhagen climate change cliffhanger could drag on a little longer". Guardian News and Media Limited. http://www.guardian.co.uk/environment/2009/mar/25/copenhagen-climate-change-summit. Retrieved 2009-04-14.
34. Andrew Biggin (16 August 2007). "Scientific bodies must take own action on emissions". *Nature* **448** (7155): 749. doi:10.1038/4487
35. **^** Azar, C., Lindgren, K., Larson, E.D. and Möllersten, K.: (2006)"Carbon capture and storage from fossil fuels and biomass – Costs and potential role in stabilising the atmosphere", Climatic Change, 74, 47-79.
36. Barker, T. *et al.* (2007). *11.2.2 Ocean fertilization and other geo-engineering options. In (book chapter): Mitigation from a cross-sectoral perspective. In: Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz* et al. *(eds.))*. Print version: Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. This version: IPCC website. ISBN 9780521880114. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch11s11-2-2.html. Retrieved 2010-04-05.
37. Bloomberg New Energy Finance (July, 2010) "Fossil Fuel Subsidies Outpace Renewables " *RenewableEnergyWorld.com*
38. Brahic, Catherine (2 August 2007). "'Sunshade' for global warming could cause drought". New Scientist. http://environment.newscientist.com/article/dn12397-sunshade-for-global-warming-could-cause-drought.html.
39. Burp vaccine cuts greenhouse gas emissions *Rachel Nowak* for NewScientist September 2004
40. Climate change is costing us, says BT boss *Wachman, Richard* The Observer June 2005
41. Climate change 'ruining' Belize BBC November 2004
42. Climate Justice Ongoing Cases
43. Coale, KH et al.,"A massive phytoplankton bloom induced by an ecosystem-scale iron fertilization experiment in the equatorial Pacific Ocean," Nature 383(6600): 495-501, 10 Oct. 1996.
44. Committee on Science, Engineering, and Public Policy (1992). *Policy Implications of Greenhouse Warming: Mitigation, Adaptation, and the Science Base*. Washington, D.C.: National Academy Press. ISBN ISBN 0-309-04386-7. http://fermat.nap.edu/books/0309043867/html/216.html[*dead link*]
45. Crutzen, P. (August 2006). "Albedo enhancement by stratospheric sulfur injections: a contribution to resolve a policy dilemma?". *Climatic Change* **77** (3-4): 211–220. doi:10.1007/s10584-006-9101-y. http://www.springerlink.com/content/t1vn75m458373h63/fulltext.pdf.
46. Data and studies on CO_2/megajoule for fossil & other fuels, at CO2List.org
47. Edward Lorenz (1982): "Climate is what you expect, weather is what you get"
48. Emission Trading Scheme (EU ETS) from *ec.europa.eu*
49. Exxon Mobile's Contribution to Global Warming Revealed from Friends of the Earth Facing a changing world: women, population and climate, United Nations Population Fund
50. Fischer, B.S., N. Nakicenovic, K. Alfsen, J. Corfee Morlot, F. de la Chesnaye, J.-Ch. Hourcade, K. Jiang, M. Kainuma, E. La Rovere, A. Matysek, A. Rana, K. Riahi, R. Richels, S. Rose, D. van Vuuren, R. Warren, (2007)"Issues related to mitigation in the long term context", In Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Inter-governmental Panel on Climate Change [B. Metz, O.R. Davidson, P.R. Bosch, R. Dave, L.A. Meyer (eds)], Cambridge University Press, Cambridge.

51. Free trade can help combat global warming, finds UN report UN News Centre, 26 June 2009
52. Fulton, William; Pendall, Rolf; Nguyen, Mai; Harrison, Alicia (2001). "Who Sprawls Most? How Growth Patterns Differ Across the U.S". Washington D.C.: The Brookings Institution Center on Urban and Metropolitan Policy. http://www.brookings.edu/es/urban/publications/fulton.pdf.
53. Graham-Rowe, Duncan (2005-02-24). "Hydroelectric power's dirty secret revealed". *New Scientist*. http://www.newscientist.com/article.ns?id=dn7046.
54. Grossman, Columbia J. of Env. Law, 2003
55. Gupta, S. *et al*. (2007). ""13.2.1.2 Taxes and charges" In (book chapter): "Policies, instruments, and co-operative arrangements." In (book): "Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz *et al*. Eds.)"". Print version: Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. This version: IPCC website. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch13s13-2-1-2.html. Retrieved 2010-03-18.
56. Hackney, Thomas (July 2009). "#7: Moratorium on New Projects for Fossil Fuel Production & Declining Cap on Existing Production". BC Sustainable Energy Association. http://www.bcsea.org/policy/files/7_Fossil_fuels.pdf. Retrieved 2008-04-24.
57. Harshvardhan (06/1978). "Albedo enhancement and perturbation of radiation balance due to stratospheric aerosols". *Science* **289**: 1763. 1978aepr.rept.....H. http://adsabs.harvard.edu/abs/1978aepr.rept.....H.
58. http://en.wikipedia.org/wiki/Geoengineering
59. How high-pressure politics threatens action on climate The Observer June 2005
60. IPCC (2007). *C. Mitigation in the short and medium term (until 2030). In (book section): Summary for Policymakers. In: Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz* et al. *(eds.))*. Print version: Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. This version: IPCC website. ISBN 9780521880114. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/spmsspm-c.html. Retrieved 2010-05-15.
61. Iron versus the Greenhouse Oceanographers cautiously explore a global warming therapy Monastersky, Richard September 1995
62. Jim Schwab, "Who'd Got the Energy?" *Planning*, American Planning Association, October 2002
63. Lenton, Tim; Vaughan (2009-01-28). *Atmos. Chem. Phys. Discuss.* (Copernicus). http://www.atmos-chem-phys-discuss.net/9/2559/2009/acpd-9-2559-2009.pdf.
64. Lowe, Marcia D. (1994, April). *Back on Track: The Global Rail Revival*. http://www.worldwatch.org/node/872. Retrieved 2007-02-15.
65. Mayell, Hillary (January 8, 2001). "Study Challenges Idea of Seeding Oceans With Iron to Curb Global Warming". *National Geographic News*. http://news.nationalgeographic.com/news/2002/01/0108_020108oceaniron.html.
66. Obersteiner, M., Azar, C., Kauppi, P., Möllersten, K., Moreira, J., Nilsson, S., Read, P., Riahi, K., Schlamadinger, B., Yamagata, Y., Yan, J., and van Ypersele, J. P.: (2001)"Managing climate risk", Science, 294(5543), 786–787.
67. Oliver Geden (2010), What Comes After the Two-Degree Target?, SWP Comments 19
68. On the buses with the leaner, greener BT *Curtis, Polly* The Guardian June 2005
69. Osborne, Hilary (2005-08-02). "Energy efficiency 'saves £350m a year'". *Guardian Unlimited*. http://money.guardian.co.uk/utilities/story/0,11992,1541051,00.html?gusrc=ticker-103704.
70. Pacala, Stephen; Socolow, Robert H. (2004). "Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies". *Science* (AAAS) **305** (5686): 968–972. doi:10.1126/science.1100103. PMID 15310891. http://carbonsequestration.us/Papers-presentations/htm/Pacala-Socolow-ScienceMag-Aug2004.pdf.
    See also: "Stabwedge". CMI (Carbon Mitigation Initiative) at Princeton University. http://www.princeton.edu/~cmi/resources/stabwedge.htm. "Resources for Pacala & Socolow(2004)"
71. Policy Implications of Greenhouse Warming: Mitigation, Adaptation, and the Science Base[*dead link*]
72. Population and Global Warming Factsheet from Sierra Club
73. Population and Global Warming National Wild Life Federation
74. Population and the Environment Fact Sheet Population Connection
75. Population Connection Statement of Policy
76. Porritt, Jonathon (March 2009). "Living within our means: avoiding the ultimate recession" (PDF). London: Forum for the Future. http://www.forumforthefuture.org/files/Living_within_our_means_sml.pdf. Retrieved 2009-04-14. "I remain astonished that so few people (even at the most progressive end of civil society) are prepared to accept that a continuing combination of a growing population and exponential economic growth will put a sustainable world for humankind forever beyond our reach."
77. Prototype Carbon Fund from the World Bank Carbon Finance Unit
78. Rasch, J.; Tilmes, S.; Turco, P.; Robock, A.; Oman, L.; Chen, C.; Stenchikov, L.; Garcia, R. (Nov 2008). "An overview of geoengineering of climate using stratospheric sulphate aerosols.". *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences* **366** (1882): 4007–4037. doi:10.1098/rsta.2008.0131. ISSN 1364-503X. PMID 18757276. edit
79. Richard Gilbert, *Energy and Smart Growth: An Issue Paper*, Neptis, 2002, page 9
80. Rogner, H.-H. *et al.* (2007). *Executive Summary. In (book chapter): Introduction. In: Climate Change 2007: Mitigation. Contribution of Working Group III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz* et al. *(eds))*. Print version: Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Web version: IPCC website. ISBN 9780521880114. http://www.ipcc.ch/publications_and_data/ar4/wg3/en/ch1s1-es.html. Retrieved 2010-05-05.
81. Romm, Joseph. "Cleaning up on carbon", June 19, 2008
82. Rosenfeld, Arthur H.; Romm, Joseph J.; Akbari, Hashem; Lloyd, Alan C. (February/March 1997). "Technology Review". Massachusetts Institute of Technology. http://eande.lbl.gov/HeatIsland/PUBS/PAINTING/.
83. Schneider, Stephen H. (2004). "Abrupt non-linear climate change, irreversibility and surprise". *Global Environmental Change* (Elsevier) **14** (3): 245–258. doi:10.1016/j.gloenvcha.2004.04.008. http://www.oecd.org/dataoecd/9/59/2482280.pdf.
84. Schwartzman, Peter (unknown). *TRUCKS VS. TRAINS—WHO WINS?*. http://www.thezephyr.com/environ/trucktrain.html. Retrieved 2007-02-15.
85. *ScienceDaily.com* (Apr. 22, 2010) "Fossil-Fuel Subsidies Hurting Global Environment, Security, Study Finds"
86. Spencer Weart (July 2006). "Aerosols: Effects of Haze and Cloud". http://www.aip.org/history/climate/aerosol.htm.
87. State and Trends of the Carbon Market International Emissions Trading Association 2005
88. Statement of G8 Climate Change Roundtable Convened by the World Economic Forum June 2005

89. Statoil, Shell in plan to raise oil output by injecting CO_2 - report, AFX News via Forbes, March 8, 2006, checked 2009-01-15
90. *StoryOfStuff.com* (2009) "The Story of Cap and Trade"
91. Stott, et al. (2004), "Human contribution to the European heatwave of 2003", Nature, Vol. 432, 2 December 2004
92. The $20,000,000,000,000 question *Robins, Nick* for Opendemocracy
93. The California Solar Initiative[*dead link*]
94. The ghost of Gleneagles *Allen, Myles* for Opendemocracy January 2005
95. To the point of farce: a martian view of the hardinian taboo—the silence that surrounds population control Maurice King, Charles Elliott BMJ
96. Toth, F.L. *et al*. (2001). *10.4.7 Emerging Conclusions with Respect to Policy-relevant Scientific Questions. In (book chapter): Decision-making Frameworks. In: Climate Change 2001: Mitigation. Contribution of Working Group III to the Third Assessment Report of the Intergovernmental Panel on Climate Change (B. Metz* et al*. Eds.)*. Print version: Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. This version: GRID-Arendal website. ISBN 9780521015028. http://www.grida.no/climate/ipcc_tar/wg3/449.htm. Retrieved 2010-01-10.
97. United States Department of Energy World Trends
98. Who is Heating Up the Planet? A Closer Look at Population and Global Warming from Sierra Club
99. http://www.epa.gov/oppt/greenengineering/pubs/whats_ge.html
100. World Bank (2010). *World Development Report 2010: Development and Climate Change*. The International Bank for Reconstruction and Development / The World Bank, 1818 H Street NW, Washington DC 20433. doi:10.1596/978-0-8213-7987-5. ISBN 9780821379875. http://go.worldbank.org/BKLQ9DSDU0. Retrieved 2010-04-06.
101. Written testimony of Dr. Grifo before the Committee on Oversight and Government Reform of the U.S. House of Representatives on January 30, 2007, archived at http://oversight.house.gov/Documents/20070130113153-55829.pdf
102. written testimony of Rick Piltz before the Committee on Oversight and Government Reform of the U.S. House of Representatives on January 30, 2007, archived at http://oversight.house.gov/Documents/20070130113813-92288.pdf last visited Jan. 30, 07
103. Yohe, G.W. *et al*. (2007). *Executive summary. In (book chapter): Perspectives on climate change and sustainability. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (M.L. Parry* et al*., (eds.))*. Print version: Cambridge University Press, Cambridge, U.K., and New York, N.Y., U.S.A.. Web version: IPCC website. ISBN 9780521880107. http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch20s20-es.html. Retrieved 2010-05-15.
104. Young, E. (2008). *IPCC Wrong On Logging Threat to Climate.* New Scientist, August 5, 2008. Retrieved on August 18, 2008, from http://environment.newscientist.com/article/dn14466-ipcc-wrong-on-logging-threat-toclimate.html

THE END

ARTICLE

25

CHANGING SOCIALIST VALUES AND THE CONCEPT OF PERSONAL PARADISE: A STUDY OF ARNOLD WEAKER'S I'M TALKING ABOUT JERUSALEM

Deler Singh* & **Dr Anil Sehrawat**
Jaypee University of Information Technology, Waknaghat, Solan, Himachal Pradesh, INDIA

Abstract:

Arnold Wesker shows concern with the loss of humanitarian values in the modern capitalist society in many of his plays. Through his plays, he makes an attempt to awaken the working class people socially, culturally, politically and morally in order to reform the social system. He does not advocate bloody revolutions but instead asks for a sensible gradual progress. The present paper deals with Wesker's play *I'm Talking About Jerusalem* where Dave and Ada have a vision of a personal paradise. Ada and Dave experiment with Morrisian type of socialism, which emphasizes the creative expressions of an artist with its local traditions and ethics of work without any external control. This concept of socialism was evolved by William Morris after his disenchantment with the industrial capitalism, which reduces man to a mere appendage of the machine. Art, according to Morris, should find free expression and should have a stamp of originality and endurance. To translate their vision into reality, Ada and Dave retire to a Norfolk village to build their idyllic world where there would be full realization of one's self in the absence of the capitalist exploitation. But the escape by Dave and Ada from the industrial capitalist society into isolation in the countryside to live by work on an individual level proves futile. It proves to be a romantic not scientific solution against the brutalizing effect on man of capitalist society and they are forced to return to the industrial society of London. Wesker here tries to show that an individual cannot build a Jerusalem without the help of other people in the society. Wesker wants that we should try to reform the society by living inside it. He wants everybody to share the fruits of culture and knowledge achieved by the society. If anybody tries to live on an individual level; he is walking against the current of progress.

Introduction

Arnold Wesker shows concern with the loss of humanitarian values in the modern capitalist society in many of his plays. Through his plays, he makes an attempt to awaken the working class people socially, culturally, politically and morally in order to reform the social system. He does not advocate bloody revolutions but instead asks for a sensible gradual progress. The present paper deals with Wesker's play *I'm Talking About Jerusalem* where Dave and Ada have a vision of a personal paradise. Ada and Dave experiment with Morrisian type of socialism, which emphasizes the creative expressions of an artist with its local traditions and ethics of work without any external control. This concept of socialism was evolved by William Morris after his disenchantment with the industrial capitalism, which reduces man to a mere appendage of the machine. Art, according to Morris, should find free expression and should have a stamp of originality and endurance. To translate their vision into reality, Ada and Dave retire to a Norfolk village to build their idyllic world where there would be full realization of one's self in the absence of the capitalist exploitation. But the escape by Dave and Ada from the industrial capitalist society into isolation in the countryside to live by work on an individual level proves futile. It proves to be a romantic not scientific solution against the brutalizing effect on man of capitalist society and they are forced to return to the industrial society of London. Wesker here tries to show that an individual cannot build a Jerusalem without the help of other people in the society. Wesker wants that we should try to reform the society by living inside it. He wants everybody to share the fruits of culture and knowledge achieved by the society. If anybody tries to live on an individual level; he is walking against the current of progress.

DAVE AND ADA'S VISION OF A PERSONAL PARADISE

I'm Talking About Jerusalem covers thirteen years from 1946 to 1959. This play charts a process of disillusionment by focusing on a private experiment with political implication Ada and Dave's attempt to build a socialist life for themselves on William Morris's lines in the lap of nature, away from the rush and confusion of industrial civilization.The seeds of the play were sown in his earlier play *Chicken Soup with Barley* when Ada declares: "When Dave comes back we shall leave London and live in the country" (*TWT* 41). Innes rightly puts in his book on Modern British Drama that, "*Roots* serves both as a commentary on the earlier play, and as a touchstone for *I'm Talking About Jerusalem*. Documenting the failure of a William Morris alternative socialism, this concluding drama in the Trilogy covers the period from the first scene of the middle Act in the opening play (1946) to a point following the end of *Roots* (1959-1960)" (Innes 108). As a volunteer for the International Brigade in Spain, Dave wants to actualize his vision of international socialism into reality but unfortunately, his experiences during the war make him realize that this vision was nothing but an illusion. He gets shocked to find that his fellow comrades participating in the Spanish Civil War know nothing about war as they "behaved like animals" (*TWT* 42). There are no feelings of camaraderie and sympathy in them. It was this disillusionment that had made many people like Dave to harbor the ideas of changing the world through the organized, militant working class movement. Resultantly, Dave decides to jump into a private heaven in order to live according to his ideals. Ada and Dave are against the industrial society, which has deprived the workers of their dignity and freedom. Their wrath is directed against such rotten society, which, they think, makes "a man stand on his head and then convinces him he is good looking" (*TWT* 42). Like Dave, Ada also has this realization that people in industrial societies lack respect for human values, ethics and morals. Such attitude of people in the society has converted them into "Lipsticked, giggling morons" (*TWT* 42).

