

ISSN 2277-1425

e-ISSN 2277-1433

*A Bi-annual Peer Reviewed
Multi-Disciplinary
Research Journal*



Himachal Pradesh University Journal

Vol. 05, No.1-2, July-December 2017

A Bi-annual Multi-disciplinary Research Journal
of Himachal Pradesh University

EDITORIAL

BOARD

EDITOR IN CHIEF

Prof. Sikander Kumar
Vice Chancellor
Himachal Pradesh University,

EDITOR

Prof. Harish K. Thakur
Department of Political Science
Himachal Pradesh University
Shimla-171005

ASSOCIATE EDITORS

Prof. Saraswati Bhalla

Department of Hindi
Himachal Pradesh University
Shimla-171005

Prof. R. P. Sharma

Department of Mathematics & Statistics
Himachal Pradesh University
Shimla-171005

Prof. A. J. Singh

Department of Computer Sciences
Himachal Pradesh University
Shimla-171005

Prof. Mamta Mokta

Department of Public Administration
Himachal Pradesh University
Shimla-171005

Prof. Arvind Kumar Bhatt

Department of Biotechnology
Himachal Pradesh University
Shimla-171005

Prof. Vikas Dogra

Department of Journalism
& Mass Communication
Himachal Pradesh University
Shimla-171005

Contents

| | |
|---|-----|
| 1. Dose dependent histopathological and biochemical alterations in liver of fresh water fish <i>Cyprinus carpio</i> exposed to organophosphorus pesticide Dichlorvos <i>Sushma Sharma and Rajinder Kumar</i> | 3 |
| 2. Response Surface Methodology for optimization of lipase production from fungal isolate RL-4 <i>Roji Sharma, Akshita Mehta and Reena Gupta</i> | 17 |
| 3. Stress induced biochemical changes in rat skeletal muscles <i>Sushma Sharma</i> | 30 |
| 4. Increased lignin peroxidase production from bacterial isolate L2 isolated from cold desert region of Himachal Pradesh, India <i>Shikha Devi and Arvind Kumar Bhatt</i> | 42 |
| 5. Isolation, screening and optimization of extracellular cellulase producing bacterial isolate <i>Vaishali Sharma, Amit Nadda, Nidhi Rana, Ravi Kant Bhatia and Arvind Kumar Bhatt</i> | 55 |
| 6. Validity of principle of exchange of stabilities of Walters' B fluid permeated with suspended particles in porous medium under the effect of rotation with variable gravity field by using operator method. <i>Pushap Lata Sharma</i> | 68 |
| 7. Community Health needs: Assessment in a Northern Hilly State of India <i>Amit Sachdeva, Satyawar Pandit, O.P. Bhuretia, Reena Singh, Jiyanand Sharma</i> | 78 |
| 8. Mental Health of Male and Female Senior Secondary Students of District Shimla <i>Reena Devi and Surender Kumar Sharma</i> | 90 |
| 9. Deendayal Upadhyaya: Man, Mission and Message <i>Suresh Kumar Soni</i> | 97 |
| 10. Problems Faced by Women Deserted by Non Resident Indian Bridegrooms <i>Ruchi Sapahia</i> | 106 |
| 11. Role of SHGs in Women's Empowerment: A Socio-economic and Psychological Analysis <i>Randhir Singh Ranta</i> | 116 |
| 12. VAS (Value Added Service) - Rise of mCommerce: Technology, Business and Society <i>Varun Bhardwaj</i> | 132 |
| 13. Awareness About Women's Rights among the Female Scholars of H.P. University <i>Bhawna Sharma</i> | 138 |

| | | |
|-----|--|-----|
| 14. | Job Satisfaction of the Employees in Himachal Road Transport Corporation with Reference to Financial Aspects <i>Vijay Singh and Simmi Agnihotri</i> | 150 |
| 15. | SHGs as Dependable Vehicles for Inclusive Growth of Rural People <i>Vijeta Sharma and O.P. Verma</i> | 164 |
| 16. | Social Media, Mobilization and Political Communication <i>Vikas Singh</i> | 180 |
| 17. | National Rural Livelihood Mission in Himachal Pradesh: A Study of Development Block Sadar Mandi <i>Baldev Singh Negi and Sandeep Thakur</i> | 187 |
| 18. | Perceptions of Government Senior Secondary School Teachers towards In-Service Training: A Study of Hamirpur District Of Himachal Pradesh <i>Sunil Kumar</i> | 198 |
| 19. | Importance of Value Education in Higher Education <i>Jai Prakash Sharma</i> | 210 |
| 20. | Depiction of Cultural Heritage of Kuluta through Art and Sculpture <i>Savita Kumari & Gopal Chauhan</i> | 219 |
| 21. | Legacy of the British Rule in India <i>Rameshwar Singh</i> | 226 |
| 22. | Armed Forces Special Power Act : An Introspection <i>Shriya Mokta</i> | 236 |
| 23. | Historiography of Translation in Punjabi <i>Ravinder Singh</i> | 248 |
| 24. | Cultural and Ethnic Disintegration of Gikuyu Society: A Study of Ngugi wa Thiong'O's <i>Weep Not, Child</i> <i>Sanjeev Kumar</i> | 257 |
| 25. | हिमाचल प्रदेश में प्रचलित लोक कलाओं की शब्दावली <i>श्रीराम शमा प्रेम प्रकाश</i> | 266 |
| 26. | महिला कथाकारों द्वारा चित्रित नारी समाज <i>पूनम कुमारी</i> | 281 |

Dose dependent histopathological and biochemical alterations in liver of fresh water fish *Cyprinus carpio* exposed to organophosphorus pesticide Dichlorvos

Sushma Sharma and Rajinder Kumar

Abstract

THE USE of chemical pesticides is one of the major reasons of contamination of various water bodies in developing countries like India. Among different group of pesticides organophosphorus compounds (OPs) have been widely used insecticides due to their low persistence and high effectiveness for insect and pest eradication. Among different OPs, Dichlorvos is widely used pesticide in agricultural practices throughout the world. It is widely used insecticide which is effective against various insects like aphids, caterpillars, thrips, mushroom flies etc. Its use has been matter of concern due to ill effects to non target organisms. Present study is aimed to investigate toxicological effects of dichlorvos on the liver of Indian carp viz. *Cyprinus carpio*. Carp was divided into five groups containing three fishes in each group. Group 1 fishes were designated as control. Fishes of group 2, 3, 4, 5 were placed in 1.0ppm, 1.4ppm, 1.7ppm and 2.0ppm concentrations of dichlorvos for the period of 10 days. Various biochemical alterations were observed after the exposure of different concentrations of dichlorvos. Increase in superoxide dismutase (SOD), catalase (CAT) and lipid peroxidation level (LPO) and decrease in total protein content was noticed after dichlorvos administration in liver. In liver various histopathological alterations like infiltration of blood cells, hemorrhage, nuclear degeneration, hypertrophic nuclei, congestion of nuclei, dilation of sinusoids, infiltration of nuclei and enucleated areas at some places was depicted after dichlorvos treatment.

Key words: Dichlorvos, Indian carp, fish liver, histology, biochemical parameters.

Introduction

The fresh water bodies are contaminating at an alarming rate. The use of chemical pesticides is one of the major reasons for this. Various health problems have been widely reported due to long term ingestion of contaminated water with different chemical pesticides. The use of chemical pesticides in agricultural field is recognized as a very important method of controlling pests. But these chemical pesticides cause environment pollution that has become a serious problem. Nowadays these pesticides are used on a large scale hence the destruction to the environment is also large. A potential pathway for the adverse effects of pesticides is through hydrologic system which supplies water for both humans and natural ecosystem (Begum *et al.*, 2009). Pesticides and other related chemicals can cause adverse effects by interfering with the enzymatic systems and causing destruction to various tissues of the body. From last three or four decades chlorinated pesticides have been fully replaced by organophosphorous pesticides due to their low cumulative ability, quick degradation and short term persistence in the environment. These insecticides are used for the control of wide variety of pests which would otherwise diminish the quantity and quality of food production. Unfortunately inspite of its advantages the disadvantages are also there. Insecticides are threatening the long term survival of major ecosystems and causing loss to biodiversity by disruption of ecological relationships between the organisms. Among different OPs, Dichlorvos is widely used pesticide in agricultural practices throughout the world. Dichlorvos or 2,2 dichlorovinyl dimethyl phosphate (DDVP) is widely used insecticide which is effective against various insects. It is also known by its trade name DDVP, Dedevap, Nogos, Nuvan, Phosvit or Vapona. Due to its prevalence in urban waterways, it's toxicological effects on other non target organisms has become a matter of major concern. The most important inhabitants of the aquatic ecosystem are fishes which are more often exposed to and affected by these toxic pesticides (Scott and Sloman, 2004). Various toxicological investigations are done by using fish as biomarker to determine the toxic effects of various chemical pesticides. So fish provide an important tool to monitor the quality of aquatic environment and thereby the health status of various organisms inhabiting those diverse aquatic ecosystems. Histopathological changes in gills, liver, heart and renal tubules of kidney, haemopoietic tissues such as spleen and different genetic and behavioral disorders are some of the biological indicators of exposure of fish to insecticides. *Cyprinus carpio* Linnaeus, 1758 commonly known as common carp is a widespread freshwater fish of eutrophic water in lakes and rivers in Europe and Asia.

Materials and methods

Present investigation was carried on the liver of *Cyprinus carpio* which was obtained from the Fish farm, Deoli (Ghagus), Bilaspur, Himachal Pradesh which is relatively free from the pollutants. The experimental set up was done on fish farm Bilaspur. The fishes of desired species of carp were collected and then transferred to cemented tanks of capacity of approximately 1800 L. The physiochemical properties of water were according to the environmental conditions of the fish farm. All experimental procedures were conducted after the approval of Department of Fisheries, Himachal Pradesh.

Experimental design

Carp was divided into five groups containing three fishes in each group. Group -1 fishes were designated as control. Group-2, Group-3, Group-4 and Group-5 fishes were kept in 1.0ppm, 1.4ppm, 1.7ppm and 2.0ppm concentrations of dichlorvos respectively for 10 days. Dichlorvos was administered by mixing it in water for ten days. Experiment was done in the still water. The fishes of each group were sacrificed at the fish farm after 10 days. The liver of treated and control fishes were excised and then transported from Deoli to the laboratory of Animal Physiology, Himachal Pradesh University, Shimla in ice box. The desired tissues were then kept in -70°C (Lab cool) and then processed for different investigations.

Histological study

Liver of *Cyprinus carpio* was excised immediately after sacrificing the fishes. Tissues were fixed in Bouin's fixative for 24 hours. After that tissues were washed in running tap water until the entire yellow color disappeared. Tissues were dehydrated serially in different grades of alcohol (30%, 50%, 70%, 90%, 100%) and cleared in xylene. Tissues were then embedded in paraffin wax ($58-60^{\circ}\text{C}$). Sections of about $5-6\mu\text{m}$ thickness were cut on the rotary microtome and subjected to hematoxylin-eosin staining.

Protein estimation

Protein content was estimated as per the method of Lowry *et al.*, (1951) using Folin-ciocalteu's reagent. The optical density was recorded at 550nm in a UV-VIS spectrophotometer.

Determination of antioxidant system

Superoxide dismutase (SOD) activity was determined by the method of Mishra and Fridovich, (1972). SOD activity was calculated in units/mg protein/min. Catalase assay was done as per method of Aebi, (1984). Enzyme specific activity was finally measured and calculated in units/mg protein/min. Levels of malondialdehyde index of lipid peroxidation was estimated according to the

method of Dhindsa *et al.*, (1981) using thiobarbituric acid (TBA). The MDA contents were calculated in μ moles/mg of fresh tissue weight.

Statistical analysis

Data was presented as statistical mean \pm SEM. Comparison amongst groups was performed using one way anova test. Statistical significance was set at $P^{**}<0.01$.

Results

Histology results

Liver

Liver is the major organ involved in the metabolism, digestion and detoxification of various substances from the body. It is principal organ that is capable of converting drug into a substance that can be easily eliminated from the body. The liver in a fish serves the digestion, waste removal and storage functions. This organ also serves as the food reserve, sustaining the fish when food resources are scarce.

Various visual changes in the general architecture of liver tissue were observed after administration of dichlorvos by mixing it in water for the period of 10 days at different concentrations. After the treatment of dichlorvos liver exhibited infiltration of blood cells, infiltration of nuclei, hemorrhage, cytoplasmic and nuclear degeneration and enucleated areas at various places. Maximum changes were observed after the treatment of 1.7ppm and 2.0ppm concentrations of dichlorvos (Fig 1-6).