She firmly believes in such views regarding society and is quite forceful when it comes to voicing her discomforts openly. She does not spare even her parents when she tells them, "You have never cried against the jungle of an industrial society. You've never wanted to destroy it's values-simply to own them yourselves" (*TWT* 42). Ada and Dave's temperament is a clear indication that they are not merely uncomfortable with the situation, but they want to rectify it also. They want to replace the wrong values with the right ones through measures such as Morris's reversal to a rural state of artisan self-sufficiency. They think of living a life of individual fulfillment, which is in harmony with their work and environment. Dave wants to construct his own wood-craft shop and sell his crafted goods directly to the customers. By doing so, he does not want to prove himself an artist or a powerful wealthy man. Rather, he wants to be a man who is useful to himself, to his family and to the society while enjoying his freedom and dignity. He wants to instill the feeling of creativity in others like Morris and see everything in society as a work of art. Both of them want to shape their lives in congruence with the Morris's Socialist ideals. But the failure of this experiment and the reasons for its failure seem to be the primary themes of the play. Wesker, in the play, does not only talk about Jerusalem but also dramatizes the complications that arise in making it. The title of the play turns out to be ironic because Jerusalem does not materialize.

LIFE OF IDEALISM AND HIGH PRINCIPLES IN NORFOLK

Dave and Ada, in an attempt to convert yet another dream into reality, reach at their Norfolk cottage where there are, "No roads, no electricity, no running water, no proper lavatory" (*TWT* 160). Their arrival there marks for them a complete break from the city life that is full of amenities. Their friends and relatives fail to understand the logic behind their move. They undermine their faith in their ideal. Sarah asks: "What's wrong with socialism that you have to run to an ivory tower" (*TWT*164). Even the two removal men, petty labourers, symbolizing "the world" (*TWT*162), according to Ronnie, cannot see any good reason for opting out of society:

1st R. M: What made you move here, mate? Not being nosey or anything, but you can't say it's everybody's choice of a new home.
Dave: It's a long story.
2nd R.M.: Couldn't you find a better place? More convenience? I mean it's not very sanitary, is it? (*TWT* 162)

For Ronnie, Dave and Ada are inspiring figures and he respects them. However he asks them for a clarification on their move and their views regarding socialism. He says:

Ronnie: Come on, Dave. Give them an answer. It's a golden opportunity. The world has asked you why you've come here. There stands the world [To R. Men] and here stand you two. You're on trial comrade. (*TWT* 162)

When Ronnie insists on knowing about their changed course and the reasons for their disillusionment in communism, Dave replies that, "I'm not going to make speeches, Ronnie" (*TWT* 162). Ada also echoes his thoughts and says, "It's no good trying to explain. We're here and let's…" (*TWT* 163).They just want to live according to their ideals. They don't believe in giving any justification for their decision and prefer living in accordance with their ideals. But still, the play in itself turns out to be an explanation of their decision. Wesker analyses every single aspect of Dave and Ada's individual socialism. Eventually, all the illusion associated with the nature of their vision clears towards the end of the play.

CRITICISM OF DAVE'S VISION

The bitterest attack on their decision comes from Libby Dobson, who is an embittered ex-socialist. Like Dave and Ada, he also has made numerous socialist experiments. He calls them: "Two ex-communists" (*TWT* 180)! He adds further that, "There's nothing more pathetic than the laughter of people who have lost their pet faith" (*TWT* 180). At a point, he seems to be justified in his bitterness as he himself has already tried and failed in somewhat that is quite similar to what Dave is trying to realize. He expresses his feelings when he says, "I've tried it, Dave - listen to me and go home-I've tried it and failed. Socialism? I didn't sell out that easily. You've gone back to William Morris, but I went back to old Robert Owen" (*TWT* 182).

Dobson had already tried to live socialism on Owen's lines as he ascribed social evils to the industrial system. He struggled to affect a new economic and social order by grounding the relations between the employees and the employer on cooperation rather than competition. He thought that nobody should be without property. On the whole, he envisioned a society that consisted of small, autonomous and cooperative communities that are established by the consent of all the people irrespective of the class or situation. Following Owen's lead, Dobson shared his five thousand pounds with some mechanics to build a cooperative workshop. He also made a plan that, "as soon as there is an excess profit of another thousand pounds, we find someone else to inherit it and we expand that way" (*TWT* 182)! But contrary to his expectations, he was betrayed. He says that he got "dirtied up" (*TWT* 183) while trying to practice socialism through his individual efforts. For this reason, he questions Dave's ideas of living socialism on "an individual level" (*TWT* 181). He says that such ideas cannot be successful in this industrial society:

That's just it! They are simple phrases. Simple, inane and irresponsible I Individual level! Have you ever taken your ideas to their logical conclusion? Well, have you? Hasn't a worker in a factory ever looked at you as though you were mad-a little potty, you know? Would you have the world do without cars, planes, electricity, houses, roads? Because

that's the logical conclusion. If no man should be tied to turning out screws all his life, then that's what it means. No screws - no transport! No labours- no roads! No banks or offices - no commercial market! No humdrum jobs, then no anything! (*TWT* 181)

But Dave is completely disillusioned by the city life and calls it a "sheer boredom" (*TWT* 182). He further complains that the city has "numbed us made us soggy and soft" (*TWT* 182) and it also makes "strangers of husbands and wives" (*TWT* 165). He believes that industrialization has dehumanized mankind which is evident in his statement:

Since being demobbed I've worked in a factory turning out doors and window frames and I've seen men hating themselves while they were doing it. Morning after morning they've come in with a cold hatred in their eyes, brutalized! All their humanity gone. These you call men? All their life they're going to drain their energy into something that will give them nothing in return. (*TWT* 164)

DISILLUSIONMENT AT NORFOLK

In spite of this, their decision to live their life away from society appears to be quite illusory. Though they have prepared a perfect plan according to them but still they remain connected to the industrial society in one way or the other. They cannot completely sever their relation with society as it fulfils many of their needs. All the things they use in their house are proofs of their dependence on the industrial society.

From Dave's acceptance of carpenter's job at Colonel Dewhurst's farm to his taking money from Colonel to build a carpenters workshop, the society's influence is visible everywhere. The idealism of employer-employee relationship between Colonel Dewhurst and Dave also fails because he is very professional and business-minded. His only mission is to earn money. Wesker here emphasizes that in the rural areas; the employer-employee relationships are worse than in the industries. There are no service conditions for these people and they can be fired without any proper notice. To show this condition, we have the example of Dave when he is fired by his employer on theft charges. Dave doesn't get any opportunity to explain his position and is dismissed. The incident again puts him in the situation from which he had tried to escape. Colonel tells him that there is a great difference between the city and country life and one should not carry the habits of one place to the other:

Colonel: In fact I don't understand you at all, Simmonds. What did you come to the country for? It's a different way of life here, y' know. They're a slow people, the country people - slow, but sound. I know where I am with them, and they know their place with me. But with you I could never -
Dave: Never get the right sort of master-servant relationship?
Colonel: Yes, if you like. But you didn't like, did you? You spoke to me as if I were a-a-
Dave: An equal.
Colonel: I don't like it, Simmonds. I'm not a slave driver, but I believe each person has his place. (*TWT* 186)

This theft episode gives us Wesker's point of view from where we can see Dave's character in an altogether different light. It hints at the moral failing in Dave, which will prevent him from achieving his ideal. Ada also points out this behavior of Dave and says, "By Christ, Dave - your ideals have got some pretty big leaks in places haven't they (*TWT* 188)? After this incident Dave starts feeling that Norfolk has lost its spiritual meaning for him and has become an alien country. It is Ada at this point who does not let him give up. She tells him: "we'll have to afford it. I'm not giving up. We'll eat less, we'll buy less, we'll do something but I'm not going away from all this" (*TWT* 187). Thus "the play belongs at least as much to the wife as it does to Dave, for at every crisis it is her decision that stops him from giving up and her earnest, didactic manner which carries the arguments with which Mr. Wesker seems most strongly to align himself" (Leeming 20). Wandor also makes a similar observation about Dave and Ada's situation, when she says, …when Ada and her husband Dave try to live out a utopian socialism in Norfolk …it is Dave who is the crafts man, Ada who backs him up" (Wandor 148).

Eventually when Dave succeeds in building his own furniture workshop, he receives another setback. He works there with his apprentice Sammy, whom he treats equally. Though Dobson warns him about the possible failure of his vision of equality and cooperation, he does not believe him. But Dave fails in his conviction as Sammy moves away from Dave to work in a factory, for Sammy considers money to be a better incentive than the equal status.

When people who come to buy furniture for him prefer low price, ignoring the artistic qualities of his works, he feels shattered. It becomes very difficult for him to make things according to his vision and imagination. During one such incident when a man asks him to make a chair, Dave employs all his innovative skills to make that chair. But Dave feels outraged as the man fails to appreciate his craft and cancels the order because the price according to him was high. He says, "That's the third person done this on me. Blast them, all of them. Twentieth century, shortsighted, insolent, Philistine - type bastards! And the world depends upon them, you know that Ada? Oh sweetheart, what an awful welcome" (*TWT*192).

DAVE'S SURRENDER

Towards the end of the play, Dave surrenders to the world of machines, which he had struggled so hard to get rid of. To survive in the industrial society he gives up his manual labor and buys machines which will increase his production. Dave's need for the machines and his struggle to get a loan sanctioned for it exposes how desperately

he depends on the social system that he hated the most. He has to turn to this very inhuman society to survive in the world. His aunt Esther rightly points out:

Now that's something I don't understand. I can remember him saying when he first moved here that he wanted to make furniture with his own hands. Now he's buying machinery, he'll be like a factory only not big enough to make their turnover. So where's the ideals gone all of a sudden? (*TWT* 200)

Earlier in the play, Dave had tried to warn his apprentice against the monetary considerations, but now he himself is trying to learn to talk with a bank manager to get the loan sanctioned. Dave no longer considers himself an idealist or a prophet. He tells Ronnie: “Once I had- I don't know-a- a moment of vision, and I yelled at your Aunty Esther that I was a prophet. A prophet! Poor woman, I don't think she understood. All I meant was I was a sort of spokesman. That's all. But it passed” (*TWT* 215). He accepts his defeat when he says, “Don't moan at me about visions. Don’t you know they don’t work? You child you - visions don't work” (*TWT* 216).

The circumstances make Dave accept the new techniques and industrialization as the inseparable part of his life to meet the daily needs of his family members. His efforts to imbibe socialism without depending upon others fail. After this disillusionment, he feels shattered and he is forced to return to the industrial and inhuman society of London. His domestic survival becomes his ambition now. He now starts considering lowering his standards of craftsmanship in order to survive in the hostile world. He says: “Well, now the only things that seem to matter to me are the day-to-day problems of my wife, my kids and my work. Face it-as an essential member of society. I don't really count. I’m not saying I’m useless, but machinery and modern techniques have come about to make me the odd man out” (*TWT* 216). Dave has already admitted total defeat, even though the retreat from the country does not come for another three years.

Conclusion

All the hopes and ideals of Ada and Dave fail and they feel alienated and dejected. They fail in their attempt to live the socialist life. Even Ronnie is shocked at the Simmonds’ failure and asks in despair: “Then where do we look for our new vision?” (*TWT* 216), to which Dave replies, “when I was younger I was even brighter. I was interested and alive to everything, history, anthropology, philosophy, architecture - I had ideas. But not now. Not now Ronnie…I'm not saying I'm useless, but machinery and modem techniques have come about to make me the odd man out” (*TWT* 215-216). Wesker here seems to analyze that ignorance of social progress whether deliberate, like that of the Simmonds, or unconscious like that of the Bryants will only cause harm. There is no escape from the prevailing norms of the society. In fact, paradoxically man can only be free by accepting the ties of social norms. We have to live with the progress society has made. We have come to depend on each other inescapably. Anything we want to accomplish can only be accomplished through a concerted action. Scientific progress and technological innovations cannot be separated from the concept of man's freedom.

Wesker in this play advocates that no ideology is totally perfect. Escape into individualistic way of life due to the pressures of the capitalist society is not a pertinent solution. Therefore, as Gindin says, the fate of Dave and Ada, “…does not depict the failure of a social ideal. Rather, the play presents the failure of two individuals, of Ada and her husband, to shape their lives in terms of the William Morris kind of ideal” (Gindin 56). Moreover, an effort to build socialism on individual level is unthinkable as socialism is not individual concept but belongs to the whole society. This vision can be achieved by the collective efforts aimed at abolishing the capitalist society. Turning away from the technological and industrial progress brought by capitalism does not bring any result.

References

1. Gindin, James Jack, Post war British Fiction: New Accents and Attitudes, University of California Press, London, 1965
2. Innes, Christopher, Modern British Drama: The Twentieth Century, Cambridge University Press, New York, 2002
3. Leeming, Glenda, Wesker, the Playwright, Methuen, London, 1983
4. Wandor, Michelene, Carry On, Understudies: Theatre and Sexual Politics, Routledge.
5. Kegan Paul, New York, 2005
6. Wesker, Arnold, The Wesker Trilogy, Longman, London, 1965

THE END

ARTICLE

26

BIOMECHANICAL ANALYSIS OF KICKING WITH INSTEP IN SOCCER

Dr. Krishna Kant Sahu
Asst. Director, ASPESS, Amity University, Noida, INDIA

Abstract:
The role that sports biomechanics can play is becoming more widely understood in the sports community and the demand for service increasing, research in sports biomechanics will have to consider carefully. This arouses curiosity in scholar to biomechanically compare two types of kicks mainly used in soccer. The study may be utilized for determining technical faults of skills and making corrections, used for selecting training programs.

Introduction

All movements of material bodies, both of men and animals, are subjected, without exception, to the laws of mechanics, as every movement involves mechanical movement and the locomotion of part of mass in space and time. It is the only first task of sciences to recognize this. It is necessary to make this qualification, because movement is not only locomotion, but is also a change in quality in fields above the purely mechanical. When we talk about scientific application of techniques it means to develop scientific basis of the techniques through skill analysis in the laboratory, or in the field.

In recent years, research in soccer has been developed, but few investigations have been exclusively concerned with muscle activity to the soccer kick motion. Some investigations (clarys et.al. 1984) have reported that extensor muscles are likely to be active during the flexion movement and vice versa. The so called 'soccer paradox'. The instep kick is one of the most fundamental and frequently used skills in the game of soccer. As many players perform the instep kick, it is often performed approaching from straight or slight diagonal.

In performing kicking movement the dominant extremely functions as an open kinetic chain system. In this segmental link system the internal muscle torques act between the individual links that in soccer kicking are thigh, shank and foot.

Purpose of the study was to biomechanically analyse kicking the ball with instep of the foot on selected biomechanical variables.

Methodology

The subjects selected for this study were four male football players of university level. Sequential photographs, the 'elgon' were prepared to analyze the kick. From the photographs, the 'elgon' were prepared by using segmentation method and various biomechanical variables were obtained.

The selected biomechanical variables were:-

- Angle at hip joint (right and left).
- Height of center of gravity at movement of stance.
- Movement of Execution.
- Movement of follow-through.
- Total horizontal distance covered by ball.
- Distance covered by ball in flight.
- Total time taken and time taken during flight.

All the kicks perform by right leg and left leg was always non-kicking leg.

Analysis of data and result of the study

The analysis of data and findings has been presented in following tables, from table 1 to table 4.

Table 1 MEAN OF SELECTED ANGULAR KINEMATIC VARIABLES OF INSTEP KICK AT THE MOVEMENT OF STANCE

Variables	Kick	Means
Right Hip Joint	Instep	179.75
Left Hip Joint	Instep	117.25
Right Knee Joint	Instep	123.75
Left knee Joint	Instep	139.75

Right Ankle Joint	Instep	134.25
Left Ankle Joint	Instep	92.75

*significant at .05 level of confidence

Table 2 MEAN OF SELECTED ANGULAR KINEMATIC VARIABLES OF INSTEP KICK AT THE MOVEMENT OF EXECUTION

Variables	Kick	Means
Right Hip Joint	Instep	151.25
Left Hip Joint	Instep	143
Right Knee Joint	Instep	140.25
Left knee Joint	Instep	143.75
Right Ankle Joint	Instep	114.5
Left Ankle Joint	Instep	89.75

*significant at .05 level of confidence

Table 3 MEAN SELECTED ANGULAR KINEMATIC VARIABLES OF INSTEP KICK AT THE MOVEMENT OF FOLLOW-THROUGH

Variables	Kick	Means
Right Hip Joint	Instep	92.75
Left Hip Joint	Instep	150.5
Right Knee Joint	Instep	160
Left knee Joint	Instep	158.5
Right Ankle Joint	Instep	122
Left Ankle Joint	Instep	86

*significant at .05 level of confidence

Table 4 MEAN SELECTED LINEAR KINEMATIC VARIABLES OF INSTEP KICK.

Variables	Kick	Means
Total Distance Covered (mts.)	Instep	73.101
Distance Covered in Flight (mts.)	Instep	64.2
Time Taken During Flight (mts.)	Instep	3.29
Total Time Taken (secs)	Instep	9.29
Height of C.G.at Stance (cms.)	Instep	116.69
Height of C.G.at Execution (cms.)	Instep	109.46
Height of C.G.at Follow-through (cms.)	Instep	118.50

*significant at .05 level of confidence

Results show that certain angular kinematics variables and linear kinematics variables have significant difference between the kicks of soccer.

Conclusions

1. All the angular kinematic variables like angle at right knee joint, right ankle joint, left ankle joint, at movement of stance , right ankle joint at the movement of execution, the movement of follow-through angles at left knee joint and right ankle joint play and exhibits significant role in kicking with instep kick.
2. Linear kinematic variables also have significant role except in the case of height of center of gravity at movement of stance, which shows a little impact on the performance.

Recommendations

Based on the conclusion drawn in this study, the following recommendations have been made:

1 The results may be utilized for determining technical faults of skill in kicking and to correct the faults.

2 The results may be used for selecting training programme.

3 The study may be conducted by using cinematography and subject of other performance level, sex and bigger size of sample.

4 Similar studies may be conducted on other types of kicks in soccer as well as on other games and sports.

References

1. Clarys.J.P. Dufous.W. and Pynaert.M. *Electromyographies of 3 soccer kick Movements* Goneestundeen Sport (1984), P.17-21
2. Devries, Herber A. A "Cinematographically Analysis of the Dolphin Swimming." Research Quarterly30: (Oct.1959) : 1333.
3. Hay, James G. "*Sports Biomechanics a Status Report*." Journal of Sports Science2 (1984):91-93.
4. Hochmuth, Gerald *Biomechanics of Athletic Movement* (Berlin: sportverlog, 1984), P.9.
5. Shaw, Dhanjoy.*Biomechanical Comparison of Different Variations of Selected Judo Skill.* Unpublished M.Phil's Dissertation, Jiwaji University, 1987.

THE END

ARTICLE

27

GEOGRAPHICAL ANALYSIS OF TOURIST TRAVEL CIRCUITS IN KARNATAKA

Dr. S.C. Adavitot
Head, Department of Geography, C.B.Khedgi's B.Science, R.V.Commerce, R.J. Arts College, Akkalkot,Maharashtra, INDIA

Abstract:

Tourism is one of the largest and fast growing industries in the world. The concept of Tourist Travel circuit has been studied and applied in studies related to developing countries of the world. The present concept is based on periodic market cycle. The basic aim is to identify and analyze the pattern of tourist Travel circuit. Karnataka is located on the Indian Peninsular Plateau. For this purpose secondary data has been used to analysis the tourist travels circuits and its geographical and tourism characteristics. With the help of GIS a tourist travel circuit map was prepared and interpreted accordingly. There are total five tourist travel circuits having different natural, cultural, historical characteristics. The study reveals that out of five circuits the maximum flow of tourist visits to Coastal circuit destinations which is top ranking and it includes, Dakshina Kannada, Udupi and Uttara Kannada districts. Followed by Southern Travel Circuit which is rich in Archeological, Religious, Historical background it includes Bangalore, Mandya, Tumakur, Mysore, Hassan, and Kolar districts. The study suggests that there is wide scope for the development of agro tourist destination in between two important destinations. The circuit number five is unable to attract tourist as it is famous for wild life travel circuit, here also wide scope for attracting maximum number of tourists by providing basic and ultra modern amenities for the tourist.

Introduction

The 21st Century tourism is one of the largest and fast growing industries across the world. As being Tourism activity had been remarked the major source of foreign exchange as well as economic growth in many developing and developed countries. Tourism has wider implications encompassing not only economic benefits but also social and cultural. Cultural tourism is a fertile ground for exercising creative talents fostering special kind of relations between the visitors and the host populations. It encompasses economic, social, cultural, educational and political significance. The socio-economic and technological advancement of society have been resulted infrastructural development and consequently improvement of standard of living.

Objectives of the Study:

The major objective of this study is to understand and analyze the pattern of the tourist flow through Travel circuit's destinations in the state of Karnataka.

Data Base and Methodology:

Basically this study is based on the secondary data collected from various departments such as Department of Tourism (Karnataka), India Tourism Development Corporation and from the private agencies working in this field. Statistical and cartographical techniques & GIS tool has been used to process the data and interpret the result.

Study Area:

Karnataka lies in the region south to the tropic of cancer. It is located on the Indian peninsular plateau. It occupies the Western & southern part of India. The latitudinal extent is between $11^0 30^1$North parallel to 18^0 30^1 North Parallel while a longitudinal extent is 74^0 East of Greenwich to 78^0 30^1East of prime Meridian of longitudes. The western boundary of the state is bordered by the Arabian Sea. The State of Maharashtra & Goa lies on the north and north-west of Karnataka and Andhra Pradesh is to the east of Karnataka where as Tamil Nadu lies towards south east and Kerala is located towards south of Karnataka. It cover area of 1, 91,791 sq.km and it occupies a total 5.8 % land of the country. The North-South extent of Study area is 750 km and its East-West extent is 400 km. The Major Tourist Destination are Classified as follow Natural Beauty- Coorge, Madikere, Historical – Hampi, Badami, Pilgrimage- Dharmastala, Kollur.

As regards population, Karnataka ranks 9th in the country. According to the census of 2011 Karnataka has a population of 61,130,704 people. There are 50.9% male and while the females are 49.1 percent. The density of population in the state is largely uneven due to many geographical, developmental, and other factors. According to the 2011 census, the general density in the state is 320 people per sq.km. The highest point in Karnataka is the Mullayanagiri hill in Chikkmagaluru district which has an altitude of 1929 meters above sea level.

There are naturally landscaped hill stations like Coorg, Chikkmagaluru, Kudremukha, Nandi Hills etc. and valley with scenic beauty the numerous historical forts that are spread throughout the state, the beautiful palaces, places of cultural heritage and the magnificent long cost line in the state. Apart from these attractions there are National parks, wildlife sanctuaries and as well as various places of pilgrimage. These destinations are attracting domestic as well as the international tourists. Therefore state has emerged as an important instrument for economic and social development of Karnataka.

Major Tourist Travel Circuit in Karnataka State:

Circuit 1: Religious or Coastal Tourist Travel Circuit:

The destinations in Religious or Coastal Tourist Travel Circuit are located across the districts of Dakshina Kannada, Udupi and Uttara Kannada, which cover the major coastal regions of Karnataka. The tourism destinations identified

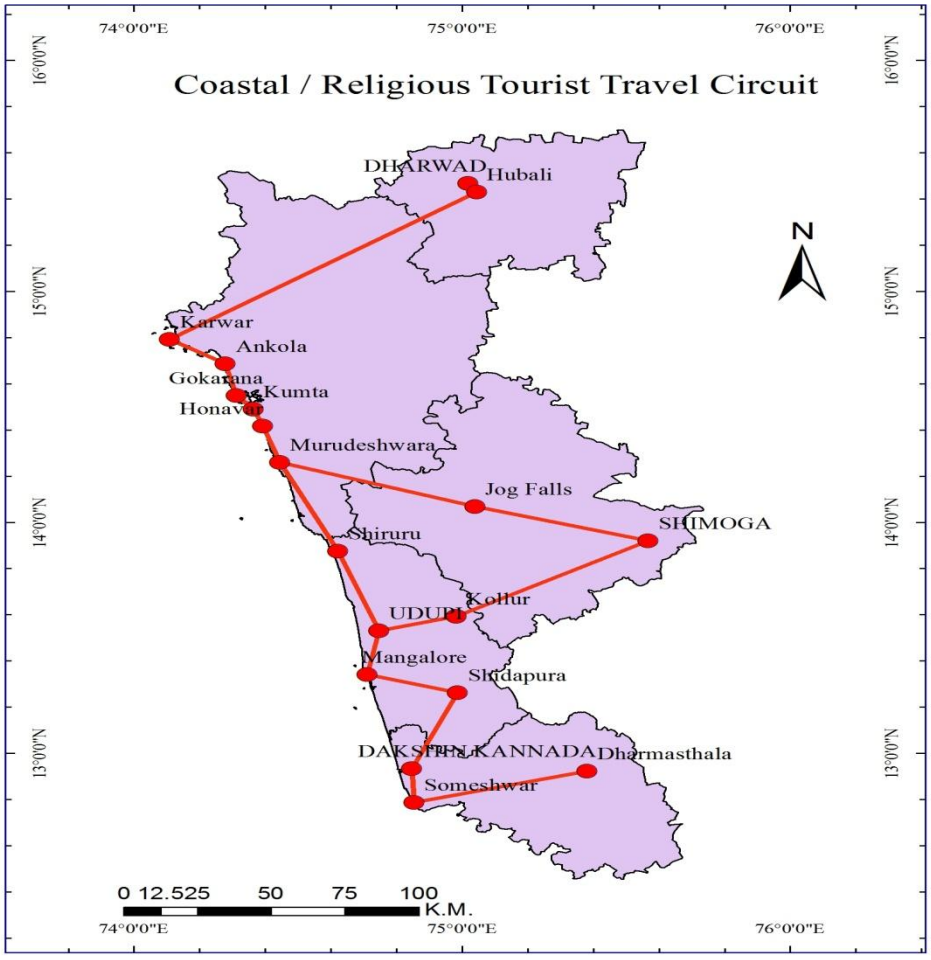
consists of a number of major and emerging destinations. The city of Mangalore is the largest urban centre in the circuit and the natural entry point cum hub for the destinations in Religious or Coastal Tourist Travel Circuit. Given the geographic spread of the tourism destinations, there are other towns which can be secondary hubs cum accommodation points in addition to Mangalore, namely Udupi and Karwar. The Religious(Gokarana, Murdehwar and Shree Krishna Temple Udupi) or Coastal Tourist Travel Circuit forms a longitudinal circuit along the Karnataka coastline with the distance between both ends being around 290 kilometers. The characteristics of circuit 1 is a combination of beaches, backwaters, scenic and religious destinations. Therefore this circuit contribute 91 per cent of the overall tourist inflows to the districts.

Tourist Flow in Religious or Coastal Tourist Travel Circuit: The destinations in Religious or Coastal Tourist Travel Circuit are located across the three coastal districts of Dakshina Kannada, Udupi and Uttara Kannada. The contribution of the above districts to the overall tourist inflows to Karnataka is provided in the Table 1.1 below. The three districts contribute around 16% of the total tourist inflows to Karnataka and 8.6% of international visitors. In this circuit high proportion of domestic tourist inflow in Dakhsina Kannada district destination and international tourist inflow is toward Uttar Kannada district.

Table 1.1 Tourist Flow in Religious or Coastal Tourist Travel Circuit

Destination	Domestic Tourist	International Tourist	Total
Dakshina Kannada	87,69,681 (99.97per cent)	2577 (0.029 per cent)	87,72258 (100 per cent)
Udupi	27,51,891 (99.62 per cent)	10,477 (0.37 per cent)	27,62,368 (100 per cent)
Uttara Kannada	20,05,769 (98.21 per cent)	36,533 (1.78 per cent)	20,42,302 (100 per cent)

Source: Report of Department of Tourism 2012



Circuit 2: Southern Tourist Travel Circuit:

This Tourist travel Circuit Covers Bangalore Mysore Mandya Srirangapatana- Sravanabelagola- Halebid- Belur – Hasan Tumakur Nandi Hills etc. Bangalore is busy destination for domestic tourist while Mysore is busy for

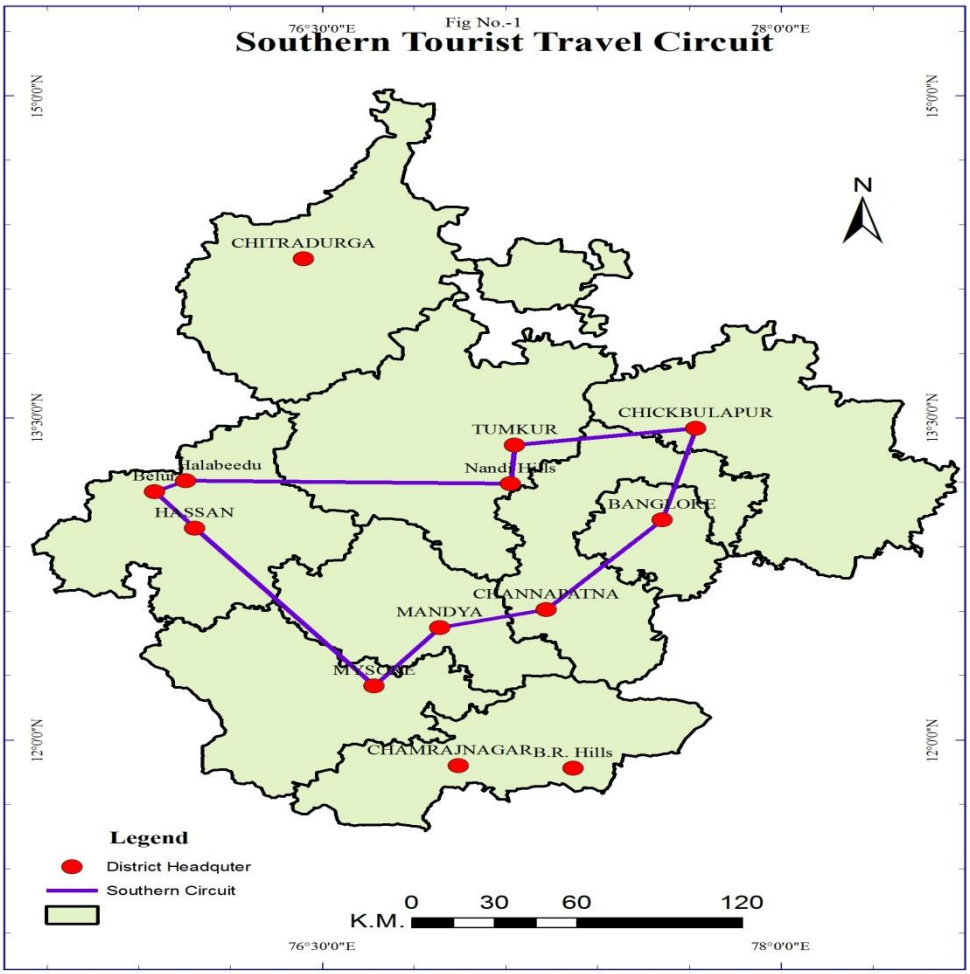
international tourist flow. Because Bangalore and Mysore is famous for religious, historical, and natural beauty. Tumakur and Mandya district is low proportion of inflow tourists domestic and international tourists.

Table 1.2 Southern Tourist Travel Circuit's Tourist Flow

Si.No.	Name of the District	Domestic Tourist	International Tourist	Total
1	Bangalore	2556416 (98.37per cent) 59.27	42118 0.97 (1.62per cent)	2598534 (100 per cent)
2	Tumkur	92362 (99.87per cent)2.14	112 (0.137per cent 2)	92474 (100 per cent)
3	Hassan	125381 (95.93per cent)2.90	1307 (4.07per cent)	126688 (100 per cent)
4	Mysore	1400367 (96.9637per cent)32.47	43783 1.01 (3.0337per cent)	1444150 (100 per cent)
5	Mandya	50517(99.68per cent)1.17	161 (0.31)	50678 (100 per cent)
				4312524

Source: Report of Department of Tourism 2005-2006

Fig No.-1



Circuit 3: Northern Karnataka Circuit:

This Tourist Travel Circuit Covers Hubli- Dharwad-Gadag-Hampi- Hospet- Badami-Pattadakal-Aihole-Bijapur- Bidar-Gulbarga-Yadagir- Raichur, Bellari Destinations.