Biochemical results

Various biochemical alterations were observed after the exposure of different concentrations of dichlorvos in liver. Decrease in total protein content (Table I) was observed after the treatment of dichlorvos. Decrease of -16.8%, -40.6%, -58.4% and -78.8% was observed with 1ppm, 1.4ppm, 1.7ppm and 2ppm concentrations of dichlorvos respectively as compared to control.

Increase in superoxide dismutase (SOD) activity (Table II) was seen after the treatment of dichlorvos. Increase of 11.9%, 15.1%, 18.4% and 22.5% in SOD activity was observed with 1ppm, 1.4ppm, 1.7ppm and 2ppm concentrations of dichlorvos respectively as compared to control.

Increased catalase (CAT) activity (Table III) was noticed after the treatment of dichlorvos. An increase of 11.5%, 22.8%, 34.9% and 49.0% was observed with 1ppm, 1.4ppm, 1.7ppm and 2ppm concentrations of dichlorvos as compared to control.

Lipid peroxidation level (LPO) (Table IV) was increased after administration of different concentrations of dichlorvos as compared to control in liver. An

increase of 11.6%, 21.6%, 32.0% and 41.0% was observed with 1ppm, 1.4ppm, 1.7ppm and 2ppm concentrations of dichlorvos as compared to control.

Discussion

Use of chemical pesticides is increasing day by day in developing countries like India. Their use has been a matter of major concern because of their harmful effects to various non target organisms. Their widespread use in agriculture to control various kinds of pests is one of the major reasons of aquatic pollution. The pesticides and their residues mostly reach into aquatic ecosystems through surface runoff (Jergentz *et al.*, 2004). Prominent insecticide families include organochlorines, organophosphates and carbamates. Organochlorine pesticides were mostly used earlier but various ecological concerns arising out of high persistence of organochlorines have favoured extensive use of organophosphates for controlling household, agricultural and public health pests due to their less persistence and high efficacy (Jyothi and Narayan, 1999). This shift has resulted into increased concentration of organophosphates into water bodies causing acute and chronic toxicity to various aquatic organisms including fish fauna (Aker *et al.*, 2008; Pandey *et al.*, 2009). Liver is the most metabolically active tissue in the body and site of major processes of transformation (Van der Oost *et al.*, 2003). Histopathology of liver is increasingly being considered as biomarker of xenobiotic exposure (Fernandes *et al.*, 2008) along with various biochemical parameters to study different kind of stresses induced by chemical pesticides (Rawat *et al.*, 2002).

Liver showed various histopathological changes like nuclear degeneration, infiltration of nuclei, hemorrhage, vacuolization and enucleated areas after the treatment of dichlorvos as compared to control. Our results were supported by Fanta *et al.*, (2003) who observed alterations like irregular shaped hepatocytes, cytoplasmic vacuolization and laterally placed nucleus in siluriform *Corydoras paleatus* after exposure of organophosphorus pesticides for 96 hrs. Various researchers observed similar results in liver after the treatment of dichlorvos like increase in sinusoidal spaces, necrosis, hepatic or cellular vacuolization, cloudy swelling of hepatocytes, shrinkage leading to damage of cytoplasmic material in hepatic cells, hepatocyte degeneration and loss of cell boundaries in hepatocytes in *Channa punctatus* (Kumar and Gautam, 2014; Kumar, 2016:) and in *Clarius batrachus* (Shukla *et al.*, 2005).

Decrease in protein content was observed with the increase in concentration of dichlorvos. Our results were supported by Giridhar *et al.*, (2015) who observed significant decrease in total protein content of liver, muscle, gills and kidney of *Labeo rohita* after 15 days treatment of nuvan. Similar results of decrease in total protein content was observed (Ahmed and Gautam, 2014) after the

treatment of dichlorvos (nuvan) in liver of *Heteropneustus fossilis* and in *Oreochromis mossambicus* (Lakshmanan *et al.*, 2013). Similar findings i.e. decrease in total protein content after the treatment with dichlorvos were witnessed in liver of *Labeo rohita* (Rani *et al.*, 2008). Increase in the activity of CAT and SOD is usually observed in environmental pollutants since SOD-CAT system represents the first line of defense against oxidative stress (Pandey *et al.*, 2003). Increase in SOD activity, CAT activity and MDA levels was observed after the exposure of various concentrations of dichlorvos. Our results were supported by Sharbidre *et al.*, (2011) who observed fluctuating levels of these antioxidant enzymes in treated groups in chlorpyrifos treated *Poecila reticulata*. Velisek *et al.*, (2011) observed increased SOD activity decreased CAT activity in liver of *Cyprinus carpio* after the exposure of terbutryn which supported our results. Kaur and Jindal, (2017) observed initial increase in SOD activity after the exposure of Chloropyrifos and long term exposure decrease the SOD activity in *Ctenopharygodon idellus*.). Kavithaa and Venkateswara, (2008) observed similar results in *Ganbusia affinis* when exposed to sublethal concentration of chlorpyrifos. Increase in lipid peroxidation was observed with the increase in concentration of dichlorvos. Similar result was seen by Sharbidre *et al.*, (2011) who observed the elevated levels of MDA contents in *Poecila reticulata* after Chloropyrifos treatment.

References

- Aebi, H. (1984). Catalase in vitro. *Methods in Enzymology*, 105: 121-126.
- Ahmad, S.I. and Gautam, R.K. (2014). Effect of organophosphate pesticide, Nuvan on serum biochemical parameters of freshwater catfish *Heteropneustes fossilis* (Bloch.). *International Research Journal of Environment Sciences*, 3(10): 1-6.
- Aker, W.G., Hu, X., Wang, P. and Hwang, H.M. (2008). Comparing relative toxicity of malathion and malaoxon in blue catfish *Ictalurus furcatus*. *Environment Toxicology*, 23: 548- 554.
- Begum, A., Hari Krishna, S. and Khan, I. (2009). Analysis of heavy metals in water, sediments and fish samples of Madivala lakes of Bangalore, Karnataka. *International Journal of ChemTech Research*, 2: 245–249.
- Dhindsa, R. S., Dhindsa, P. P. and Thrope, T. A. (1981). Leaf senescence correlated with increased level of membrane permeability and lipid peroxidation and decrease level of SOD and catalase. *Journal of Experimental Botany*, 126: 32-33.
- Fanta, E., Rios, F. S., Ramao, S., Vinna, A. C. C. and Freiburger, S. (2003). Histopathology of the fish *Corydoras paleatus* contaminated with sublethal

levels of organophosphorus in water and food. *Ecotoxicology Environment Safety*, 54: 119-130.

Fernandes, C., Fontainhas-Fernandes, A., Rocha, E and Salgado, M.A. (2008). Monitoring pollution in Esmoriz-Paramos lagoon, Portugal: Liver histological and biochemical effects in *Liza saliens*. *Environmental Monitoring Assessment*, 145: 315-322.

Giridhar, P., Neeraja, S. R. K. and Indira, P. (2015). Effect of organophosphorus Nuvan on some aspects of protein metabolism in freshwater fish *Labeo rohita* (Hamilton). *International journal of Advanced Research*, 3(7): 977-984.

Jergentz, S., Mugni, H., Bonetto, C. and Schulz, R. (2004). Run off related endosulfan contamination and aquatic macroinvertebrate response in rural basins near Buenos Aires, Argentina. *Archives of Environmental Contamination and Toxicology*, 46: 345-352.

Jyothi, B. and Narayan, G. (1999). Certain pesticide induced carbohydrate metabolic disorders in the serum of freshwater fish *Clarias batrachus* (Linn.). *Food and Chemical Toxicology*, 37: 417-421.

Kaur, M. and Jindal, R. (2017). Oxidative stress response in liver, kidney and gills of *Ctenopharyngodon idellus* (Cuvier & Valenciennes) exposed to Chlorpyrifos. *Medcrave Online Journal of Biology and Medicine*, 1(4): 00021.

Kavithaa, P. and Venkateswara Rao, J. (2008). Toxic effects of chlorpyrifos on antioxidant enzymes and target enzyme acetylcholinesterase interaction in mosquito fish, *Gambusia affinis*. *Environment Toxicology and Pharmacology*, 26: 192-198.

Kumar, S. (2016). Toxic impact of nuvan (DDVP) on tissues of common carp *Channa punctatus* (Bloch.). *International journal of Agriculture, Environment and Biotechnonology*, 1(4): 890-892.

Kumar, S. and Gautam, R. K. (2014). Study of biochemical toxicity of nuvan in *Channa punctatus* (Bloch.). *Advance Research in Agriculture and Veterinary Science*, 1(1): 31-34.

Lakshmanan, S.A., Rajendran, C. and Sivasubramaniyan. (2013). Studies on impact of Dichlorvos on selected haematological parameters of freshwater fish, *Oreochromis mossambicus* (Peters). *International Research Journal of Biological Science*, 3(1): 28-33.

Lowry, O.H., Rosenbrough, M.J., Faar, A.L. and Randall, R.J. (1951). Protein measurements with folin-phenol reagent. *Journal of Biological Chemistry*, 193: 265.

Mishra, H. P. and Fidovich, I. (1972). The role of superoxide anion in the

autoxidation of epinephrine and a simple assay for superoxide dismutase. *Journal of Biological Chemistry*, 25: 3170-3175.

Pandey, S., Parvez, S., Sayeed, I., Haque, R., Bin-Hafeez, B. and Raisuddin, S. (2003). Biomarkers of oxidative stress: a comparative study of river Yamuna fish *Wallago attu* (Bl. & Schn.). *Science of Total Environment*, 309: 105–115.

Pandey, R.K., Singh, R.N., Singh, S., Singh, N.N. and Das, V.K. (2009). Acute toxicity bioassay of dimethoate on freshwater air breathing catfish, *Heteropneustes fossilis* (Bloch). *Journal of Environmental Biology*, 30: 437 – 440.

Rani, R., Gautam, R.K., Gautam, K. and Kumar, S. (2008). Nuvan intoxication leads protein alteration in kidney of *Labeo rohita*. *Journal of Experimental Zoology, India*, 11(1): 113-115.

Rawat, D.K., Bais, V.S. and Agrawal, N.C. (2002). A correlative study on liver glycogen and endosulfan toxicity in *Heteropneustes fossilis* (Bloch.). *Journal of Environmental Biology*, 23: 205-207.

Scott, G. R. and Sloman, K. A. (2004). The effects of environmental pollutants on complex fish behaviour: integrating behavioural and physiological indicators of toxicity. *Aquatic Toxicology*, 68(4): 369-392.

Sharbidre, A.A., Metkari, V. and Patode, P. (2011). Effect of methyl parathion and chlorpyrifos on certain biomarkers in various tissues of guppy fish, *Poecilia reticulata*. *Pesticide Biochemistry and Physiology*, 101: 132-141.

Shukla, S., Sujata, D. K. and Saksena, D. N. (2005). Effect of sublethal exposure of an organophosphorus pesticide, nuvan on liver of catfish, *Clarias batrachus*. *Nature Environment and Pollution Technology*, 4(3): 447-452.

Van der Oost, R., Beyer, J. and Vermeulen, N.P. (2003). Fish bioaccumulation and biomarkers in environmental risk assessment: a review. *Environment Toxicology and Pharmacology*, 13: 57-149.

Velisek, J., Stara, A., Kolarova, J. and Svobodova, Z., (2011). Biochemical, physiological and morphological responses in common carp (*Cyprinus carpio* L.) after long-term exposure to terbutryn in real environmental concentration. *Pesticide Biochemistry and Physiology*, 100: 305–313.

Tables:-Protein estimation

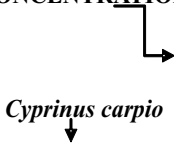
| <div>CONCENTRATION</div> <div>  </div> | PROTEIN CONTENT (mg/g fresh tissue) | | | | |
|---|-------------------------------------|--------------|--------------|--------------|--------------|
| | Control | 1ppm | 1.4ppm | 1.7ppm | 2ppm |
| Liver | 87.03±0.53 | 80.66±0.55** | 78.18±0.72** | 75.11±1.12** | 69.55±0.35** |
| % decrease | | -16.8% | -40.6% | -58.4% | -78.8% |

Table I:- Changes in protein content (mg/g tissue wt.) in normal and dichlorvos treated liver of *Cyprinus carpio* for 10 days at different concentrations of dichlorvos. Values are mean ± SEM; n=3 (p** < 0.01).

SOD activity

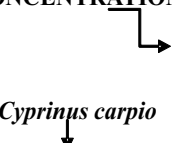
| <div>CONCENTRATION</div> <div>  </div> | SOD ACTIVITY (units/mg protein/minute) | | | | |
|---|--|--------------|--------------|--------------|--------------|
| | Control | 1ppm | 1.4ppm | 1.7ppm | 2ppm |
| Liver | 17.0±0.18 | 19.03±0.12** | 19.58±0.21** | 20.32±0.14** | 20.84±0.13** |
| % increase | | 11.9% | 15.1% | 18.4% | 22.5% |

Table II:- Changes in SOD specific activity (units/mg protein/min) in normal and dichlorvos treated liver of *Cyprinus carpio* for 10 days at different concentrations of dichlorvos. Values are mean ± SEM; n=3 (p** < 0.01).