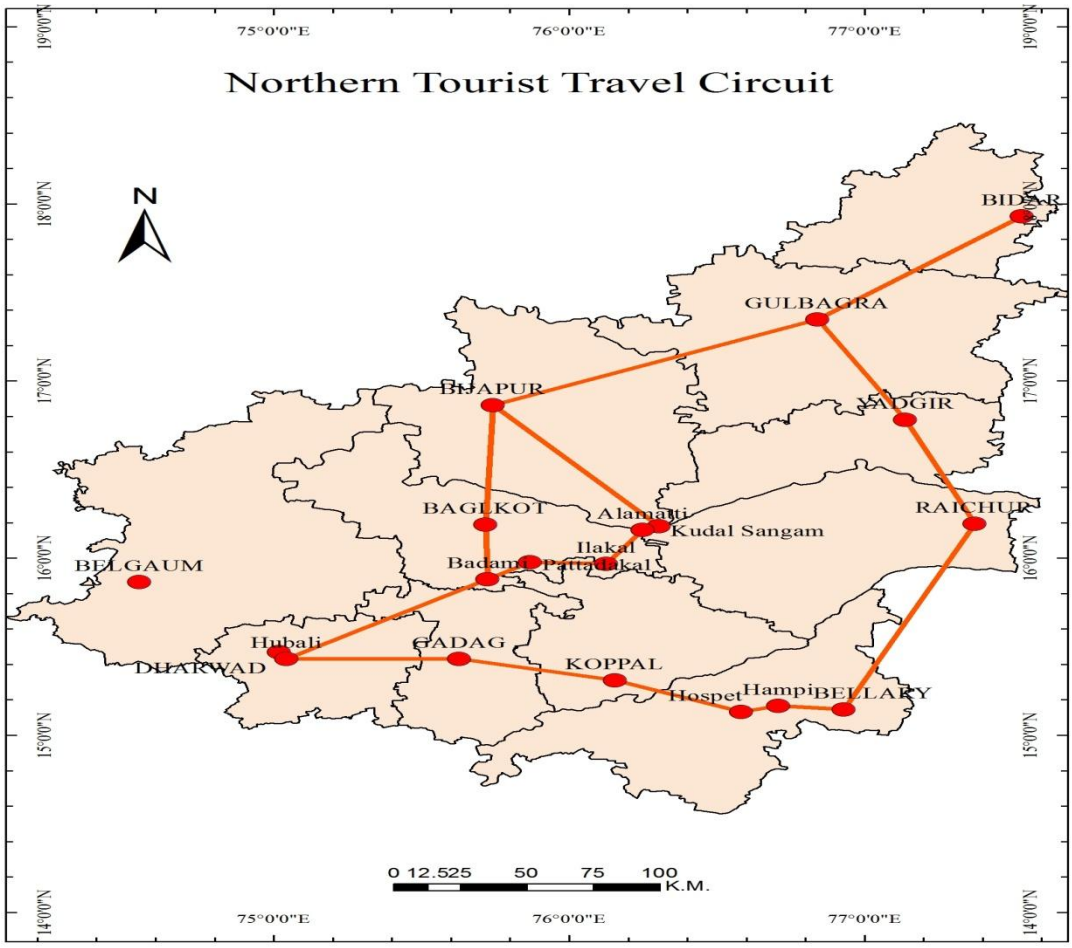


Table 1.3 Northern Tourist Travel Circuit's Tourist Flow

Si.No.	Name of the District	Domestic Tourist	International Tourist	Total
1	Dharwad	100924(19.75)	154	101078
2	Bagalkot	63250(12.37)	213	63463
3	**Bijapur**	**177928(34.80)**	**2574(0.50)**	**18052**
4	Raichur	84540(16.53)	93	84633
5	Gulbarga	175658(34.36)	693(0.13)	176351
6	Bidar	67368(13.17)	210	67578
				511155

Source: Department of Tourism 2005-2006

As per table 1.3 Northern Tourist Travel Circuit's Tourist Flow Shows that Bijapur (34.80per cent) is the top most destinations for domestic as well as international tourist. It is famous for the historical monuments while Gol Gumbaz is world heritage center. Followed by Bagalkot ,Gulbarga, Dharwad, Hubali, Raichur, and Bidar etc. In these Hampi, Aiwale, Pattadkal are historical heritage destination while Badami, Hubali Kudalsangm and Ganagapur a religious destinations located in this circuit.

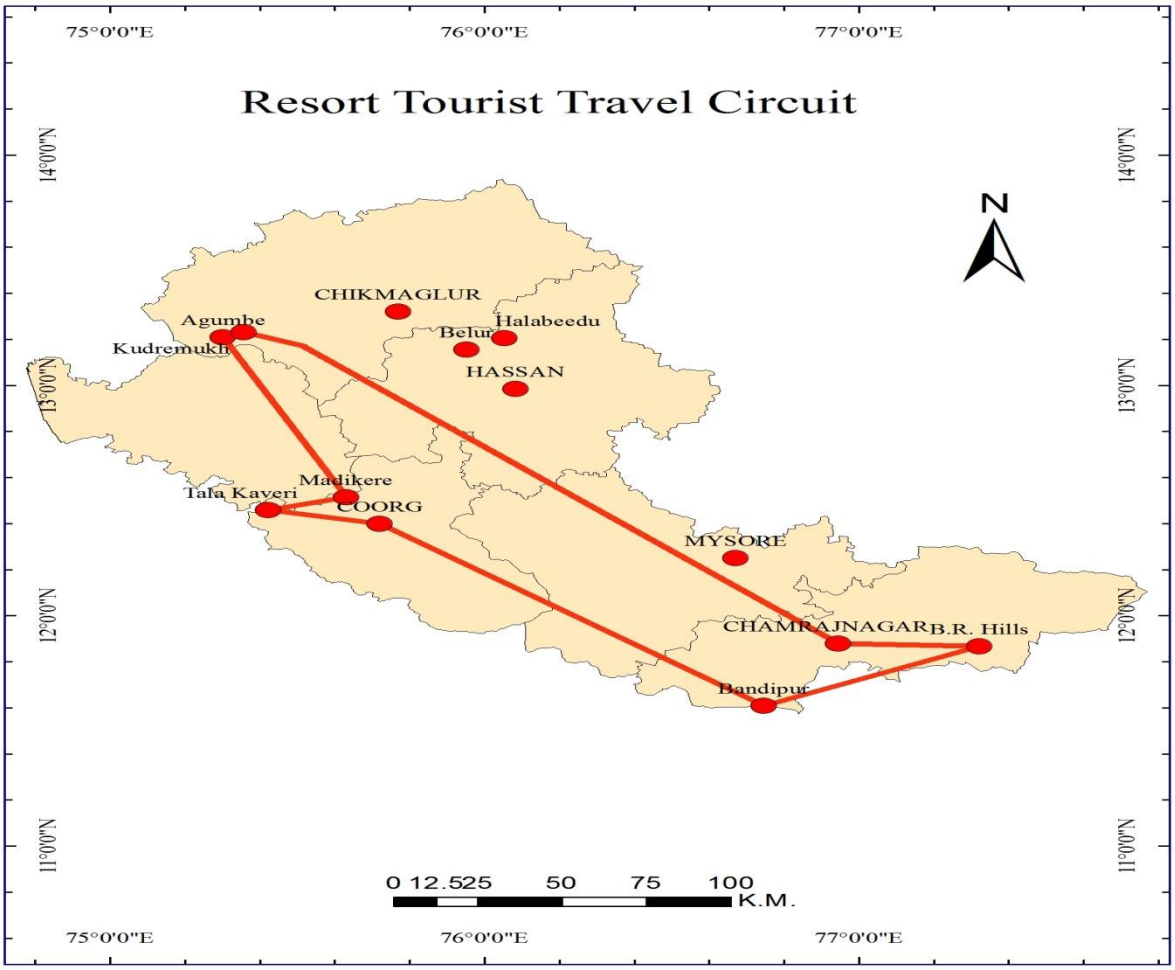
Circuit 4: Resort circuit:

This circuits covering the hill stations like Mercara(Coorg) Chikkmagaluru, Kudremukha, Nandi Hills, Sandur, Biligere, Rangan Hills etc**.** In this circuit domestic as well as international tourists flow to Madikere destination. It is rich for natural beauty so it is known as **Scotland of India.**

Table 1.4 Resort Tourist Travel Circuit's Tourist Flow

Sr.No.	Name of the District	Domestic Tourist	International Tourist	Total
1	Chamarajnagar	24255 (10.40per cent)	00	24255
2	Madikere	133434 (57.23 per cent)	2445 (1.04 per cent)	135879
3	Chickkamanglore	72795 (31.22 per cent)	200 0.08	72995

Source: Department of Tourism 2005-2006



Conclusion:

Tourism is one of the largest and fast growing industries across the world. Karnataka is the hub of tourism. The study reveals that Millions of domestic and foreign tourists visit to Karnataka because of promotional efforts taken by government of Karnataka. As par number of tourist flow to the each destinations the coastal circuit ranks first to attracting high proportion of domestic tourist inflow in Dakhsina Kannada district destination and international tourist inflow is toward Uttar Kannada district.

The second ranking tourist travel circuit is Southern circuits where Bangalore and Mysore is famous for religious, historical, and natural destinations are located.. In Northern circuits Bijapur is the top most destinations for domestic as well as international tourist. Resort circuits covering the hill stations like Mercara(Coorg) Chikkmagaluru, Kudremukha, Nandi Hills, Sandur, Biligere, Rangan Hills etc**.** In this circuit domestic as well as international tourists flow to Madikere destination. Apart from these circuits a tourist undertake his won choice covering religious, historical and natural scenic places therefore the study suggests that a different tourist travel circuit should be identified for example Bijapur (Historical),Kudalsangam(Religious)Humpy(Heritage) , Bangalore and Mysore (Cultural) destinations. Therefore it is said that Karnataka, a **Mini Incredible India** is the country's fourth most popular tourist destination.

References

1. Alhammadi, A. S. A. 2008. Allelopathic effect of *Tagetes minuta* L. Water exrtracts on seed germination and seedling root growth of Annual Final Report: Domestic Tourism Statistics for the State : Karnataka
2. Bhat Sushma B. (2006):"Successful Tourism Management," Sterling Publishers, Pvt. Ltd Pp.75-95.
3. Economic Survey of Karnataka State 2011-12
4. Parbati Nandi and Premangshu Chakraborty (1999): "Tourism and environmental degradation: Facts and remedies," Geographical review of India, March 1999, Pp22-28.
5. KSTDC: Karnataka State Tourism Development Report and Policies(2009-2014)
6. Ranganath & Somashekhar : Geography of Karnataka
7. Web. Bharathonline. Com, (http:/www.tribuneindia.com)
8. http://en.wikipedia.org
9. http://www.karunadu.gov.in

THE END

ARTICLE

28

MGNREGP: ISSUES & PROSPECTS

Dr R K Sinha
Department of Rural Management,School for Management Studies,
Babasaheb Bhimrao Ambedkar University (A Central University), Lucknow, INDIA

Abstract:

Employment generation and eradication of poverty has always being an objective of planning in India. A number of self-employment and wage employment programmes were initiated to cater to this objective. Discussions and debates on pros and cones of the programmes aimed at employment and income generation, poverty eradication, security net for the mass of humanity residing in the remote areas lead to formulation of new policies and programme to achieve different dimensions of the same problem. Notwithstanding these efforts study after study, research after research brought to surface empirical evidences of increasing chasm between the haves and the have-nots. Malpractices, inappropriate execution and lack of awareness were often quoted as prominent reasons for the tardy progress of the respective programmes. An effort in the form of National Rural Employment Guarantee Act (NREGA) was initiated in the year 2005. It was notified on September 7, 2005. It may not be out of place to say that this was no less than an out of the box effort as this programme differed to all the wage employment programmes started previously in many ways- its demand driven focus, its bottom-up approach, legal entitlement to work.

This paper makes an effort to look at what this flagship programme of the Government of India (GoI) has been able to attain. Where does the skepticism about the practicability of this initiative stand after more than eight years of its execution is the idea behind writing this piece. This paper is divided into four sections. Section I furnish an introduction with respect to the finer details and provisions of the Mahatma Gandhi National Rural Employment Guarantee Programme (MGNREGP). It briefly dwells on few of them. Section II analytically examine the performance of the programme with respect ensuring social protection and examines the state of aiding in the empowerment of the marginalized communities especially the women, Scheduled Castes & Scheduled Tribes. Section III sees through whether Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) wages has been responsible for the increase in the well being of the rural households with reference to meals, Monthly per Capita Expenditure (MPCE) and a comparison of MGNREGA wage rates from 2006 to April 2012 & average wage rate in MGNREGP with average casual wage rates, in brief. Section IV tries to draw inference on the basis of the aforestated sections.

This article is based on secondary data and do not use any quantitative technique for the analysis of empirical facts taken from different authentic sources (sources of information /data is mentioned at the respective place.).

Introduction

Asaf-Ud-Daula's (1784) public work undertaken to meet the socio-economic challenges emerging from the famine of Lucknow (U P) India, public works undertaken by the British to combat famine in India during the colonial era (Dreze 1990), 'charity workshops' in pre-revolution France, organasied so that the poor could receive alms in return for work, the English Poor Law of 1834 which required that the poor should reside in the 'workhouse' in order to receive welfare (Himmelfarb 1984), public works to combat inter-war unemployment and inter-city high ways of Germany, many of which are still in use, are a good example in this regard and most recently, the concept of 'workfare' was launched in the United States in the late 1960's with the same underlying idea of trying social benefits to requirements. Subbarao (2003) provides an overview of contemporary public works programmes in Asia and Africa. Notwithstanding the history of long works and debates on public works and workfare in the academic and policy maker' circles the debate over the effect of it on poor and on the wider society continues. Theory suggests that the public works have a direct effect on those employed in the works, a labour market effect related to the shift in labour demand and an increase in productivity related to the public goods into which the labour is invested. The effect on the wages could be muted if the public works are implemented mainly during slack agricultural seasons when the overall demand for rural labour is low, or if the scheme mainly employs workers who would otherwise be unemployed.

National Rural Employment Guarantee Scheme (NREGS) ,see end note no.1, is ranked among the major workfare initiatives worldwide. It need not to mention here that this particular approach to target poverty was unique as it focused on the right to demand work and made it obligatory on the part of the state, the state governments (Section 3 of the Act.), to make payments in the form of unemployment allowance if the work was not made available within a stipulated timeframe, i.e., 15 days. A de mand driven, self targeting, social security public works p rogramme unprecedented anywhere in the world at such a large scale. It may not be out of place to call it an out of the box approach in the overall economic scenario of market driven prescript preached and practiced across the globe. An Act to provide for the enhancement of livelihood security of the households in rural areas of the country by providing at least one hundred days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work and for matters connected therewith or incidental thereto[ii]. The provision of legal entitlement to work, that it promises work on demand makes it different from all the previous programmes. It aims to follow "bottom-up" approach so as to empower the rural poor to help them take actions in various domains that may help them to escape poverty. The programme has been considered to have the potential to transform rural economic, social & political relations at several levels. It is asserted that 'this "inclusive" form of public spending is not only desirable from a social or welfare perspective-it also provides very direct benefits

because it is much more effective in dealing with the economic situation of credit crunch and aggregate demand slowdown'. It was looked at as a programme which the non-poor will not want to undertake and also prevents dependency as poor people will readily turn away from the scheme when better opportunity arise (Besley and Coate 1992).

One of the concerns with MGNREGP was that its success would depend on villagers internalizing the fact that MGNREGP offers an entitlement to demand work and is not a relief program. The asset case studies, as well as the fieldwork found several instances where the implementation of MGNREGP was driven not by an overwhelming demand for wage labour but by the MGNREGP administration at various levels. It did not always appear as if the administration itself understood well the difference between MGNREGP and other centrally sponsored schemes. The Sarpanch viewed MGNREGP as an opportunity to gain political mileage and enhance their social clout at the expense of the Government of India. The Block and District administration set spending targets for themselves in order for the State to take advantage of a centrally sponsored program with near-unlimited access to funds. The MGNREGP administration in Delhi did not help either by awarding districts that managed to generate more days of employment, and in effect, spend more money. While this enthusiasm might have led to some high quality assets, in several cases they also led the administration to ignore work quality and focus exclusively on employment creation.

MGNREGP administration resorted to dubious ways of creating demand. In Punjab and Haryana, Shah and Indu (2009) found that migrant laborers, children, old people and virtually anyone willing to work was being accepted in order to complete MGNREGP works. In 2009-10 overzealous administration in Gujarat undertook the construction of bori-bandhs & constructed 25,000 bori bandhs without realizing that the construction of effective bori bandhs required a thorough understanding of local stream hydrology or that it needed to be done in a small time window – when the stream flow was neither too much nor too low. Not surprisingly, studies found that more than 85 percent of the bori bandhs were rendered useless in no time (Shah and Mistry 2012).

Either as a result of the supply-push discussed above or the perception, even among the administration, that MGNREGP was primarily the government's way of handing out extra cash to people, the focus of MGNREGP implementation on the benefits derived out of assets was often found to be missing. MGNREGP has an elaborate system of reporting, much of which is done near-real time. However, none of the parameters of MGNREGP implementation in the management information system (MIS) focus on the quality of assets, the benefits people can derive from them, or on their sustainability. Once a work is declared complete, the MIS stops tracking it.

It is important to look at the intricacies that lie therein as far as the demand for work is concerned. One must get registered himself and once registered Job Card (JC) is issued to the person. Schedule II of the Act specifies that, "1. The adult members of every household who-

(I) reside in any rural areas; and
(ii) are willing to do unskilled manual work, may submit their names, age and the address of the household to the

Gram Panchayat at the village level (hereafter in this Schedule referred to as the Gram Panchayat) in the jurisdiction of which they reside for registration of their household for issuance of a job card".

It has been specifically mentioned in the Para 5.2.5 of the operational guidelines of MGNREGP that door-to-door survey has to be undertaken so as to identify the persons willing to get registered themselves under the Act. Clear instruction about the composition of the team that would visit to conduct door-to-door survey is given. The team will comprise of the President of the Gram Panchayat (GP), SC/ST and women residents, village level government functionary and GP Secretary will be the members. It was found in the CAG Report, table number 1, that across states discrepancies were found in this regard.

Table Number: 1
Door –to-door Survey not Conducted

Sl.No.	Name of State	No. Of GPs/Blocks/Districts	Audit Comment
1	Assam	7 GPs	Door-to-door survey not conducted. Orientation training not imparted to teams
2	Bihar	250 GPs	No door-to-door survey was conducted to identify persons willing to register.
3	Chhattisgarh	140 GPs	Door-to-door survey not conducted.
4	Haryana	38 GPs	Door-to-door survey not conducted.
5	Jammu & Kashmir	1 district	No door-to-door survey was conducted in the villages.
6	Jharkhand	6 district	No door-to-door survey was conducted in villages of any of the test checked districts.
7	Karnataka	157 GPs	Details of the door-to-door surveys were not available.