CAT activity

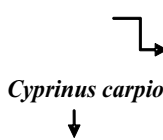
| CONCENTRATION  <i>Cyprinus carpio</i> ↓ | CATALASE ACTIVITY (units/mg protein/minute) | | | | |
|---|---|-------------|-------------|-------------|-------------|
| | Control | 1ppm | 1.4ppm | 1.7ppm | 2ppm |
| Liver | 2.74±0.04 | 3.06±0.02** | 3.37±0.01** | 3.70±0.06** | 4.09±0.03** |
| % increase | | 11.5% | 22.8% | 34.9% | 49.0% |

Table III:- Changes in catalase activity (units/mg protein/min) in normal and dichlorvos treated liver of *Cyprinus carpio* for 10 days at different concentrations of dichlorvos. Values are mean ± SEM; n=3 (p^{} < 0.01).**

Lipid peroxidation

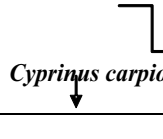
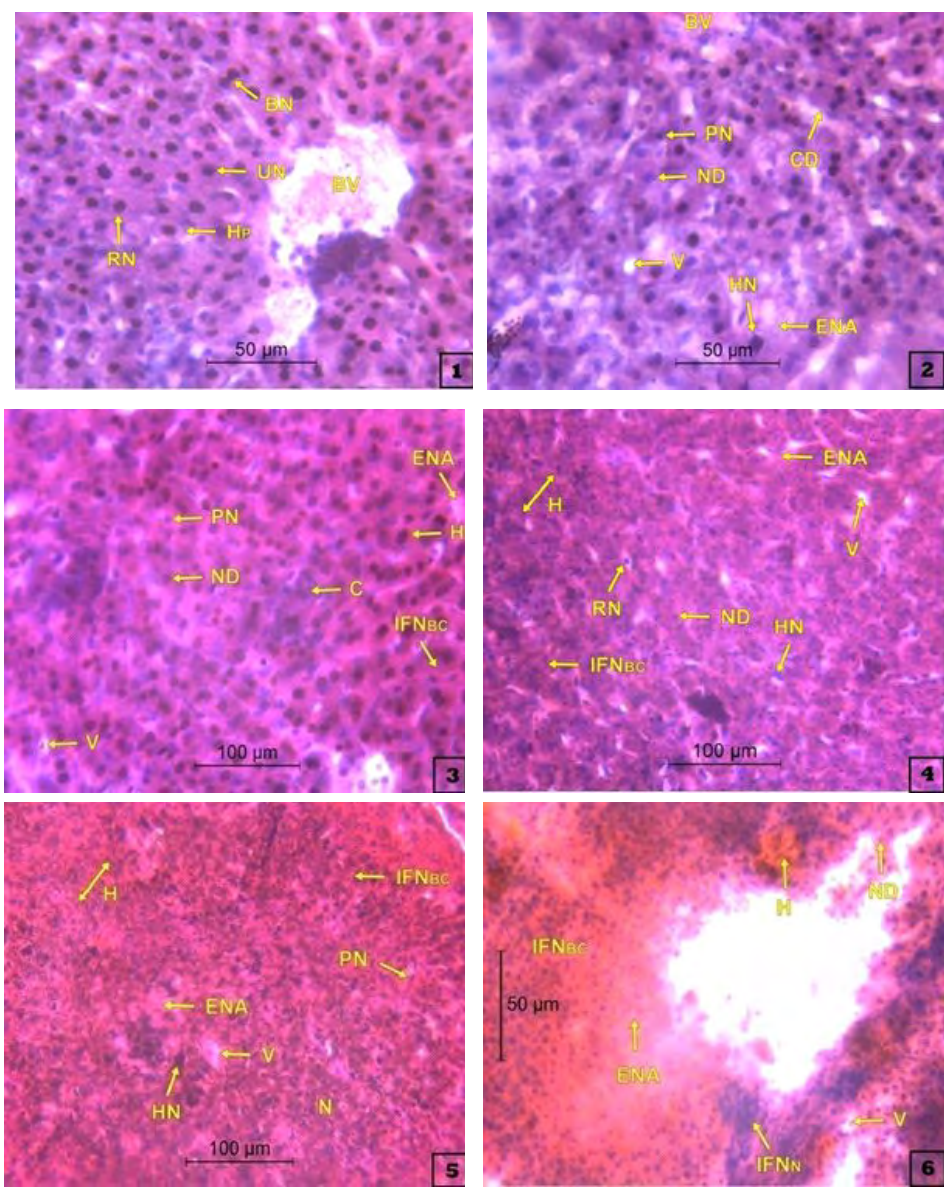
| CONCENTRATION N  <i>Cyprinus carpio</i> ↓ | LIPID PEROXIDATION LEVEL (n moles of TBARS formed/g fresh tissue weight) | | | | |
|--|---|-----------------|-----------------|-----------------|-----------------|
| | Control | 1ppm | 1.4ppm | 1.7ppm | 2ppm |
| Liver | 4.99±0.0 8 | 5.57±0.08* * | 6.07±0.07* * | 6.59±0.12* * | 7.04±0.19* * |
| % increase | | 11.6% | 21.6% | 32.0% | 41.0% |

Table IV:-Changes in lipid peroxides level (n moles of TBARS formed/g fresh tissue wt.) in normal and dichlorvos treated liver of *Cyprinus carpio* for 10 days. Values are mean ± SEM; n=3 (p^{} < 0.01).**

Liver



- Fig. 1:** Transverse section (T.S.) of control common carp liver exhibiting polygonal hepatocytes (H_p) with a majority of uninucleate (UN) cells and some binucleate (BN) cells and centrally placed rounded nucleus (RN). Blood vessel (BV) is also seen in this section X 400.
- Fig. 2:** T.S. of common carp liver treated with dichlorvos (1ppm) concentration for 10 days showing blood vessel (BV), pyknotic nuclei (PN) and hypertrophic nuclei (HN) at some places. Nuclear degeneration (ND), cytoplasmic degeneration (CD) and vacuolization (V) is observed. Some areas are totally enucleated (ENA) X 400.
- Fig. 3:** T.S. of common carp liver treated with dichlorvos (1.4ppm) concentration for 10 days depicting pyknotic nuclei (PN) and hypertrophic nuclei (HN) at some places. Nuclear degeneration (ND), congestion (C) of nuclei, infiltration of blood cells (IFN_{BC}), enucleated areas (ENA) and vacuolization (V) is also seen X 400.
- Fig. 4:** T.S. of common carp (*Cyprinus carpio*) liver treated with dichlorvos (1.7ppm) concentration for 10 days exhibiting severe hemorrhage (H), more infiltration of blood cells (IFN_{BC}), vacuolization (V) and some enucleated areas (ENA). Hepatocytes are with hypertrophic (HN), round (RN) and degenerated nuclei (ND) X 200.
- Fig. 5:** T.S. of dichlorvos treated common carp liver with 2ppm concentration demonstrating complete degeneration of hepatocytes (H_p), more infiltration of blood cells (IFN_{BC}), hemorrhage (H), vacuolization (V), necrosis (N) and enucleated areas (ENA). Hepatocytes are with hypertrophic (HN) and pyknotic nuclei (PN) X 200.
- Fig. 6:** T.S. of dichlorvos treated common carp liver with 2ppm concentration revealing some degenerated nuclei (ND) and large enucleated areas (ENA). Congestion (C) of nuclei, hemorrhage (H), vacuolization (V) and infiltration of nuclei (IFN_N) is also seen at some places. The hepatocytes show the maximum infiltration of blood cells (IFN_{BC}) and total loss of hepatocyte membrane X 400.

Response surface methodology for optimization of lipase production from fungal isolate RL-4

Roji Sharma, Akshita Mehta and Reena Gupta

Abstract

RESPONSE Surface Methodology is the most popular optimization method used in recent years. The production process specific for lipase was optimized by Response Surface Methodology and a Plackett-Burman analysis and Central Composite Design (CCD) was used to study the interactive effect of medium components on lipase activity and microorganism growth. It was found that inoculum size, galactose concentration, peptone concentration, incubation temperature, pH and incubation time had effect on lipase production and microorganism growth. The concentrations of six variables were optimized. Among these six variables, concentration of galactose, concentration of peptone, incubation time and pH had significant effect on lipase production. These variables were optimized using a Central Composite Design for obtaining the maximum lipase activity. The statistical model showed 1.25- fold increase in lipase activity (4.62 U/ml) with the experimental data as compared to activity obtained (3.69 U/ml) using one variable at a time.

Keywords: Optimization, Response Surface Methodology, Plackett-Burman analysis, Central Composite Design

Introduction

Lipases (triacylglycerol acyl hydrolases, E.C. 3.1.1.3) catalyze the hydrolysis of triacylglycerol into mono and di acyl glycerol and fatty acid. All lipases are the members of the α/β hydrolase fold super-family. Lipases have emerged as one of the leading biocatalysts with proven potential for contributing to the multibillion dollar underexploited lipid technology bio-industry and have been used *in situ* lipid metabolism and *ex situ* multifaceted industrial application (Sharma and Kanwar, 2012). Lipases are ubiquitous in nature and are produced by several

plants, animals and microorganisms (Thakur, 2012). Some important lipase-producing bacterial genera are *Bacillus*, *Pseudomonas* and *Burkholderia* (Gupta *et al.*, 2004) and fungal genera include *Aspergillus*, *Penicillium*, *Rhizopus*, *Candida* (Singh and Mukhoapadhyay, 2012). Fungi are recognized as the best lipase producing and currently the preferred option, especially *Aspergillus niger* which is superior to the other microorganisms and produces lipase suitable for many applications (Kumar and Ray, 2014). The numerous industrial applications of lipases have stimulated interest in isolation of new lipases from novel sources and strong efforts have been concentrated on the engineering of enzymes with specific properties or better performance for industrial applications (Marques *et al.*, 2014). They recognize a wide variety of substrates and may catalyze many different reactions, such as hydrolysis or synthesis of esters bonds, alcoholysis, aminolysis, peroxidations, epoxidations and interesterifications (Ramos-Sanchez *et al.*, 2015).

In fermentation processes, where the operational variables interact and influence each others effects on response, it is essential that the optimization method accounts for these interactions so set of optimal experimental conditions can be determined. Response Surface Methodology (RSM) is a collection of mathematical and statistical techniques widely used to determine the effect of several variables and to optimize different biotechnological processes (Rao *et al.*, 2000). RSM has been successfully applied to evaluate and optimize the effects of process parameters in the production of lipase. It is widely used to solve multiple variable problems in different biotechnological processes.

The optimization using statistical analysis and RSM are important tool to determine the optimal medium culture conditions and strategy for solving problems in industrial fermentation processes (Chandrashekar *et al.*, 1999); for the reason that when the medium components are analysed separately, the concentration of each compound becomes time consuming (Veerapagu and Narayanan, 2013). Any enzymatic process runs under multiple parameters. These parameters are also called variables as change in these parameters decides the yield of process. Each process variable can be optimized and studied manually but study of cumulative impact of all the variables is tedious and laborious work. Response Surface Methodology (RSM) is a way for statistical analysis of the impact of different variables of process and also displays the relation of different variables with each other (Box and Wilson, 1951).

Keeping this in view, the present work was carried out to study interactions among different production parameters and to optimize them for lipase production from fungal isolate RL-4 using Response Surface Methodology (RSM).

2. Materials and Methods

2.1 Materials

Lipase producing fungal isolate was procured from the Department of Biotechnology, Himachal Pradesh University, Shimla. The materials used were potato dextrose agar (PDA), *p*-nitrophenyl benzoate (*p*-NPB), Tween 80, Tris buffer, peptone, galactose, NaCl, iso-propanol, lactophenol, CaCl₂. All the chemicals used in the present investigation were of analytical grade and of high purity either procured from Sigma Aldrich (U.S.A) or HIMEDIA (Mumbai, India).

2.2 Methods

2.2.1 Production of lipase

The production medium containing (w/v) peptone 1.8%, galactose 1.5%, NaCl 0.5%, CaCl₂ 0.1% and Tween 80 1% (Sneath *et al.*, 1986) was autoclaved at 15 lb/inch² pressure at 121°C for 15 min and cooled at room temperature. The sterile production medium (50 ml in 250 ml Erlenmeyer flask) was inoculated with 2.4×10^5 spores and incubated at 45°C for 3 days. The culture broth was analyzed for lipase activity.