8	Kerala	39 GPs	Door-to-door survey not conducted.
9	Mizoram	39 GPs	Door-to-door survey was not conducted, the willing persons themselves came to the Village Councils for registration.
10	Nagaland	33 GPs	Door-to-door survey not conducted.
11	Odisha	199 GPs	Door-to-door survey was not undertaken for registering households to be covered under the Scheme.
12	Punjab	79 GPs	Door-to-door survey not conducted.
13	Rajasthan	40 GPs	Door-to-door survey not conducted.
14	Sikkim	8 GPs	Door-to-door survey to identify persons willing to register under the scheme was not conducted.
15	Tripura	30 GPs	No door-to-door survey was conducted.
16	Uttar Pradesh	420 GPs	Door-to-door survey was not conducted. No orientation training was imparted to survey teams at block and district levels
17	Total	1479 GPs & 7 districts	

Source: CAG Report Number 6 of 2013, Annex-6A, page number 190

That is basically the enrollment process. Thereafter the individual may or may not demand for work. If one is desirous of work one may apply/request for work, this may be through an application in written. As is known that in case of a written request there is a provision for the receipt or receiving to be given on which the date of request is mentioned. There are a number of cases where no receipt was given or given without date to the applicant. Once either no receiving is given or given without date then how to ensure the Mahatma Gandhi National Rural Employment Guarantee Act, (MGNREGA) provision for the unemployment allowance. Many times demand for work is assumed to be identical with the work provided while in reality it differs. The MGNREGS-Management Information System (MIS) has features that capture the gap between the demand for work and supply of work. National Sample Survey of the NSSO of June 2009 to July 2010 reveals that the percentage of the rural households (HHS) who sought work and did not get work was around 19.

In a significant study of U P (refer to end note no.2) it was found that mostly (92.5 percent) applications for work were given orally by beneficiaries. It is similar in all districts. Gorakhpur has the highest (98.8%) of oral application and lowest in Jalaun (87.5%). As far as the issuance of receipts in lieu of application is concerned, 88 percent beneficiaries were never issued receipts in lieu of application for work, as most of the applications for employment were oral. Similarly in every district, the non-issuance of receipts reported by beneficiaries is very high and varies between 75% (Jalaun) to 95% (Khushinagar). Overall only 57.8% beneficiaries were always provided employment within 15 days. The response of beneficiaries in individual districts is also near the overall percentage as it varies from 55% (Gorakhpur and Jhansi) to 62.5% (Jalaun). [Page: 263, IIM report]. As far as the state of supplementary employment and livelihood opportunities are concerned the situation is not promising, refer table 2 and table no.3 respectively.

Table Number: 2

Supplementing Employment and Livelihood Opportunities in the Selected Districts of Uttar Pradesh

District	No. Of Persons Demanded>=100 Days Employment		No. Of Persons Provided>=100 Days Employment	
	N	%	N	%
Bareilly	12	15	0	0
Jalaun	21	26.25	13	16.25
Jhansi	11	13.75	9	11.25
Gorakhpur	11	13.75	1	1.25
Kushi Nagar	6	7.5	2	2.5
Total	61	15.25	25	6.25

Source: IIML Report page; 256 table no. 9.1

Table Number: 3

Demand & Creation of Employment in the Selected Districts of Uttar Pradesh (Average number of days of work per household)

	Bareilly	Gorakhpur	Jalaun	Jhansi	Kushinagar
Employment Demanded	36.62	60.08	93.52	67.27	63.56
Employment Provided	20.60	67.36	101.41	67.91	62.52

IIML Page: 257 table no. 9.2

The Comptroller and Auditor General (CAG) report pointed out that dated receipts of application were not given in 282 Gram Panchayats (GPs) across 21 states. Findings of the study of four districts across Kerala was reported where out of 620 total respondents seeking employment 57% got dated receipts while around 71% got work within the given

timeframe of 15 days. One may even correlate this with the fact that unemployment allowance was not paid in 58 of the surveyed blocks across 17 states including Assam, Chhattisgarh, Jharkhand, Karnataka, Odisha, Rajasthan and Uttar Pradesh, as reported by CAG. This has negative influence on the incentive for the beneficiaries to expect employment through this and on the other hand it violates the fundamental spirit of the Act.

Table Number: 4
Non-Issue Job Cards

Sl. No.	Name of State	Name of GPs/Blocks/District	No. of Regd. Households	No. of JCs issued	No. of JCs not issued	Remark
1	Andhra Pradesh	6 GPs	-----	-------	183	No record of issue of 183 job cards produced to audit
2	Karnataka*	8 districts	14,21,470	14,17,340	4,130	Not issued during 2007-12
3	Manipur	1 districts (Emphal East)	75,574	70,656	4,918	Not issued during 2007-12
4	Odisha	6 blocks	------	------	1,915	Pending since 1 to 4 years
5	Punjab	1 district	----	-----	11	Pending since 1 to two years
6	Uttar Pradesh	1 district 1 block	1,05,369 12,062	1,05,318 10,815	51 1,247	------
7		Total			12,455	

Source: CAG Report No. 6 of 2013, Table No. 11, page 47. *Figures as per MIS.

Consequently, the scheme falls short to accomplish the much desired objective of social security for the poor. It was found that in some of the poorest states Bihar (34%), Odisha (29%) and Jharkhand (28%) have lowest participation rates and high levels of un-met demand. Even in much cited Andhra Pradesh study it was found that even though of the 4800 rural HHS 53% were from the poorest among the poor and 56% were from the poor category were the JC holders in the 480 villages of the 5 selected districts the actual participation rates was only 17%, 11% and 5% in Phase I, Phase II and Phase III respectively. Empirical facts, as evident in table 5, raise certain pertinent questions. One may refer to column 6 of table 5 it may be a natural curiosity as to why substantial number of people (HHS) is not seeking MGNREGP work.

Table Number: 5
Unmet Demand across States as Per NSSO 66th Round

State	Head Count Index of Poverty(% below poverty line)	No. of HHS having MGNREGA JC per 1,000 HHS	Per 1,000 distribution of HHS who got MGNREGA work	Per 1,000 distribution of HHS who sought but did not got MGNREGA work	Per 1,000 distribution of HHS who did not seek MGNREGA work
1	2	3	4	5	6
Andhra Pradesh	22.8	434	354	117	529
Assam	39.9	286	176	224	570
Bihar	55.3	172	95	344	513
Chhattisgarh	56.1	589	479	211	310
Gujarat	26.7	300	181	141	522
Haryana	18.6	66	51	144	805
Himachal Pradesh	9.1	454	334	85	582
Jammu & Kashmir	8.1	190	81	197	556
Jharkhand	41.6	303	163	275	409
Karnataka	26.1	151	80	148	772
Kerala	12	196	112	120	768
Madhya Pradesh	42	688	364	215	318
Maharashtra	29.5	135	44	232	723
Odisha	39.2	404	219	287	493
Punjab	14.6	86	52	260	688
Rajasthan	26.4	709	590	108	256
Tamil Nadu	21.2	396	335	78	586
Uttrakhand	14.9	343	271	105	551
Uttar Pradesh	39.4	211	162	187	650
West Bengal	28.8	592	430	225	341
All India	33.8	347	242	193	538

Note: (1) Poverty rates are based on Tendulkar poverty estimates, as on March 2010. (2) Only major states have been included in the table above. (3) All India level includes all the States and Union Territories.
Source: NSSO 66th Round 2009-10 and Press note on Poverty, Planning Commission, March 2012.
Courtesy: MGNREGA SAMEEKSHA: AN ANTHOLOGY OF RESEARCH ON THE MGNREG ACT, 2005 (2006-2012). Ministry of Rural Development, Government of India. Table 6.1, page 59. Column number is not in the original table.

A comparison of the state-level demand calculated from NSSO data shows that these are considerably higher than those reported by the official MNREGS website. This difference is fairly substantial even if we account for the fact that the NSSO numbers are subject to sampling errors. An even more troubling fact is the positive correlation of the proportion by which the official demand data is under-reported and the proportion of workers demanding MNREGS jobs but who did not get work.

Through the analysis of the National Sample Survey data for 2009-10, Dutta et al. (2012) show that poorer states have greater unmet demand for MGNREGP work. This reiterates the point made earlier that MGNREGP implementation has become a function of the ability of the MGNREGP administration rather than of the demand for MGNREGP work, as originally envisaged. The administration in better-off states tends to be better equipped in implementing MGNREGP, in a supply-push mode even when the effective demand might be relatively lower. Poor states, on the other hand, are likely to be less resourceful and have less effective MGNREGP administration. They are also more likely to have less effective, less informed and less empowered Gram Panchayats. There is, therefore, a need to pay special attention to ensuring that MGNREGP administration at all levels is well trained and equipped, especially in the poorer states.

Delayed payment was reported by the CAG report (2006) in the 213 GPs in 16 states including Andhra Pradesh, Chhattisgarh, Jharkhand, Karnataka, Uttar Pradesh and West Bengal. In this regard the usual reason cited by the different studies is inadequate staff and irregular flow of funds. Here it becomes more pertinent to discuss about the via-media through which funds were to be made available to the beneficiaries, i.e. through banks and post offices. It is stated that around 80% of MGNREGP payments are made through this route. There are, of course, certain exceptions in case of Manipur, Mizoram and Integrated Plan Districts in which due to logistic reasons, which comprise of poor bank coverage & that of post offices, were allowed to make cash payments. Delayed payment is also subject to assessment of work demand that would facilitate proper planning and budgeting. At the same time it also implies proper scanning of muster rolls, verification, measurement of books and onsite physical valuation of work. To meet the paucity of trained staff is in itself a challenge. Technically equipped staff is considered by many as a prerequisite to assist the GPs. This will enable the GP to prepare annual plans, labour budget, monitor the performance and execute permissible works.

Updation of the list has to be done in accordance with the operational guidelines of MGNREGP. In the Para 5.2.12 and 5.3.5 it is the requirement of the guidelines that cancellation of the ineligible registered households (hhs) be made public and be read out in Gram Sabha (GS) respectively. The audit report of the CAG found out short coming in the states with respect to different aspects as mentioned in the table number 6. In 219 GPs (5.69 per cent of all test checked GPs) in three states viz. Nagaland, Uttar Pradesh and West Bengal the registration list was not updated. In 763 GPs (19.82 per cent of all test checked GPs), three blocks and six districts in Assam, Nagaland, Odisha, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal (seven states) it was not made public. The practice of non-display of registration list was wide spread in Assam, Odisha, Tripura and Uttar Pradesh. As a result, it could not be ascertained if all the potential beneficiaries were included in the registration list.

Table Number: 6
Non-updation/display of Registration List

Sl. No.	Name of State	**Details regarding non-updation of list**			**Details regarding non-display of list**		
		No. Of GPs/Blocks/Districts	Test Checked	Per cent	No. Of GPs/Blocks/Districts	Test Checked	Per cent
1	Assam	-	-	-	6 districts	8 districts	75.0
2	Nagaland	12 GPs	54GPs	22.2	34 GPS	54 GPs	63.0
3	Odisha	-	-	-	199 GPs	199 GPs	100.0
4	Tamil Nadu	-	-	---	3 blocks	23 blocks	13.0
5	Tripura	-	-	-	60 GPs	60 GPs	100.0
6	Uttar Pradesh	176 GPs	460 GPs	38.3	436 GPs	460 GPs	94.8
7	West Bengal	31 GPs	120 GPs	25.8	34 GPs	120 GPs	28.3
	Total	219 GPs	634 GPs		763 GPs, 3blocks & 6 districts	893 GPs, 23 blocks & 8 districts	

Source: CAG Report Number 6 of 2013, Annex-6B, page number 192

It is imperative to mention here that studies undertaken to find out the impact of MGNREGS on the net household income shows that the share of MGNREGS in the income of the poor was highest in Andhra Pradesh, about 17 per cent, and in Maharashtra it was estimated to be about 7 per cent. It has also been reported in the study of Medak district of Andhra Pradesh (AP) that 12% of the total number of households surveyed said that the increase in their total supplementary income was an outcome of more number of their family members getting an opportunity to work.
One must take note of the mandates and objectives of MGNREGA, "Aiding in the empowerment of the marginalised communities, especially women, Scheduled Castes (SCs) and Scheduled Tribes (STs) through the process of right based legislation". The operational guidelines[iii] point 1.2 (iv.) of goals states, "iv) Empowerment of the socially disadvantaged, especially women, Scheduled Castes (SCs) and Schedules Tribes (STs), through the processes of a rights-based legislation". Furthermore, it states that "While providing employment, priority shall be given to women in such a way that at least one-third of the beneficiaries shall be women who have registered and requested for work under the Scheme (Mahatma Gandhi NREGA, Schedule II, para. 6)". When one discuss about how to have inclusive policy frame work that works, the country is faced with multiple challenges. The challenge of ensuring social protection for the vulnerable people living in the rural areas, ensuring livelihood security for the poor through creation of durable assets, improved water security, soil conservation and high land productivity and the ways and means to aid the empowerment of the marginalized communities especially the women, Scheduled Castes & Scheduled Tribes. A majority of the population is left out of the main stream of economic life that may ensure a decent living or atleast enables them to have access to the very basic amenities that are a prerequisite for survival. It is also being reported in a study that exclusion from issuing JCs was arising due to social and caste conflicts. It was found that the cause of the problem was in electoral politics of Gram Panchayats (GPs).

There are comforting outcomes when it comes to the participation of women in MGNREGA (47%), which is considerably more than the minimum set (33%). But at the same time inter-state variation in this regard calls for further empirical investigation. One may find that the area demarcated for the work, within 5 km, is also a significant contributor in this regard. It also surfaced in the study of ten selected districts of seven states that only 30% of the total number of women surveyed actually did work and earned income from sources other than MGNREGS. 50% of the total respondent stated that had MGNREGS would not have been there they would have to be confined to home and remained unemployed. It is also important to take notice of the fact that nine states, namely, U P, J & K, Mizoram, Assam, Nagaland, Bihar, Jharkhand, Arunachal Pradesh and West Bengal were where the participation of women on MGNREGS was less than the 33% benchmark. Women participation is high where market wage rate are higher than MGNREGA wage rates as men opts to work other than MGNREGA work.

In a study of five selected districts of Uttar Pradesh regarding providing employment to women in MGNREGP the empirical evidence that emerged was not too encouraging, as is evident from table no. 7.

Table Number: 7
Employment Provided to Female Workers out of the Total Workers in the Selected Districts of Uttar Pradesh (Percent)

Bareilly	Gorakhpur	Jalaun	Jhansi	Kushinagar	Total
5.2	18.95	29.32	12.7	35.2	19.8

Source: IIM page 257 table no. 9.3

The MGNREG Act envisages 1/3 of the participants in the programme to be women. Uttar Pradesh on this aspect does not stand upto the expectations. Official estimates estimate women participation in Uttar Pradesh to be 15 per cent. The low participation rate of women in MGNREGP in UP is not due to a lack of demand for the program by women. A recent survey whose interviewees included women from UP, reported that women find MGNREGA work to have significant benefits. The survey found that 30% of women workers had not earned any income other than MGNREGP wages in the last three months. Importantly, the majority of the women surveyed collected their own wages (79%) and kept what they earned (68%), indicating that MGNREGP has served as a truly independent income source for women who do not otherwise have access to financial sources free from their husband's control.

A 2008 UP survey found that an astounding 100% of female participants stated that MGNREGP had helped them avoid hunger. Sixty-seven percent reported that MGNREGP had helped them repay debts, and half of female participants said that MGNREGP work had helped them with in child's schooling. It was also found during survey that even though women intended to work in MGNREGP work but yet were denied work because of caste, religion and sometime for voting against the sitting Gram Pradhan in the panchayat elections. Obviously, these factors work to defeat the larger objectives. Social factors and social prestige also factored in those cases where women belonged to upper caste were not permitted by the family members to do MGNREGP work even though the family needed it. In certain cases it was religious belief which prohibited women to go out and work. It may not be possible to pose a common reason behind women for not taking up MGNREGP work, as different circumstance and situations prevailed there that worked as an impediment in women's participation. For instance, Rajasthan experiences cyclical droughts that disrupt livelihoods and require both women and men to work outside of the home in order to survive while UP has no such factor is responsible. Factors like physical security of women etc surfaced as reasons behind the low level of women participation in the work in UP.