2.2.2 Assay of lipase enzyme

2.2.3 Colorimetric method

Lipase activity was assayed by the method given by Winkler and Stuckmann in 1979 by measuring the micromoles of *p*-nitrophenol (*p*-NP) released from *p*-nitrophenyl benzoate (*p*-NPB).

2.3 Experimental design

The RSM was used to investigate the effect of combined interactions of six independent production variables on lipase production from fungal isolate RL-4. These were concentration of galactose, concentration of peptone, incubation temperature, incubation time, inoculum size and pH. The RSM was carried out using Plackett-Burman analysis and Central Composite Design (CCD) of Design expert software (Version 10).

2.3.1 Plackett-Burman analysis

The Plackett-Burman analysis has been widely used for the screening of process variables to improve the production of enzymes. This design is based on a first-order model with no interaction among the factors.

In Plackett-Burman analysis, six different production variables were screened for responses at two levels *i.e.* minimum and maximum concentration of substrate. Six different variables considered in the present study were peptone concentration, galactose concentration, inoculum size, pH, incubation time and

temperature. Design expert (version 10) was used for Plackett-Burman design and regression analysis. The effect of each variable was calculated using the following equation:

$$[E = (\sum M_+ - \sum M_-)/N]$$

Where E is the effect of tested variables and M_+ and M_- are responses (enzymatic activity) of trials at which the parameters were at their higher and lower levels respectively and N is the number of experiments carried out (Bhatia *et al.*, 2013).

2.3.2 Central Composite Design

Different independent variables which showed positive effect (peptone concentration w/v, galactose concentration w/v, incubation time and pH) on the production of lipase were further optimized using CCD (Xiao *et al.*, 2007) to analyze the optimum level and combined effect of variables. Effects of interactions of various parameters on the lipase production were studied by plotting three dimensional response curves against any two independent variables.

2.3.3 Validation of Statistical Model

The statistical model was validated for the production of lipase by performing at shake flask under predicted set of conditions.

3. Results and Discussion

3.1 Plackett-Burman analysis

The six selected independent variables and their corresponding responses on production of lipase from fungal isolate RL-4 are shown in Table 1. A set of 6 experiments exhibited variation in activity ranging from 2.38 to 9.51 U/ml in which run 10 was found to be the most appropriate and gave maximum activity of 9.51 U/ml. Results obtained from Plackett-Burman with six variables were further used to construct a Pareto chart (Fig. 1). It was evident from the Pareto chart that the concentration of peptone, galactose, incubation time and pH showed positive effect and thus had significant effect on lipase production from fungal isolate RL-4.

Table 1. Plackett-Burman experimental design for evaluating the influence of various independent variables on the production of lipase from fungal isolate RL-4.

| Run | Inoculum size (spores/ml) | Galactose (%w/v) | Peptone (%w/v) | pH | Incubation time (hrs) | Temperature | Response (U/ml) |
|-----------|---------------------------|------------------|----------------|----------|-----------------------|-------------|-----------------|
| 1 | 3 | 2 | 1.5 | 11 | 96 | 50 | 4.16 |
| 2 | 1.8 | 1 | 1.5 | 9 | 48 | 40 | 4.82 |
| 3 | 1.8 | 2 | 1.5 | 11 | 96 | 40 | 5.6 |
| 4 | 3 | 1 | 1.5 | 11 | 48 | 40 | 4.90 |
| 5 | 3 | 1 | 2.1 | 11 | 96 | 40 | 5.61 |
| 6 | 1.8 | 1 | 2.1 | 11 | 48 | 50 | 4.42 |
| 7 | 1.8 | 2 | 2.1 | 11 | 48 | 50 | 6.09 |
| 8 | 3 | 2 | 1.5 | 9 | 48 | 50 | 3.85 |
| 9 | 1.8 | 1 | 1.5 | 9 | 96 | 50 | 2.38 |
| 10 | 1.8 | 2 | 2.1 | 9 | 96 | 40 | 9.51 |
| 11 | 3 | 1 | 2.1 | 9 | 96 | 50 | 4.25 |
| 12 | 3 | 2 | 2.1 | 9 | 48 | 40 | 3.94 |

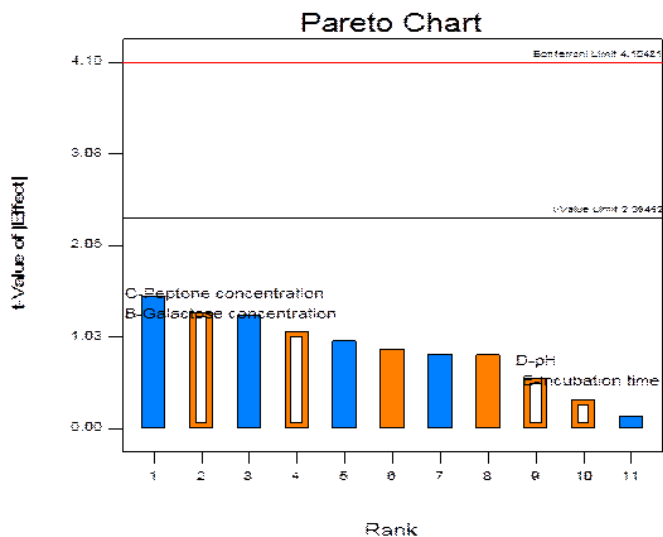


Fig.1 Pareto chart showing the effect of different factors on the production of lipase from fungal isolate RL-4.

3.2.2 Central Composite Design

A central composite design (Table 2) was prepared for variables having positive effect on lipase production as shown in Pareto chart. Their interactions with each other are depicted in Fig. 2-4. The data obtained from CCD was used to generate the ANOVA (Table 3) which showed that lack of fit is non-significant and experimental data was highly reliable. In a previous study, Hatzinikolaou *et al.* (1996) used RSM to study the effect of carbon and nitrogen sources on the extracellular lipase production from *Aspergillus niger*. A maximum lipase activity of 42.4 U/ml was obtained in the optimum medium with a combination of corn oil and peptone (Zhang *et al.*, 2015). In another study, Kaushik *et al.* (2006) reported that sunflower oil, glucose, peptone, agitation rate and incubation temperature were the most influential parameters in the production of extracellular lipase from *Aspergillus carneus*. Corn oil was found most influential factor in lipase production by *Rhizopus arrhizus* using Central Composite Design (CCD) (Elibol and Ozer. 2002).

Table 2. Effect of positive factors obtained from Plackett-Burman in CCD.

| Standard | Run | Peptone concentration (%,w/v) | Galactose concentration (%,w/v) | Incubation time (hrs) | pH | Response U/ml |
|----------|-----|----------------------------------|------------------------------------|--------------------------|----|------------------|
| 23 | 1 | 1.8 | 1.5 | 72 | 8 | 4.14 |
| 8 | 2 | 2 | 1.6 | 96 | 9 | 3.71 |
| 26 | 3 | 1.8 | 1.5 | 72 | 10 | 4.19 |
| 5 | 4 | 1.6 | 1.4 | 96 | 9 | 3.78 |
| 13 | 5 | 1.6 | 1.4 | 96 | 11 | 3.68 |
| 24 | 6 | 1.8 | 1.5 | 72 | 12 | 3.66 |
| 16 | 7 | 2 | 1.6 | 96 | 11 | 3.2 |
| 27 | 8 | 1.8 | 1.5 | 72 | 10 | 4.19 |
| 2 | 9 | 2 | 1.4 | 48 | 9 | 3.35 |
| 15 | 10 | 1.6 | 1.6 | 96 | 11 | 3.11 |
| 4 | 11 | 2 | 1.6 | 48 | 9 | 3.6 |
| 12 | 12 | 2 | 1.6 | 48 | 11 | 3.19 |
| 18 | 13 | 2.2 | 1.5 | 72 | 10 | 4.26 |
| 11 | 14 | 1.6 | 1.6 | 48 | 11 | 3.4 |
| 17 | 15 | 1.4 | 1.5 | 72 | 10 | 4.62 |

| | | | | | | |
|----|----|-----|-----|-----|----|------|
| 20 | 16 | 1.8 | 1.7 | 72 | 10 | 3.38 |
| 25 | 17 | 1.8 | 1.5 | 72 | 10 | 4.19 |
| 9 | 18 | 1.6 | 1.4 | 48 | 11 | 4.03 |
| 1 | 19 | 1.6 | 1.4 | 48 | 9 | 4.01 |
| 10 | 20 | 2 | 1.4 | 48 | 11 | 2.98 |
| 3 | 21 | 1.6 | 1.6 | 48 | 9 | 3.42 |
| 19 | 22 | 1.8 | 1.3 | 72 | 10 | 3.64 |
| 22 | 23 | 1.8 | 1.5 | 120 | 10 | 1.7 |
| 14 | 24 | 2 | 1.4 | 96 | 11 | 3.08 |
| 7 | 25 | 1.6 | 1.6 | 96 | 9 | 3.11 |
| 29 | 26 | 1.8 | 1.5 | 72 | 10 | 4.07 |
| 6 | 27 | 2 | 1.4 | 96 | 9 | 3.51 |
| 21 | 28 | 1.8 | 1.5 | 24 | 10 | 1.83 |

Table 3 Model analysis using ANOVA test.

| Analysis of variance table [Partial sum of squares - Type III] | | | | | | |
|--|----------------|----|-------------|---------|-----------------|-------------|
| Source | Sum of Squares | dF | Mean Square | F Value | P value Prob> F | Remark |
| Model | 12.48 | 14 | 0.89 | 309.66 | <0.0001 | Significant |
| A-peptone concentration | 0.29 | 1 | 0.29 | 100.87 | <0.0001 | |
| B-galactose concentration | 0.20 | 1 | 0.20 | 70.05 | <0.0001 | |
| C-incubation time | 0.047 | 1 | 0.047 | 16.26 | 0.0011 | |
| D-pH | 0.32 | 1 | 0.32 | 111.85 | <0.0001 | |
| AB | 0.66 | 1 | 0.66 | 227.90 | <0.0001 | |
| AC | 0.15 | 1 | 0.15 | 52.83 | <0.0001 | |
| AD | 0.16 | 1 | 0.16 | 56.98 | <0.0001 | |
| BC | 1.600E-003 | 1 | 1.600E-003 | 0.56 | 0.4675 | |
| BD | 2.250E-004 | 1 | 2.250E-004 | 0.078 | 0.7836 | |
| CD | 4.225E-003 | 1 | 4.225E-003 | 1.47 | 0.2445 | |
| | | | | | | |

| | | | | | | |
|----------------|-------|----|------------|---------|---------|-----------------|
| A ² | 0.15 | 1 | 0.15 | 53.29 | <0.0001 | |
| B ² | 0.68 | 1 | 0.68 | 236.97 | <0.0001 | |
| C ² | 9.68 | 1 | 9.68 | 3361.17 | <0.0001 | |
| D ² | 0.099 | 1 | 0.099 | 34.54 | <0.0001 | |
| Residual | 0.043 | 15 | 2.879E-003 | | | |
| Lack of Fit | 0.031 | 10 | 3.118E-003 | 1.30 | 0.4075 | Non significant |
| Pure Error | 0.012 | 5 | 2.400E-003 | | | |
| Cor Total | 12.52 | 29 | | | | |

Fig.2 represents the moderate interaction between peptone concentration and incubation time. Neither high nor low concentration of peptone concentration and incubation time gave higher enzyme yield. Peptone at a concentration of 1.4% and incubation time of 72 hrs gave optimum yield of enzyme but incubation time had distinct impact on enzyme production in comparison to peptone concentration.

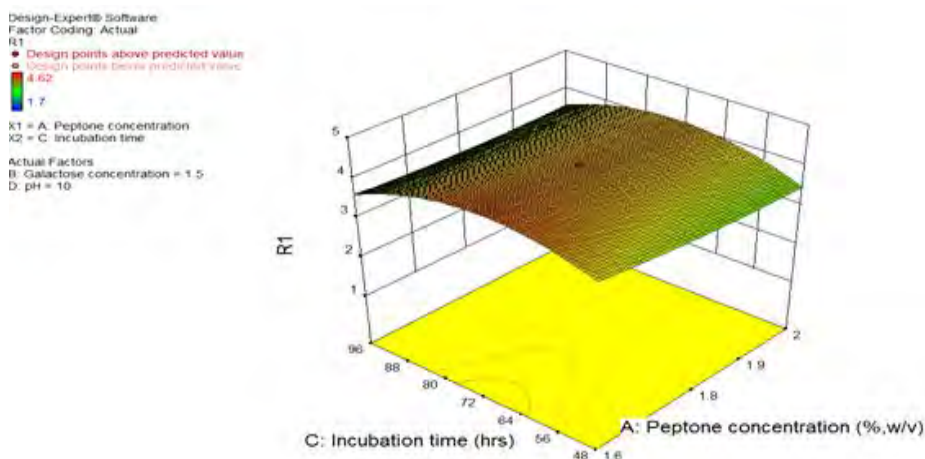


Fig. 2 Three dimensional response surface plot for the effect of A: peptone concentration and C: incubation time on lipase production by fungal isolate RL-

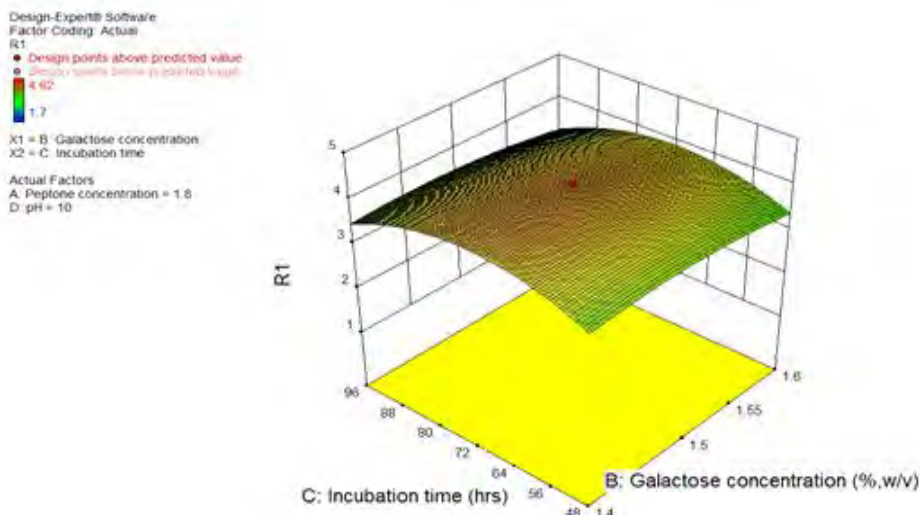


Fig. 3 Three dimensional response surface plot for the effect of B: galactose concentration and C: incubation time on lipase production by fungal isolate RL-4

Fig.3 shows the moderate interaction between galactose concentration and incubation time. Galactose at a concentration of 1.5% and incubation time of 72 hrs gave optimum yield of enzyme but incubation time had distinct impact on enzyme production in comparison to galactose concentration for the production of lipase.

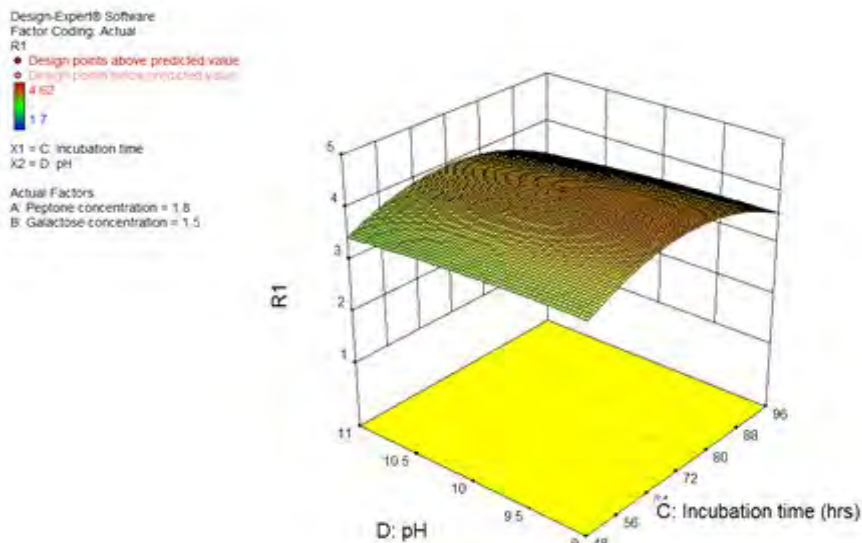


Fig. 4 Three dimensional response surface plot for the effect of C: incubation time and D: pH on lipase production by fungal isolate RL-4

Fig.4 represents the moderate interaction between incubation time and pH. Neither high nor low concentration of incubation time and pH gave higher enzyme yield. Incubation time of 72 hrs and pH of 10.0 gave optimum yield of enzyme but incubation time had distinct impact on enzyme production as compared to pH.

3.2.3 Validation of model

The RSM adequacy was shown by comparing the experimental data and the predicted values, which is performed by generating a fitted line plot (with experimental values on X-axis and predicted values on Y-axis) for the obtained results, showing its closeness or deviation from the fitted line (Fig. 5). There was a good agreement between the experimental and predicted values. The maximum activity obtained by performing RSM was 4.62 U/ml which was close to the predicted value 4.68 U/ml as calculated by ANOVA test. The final lipase activity of *A. niger* G783 was 2,171±41 U/ml with slight increase compared to the predicted value (Zhang *et al.*, 2015). The figure shows the overall closeness of selected variables, thus indicating that the response surface model is adequate for predicting the lipase characteristics. A perturbation plot was also obtained (Fig. 6) that showed optimum values of variables for lipase production from fungal isolate.

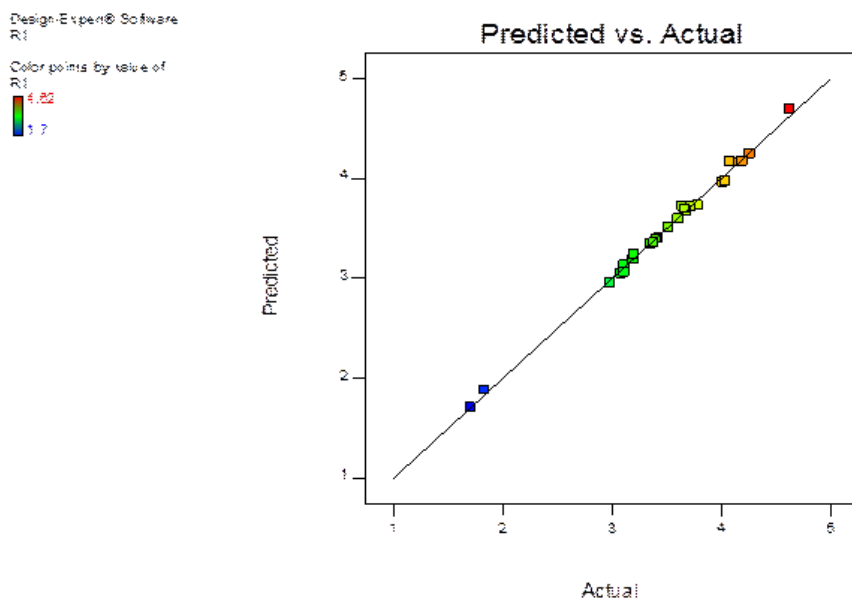


Fig.5 Comparison between predicted and actual response values

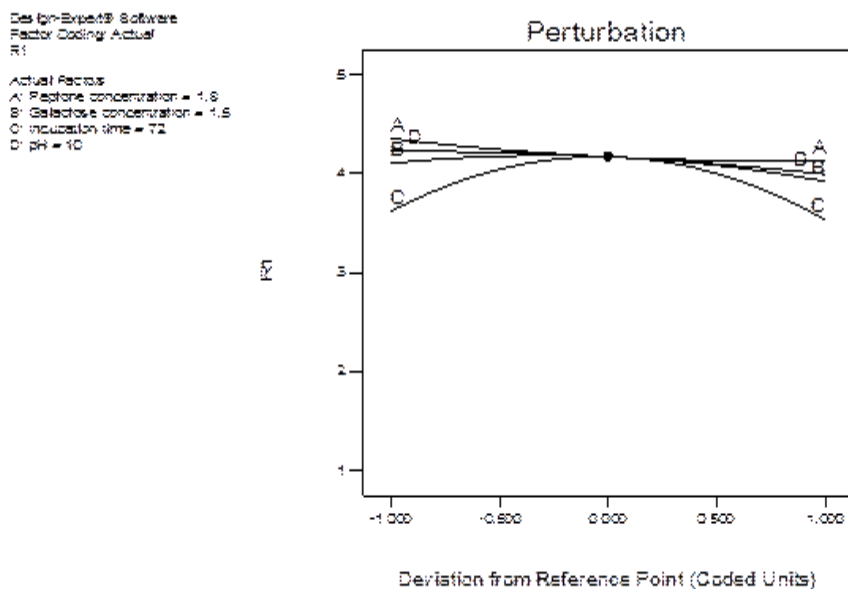


Fig.6 Perturbation graph showing impact of all variables considered in CCD on lipase production.

Conclusion

The present work aimed to optimize lipase production by fungal isolate RL-4 using Response Surface Methodology (RSM). RSM was successfully applied to study the interection among factors and their contribution. The optimization of lipase production was possible through the use of sequential experimental design. The optimization of galactose concentration, peptone concentration, incubation time and pH using a Central Composite Design led to a mathmethical model of 1.25-fold increase in lipase activity (4.62 U/ml) as compared to activity obtained (3.69 U/ml) using one variable at a time.

Acknowledgements

The financial support from Department of Biotechnology, Ministry of Science and Technology, Government of India to Department of Biotechnology, Himachal Pradesh University, Shimla (India) is thankfully acknowledged.

References

- Box, G.E.P. and Wilson, K.B. 1951. On the experimental attainment of optimum conditions. Journal of the Royal Statistical Society, **13**:1-45.
- Bhatia, S.K., Mehta, P.K., Bhatia, S.K. and Bhalla, T.C. 2013. An isobutyronitrile-induced bienzymatic system of *Alcaligenes* sp. MTCC 10674 and its application in the synthesis of α -hydroxyisobutyric acid. Bioprocess and Biosystems

- Engineering, **36**: 613-625.
- Chandrashekar, K., Felse, P.A. and Panda, T. 1999. Optimization of temperature and initial pH and kinetic analysis of tartaric acid production by *Gluconobacter suboxydans*. Bioprocess Engineering, **20**: 203-207.
- Elibol, M. and Ozer, D. 2002. Response surface analysis of lipase production by freely suspended *Rhizopus arrhizus*. Process Biochemistry, **38**: 367-372.
- Gupta, R., Gupta, N. and Rathi, P. 2004. Bacterial lipases: an over view of production, purification and biochemical properties. Applied Microbiology and Biotechnology, **64**: 763-781.
- Hatzinikolaou, D.G., Macris, J.B., Christakopoulos, P., Kekos, P.D., Kolisis, F.N. and Fountoukidis, G. 1996. Production and partial characterisation of extracellular lipase from *Aspergillus niger*. Biotechnology Letters, **18**: 547-552.
- Kaushik, R., Saran, S., Isar, J. and Saxena, R.K. 2006. Statistical optimization of medium components and growth conditions by Response Surface Methodology to enhance lipase production by *Aspergillus carneus*. Journal of Molecular Catalysis B: Enzymatic, **40**: 121-126.
- Kumar, D.S. and Ray, S. 2014. Fungal lipase production by solid state fermentation. Journal of Analytical and Bioanalytical Techniques, **6**: 6-10.
- Marques, T.A., Baldo, C., Borsato, D., Buzato, J.B. and Celligo, M.A.P.C. 2014. Production and partial characterization of a thermostable, alkaline and organic solvent tolerant lipase from *Trichoderma atroviridae* 676. International Journal of Scientific and Technology, **3**: 77-83.
- Ramos-Sanchez, L.B., Cujilema, M.C., Julian, M.C., Cordova, J. and Ficker, P. 2015.** Fungal lipase production by solid-state fermentation. Journal of Bioprocess and Technology, **5**: 203-205.
- Rao, K.J., Kim, C.H. and Rhee, S.K. 2000. Statistical optimization of medium for the production of recombinant hirudin from *Saccharomyces cerevisiae* using Response Surface Methodology. Process Biochemistry, **35**: 639-647.
- Sharma, C.K. and Kanwar, S.S. 2012. Purification of a novel thermophilic lipase from *B. licheniformis* MTCC-10498. International Research Journal of Biological Sciences, **1**: 43-48.
- Singh, A.K. and Mukhopadhyay, M. 2012. Overview of fungal lipase: a review. Applied Biochemistry and Biotechnology, **166**: 486-520.
- Sneath P.H.A., Mair N.S., Sharpe M.E. and Holt J.G. 1986. In: Bergey's Manual of Systematic Bacteriology. Williams and Wilkins U.S.A. pp 1105-1138.
- Thakur, S. 2012. Lipases, its sources, properties and applications: A review. International Journal of Scientific and Engineering Research, **3**: 1-29.
- Veerapagu, M. and Narayanan, D.R.A. 2013. Screening, selection, identification, production and optimization of bacterial lipase from spilled soil. Asian Journal of Pharmaceutical and Clinical Research, **6**: 62-67.