Table Number: 8

Percentage of Women Persons-Days from Financial Year 2006-07 to Financial Year 2011-12*

State	Women person-days(% of total person-days in the State)FY 2006-07	Women person-days(% of total person-days in the State) FY 2007-08	Women person-days(% of total person-days in the State) FY 2008-09	Women person-days(% of total person-days in the State) FY 2009-10	Women person-days(% of total person-days in the State) FY 2010-11	Women person-days(% of total person-days in the State) FY 2011-12*
Andhra Pradesh	55	58	58	58	57	58
Assam	32	31	27	28	27	25
Bihar	17	28	30	30	28	29
Chhattisgarh	39	42	47	49	49	45
Gujarat	50	47	43	48	44	45
Haryana	31	34	31	35	36	36
Himachal Pradesh	12	30	39	46	48	60
Jammu & Kashmir	04	01	06	07	07	18
Jharkhand	39	27	29	34	33	31
Karnataka	51	50	50	37	46	46
Kerala	66	71	85	88	90	93
Madhya Pradesh	43	42	43	44	44	43
Maharashtra	37	40	46	40	46	46
Odisha	36	36	38	36	39	39
Punjab	38	16	25	26	34	43
Rajasthan	67	69	67	67	68	69
Tamil Nadu	81	82	80	83	83	74
Uttar Pradesh	17	15	18	22	21	17
Uttrakhand	30	43	37	40	40	45
West Bengal	18	17	27	33	34	32
All India	40	43	48	48	48	47

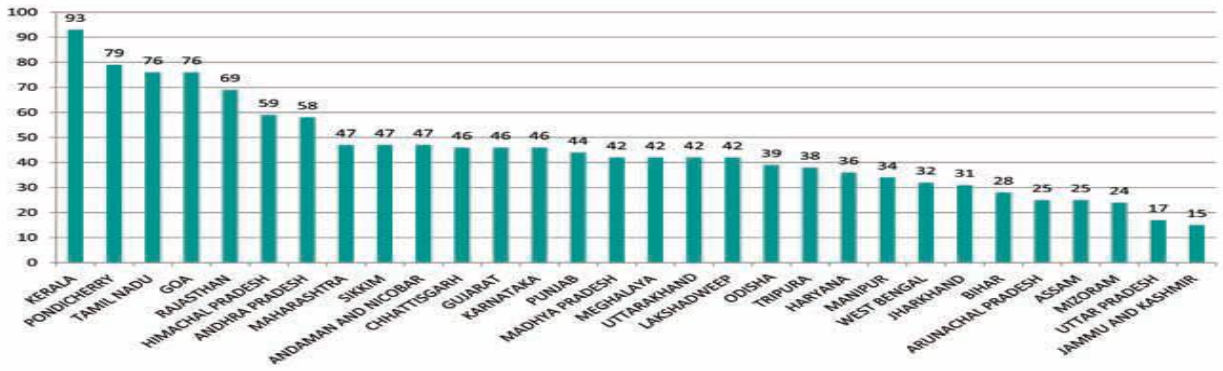
Note: (1) Union Territories and some States are not included in the table. (2) All India total is for all states & Union Territories. *Provisional Data at the time of the preparation of the report, data entry for States was still open for the year 2011-12.

Source: www.mgnrega.nic.in.

Even though the all India figure of per cent of women persons-days has remained above the minimum level stipulated but given the fact that it has over six years increased from 40 to 47 per cent reveals the other side of the story. One can look at the state of women participation in different states in table 8. The performance of Uttar Pradesh cannot be considered as satisfactory & calls for immediate attention and steps to work out in this regard.

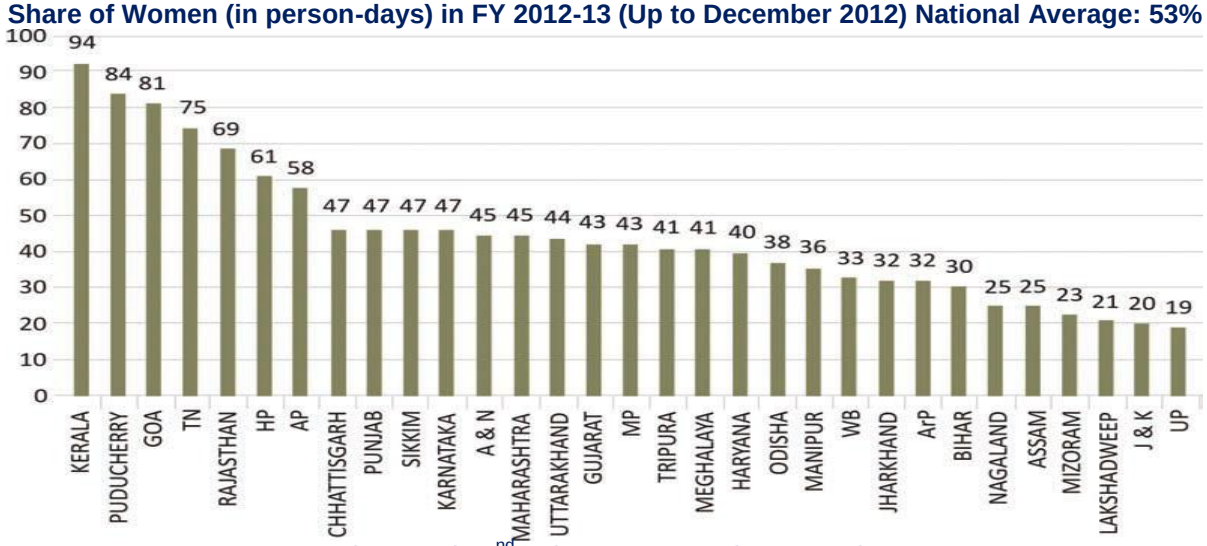
Figure Number: 1

Significant Share of Women in Workforce in current financial 2011-12 up to December, 2011 National Average: 49%



Source: MGNREGA, Report to the People February 02, 2012, Figure Number: 2 page 23. MRD, DRD, GoI.

Figure Number: 2
Share of Women (in person-days) in FY 2012-13 (Up to December 2012) National Average: 53%



Source: MGNREGA, Report to the People 2nd February, 2013. Figure Number: 2 page 19. MRD, DRD, GoI.

Various provisions under the Act and its guidelines, aim to ensure that women have equitable and easy access to work, decent working conditions, equal payment of wages and representation on decision-making bodies. From FY 2006–07 up to FY 2012–13 (up to Dec, 2012), around Rs 62,000 crore have been spent on wages for women. In fact, the participation rate of women under the Scheme has been higher than in all forms of recorded work. Research studies also indicate that MGNREGA is an important work opportunity for women who would have otherwise remained unemployed or underemployed. With an increased rate of participation and large amounts being spent on wages for women, studies and field evidence suggest a positive impact of the Scheme on the economic well-being of women. The NSSO 66th Round indicated that MGNREGA has reduced traditional wage discrimination in public works. Access to economic resources has also had a favourable impact on the social status of women, refer to figure 1 & figure 2.

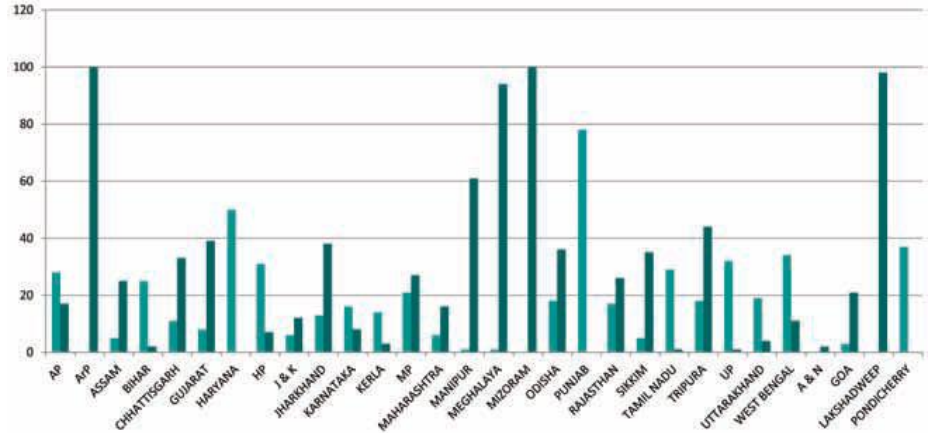
The MGNREGA is succeeding as a self-targeting programme, with high participation from marginalised groups including the Scheduled Castes (SCs) and Scheduled Tribes (STs). At the national level, the share of SCs and STs in the work provided under MGNREGA has been high and ranged between 40–60 per cent across each of the years of the Scheme's implementation. The participation rate of SCs and STs in the Scheme exceeds the percentage share in the total population in most states, refer to figure 3 & figure 4.

Table Number: 9
Employment Generation for Disadvantageous Groups in Selected Districts of Uttar Pradesh (Percentage)

Category	Bareilly	Gorakhpur	Jalaun	Jhansi	Kushinagar	Total
BPL	95.8	78.95	77.44	86.1	91.2	85.3
SC	44.8	44.21	72.18	44.8	38.5	50.0
OBC	50.0	50.53	19.55	52.1	54.9	44.5

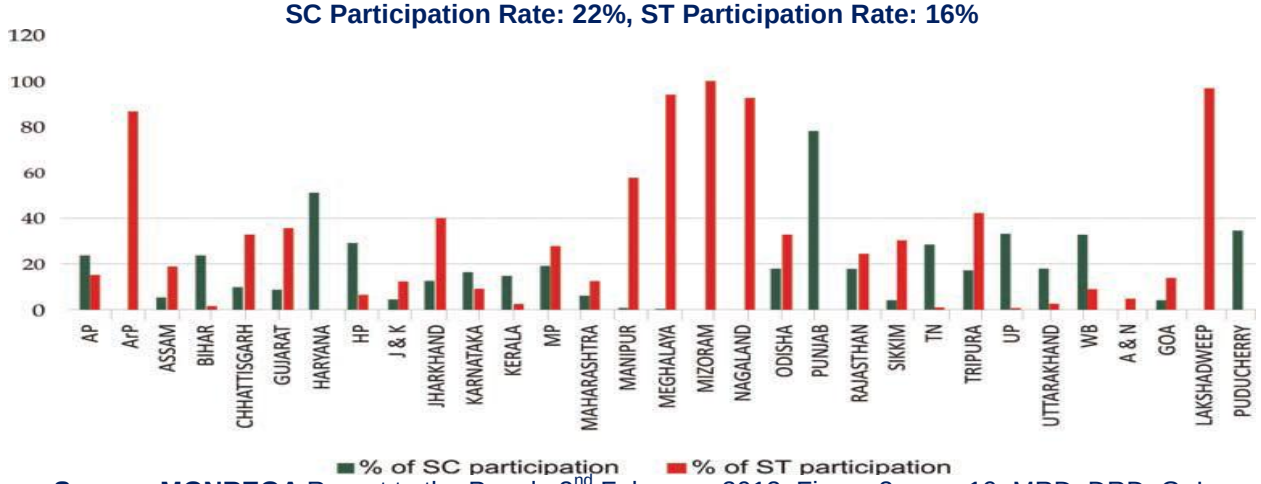
Source: Quick Appraisal of 5 Districts Under NREGS Uttar Pradesh.

Figure Number: 3
Participation of SC/ST HHS in current financial year 2011-12, up to December, 2011
SC & ST Participation Rate: 40% SC Participation Rate: 23%, ST Participation Rate: 17%



Source: MGNREGA, Report to the People February 02, 2012, Figure Number: 3 page 24. MRD, DRD, GoI.

Figure Number: 4
Participation of SC/ST in FY 2012-13, (Up to Dec '2012)
SC & ST Participation Rate: 38%
SC Participation Rate: 22%, ST Participation Rate: 16%



Source: MGNREGA Report to the People 2nd February, 2013. Figure 3 page 19. MRD, DRD, GoI.

Participation of SC & ST declined to two percent points from 40% to 38% during February 2012 to February 2013. In the respective categories the decline was of 1% point each. Researchers have pointed out caste factor hindering the basic spirit of the Act. The need is to check such practices and to ensure impartial execution.

MGNREGA entitles every worker to wages at the specified wage rate for each day of work. The Government of India (GoI) has set minimum wage levels for unskilled manual labour and semi-skilled labour as well.

"3. *(1)* Save as otherwise provided, the State Government shall, in such rural area in the State as may be notified by the Central Government, provide to every household whose adult members volunteer to do unskilled manual work not less than one hundred days of such work in a financial year in accordance with the Scheme made under this Act…"

It is, therefore, possible to evaluate the effectiveness of MGNREGA implementation in a state by comparing the wages disbursed to workers in that state to the wage levels they are entitled to receive under the MGNREGA program (refer to table number 10 & 11). Food security analysis based on nutritional intake-calories, micro-nutrients etc, can enable one to comprehend how far these policy prerogative have been successful in helping the poorest among the poor to overcome the poverty trap where low nutrition leads to low productivity consequently leading to low wages and thereby ending up in low nutrition. Study undertaken by Engler and Ravi in Andhra Pradesh drew an inference that as a consequence of MNREGS the number of meals foregone has declined..

Table Number: 10
Increase in MGNREGA Notified Wages from FY 2006-07 to FY 2011-12 & Minimum Agriculture Wage (Rs per Day) FY 2011-12

State	MGNREGA Wage FY 2006-07	MGNREGA Wage FY 2007-08	MGNREGA Wage FY 2009-10	MGNREGA Wage FY 2010-11& 2011-12	MGNREGA Wage(revision with effect from 1/4//2012)	Minimum Agriculture Wage(Minn. Wages Act) FY 2011-12
1	2	3	4	5	6	7
Andhra Pradesh	80	80	100	121	137	168
Arunachal Pradesh	55-57	65-67	80	118	124	135-154
Assam	66	76.35	100	130	136	100.42
Bihar	68	77	100	120	122	120
Chhattisgarh	62.63	62.63	100	122	132	114
Gujarat	50	50	100	124	134	100
Haryana	99.21	135	141.02	179	191	173.19

Himachal Pradesh	75	75	100	120-150	126-157	120-150
Jammu & Kashmir	70	70	100	121	131	110
Jharkhand	76.68	76.68	99	120	122	127
Karnataka	69	74	100	125	155	145.58
Kerala	125	125	125	150	164	200
Madhya Pradesh	63	85	100	122	132	124
Maharashtra	47	66-72	100	127	145	100
Manipur	72.4	81.4	81.4	126	144	122.1
Meghalaya	70	70	100	117	128	100
Mizoram	91	91	110	129	136	170
Nagaland	66	100	100	118	124	-
Odisha	55	70	90	125	126	90
Punjab	93-105	93-105	100-105	153	166	153.8
Rajasthan	73	73	100	119	133	135
Sikkim	85	85	100	118	124	100
Tamil Nadu	80	80	100	119	132	100
Tripura	60	60	100	118	124	100
Uttar Pradesh	58	58	100	12	125	100
Uttrakhand	73	73	100	120	125	121.65
West Bengal	69.4	69.4	100	130	136	167

Source: MGNREGA (Official website), http://www.mgnrega.nic.in. Refer to end note no.3.

Table Number: 11
Average MGNREGA Wage Rate & Average Casual Wage Rate (as per NSSO 66th Round)

State	Average Wage Rate on MGNREGA (Rs/day)	Average Casual Wage Rate			
		Overall	Male	Female	Difference
Andhra Pradesh	91.9	98.5	115.4	75.7	39.7
Assam	87	90.1	94.4	74.9	19.5
Bihar	97.5	79.4	81	65.8	15.2
Chattisgarh	82.3	68.8	70.8	65.5	5.3
Gujarat	89.3	83.3	87.3	71	16.3
Haryana	150.9	139.6	146.1	99.1	47
Himachal Pradesh	109.5	139.6	141.4	110.2	31.2
Jammu & Kashmir	93.3	158.3	157.5	n.a	n.a
Jharkhand	97.7	101.2	103.6	82.2	21.4
Karnataka	86	84.5	96.9	62.8	34.1
Kerala	120.6	206.5	226.6	119.3	107.3
Madhya Pradesh	83.7	69	74.5	58.1	16.4
Maharashtra	94.3	75.2	86	58.2	27.8
Odisha	105.9	75.6	81	59.1	21.9
Punjab	123.5	130.4	133.5	91.8	41.7
Rajasthan	87.4	125.7	132.3	94.3	38
Tamil Nadu	71.6	110.8	132.1	72.6	59.5
Uttar Pradesh	99.5	94.3	97	69.2	27.8
Uttarakhand	99	118.7	122.1	96.7	25.4
West Bengal	90.4	85.3	87.8	65.9	21.9
All India	90.2	93.1	101.5	68.9	32.6

Note: (1) Average MGNREGA wage per day are based on unskilled expenditure total person-days, and not on the official notified MGNREGA wages. (2) Union Territories & some States are not included. (3) All India includes all Sates.

Source: NSSO, Government of India, 2009-10 and Mahatma Gandhi National Rural Employment Guarantee Act (official website), http://www.mgnrega.nic.in. Adapted from P.Dutta, R. Murgai, M. Ravallion and W.V. Dominique, 'Does India's Employment Guarantee Scheme Guarantee Employment', Policy Research Paper, Washington, DC: World Bank, 2012.

Courtesy: MGNREGA SAMEEKSHA, 2012.

A number of studies have looked to assess the impact of MGNREGS on wage rates and its impact on poverty alleviation. One way of looking at it is to look at the trend of Monthly Per Capita Expenditure (MPCE). It is found that in the study on certain areas in Andhra Pradesh that MGNREGS has increased the MPCE by around 10%. Expenditure on non-food consumerables increased by 23%. Most interestingly, expenses on transportation have reduced by 65% because of the availability of work within a specified kilometer of area. Another study in Rajasthan revealed the composition of expenditure pattern of the additional wages from MGNREGS. It stated it to be on food (50%), clothing (20%), education (10-15%) and health care (10%) of the additional amount. MNREGS is also enabling the poor to withstand the economic shocks and deal with inflation as it was revealed in the studies in Chhattisgarh, Jharkhand and Odisha that had MNREGS not been there it would have severely affected their ability to purchase foodgrains. From FY 2006-07 up to FY2012-12 (up to Dec, 12) over Rs. 1,29,000 crore has been spent on wages. This is almost 70% of the total expenditure. The Scheme's notified wages have increased across all States since 2006. The average wage earned per beneficiary has risen from Rs. 65 per person day in 2006 to Rs.115 by 2012. One of the arguments that need to be taken into account is the timing of the work. It has been argued that MGNREGA work should be so planned that it do not coincide with the seasonal occupational commitments. If it runs parallel than of course it will have its impact on the prevailing wage rates.