- Winkler, U.K. and Stuckmann, M. 1979. Glycogen, hyaluronate, and some other polysaccharides greatly enhance the formation of exolipase by *Serratia marcescens*. Journal of Bacteriology, **138**: 663-670.
- Xiao, Z.J., Liu, P.H., Qin, J.Y. and Xu, P. 2007. Statistical optimization of medium components for enhanced acetoin production from molasses and soybean meal hydrolyzate. Applied Microbiology and Biotechnology, **74**: 61-68.
- Zhang, Q., Wu, Z., Lin, Z., Gao, H. and Wang, J. 2015. Optimization of fermentation medium for extracellular lipase production from *Aspergillus niger* using Response Surface Methodology. BioMed Research International, **2015**: 1-8.

Stress Induced Biochemical Changes in Rat Skeletal Muscles

Sushma Sharma

INTRODUCTION

Muscle intact nerve supply determines the phenotypic expression of skeletal muscles and early post natal period is a critical stage in fiber type differentiation (Redenbach *et al.*, 1988). Nerve deprivation through the loss of trophic influence and contractile activity (Vrbova *et al.*, 1978) disturbs the metabolism, contractile strength, ultra structural organization and biochemical composition of the skeletal muscle. The loss of neural control and the resultant diminishment of neurotrophic factors induces modifications in the cell membrane (Malhotra *et al.*, 1989). Myofibrillar proteins suffer a continuous breakdown during post denervation period (Furuno *et al.*, 1990) and directly count for myonecrosis. Chronic exercise and excessive workload (Sharma and Malhotra, 1997) results in general hypertrophy of constituent cells. Striking changes occur in the fast twitch anterior *tibialis* and *extensor digitorum longus* muscles whereas carbonic anhydrase III protein and mRNA are increased several fold, 16 days after denervation (Carter *et al.*, 1988) and early onset of anabolic proteins after drug treatment (Kumar *et al.*, 2003). Keeping the above points in view the scope of the present investigation is to see biochemical changes brought about by extirpation of nerve supply to the muscles and work overload stress.

MATERIAL AND METHODS

Adult male albino rats (120-150g) obtained from Central Research Institute (CRI) Kasauli were maintained in the laboratory under suitable hygienic conditions (16hr. day light; $24 \pm 2^\circ\text{C}$). The rats were provided feed (Hindustan Lever Ltd.) and water *ad libitum*. Normal healthy rats were divided into three groups and housed in flat bottomed steel cages. Rats of first group served as control animals and members of second group maintained under identical conditions were subjected to unilateral sciectomy (Malhotra *et al.*, 1983) and

their corresponding contralateral muscles of third group served as exercised muscles. Thus, the group of denervated animal provided two experimental designs with respect to two distinctly different stress conditions.

Rats with no signs of morbidity were sacrificed by cervical dislocation after 7, 15, 30 and 60 days of denervation. Four sets of muscles were used for each parameter under study. The exercised *gastrocnemius* and *pectoralis* muscles were immediately employed for histochemical and biochemical studies. Normal controls were studied along with at the above mentioned stages. Cytochemical localization of total lipids was done with sudan Black 'B' Staining (Sharma and Malhotra, 1991) and succinate dehydrogenase by neotetrazolium chloride method of Nachlas *et al.*, (1957). Fresh frozen handcut sections of *gastrocnemius* and *pectoralis* muscles of 10-15 μ m thickness were used. The slides were mounted in glycerol jelly stored in refrigerator and photographed.

The lipid extraction was done according to the method of Folch *et al.*, (1957) using chloroform and methanol. The quantitative estimation of total lipids was made by acid dichromate method of Pandey *et al.*, (1963) whereas estimation of triglycerides was done by the method of Vanhandal and Zilversmith, (1957) using arsenic trioxide and chromotropic acid. Phospholipids were estimated by the ammonium molybdate method of Ames (1966), whereas quantitative estimation of cholesterol was done by the colorimetric method of Stadman (1957) using acetic anhydride and conc. sulphuric acid. Standard calibration curves for total lipids, triglycerides, phospholipids and cholesterol were drawn using various concentrations of palmitic acid, olive oil, KH_2PO_4 and cholesterol respectively and optical densities were noted at 590 nm, 570nm, 800nm and 680nm respectively. Proteins (acidic and basic) from rat *gastrocnemius* and *pectoralis* were extracted by the method followed by Malhotra and Bindal (1973). The colorimetric estimation of both protein fractions was done according to Lowry *et al.*, (1951) using Folin-ciocalteu reagent. A standard curve was plotted using different concentrations of bovine serum albumen. Nucleic acids were extracted from the tissues by the method of Webb and Levy (1958) using TCA and perchloric acid. Colorimetric estimation of DNA was made as per method of Burton (1956) using diphenylamine and RNA was done according to Markham (1955) using orcinol reagent. Calibration curves were drawn using various concentrations of Pure DNA and RNA (BDH). The colour densities were noted at 600 nm and 675 nm respectively.

Statistical significance was determined by student's *t*-test to find out significance of main difference among different groups. Differences were assumed significant at $P < 0.01$ and < 0.001 .

RESULTS AND DISCUSSION

Cytochemical Studies

Cytochemical localization of total lipids demonstrates the differentiation of muscle fibers in three types; Broad (white), narrow (red) and intermediate types on the basis of sudanophilic material (Fig.1). The fiber heterogeneity is noticed in *gastrocnemius* and *pectoralis* muscles in all the experimental stages (Sharma and Malhotra, 1991).

Rat *gastrocnemius* shows disfiguration of its constitute fibers after denervation. Variable fiber shapes are seen such as polygonal, oval, round, triangular and even rectangular in denervated *gastrocnemius* (Fig. 2). White fibers appear to undergo transient hypertrophy scattered amongst small sized muscle fibers (Fig. 3). The large hypertrophied white and intermediate fibers are poor in lipids whereas red fibers show a moderate staining for lipid distribution. The *gastrocnemius* muscle continue to exhibit rapid loss of lipids throughout 7-60 days post denervation (Fig. 4). Partial merging of fibers and myonecrotic regions are observed at 15 days stage and many fibers demonstrate a myofibrillar degeneration in the center (Fig. 5). At 60 days of denervation, majority of hypertrophied fibers depict lipid loss and only narrow fibers continue to maintain high lipid content (Fig. 6).

The mechanism involved in the lipid accumulation are intricately related to the neurotrophic processes. As a result of denervation growth of muscle is retarded and large number of muscle fibers undergo atrophy (Somasekharet *al.*, 1986). Disfiguration of muscle cells results in variable fiber shapes leading to pathological state. It has been supported by Sharma and Malhotra,(1995) according to whom nerve deprivation disturbs the ultra structural organization and other physiological processes of skeletal muscles. The loss of lipids is on account of increased metabolic rate induced as a result of denervation and also intracellular and intercellular loss of lipids is on account of sarcoplasmic and sarcolemmal breakdown. Structural changes including partial merging of muscle fibers, angular fiber shapes and reduction in fiber heterogeneity is also characterized in denervated rat muscles at 15 days stage.

Both *gastrocnemius* and *pectoralis* exhibit noticeable changes as a result of continuous exercise. At 7 days, both the muscles exhibit stronger sudanophilia than the normal muscles and higher content is seen at 15 days stage (Fig. 7). Partial merging of muscle cells and large interfascicular spaces are exhibited by 30 days exercised *gastrocnemius* (Fig 8). In *pectoralis* white fibers are more hypertrophied and less sudanophilic than red fibers. In creased sudanophilia is experienced at 60 days of exercise. Fiber hypertrophy is exhibited by both rat muscles and it is supported by Fronteret *al.*, 1988 in human muscles. The level of hypertrophy is dependent upon heredity and extent of training (Hopp, 1993;

Thompson, 1994). The mechanism behind hypertrophy is synthesis of myofibrils which enhance protein synthesis and breakdown of proteins decreases. The acceleration of protein synthesis is directly dependent upon increased tension that the muscle is required to generate during exercise (Bandy and Dunleavy, 1996; Tipton and Wolfe, 1998).

Succinate dehydrogenase is a marker enzyme for oxidative metabolism whose histochemical localization allows an identification of well characterized fiber heterogeneity in the tissue sections. The constituent muscle cells typically show three distinct cell types (Fig. 10). Towards 60 days, rat *gastrocnemius* depict less diformazan deposition with granular enzymatic activity. Majority of white fibers depict increased diffused as well as granular enzymatic activity (Fig. 11).

Succinate dehydrogenase activity serves as very index for studying the alterations induced in the rate of oxidative metabolism of the muscle during their normal growth as also under stress induced conditions. The different oxidative capabilities of the broad white fibers and the narrow red fibers are clearly visualized. Such variation in the SDH activity in the growing chick muscles have already been reported (Soni and Katoch, 1997)

Under denervation stress the *gastrocnemius* exhibits lowered enzymatic activities and the fiber types not easily distinguishable on the basis of tetrazolium reaction. Structural changes recognized at 7 days post denervation include transitory hypertrophic response. During 15-60 days period, a number of hypertrophied fibers with strong SDH activity are observed. At 30 days stage, the degenerating muscle bundles include changes in fiber shape, formation of pin head foci, core degeneration and peripheral necrosis (Fig. 12,13). Evidently, the denervation induced fiber hypertrophy also involves stimulation of oxidative enzymes which are essential for higher energy production to meet with elevated proteosynthetic activities. Hypertrophied fibers undergo degeneration towards 60 days stage which leads to an acute decline in the rate of oxidative metabolism in denervated muscle. Single fiber analysis by Reichmann (1985) for SDH in fast twitch muscle from rabbit showed a more uniform distribution of activity in electrically stimulated denervated muscle. Importance of neurotrophic regulations points towards the maintenance of oxidative energy production mechanism in skeletal muscles.

Variable fiber shapes and partial merging of muscle cells are displayed by *gastrocnemius* at 15 days growth (Fig. 14) whereas *pectoralis* depict strong dense SDH activity with central degenerating core region. Red fibers of *pectoralis* at 30 and 60 days exhibits peripheral distribution of diformazan activity. Fiber hypertrophy in both muscles is accompanied with change in the shape of fibers between 30-60 days of exercise (Fig. 15-17). Exercises induce fiber hypertrophy and is accompanied with increasing oxidative capacity which

results in increased SDH activity. The broad fibers become physiologically adapted for increased oxidative phosphorylation as observed by Power *et al.*, 1996 and Mcallister *et al.*, 1997. Such an increase in the oxidative capabilities is due to muscular hyperfunctioning (Power *et al.*, 1996)

Biochemical Studies: (A) Total Lipids

The quantitative estimation of total lipids in both rat muscles reveals almost identical pattern of variation during their post natal growth (Table 1). At 7 day's developmental stage, *gastrocnemius* exhibits high lipid level but during the succeeding stages, the levels are lowered. *Pectoralis* muscle starts at a highest total lipid at 7 days, with lowest levels at 30 days and sudden increase towards 60 days stage (Table-1). Denervated rat *gastrocnemius* shows as increase in total lipids compared to normal muscles at 7 days stage and thereafter the values decline. This declining pattern in total lipid content is found to be parallel to that of normal muscles (Ruderman *et al.*, 1991).

Biochemical investigations in alterations in various tissues have been carried out by numerous workers (Morisaki *et al.*, 1984) but denervated *gastrocnemius* muscle exhibits a pattern of gradual decline in total lipids. These levels are found higher than that of normal muscles. Similar increase in lipid levels in insulin treated denervated, muscles was recorded by Ruderman *et al.*, (1991). Increment in lipid level is due to utilization of glucose for lipid synthesis. The increase in lipids may also be attributed to their reduced utilization in denervated muscle.

Between 7-30 days, a lowered lipid levels are experienced however a transient increase at 60 days of exercise stage is recorded. *Pectoralis* shows as increase in total lipids except 30 days stage. During 7-15 days induced exercise stimulates not only the lipogenetic processes but also elevates the rate of lipid mobilization in the muscles. After 15 days of workoverload stress, not only lipid diluted as a result of fiber growth but lipid metabolism also appears to be retarded resulting in low lipid levels (Sharma and Malhotra, 1991)

B. Triglycerides

The development of both the muscles begins with the moderate triglycerides levels. Normal *gastrocnemius* shows highest triglyceride content at early stage followed by gradual decrease towards 60 days but normal *pectoralis* records elevated triglycerides values at 60 days stage (Table 2). Some workers reported an age related increase in serum triglycerides of rats while others found a decline in same parameter in rats, human and in male rhesus monkeys (Kessler and Rawlins, 1983).

The denervated *gastrocnemius* depicts elevated triglyceride levels at 7 days thereafter gradual decline is recorded till 60 days. Increase desmosterol, total cholesterol and triglyceride levels in children suffering muscular dystrophy have

been reported by Wakamatsu *et al.*, (1970).

The work stress includes differential response in rat *gastrocnemius* and *Pectoralis*. Both the exercised muscles exhibit fluctuating triglycerides content during the entire investigation period. Elevated triglycerides are seen in *gastrocnemius* at 60 days stage. In light of discussion in denervated muscle, it can be concluded that continuous work overload stress induces metabolic aberrations in muscle mitochondria resulting in their abnormal functioning at different times which further leads to fluctuation in triglyceride levels of tissues (Malhotra and Sharma, 1989).

C. Phospholipids

During the normal growth of both rat muscles, increased phospholipids are established at 7 days stage but thereafter gradual decline in their phospholipids is noticed towards 60 days period. In denervated *gastrocnemius*, fluctuating pattern of phospholipids is maintained due to ablation of neurotrophic factors. *Exercised perctoralis* shows decline in phospholipid content at 30 days whereas slight increase is noticed at 60 days stage (Table 3). Similar studies were carried out in chick skeletal muscles by Malhotra and Sharma (1989).

D. Cholesterol

Both the normal muscles (*gastrocnemius* and *perctoralis*) exhibit higher cholesterol content at 7 days with a gradual decline towards 60 days of growth period but from 15-60 days stage, fluctuations are recorded in *perctoralis* (Table 4). According to Hruza and Zbuzkova (1975), increased age also resulted decrease in rate of exchange of blood cholesterol with various tissues, which further results increase in cholesterol level and explains the increase from 30-60 days stage in *perctoralis* in its cholesterol content. Most of the investigations indicated that quantity of cholesterol in the tissues increased with age (Story *et al.*, 1976) while Crouse *et al.*, (1972) reported the same in human muscles. Iwamori *et al.*, (1978) observed its decline with age in brain and sciatic nerve.

A pattern of decline in cholesterol content is maintained from 7-60 days of denervation. Denervated *gastrocnemius* exhibits high cholesterol content at 7 days stage which is due to release of cholesterol in cytoplasmic ground substances, is a sign of pathological conditions (Sharma and Malhotra, 1993).

Exercised *perctoralis* depict increase in cholesterol values from 7-60 days but fluctuation are recorded at 15 days stage. Initially, exercise acts as a stimulant for higher cholesterol synthesis but during the later period, the necrotic changes in muscle fiber result in cholesterol accumulation in the ground substance (Wakamatsu *et al.*, 1970).

E. Acidic protein and Basic proteins

The rat *gastrocnemius* and *perctoralis* shows a continuous rise in acidic protein concentration till 60 days of growth (Table 5). The basic protein content in both the muscles rises suddenly at 7 days which followed by abrupt decrease upto 60 days (Table 6). The acidic proteins are mainly responsible for the muscle mass whereas the basic proteins are primarily the regulatory proteins like tropomyosin which controls the extent of contraction. Some of the basic proteins may also act at the muscular level and influence the fundamental transcriptional processes responsible for proteosynthesis in muscle fibers. A continuous rise in acidic proteins of both muscles indicates continuous proteosynthetic processes (Jakubiec-Puka *et al.*, 1990).

The denervated rat *gastrocnemius* results in overall decrease in acidic protein content. After 7 days of post denervation, there is decline in acidic protein concentration upto 15 days followed by a rise at 30 and 60 days of post denervation. A rise in basic protein content is estimated at 15 days followed by a decline towards 60 days of post denervation (Table 5,6). There is a decline in acidic proteins in rat *gastrocnemius* under denervation period. Loss of neural control results in muscle atrophy which is accompanied by degeneration of cytocontractile apparatus (Jakubiec-Puka *et al.*, 1990) and results in significant loss of myofibrillar proteins including myosin and actin (Furuno *et al.*, 1990). The increment in the acidic protein content at 7 days is attributed to possibility of nerve regeneration and rapid transport of neurotrophic factors present in distal stump of cut sciatic nerve. Proteosynthetic activities get diminished after exhausting of neurotrophic factors and protein degradation is continued which explains the decrease in acidic protein value of 15 days of postdenervation.

In comparison to normal muscles, the acidic protein content are higher in exercised muscles at all the corresponding stages but a continuous decline in the levels of basic proteins is noticed in both the muscles from 7-60 days stages (Table 5,6). Exercised muscles show continuously increasing acidic protein levels (Sharma and Malhotra, 1991). Bandy and Dunleavy (1996) reported acceleration of protein synthesis directly dependent on the increased tension that the human muscle acquired to generate during exercise. In denervated *gastrocnemius*, lowered value of basic proteins from 30-60 days demonstrate denervation induced muscle atrophy which causes the breakdown of myofibrillar proteins as a result of stepped up proteolysis (Furuno *et al.*, 1990; Tischer *et al.*, 1990). A reciprocal relationship to two proteins is established and inhibitory role of synthesis of acidic proteins is visualized (Sharma and Malhotra, 1991).

F. Nucleic acids: DNA and RNA

The quantitative estimation of DNA in two muscles reveals almost identical

pattern of variations. A pattern of fluctuations in DNA concentration shows gradual alternative decrease and increase during the course of experiment (Table 7). The DNA content tends to remain around a common concentration and generally exhibits decrease towards adult stage. The rat *gastrocnemius* and *pectoralis* show a gradual increase in RNA levels upto 60 days (Table 8). Specific maintenance of DNA to RNA ratio is essential for controlled growth to tissue.

A gradual increase in DNA concentration is registered upto 30 days with a subsequent decline towards 60 days of post denervation. Denervated *gastrocnemius* depicts higher RNA concentrations from 7-15 days. Between 15-60 days, a continuous decline in RNA concentration is noticed. It is evidenced by Carter et al., (1988) according to whom CA III protein and mRNA increases many fold after 16 days denervation. Denervation decreased the expression of $\alpha\beta$ crystalline in mRNA is slow muscle but increases it in fast muscle (Atomiet al., 1991). Eftimieet al., (1991) established approximately 40 and 15 fold higher myogenin and myo D mRNA levels in denervated muscle.

Muscles subjected to functional overload tend to maintain slightly high DNA levels upto 30 days and thereafter DNA content declines toward 60 days period of development. At 7 days, rat *gastrocnemius* and *pectoralis* show slight increase in RNA concentration than the normal. From 15-60 days, a continuous decline in RNA content is measured. Exercised muscles exhibit fluctuation and have almost identical DNA values at all stages of investigation. Since most of the RNA in the skeletal muscle is that of ribosomal fraction (Goldspink, 1977), it should provide an indirect index towards the translational rate of the ribosomal activity and hence growth of the tissue.

CONCLUSION:

From the present study it can be concluded that neurotrophic regulation is important for the maintenance of oxidative energy production which is depicted by depletion of lipids and myofibrillar degeneration in rat skeletal muscles. However exercise leads to rapid growth of muscles which is related to high rate of contractile activity. It also acts as a stimulant for higher lipid synthesis but during the later period, necrotic changes in muscle fibers result in lipid accumulation in the ground substance. A reciprocal relationship of two proteins (acidic, basic) is exhibited and inhibitory role of synthesis of acidic proteins is examined. A fluctuating patterns of variations in DNA content is observed whereas high RNA content is responsible for growth of tissue.

REFERENCES:

- Ames, B.N. 1966: Assay of inorganic phosphate, total phosphate and phosphatases In: *Methods in Enzymology* Vol. B 115.
- Atomi, Y., Yamada, S. and Nishida, T.1991. Early changes of alpha B-crystallin mRNA in rat skeletal muscle to mechanical tension and denervation.*Biochem.Biophys. Res. Commun.*181:1323
- Bandy, W.D. and Dunleavy, K.1996. Adaptability of skeletal muscle: Response to increased and decreased use In: *Athletic injuries and rehabilitation* (eds J.E. Zachazewski, D.J. Magee and W.S. Quillens)WB Saunders Company, Philadelphia.
- Burton, K.1956. A study of the conditions and mechanism of the diphenylamine reaction for colorimetric estimation of deoxy ribonucleic acid.*Biochem. J.*62:315.
- Carter, N.D., Wistrand, P.J., Isenberg, H., Askmark, H., Jeffery, S., Hopkinson, D. and Edwards, Y.1998. Induction of carbonic anhydrase III mRNA and protein by denervation of rat muscle. *Bio. Chem. J.*256:147.
- Crouse, E.R., Grundy, S.M. and Ahrens, E.H. Jr. 1972. Cholesterol distribution in the bulk tissue of man. Variation with age.*J. Clin, Invest*, 51: 1292
- Eftimie, R., Brener, H.R. and Buananno, A. 1991. Myogenic and Myo D join an family of skeletal muscle genes regulated by electrical activity. *Proc. Natl.Acad. Sci. U.S.A.* 88:349.
- Folch, J., Less, M., and Sloane Stanely, G. H. 1957.Simple method for the isolation and purification of total lipids from animal tissues.*J. Biol Chem.*,226:497.
- Frontera, W. R., Meredith, C. N., O'Reiley, K.P. and Evans, W.J. 1998.Strength conditioning in the oldermen.Skeletal muscle hypertrophy and improved functions.*J. Applied Physiol.*, 64: 483.
- Furuno, K., Goodman, M.N. and Goldberg, A. L. 1990: Role of different proteolytic systems in the degradation of muscle proteins during denervation atrophy. *J. Biol Chem.*,265:8550.
- Goldspink, D.F. 1977. Agerelated changes of RNA and DNA in muscles of dystrophic hamsters, *Life Sci.* 20:57.
- Hopp, J.F. 1993. Effects of age and resistance training on skeletal muscle. A Review *Physical Therapy*, 73:361.
- Hruza, Z. and Zbuzkova, V. 1975.Cholesterol turnover in plasma, aorta, muscle and erythrocytes in young and old rats.*Mech. Age Dec.*4 :169.

- Iwamori, M., Akiyama, K. Nagou, Y. 1978. Lipid composition in sciatic nerve of the aged. *Proc 11th Int. Geront. Tokyo*.
- Jakubiec-Puka, A. Kordowska, J., Catano, C. and Carrav, U. 1990. Myosin heavy chain isoform composition in striated muscle after denervation and self innervation. *Eur. J. Biochem.* 193: 623.
- Kessler, M.J. and Rawlins, R. G. 1983. Age and pregnancy related changes in serum total cholesterol and triglyceride levels in the Cayman Islands Rhesus Macaques. *Exp Geront*, 18:1
- Kumar, S., Sharma, S. and Katoh, S.S. 2003. Early onset of the maximum protein anabolic effect induced by isoproterenol in chick skeletal muscle and cardiac muscle. *Acta Physiol Hung.* 90(1):57-67.
- Lowry, O.K., Rosenbrough, N.J., Farr, A.L. and Randall, R.J. 1951. Protein measurement with the Folin-Phenol reagent. *J. Biol. Chem.* **193**:295.
- Malhotra, R.K. and Bindal, A.K. 1973. Control of basic proteins on the metabolism of skeletal muscle in chick. *Ind. J. Exp. Biol.* **11**:233.
- Malhotra, R. K., Katoh, S.S., Krishan, K. and Asotra, K. 1983. Role of neural influence and work overload in growth metabolism of chick *gastrocnemius* muscles. *Ind J. Comp Animal Physiol*, **1**:9.
- Malhotra, R.K., Sood, A., Sharma, S. and Chaudhry, S.C. 1989. Changes in leaching properties of chick skeletal muscles. *Ind. J. Exp. Biol.* **27**:1010.
- Markham, R. 1955. Nucleic acids, their components and related compounds In: *Modern Methods of Plant Analysis* (Eds. K. Peech and M.V. Tracey). Springer Verlag, Berlin.
- McAllister, R M., Brian, L., John, F.A. and Lughlin, M.H. 1997. Skeletal muscle biochemical adaptation to exercise training in mature swine. *J. Appl. Physiol.* **82**: 1862.
- Nachlas, M.M., Tsou, K.C., De Souza, E, Cheng, C. S. and Saligman, A.M. 1957. Cytochemical demonstration of succinate dehydrogenase by the use of p-nitrophenyl substituted diazotol. *J. Histochem. Cytochem.* **5**:420.
- Pandey, S.V., Parvin, R. and Venkatasubramanian. 1963. Microdetermination of lipids and serum total fatty acids. *Anal. Biochem.*, **6**: 415
- Powers, S.K., Haydar, D., Jeff, C., Heather, V., Hisashi, N., Andy, S. and Damny, M. 1996. Exercise and age related changes in skeletal muscle. *Ind. Physiol. & Allied Scs.* **50**:188
- Redenbach, D.M., Ovalle, W.K. and Bressler, B.H. 1988. Effect of neonatal denervation on the distribution of fiber types in a mouse fast twitch skeletal muscle. *Histochemistry*, **4**:333.