Notwithstanding the efforts to alleviate poverty, ensuring social security network and empowering the women, SC's & ST's much is yet to be looked after. May be it has been envisaged as an instrument of 'inclusive development' but there are ample of instances reported where discrimination was practiced on one or the other basis. Application of technology to tackle the problem of inappropriation of fund and to make execution efficient is yet to be evaluated but yes it gathers with it a ray of hope. Sustenance of assets created and their productivity is another matter that needs focused attention. It is easy to emphasis on the creation of assets which are durable than to actually accomplish. The findings of CAG shall not be used as an obituary to MGNREGS, it makes the policy makers cautious of the grey areas which needs to be addressed, for instance, whether it was about involving the contractors, as was the case in the Kalahandi district of Odisha or the use of machinery in Chitradurga district in Karnataka. One must not forget to take note of the fact that majority of the people who are the focus of this scheme are either illiterate or do not understand the nitty-gritty of the provisions. There are instance where Gram Panchayats (GPs) have taken a lead in this direction by pasting various provisions of the scheme on the walls of GPs. This can be applied elsewhere too. Awareness of the changes that are introduced from time to time must be propagated among the targeted group. MGNREGA guidelines as issued at specific interval should be briefed at the panchayat level especially the points that are incorporated or the modification that has been introduced should be timely briefed.

Notes:

1. The National Rural Employment Guarantee Act (NREGA) was enacted in September, 2005, came into force in February 2, 2006. Executed in Three Phases: Phase I (2006) in 200 most backward districts of the country. Phase II (2007-08) in 130 districts. Phase III (April 1, 2008). Since October 2, 2009 it has been rechristened as Mahatma Gandhi National Rural Employment Guarantee Scheme.
2. Quick Appraisal of 5 districts under NREGS in Uttar Pradesh. Final Report. Centre for Food & Agribusiness Management, Indian Institute of Management, Lucknow. Submitted to Ministry of Rural Development, Government of India. Funded by United Nations Development Programme.
3. **Note:** (1) From 1.1.2009 MGNREGA wages were moved from Section 6(2) to Section 6(1) of the Act. (2) From 1.1.2011 MGNREGA wages were linked with Consumer Price Index for Agriculture (CPI_AL). (3) In the table, in the case of two wages, the wages are for different areas within the State, for example, scheduled area and non-scheduled. In this case the difference between notified MGNREGA Wage and agriculture wage has been taken from the upper limits. (4) Union Territories have not been included.

References

1. Ahluwalia, Isher. Judge 2013: "UPA Guarantee 100 Days Work to Poor, over 96% didn't get it, says first audit". The Indian Express, Thursday 31, January.
2. Berg, Erlend. Sambit Bhattacharya, Rajasekhar Durgam and Manjula Ramchandra 2012: "Can Rural Public Works Affect Agricultural Wages ? Evidence from India". CSAE Working Paper WPS/2012-05. Oxford University Press.
3. Besley, Timothy and Stephen Coate 1992: "Workfare Vs Welfare: Incentive Arguments for Work Requirements in Poverty Alleviation Programs", American Economic Review 82(1): 249-61.
4. Birner, R. K. Gayathridevi, K Raabe, E. Schiffer and M. Sekhar 2010: "How to overcome the Governance Challenges of Implementing NREGA". International Food Policy Research Institute (IFPRI). Discussion Paper 000963.
5. Bonner, Kim .Jennifer Daum, Jessie Duncan, Ellen Dinsmore, Kari Fuglesten, Leslie Lai, Julian Lee, Katherine Manchester, Feker Tadesse, Robert Quinn 2012: "MGNREGA Implementation: A Cross-State Comparison". The Woodrow Wilson School's

Graduate Policy Workshop. Woodrow Wilson School of Public & International Affairs, Princeton University. Atul Kohli, Project Advisor. January.
6. C,Imbert and J.Papp 2012: "Equilibrium Impacts of Government Programs: Evidence from India's Employment Guarantee". Paris School of Economics.
7. Chandrasekhar, C. P and Jayati Ghosh 2009: "Social Inclusion in NREGS". Business Line (The Hindu) edition dated January 27.
8. Comptroller & Auditor General, India. Performance Audit Report No. XXXXII of 2008.
9. Comptroller & Auditor General, India. Performance Audit Report of MGNREGS, Report No. 6 of 2013.
10. Doug Johnson 2009: "Can Welfare Serve as a Substitute for Weather Insurance? The Case of NREGA in Andhra Pradesh?"Working Paper 32, Chennai, Institute of Financial Management and Research (IFMR).
11. Dreze, Jean 2011: "Employment Guarantee: Beyond Propaganda". www.thehindu.com/2008/1/11.
12. Dreze,J. 1990: "Famine prevention in India". In Political Economy of Hunger, Vol. 2, ed. J. Dreze and A.Sen, Oxford. Clarendon Press.
13. Dreze,J. and A.Sen 1990. Hunger and Political Action. Oxford. Clarendon Press.
14. Dreze,J. and R Khera 2009: "The Battle for Employment Generation. Oxford University Press, pp. 43-81. New Delhi
15. Dutta, Piju, Rinku Murgai, Martin Ravallion and Dominique van de Walle 2012: 'Does India's Employment Guarantee Scheme Guarantee Employment?" Economic & Political Weekly, April 21. Vol. XLVII. No. 16. pp.55-64
16. Engler, Monica., and Shamika Ravi 2009: "Workfare in Low Income Countries: An Effective Way to Fight Poverty? The Case of India's NREGS". Social Science Research Network:http://ssrn.com/paper=1336837 as quoted in MGNREGA Sameeksha 2006-12 on page 87.
17. Himmelfarb, Gertrude, 1984, The Idea of Poverty, New York: Knopf
18. Jha, Raghbendra, Raghav Gaiha and Manoj K. Pandey 2011: "Net Transfer Benefit under National Employment Guarantee Scheme". Journal of Policy Modelling. Vol. 34, no.2.
19. Liu, Y. and K. Deininger 2010: "Poverty Impacts of India's National Rural Employment Guarantee Scheme: Evidence from Andhra Pradesh", selected papers prepared for Presentation at the Agriculture and Applied Economic Association, Denver, Colorado.
20. "MGNREGA SAMEEKSHA: AN ANTHOLOGY OF RESEARCH STUDIES ON THE Mahatma Gandhi National Rural National Rural Guarantee Act, 2005. 2006-2012. Ministry of Rural Development (GoI). Orient Blackswan Private Limited. 2012.
21. Ravallion, M and G. Datt 1995: "Is Targeting Through a Work Requirement Efficient? Some Evidence from Rural India", in Public Spending and the Poor: Theory and Evidence, ed. D.Van De Walli and Kimberley Nead, Washington, DC. The World Bank, (page 413-14)
22. Reforms in MGNREGA Implementation. Ministry of Rural Development (MoRD), Government of India (GoI), September 01, 2011.
23. Selvamani, P 2012: "An Analysis of the Performance of MGNREGP in India". Global Research Analysis. Vol. 1 Issues 5, October. ISSN No: 2277-8160.
24. Shah, H. and Mistry, P. 2012. "The Invisible Bags: A Case Study of Bori Bandhs constructed under MGNREGA in Gujarat". Ahmedabad: DISHA.
25. Shah, T. and Indu, R. 2009. MGNREGA in Indo-Gangetic Basin: Fieldnotes from Here and There. Anand: International Water Management Institute.
26. Sidhatha, Anish Vanaik, 2008: "CAG Report on NREGA: Fact and Fiction". Economic and Political Weekly, June 21, 2008, page 39-45.
27. Subbarao, Kalanidhi 2003: "Systemic Shocks and Social Protection: Role and Effectiveness of Public Works Programs". Social Protection Discussion Paper No. 0302, Social Protection Unit. Human Development Network. The World Bank.
28. Sudarshan, R.M 2009: "Examining India's Rural Employment Guarantee Act: Its Impact and Women Participation". Institute of Social Science Trust (ISST). New Delhi.
29. Sudarshan, R.M 2011: "India's Rural Employment Guarantee Act: Women's Participation and Impact's in Himachal Pradesh, Kerala and Rajasthan". Institute of Development Studies (IDS).

THE END

ARTICLE

29

DEVELOPMENT AND PROBLEMS OF WINERIES IN NASHIK DISTRICT, MAHARASHTRA

Dr.Sanjay D.Pagar
HOD & Assistant Professor, MVP Samaj's Arts, Science and Commerce College, Ozar Mig, Dist. Nashik,College affilated to Pune University, Maharashtra, INDIA

Abstract:

Nashik is the leading District in India with regards to agricultural land under Grape cultivation and production. Nashik is popularly known as Wine Capital of India. Grape wine making is gradually picking up in Nashik district since last thirteen years. First winery was established in 1999 at Govardhan, Gangapur Road in Nashik and now numbers of wineries gone upto 38 during last thirteen years. Maharashtra Industrial Development Corporation (MIDC) has established two wine parks in Maharashtra, one is at Palus near Miraj and the second is at Vinchur near Nashik.

For the last thirty years, grape has acquired dominance in the agricultural economy of the district. Grape share 64.39 percent of area fruits in the Nashik District. The grape cultivation is mostly concentrated in Niphad, Dindori, Chandwad, Nashik, Satana and Sinnar tahasils, where nearly 97 percent grape cultivation area of the district is located.

The main aim of the present paper is to study the development of wineries in the Nashik District of Maharashtra. Nashik is one of the major agriculturally and industrially developed district in the North Maharashtra. The Primary and secondary data are used for the present study. The Tahsil has been taken as a unit for analysis of wineries.

The study has observed that wineries are mostly concentrated in Niphad & Dindori tahsil where climatic condition is suitable and agricultural development is more than other tahsils of the district. Wineries are not uniformly located in the study area. Unstable price of wine grape and unavailability of local market for wine are the major problem of this industry.

Introduction

Production, productivity and marketing are the important aspects in the agricultural development in India **(Shitole B.B., 2010).** Since last 15 years the area under grape and its production is continuously increasing. Therefore processing on grape is very important. In India, first winery was started in 1986 at Narayangaon in Maharashtra but during first thirteen years there was not too much progressed in this regards. But after 2001 grape wine industry started grow rapidly due to implementation of Maharashtra Government Wine Policy in 2001. Now there are 117 wineries spared across India. Out of country's 117 wineries, Maharashtra's share is 77 wineries. In Maharashtra, Nashik is leading district where 38 wineries are located. Nashik is popularly known as Wine Capital of India. For the last thirty years, grape has acquired dominance in the agricultural economy of the district. Grape share 64.39 percent of area fruits in the Nashik District. Godavari Wine Park is also located in the heart of grape growing area at Vinchur in the study region. The grape area in Nashik District is a naturally developed cluster due to agro-climatic condition and easy availability of related inputs **(Bhosale Suresh, 2001).**

In the study area every year's 50 to 60 lakh liters grape wine is produced **(Mahenrda Mahajan, 2013).**In India consumption of wine is only 100 ml and one percent population of India consuming this wine. During the year 2012 the production of wine was 10 million liters, which is expected to grow upto 72 million liters in 2020.The Government of Maharashtra established Godavari wine park at Vinchur. In the future this wine park will give a boost to the wine industry in the Nashik District. Wine tourism is new buzzword in Nashik, around four hours from Mumbai **(Aditi Raut & Jayashree Bhakay, 2012).**

The main objectives of the present paper are as fallows.

i. To analyze the growth of wineries in the Nashik District.
ii. To highlight the favorable factors for development of wineries in the study area.
iii. To identify the problems relating to wineries in the study area.
iv. To suggest suitable measures for efficient wine marketing.

Study Area

Nashik is one of the major agriculturally and industrially developed district in the North Maharashtra. It lies between 19° 33` to 20° 53` north latitude and 73° 15' to 75° 16' east Longitude ***(Nashik Gazetteer,1983)*** Nashik District has an area of 15,530 Sq.k.m. In 2011, Nashik District had population 6,109,052 as per the 2011 census. Location of the study area is showed in Fig. No.1.There are 15 tahsils included in the Nashik District. The main system of hills is the *sahyadries*, which run north- south in the western portion of the district.

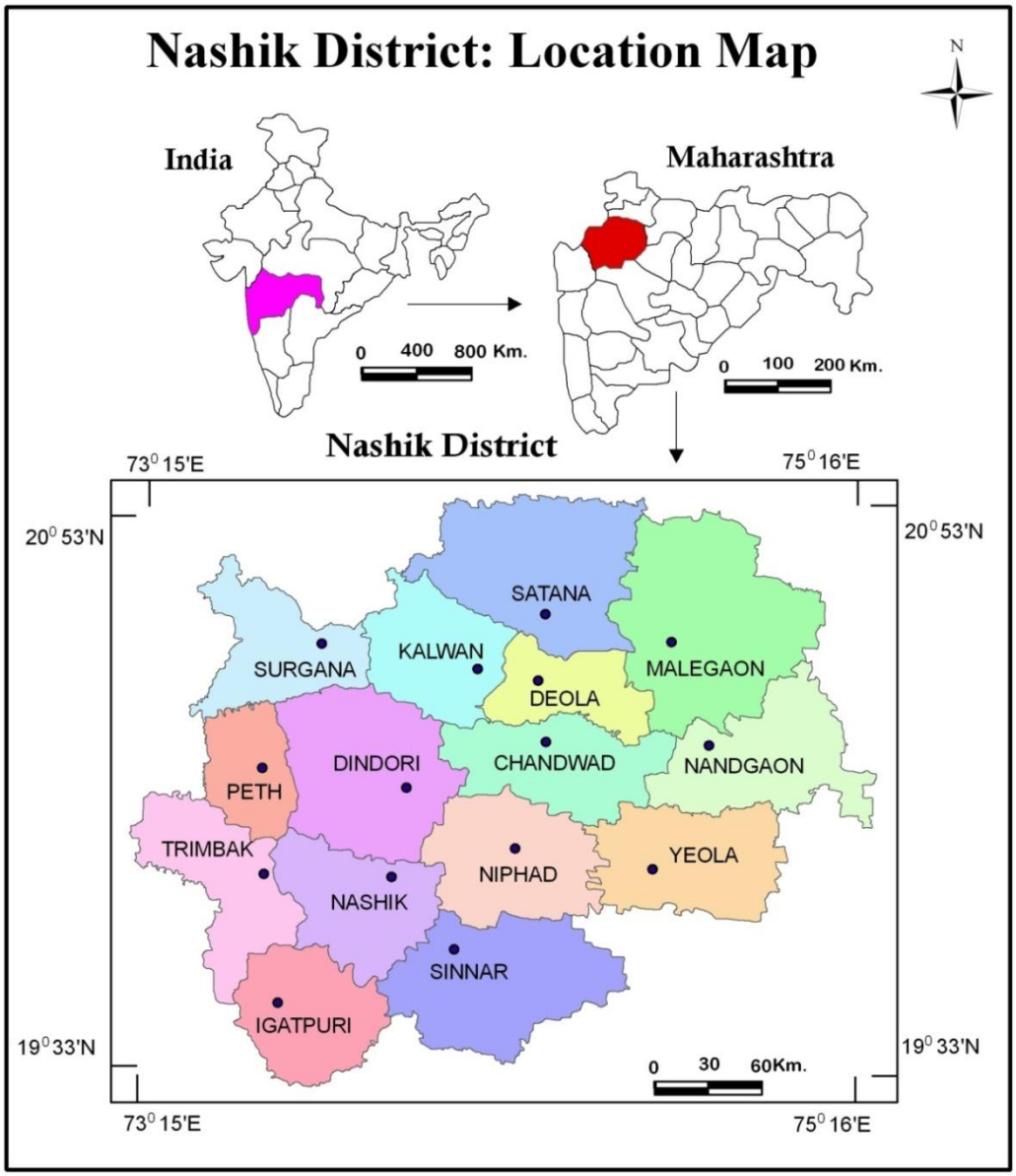


Fig. No.1

In the extreme north is *selbari* range, which approximately forms and boundary between Nashik and Dhule district. Next is the *Satmala* range which runs right across district. *Kalsubai* range is located in the south part of the district. The district has two main rivers the *Girna* and the *Godavari*. The district is surrounded by Dhule district in the north, Jalgaon and Aurangabad districts in the east, Ahemadnager district in the south, and Thane district in the south-west and Gujarat state in the north- west. Rice, Sugarcane, Onions, Grapes, Jowar, Bajra and Vegetables are the dominant crops of this region. The climate of the district is generally dry except during the monsoon season. The average annual rainfall of the district as a whole is 1034.5mm. The rainfall in general decreases from west to east. The summer season is moderately hot and the temperature varies from 36° c to 43° c. The air is humid during the monsoon season and is generally dry during the rest of the year.

Materials & Methodology

Present study is based on both primary and the secondary source of data. The primary data has been collected by adopting field survey and interviews with winery owner and wine grape cultivators of the study areas. Secondary data obtained from socio-economic abstract of the Nashik district (2010-11), District census handbook, District Gazetteers & Various general articles also used for the study which are published in local newspaper like Lokmat, Divya Marathi, Sakal and other papers. The Tahsil has been taken as a unit for analysis. Statistical tools like percentage, average etc. have been used in the study. Data is processed and represented with the bar graph, line graph & point map by using Illwis software.

Results:

Growth of wineries:

The first winery was started in Nashik at Govardhan near Nashik city in 1999.But after the announcing Maharashtra Government Wine Policy in 2001, the numbers of wineries are increased rapidly. At present 38 wineries are located in the study region and Nashik district produced 75 percent grape and grape wine of the country. Table No.1 &

Graph No.1 indicates the growth of wineries in the study area. The maximum wineries (17 units) are started during the year 2005 to 2007.

In Maharashtra, Nashik is leading district in grape and grape-wine production. Nashik is popularly known as Wine Capital of India. Table No.2 & Graph No.2 indicates that mostly wineries are located in Dindori, Niphad and Nashik tahsils of the study area. In this triangle 79.95 % (30 units out of 38 Units) wineries are located due to suitable climatic condition and development of Wine Park at Vinchur.

Favorable factors for development of wineries:

Climatic condition:

The climate of Nashik District is relatively cooler and suitable for grape cultivation. Diurnal variation with cool night having temperature 15° to 18° C and warm days from 20° to 32° C is essential for wine grape production. This condition is available during the month of September to march in the study area. Due to local raw a material that is grapes are available in large scale which the prime factor in development of wineries in the study area.

Table No.1 .Nashik District: Growth of Winery Units-1999 to 2013

Sr. No.	Year	Established Winery Unit in the year	Total No. of Winery Units at the end of the year
1	1999	01	1
2	2000	00	1
3	2001	02	3
4	2002	03	6
5	2003	02	8
6	2004	03	11
7	2005	07	18
8	2006	04	22
9	2007	06	28
10	2008	02	30
11	2009	04	34
12	2010	01	35
13	2011	01	36
14	2012	01	37
15	2013	01	38

Source: Survey, Dec.2013

Growth in Grape Cultivation:

Grape farming is a highly specialized form of agriculture ***(Todkari & Patil, 2012).***In Nashik District Grape is main fruit cash crops. Area under grape cultivation is continuously increased in the district from the year 1960-61.During 1960-61, only 582 hectors area was under grape cultivation ,which is increased upto 26326 hectors in the year 2008-09.Graph.No 2 indicates that during the span of forty eight years, area under grape is increased by 25744 hectors.

Fig.No.2 indicates that the area under grape farming is mostly concentrated in Niphad, Dindori and some part of Nashik, Chandwad, Satana and Sinnar tahsils of the district. Geographically, the area under grape cultivation is the main concentrated in Godavari and Girna Basin of east Sahyadries. The higher concentration of grapes in these areas is due to availability of irrigation facilities, well drained black soil & good agricultural infrastructure. During the forty eight years from 1960-61 to 2008-09, the grape cultivation is increasing continuously in the

Graph No.1 .Nashik District: Growth of Winery Units-1999 to 2013

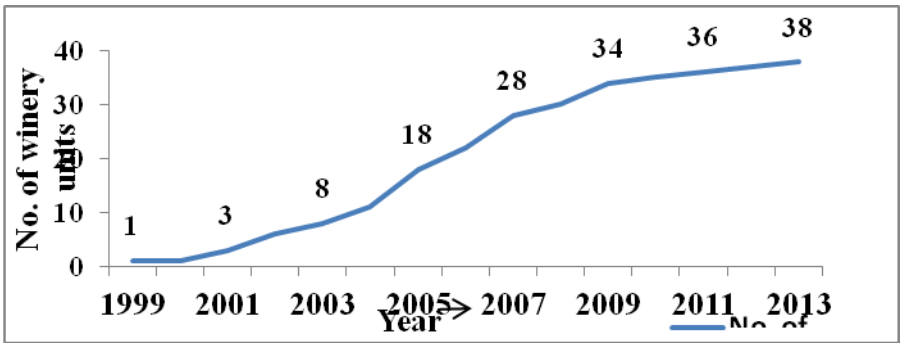
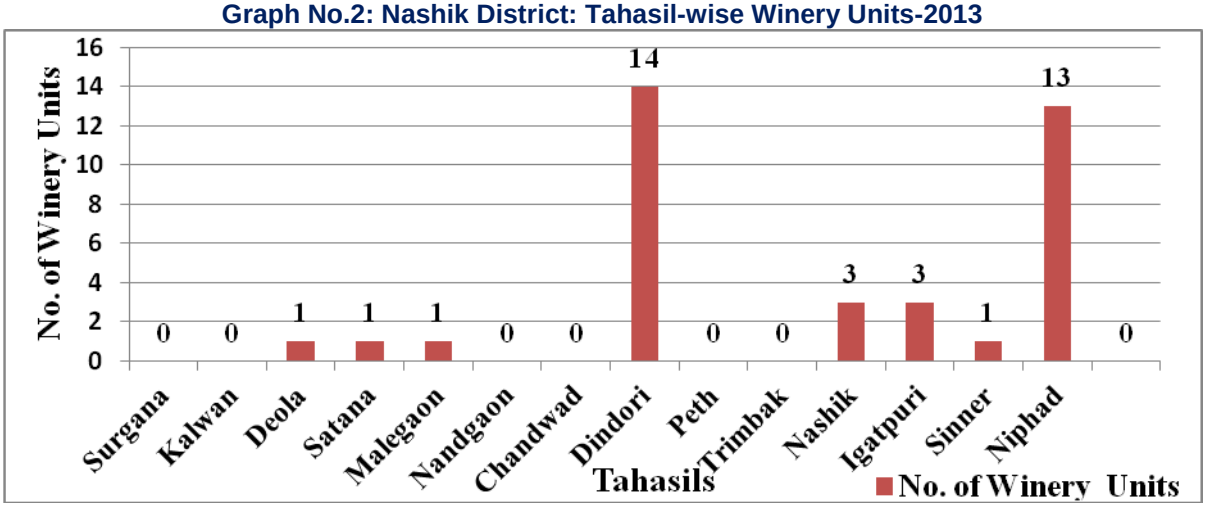


Table No.2. Nashik District: Tahasil-wise Winery Units-2013

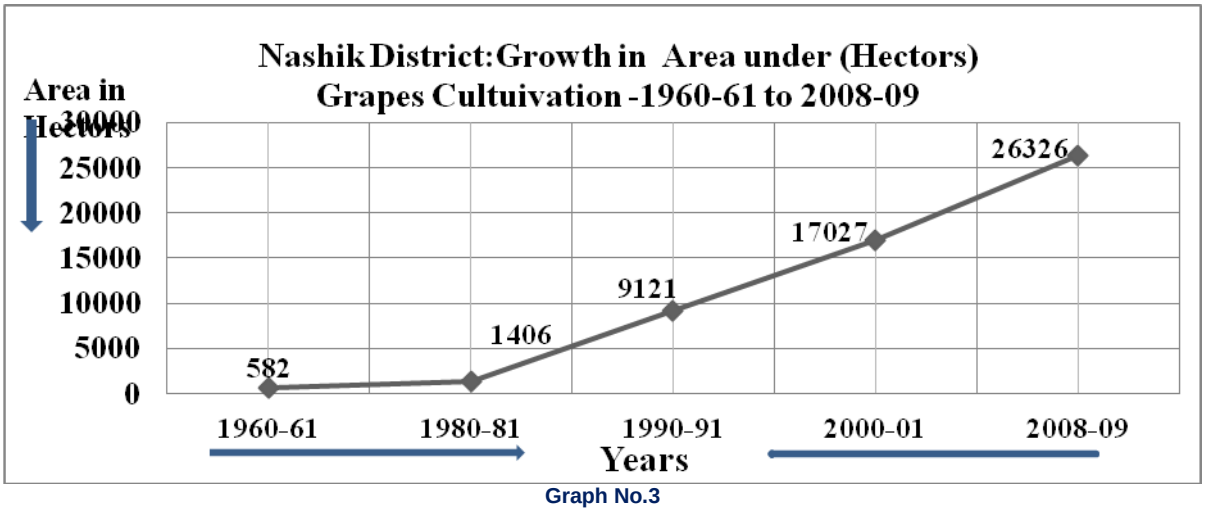
Sr.No.	Name of Tahasil	No. of Winery Units
1	Surgana	0
2	Kalwan	0
3	Deola	1
4	Satana	1
5	Malegaon	1
6	Nandgaon	0
7	Chandwad	0
8	Dindori	14
9	Peth	0
10	Trimbak	0
11	Nashik	3
12	Igatpuri	3
13	Sinner	1
14	Niphad	13
15	Yeola	0
Total		**38**

Source: Field Survey, Feb.2014

Graph No.2: Nashik District: Tahasil-wise Winery Units-2013



Study region. It was only 0.06 percent in the year 1960-61 to district net sown areas, which is increased upto 3.51 percent and it shown in the Graph.No.3.Table No.3 indicates that the tahasilwise distribution of grape cultivation of the district. In 1960-61, the area under grape cultivation was high observed in Niphad (35.40 %) and Nashik



Graph No.3

Table No.3: Nashik District:
Tahasilwise Area under Grape Cultivation- 2008-09

Sr.No.	Name of Tahsil	Percentage to Tahsil Total	Percentage to Dist. Total
1	Surgana	0.07	0.08
2	Kalwan	0.00	0.00
3	Deola	0.19	0.27
4	Satana	0.71	2.05
5	Malegaon	0.31	0.79
6	Nandgaon	0.03	0.05
7	Chandwad	3.32	7.50
8	Dindori	9.61	25.06
9	Peth	0.00	0.00
10	Trimbak	0.00	0.00
11	Nashik	2.31	2.04
12	Igatpuri	0.22	0.33
13	Sinner	1.48	3.61
14	Niphad	24.53	57.12
15	Yeola	0.40	1.10
	Total	**3.51**	**100**

Source: Nashik District Statistical Abstracts, 2010-11

N.B: Percentage is calculated from Total Net Sown Area

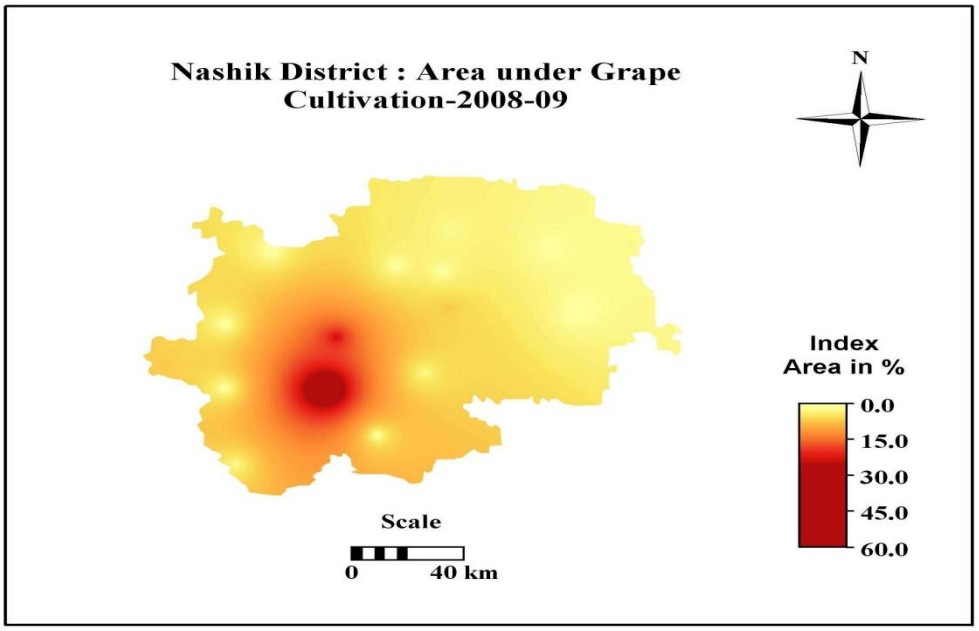


Fig.No.2

(32.47 %), whereas it was medium in Dindori (19.24 %) tahsil, which is shown in the Fig.No.2.In other tahsils of the district, the area under grape less than 10 percent.

In the year 2008-09, the area under grape cultivation was high in Niphad (57.12 %) and Dindori (25.06 %), where twenty seven wineries, out of thirty eight are located. Table No.3 also indicates that Peth, Surgana, Igatpuri, Deola, Nandgaon and Trimbak tahsils have very low area under grape cultivation. Even it was zero or less than 1 percent due to unfavorable physical condition and shortage of water.

Enology:

The main raw material for making wine is availability of different wine varieties of grapes in the study area. In the study area major varieties of wine grapes are Red wine grapes (Shiraz, Cabernet Sauvignon, Merlot & Zinfandel) and white wine grapes (Sauvignon Blanc, Chenin Blanc, Viognier & Chardonnay). Vines are planted on slopes to facilitate good drainage. Plantation is done in late December and early January.

Establishment of Wine Park at Vinchur:

In accordance with the Maharashtra Grape Processing Industrial Policy of 2001 the Government of Maharashtra has declared the Nashik Wine Park at Vinchur. It is on Nashik-Aurangabad Highway, from Nashik it is about 53 kms. The total area of Wine Park is 162.02 hect. It is mother unit for Nashik. Government provides basic infrastructure for winery at Wine Park at Vinchur which is helping to rise of more and more wineries in the study area.

Capital:

The Winery unit is capital intensive and requires financial assistance from the banks. The District is having a good network of commercial and co-operative banks. The Nashik District co operative bank, Banks of Maharashtra, State bank of India and other nationalized banks providing long and short term loans for winery in the study area.

Problems of wineries:

Based on formal discussions with winery owners and grape farmers many problems related to wineries are found. The major problems are as below.

1. Over production of grape wine is the major problem in the study area. Therefore three to four units are temporary closed.
2. Marketing of grape wine is very important problem. At local, regional and national level market for wine is still not too much only few cities Like Mumbai, Delhi, Chandigarh Banglore and state like Goa & Karnataka have good market. Rest parts of the country don't have so good market. For international level still we not success due to quality and government support. At some extend India export grape wine to UK,Canada,America,Japan,China,Italy,Hong-Kong, Bhutan and Dubai but it is not too much.
3. Lack of awareness & willingness in wine tourism in India.
4. Government policy about winery and wine marketing is different in many states that make problems in marketing operations.
5. Due to over production, demand for wine grape is not stable. Therefore many grape farmers started to produce table grape. It may be possible in future shortage of wine grape.
6. Lack of adequate infrastructure in rural areas, poor packing techniques, poor storage and insufficient marketing mechanism are other problems, which this industry facing in the study area.
7. The lack of technology upgradation has lead to major problems in the winery growth.

Conclusion:

1. Production, productivity and marketing are the important aspects in the agricultural development in India.
2. Since last 15 years the area under grape and its production is continuously increasing therefore processing on grape is very important.
3. Nashik is popularly known as Wine Capital of India. Grape wine making is gradually picking up in Nashik district since last thirteen years.
4. Mostly wineries in the study area are located in Dindori, Niphad and Nashik tahsils. In this triangle 79.95 % (30 units out of 38 Units) wineries are located due to suitable climatic condition and development of Wine Park at Vinchur.
5. Climatic condition, More area under grape, Government Policy of Maharashtra-2001, Availability of capital, Development of Wine Park at Vinchur are favorable factors for development of winery in Nashik District.
6. Over production, marketing of grape wine, Lack of awareness & willingness in wine tourism, Demand for wine grape is not stable, Lack of adequate infrastructure in rural areas & the lack of technology upgradation are important problems of winery in the study area.

Suggestions:

1. Marketing of wine is major problem that affects progress and success of winery. There should be uniform law in all the states in India and government also encourage to export grape wine in other country. The Government must provide subsidies to the winery owners to export more grape wine in the International market.
2. The State and central Government should provide assurance to wine grape farmers about wine grape farming and marketing. Both the government should provide grape wine export facilities to winery owners.

3. There is too much scope for wine tourism in the study area, which can helps to grape wine marketing. Mumbai, Pune & Aurangabad are located around three to four hours from the Nashik. Many vineyards now have tasting rooms that are open for public. Now in this regards efforts are on by organizing wine festivals at Nashik (March 2013) and Vinchur (Feb.2014).But frequency of such festivals should increased in the study area and as well as rest part of India. Recently the Government of Maharashtra organized committee under the chairmanship of Mr.Jagdish Holakar for development of wine tourism. It is good steps taken by State Government for grape wine marketing.
4. Winery is highly capital intensive projects which required much capital so there is need to reduce rate of interest to 6 to 7 from the present.

References

1. Aditi Raut & Jayashree Bhakay (2012), "Wine tourism in Maharashtra: Problems and solutions", 'Asian journal of food and Agro-Industry', Vol.5 Issue: 2, 2012, Pp.141-155.
2. Bhosale Suresh (2001) "Grape cluster in Nashik (Maharashtra)", UNIDO CDP, New Dehil 2001 Report, Pp.1-10.
3. Gazetteer of the Bombay presidency (1883) Nashik District Volume No.19.Pp.5.7.
4. Mahenrda Mahajan (2013), Articles on wine marketing, Nashik Sakal newspaper dated 24.1.2013.
5. Shitole B.B (2010) "Problems of Grape Marketing: A case study of Sangali District in Maharashtra", 'Cyber Literature The International online journal-Literature, Humanities & Communication Technology', Vol.2, Issue No.2, December .2010, Pp.8-11.
6. Shitole B.B. (2010), "Problem of Grape Marketing: A case study of Sangli District in Maharashtra", 'Cyber Literature: The International online Journal', Vol.No.3, Issue No.2, Dce.2010, ISSN No.0972-0901, Pp. 8-11.
7. Todkari G.U. & Patil B.D. (2012), "Spatio-temporal pattern of grape farming in Solapur District-A Geographical Analysis", 'Paripex-Indian Journal of Research', Vol.1, Issue-3, March-2012, ISSN No.2250-1991, Pp 67-69.

THE END

Coming Soon Next

IJHEPS/JANUARY 2015

ISBN: 978-81-909047-9-7

Website: www.ijheps.org
Facebook: www.facebook.com/ijheps
E-mail: editorboard@ijheps.org

Original Price: 30$
Special Indian Price: Rs.1000