- Reichmann, H. 1985. Changes of energy metabolism, myosin light chain composition, lactate dehydrogenase isozyme pattern and fiber type distribution of denervated fast twitch muscle from rabbit after low frequency stimulation *pflugers Arch.* **405**:244.
- Ruderman, N.B., Kurowski, T.G., Adams, H.B. and chen, K.S. 1991. Enhanced stimulation of discylglycerol and lipid synthesis by insulin in denervated muscle. Altered protein Kinase C activity and possible link to insulin resistance. *Diabetes* **40**:1707.
- Sharma, S. and Malhotra, R.K. 1991. Metabolic transformation of lipids in chick skeletal muscle under stress conditions *J. Anim. Mophol. & Physiol.*, **38**:55
- Sharma, S. and Malhotra, R.K. 1993. Denervation and exercise effects on cholesterol content of chick *pectoralis* and *gastrocnemii* muscles *Ind J. Exp Biol.*, **21**:493.
- Sharma, S. and Malhotra, R.K. 1995. Pathological changes in muscle fibers of chick *gastrocnemii* under stress conditions. *J. Anim Morphol Physiol* **42**:1
- Sharma, S. and Malhotra, R.K. 1997. Cross-sectional fiber differentiation in chick skeletal muscles *J. Anim Morphol & Physiol.*, **44**:123.
- Somasekhar, T. Ramakrishna, T. and Krishnamoorthy, R.V. 1986. *Curr. Sci.* **55**:137 cited from Karanth and Nair (1995). Changes in level of certain serum constituents following sciactectomy in the common frog, *Rana Tigrina* (Daud) *Ind., J. Exp Biol.*, **33**:54.
- Soni, A. and Katoch, S.S. 1997. Structural and metabolic changes in skeletal muscle of cold acclimated rats. *J. Therm. Biol.* **22**: 95.
- Stadman, T.C. 1957. In: *Methods in Enzymology* (Eds. SP Colowick and NO, Kaplan) Vol II p392, Academic press, New York.
- Story, J.A., Tepper, S.A and Kritchevsky, K. 1976. Age related changes in the lipid metabolism of fisher-334 rats. *Lipids II Excerpta medica*, **20** 623.
- Thompson, L.V. 1994. Effects of age and training on skeletal muscle physiology and performance. *Physical therapy*, **74**:71
- Tipton, K.D. and Wolfe, R.R. 1998. Exercise induced changes in protein metabolism. *Acta PhysioLogica Scandinavica*. **162**:377.
- Tischer, M.E., Rosenberg, S., Satarung, S., Henriksen, E.J., Kirby, C.R., Tome, M. and Chase, P. 1990. Different mechanisms of increased proteolysis in atrophy induced by denervation or unweighting of rat soleus muscle. *Metabolism* **39**:756.

- Vanhandal, E. and Zilversmith. 1957. Micromethod for direct determination of serum triglycerides. *J Lab & clin. Med.*, **50**:152.
- Vrbova, G., Gorden, T. and Join, R. 1978. Nerve muscle interaction, John Wiley and Son, New York.
- Wakamatsu, H. Nakamura, H., Ito, K., Anazawa, W., Okamoto, S., Shigeno, K. and Yuchiro, G. 1970. Serum cholesterol and other lipids in myotonic dystrophy. A possible pathogenesis of myotonic dystrophy. *J. Med.*, **19**:145.
- Webb, J.M. and Levy, H.B. 1958. New developments in the chemical determination of nucleic acid. In: *Methods of Biochemical Analysis*. Vol. 6. (Ed. D. Chick). Interscience Publisher, New York.

ABSTRACT

Motor innervation plays an important and discriminatory role in skeletal muscle architecture regulation and function. Present investigation demonstrates *gastrocnemius* and *pectoralis* muscles of rat (120-150g) during its normal growth and under conditions of denervation and work induced stress from 7-60 days of post natal development employing histochemical and biochemical methods for total lipids, triglycerides, phospholipids, cholesterol content, succinate dehydrogenase, acidic, basic proteins and nucleic acids. Normal and denervated muscles show decline in lipid fractions from 7-60 days of study whereas fluctuations in these fractions in rat *gastrocnemius* and *pectoralis* muscles are recorded under exercise stress. A reciprocal relationship to two proteins (acidic, basic) is exhibited and inhibitory role of acidic proteins is examined. Exercise tends to maintain slightly high DNA level upto 30 days and thereafter it declines. RNA content in skeletal muscles is responsible for growth of tissue.

Table-1: Total lipid concentration (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|-----------|-----------|-----------|
| | 7→ | 15→ | 30→ | 60→ |
| Normal <i>gastrocnemius</i> | 22±0.22 | 15±0.21 | 13±0.11 | 11±0.07 |
| Normal <i>pectoralis</i> | 21±0.21 | 19±0.35 | 9±0.04 | 16±0.14 |
| Denervated <i>gastrocnemius</i> | 25±0.22** | 21±0.13** | 14±0.10** | 13±0.08** |
| Exercised <i>gastrocnemius</i> | 23±0.23* | 14±0.11** | 8±0.40** | 14±0.12** |
| Exercised <i>pectoralis</i> | 22±0.22 | 13±0.11** | 9±0.05** | 9±0.05** |

Table-2:Triglycerides content (mg/g fresh tissue weight) in normal, denervated and exercised muscles.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|----------|----------|-----------|
| | | 15→ | 30→ | 60→ |
| Normal <i>gastrocnemius</i> | 13±0.90 | 8±0.39 | 8±0.36 | 5±0.13 |
| Normal <i>pectoralis</i> | 5±0.11 | 7±0.32 | 5±0.13 | 10±0.59 |
| Denervated <i>gastrocnemius</i> | 12±0.80 | 10±0.55 | 7±0.25 | 4±0.04** |
| Exercised <i>gastrocnemius</i> | 5±0.14** | 5±0.14** | 4±0.06** | 11±0.71** |
| Exercised <i>pectoralis</i> | 4±0.02 | 9±0.45 | 5±0.13** | 8±0.42 |

Each value represents means± SE of six observations
(P value: *<0.01, **<0.001)

Table-3:Phospholipid concentration (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|----------|-----------|-----------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 1.7±0.25 | 1.2±0.20 | 1.2±0.20 | 0.4±0.20 |
| Normal <i>pectoralis</i> | 2.0±0.31 | 1.2±0.20 | 1.1±0.19 | 0.6±0.18 |
| Denervated <i>gastrocnemius</i> | 1.6±0.27 | 1.2±0.19 | 1.0±0.17 | 1.1±0.01* |
| Exercised <i>gastrocnemius</i> | 1.1±0.20 | 1.0±0.17 | 0.7±0.13 | 1.7±0.26 |
| Exercised <i>pectoralis</i> | 1.5±0.20 | 1.3±0.21 | 0.3±0.14* | 0.8±0.24 |

Table-4:Cholesterol content (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|------------|------------|-------------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 1.9±0.10 | 1.4±0.07 | 1.2±0.06 | 1.0±0.06 |
| Normal <i>pectoralis</i> | 1.3±0.05 | 0.7±0.06 | 1.0±0.06 | 1.1±0.06 |
| Denervated <i>gastrocnemius</i> | 2.0±0.09 | 1.3±0.04 | 0.3±0.04** | 0.05±0.03** |
| Exercised <i>gastrocnemius</i> | 1.6±0.07 | 0.5±0.05** | 1.0±0.05 | 1.0±0.06 |
| Exercised <i>pectoralis</i> | 1.3±0.08 | 1.1±0.06** | 1.4±0.07* | 1.5±0.07** |

Each value represents means± SE of six observations (P value: *<0.01, **<0.001)

Table-5:Acidic protein concentration (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|-----------|-----------|-----------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 224±0.6 | 338±1.0 | 442±1.2 | 581±1.7 |
| Normal <i>pectoralis</i> | 232±0.7 | 389±1.1 | 482±1.4 | 599±1.7 |
| Denervated <i>gastrocnemius</i> | 283±0.8** | 224±0.6** | 295±0.8** | 483±1.4** |
| Exercised <i>gastrocnemius</i> | 263±0.7** | 378±1.1** | 505±1.5** | 636±1.9** |
| Exercised <i>pectoralis</i> | 238±0.7** | 405±1.2** | 556±1.6** | 653±1.9** |

Table-6: Basic protein concentration (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|-----------|----------|----------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 75±0.2 | 120±0.3 | 59±0.1 | 35±0.1 |
| Normal <i>pectoralis</i> | 81±0.2 | 63±0.2 | 55±0.1 | 43±0.1 |
| Denervated <i>gastrocnemius</i> | 72±0.2** | 110±0.3** | 67±0.2** | 33±0.1** |
| Exercised <i>gastrocnemius</i> | 93±0.7** | 72±0.2** | 61±0.1** | 39±0.1** |
| Exercised <i>pectoralis</i> | 86±0.2** | 82±0.2** | 81±0.2** | 63±0.1** |

Each value represents means± SE of six observations (P value: *<0.01, **<0.001)

Table-7: Deoxyribonucleic acid (DNA) concentration (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 4.6±1.9 x 10 ⁻⁴ | 4.4±2.6 x 10 ⁻⁴ | 5.0±4.6 x 10 ⁻⁴ | 2.6±1.3 x 10 ⁻⁴ |
| Normal <i>pectoralis</i> | 4.9±2.4 x 10 ⁻⁴ | 4.5±2.8 x 10 ⁻⁴ | 5.4±3.0 x 10 ⁻⁴ | 3.6±1.5 x 10 ⁻⁴ |
| Denervated <i>gastrocnemius</i> | 6.3±5.1 x 10 ⁻⁴ ** | 6.8±3.8 x 10 ⁻⁴ ** | 6.8±6.5 x 10 ⁻⁴ ** | 2.9±5.7 x 10 ⁻⁴ ** |
| Exercised <i>gastrocnemius</i> | 3.6±6.3 x 10 ⁻⁴ ** | 4.0±2.6 x 10 ⁻⁴ ** | 4.5±3.2 x 10 ⁻⁴ ** | 2.8±1.7 x 10 ⁻⁴ ** |
| Exercised <i>pectoralis</i> | 4.1±2.0 x 10 ⁻⁴ ** | 4.3±2.8 x 10 ⁻⁴ ** | 4.3±3.6 x 10 ⁻⁴ ** | 3.0±2.9 x 10 ⁻⁴ ** |

Table-8: Ribonucleic acid (RNA) content (mg/g fresh tissue weight) in normal, denervated and exercised muscles at different stages of growth.

| Muscles | Periods in days | | | |
|---------------------------------|-----------------|--------------|-------------|-------------|
| | 7? | 15? | 30? | 60? |
| Normal <i>gastrocnemius</i> | 38.3±0.03 | 56.0±0.03 | 44.6±0.02 | 46.6±0.3 |
| Normal <i>pectoralis</i> | 33.9±0.01 | 56.7±0.04 | 42.7±0.02 | 47.8±0.03 |
| Denervated <i>gastrocnemius</i> | 71.2±0.05** | 108.4±0.08** | 74.3±0.05** | 39.6±0.02** |
| Exercised <i>gastrocnemius</i> | 40.2±0.02** | 54.1±0.03** | 44.0±0.02** | 43.4±0.02** |
| Exercised <i>pectoralis</i> | 35.8±0.03** | 55.4±0.2** | 40.8±0.04** | 38.3±0.02** |

Each value represents means± SE of six observations (P value: *<0.01, **<0.001)

Increased lignin peroxidase production from bacterial isolate L2 isolated from cold desert region of Himachal Pradesh, India

Shikha Devi and Arvind Kumar Bhatt

Abstract

LIGNOCELLULOSIC biomass is primarily composed of cellulose, hemicellulose and lignin. After cellulose, lignin is important most plentiful renewable biopolymer found in nature. In recent years, microbial degradation of lignin by lignin degrading microorganisms and lignolytic enzymes has been well appreciated globally because of their environmental friendly applications in a wide variety of industrial processes. Therefore, the present study was aimed at isolation and screening of lignin degrading bacteria from various locations in the cold desert region of Lahaul Spiti, Himachal Pradesh (HP), India and optimization of lignin peroxidase (LiP) production by the potential bacterial isolate. During the course of investigation, a total of 41 bacteria were isolated and screened for the lignolytic activities by methylene blue reduction assay method using lignin as substrate. Out of which, eighteen isolates showed positive results for LiP activity and isolate L2 which showed maximum *decolourization* of dye (18.20%) was selected for optimized production of LiP. The optimized conditions for LiP production were 30^o C, pH 7, 1.4% (w/v) glucose as carbon source and 1.5% (w/v) yeast extract as nitrogen source in lignin amended basal medium. After optimization, 44% increase in LiP enzyme production was achieved and signifying its role in a variety of industrial applications such as treatment of lignin degradation, textile dye degradation, dye decolorization, sewage treatment and biofuel production etc.

Keywords: Decolourization, lignin, lignocellulosic biomass, lignin peroxidase (LiP) and optimization

2. Introduction

Lignocellulosic biomass serves as wonderful source for the production of a number of valuable bio-based chemicals and polymers (Isikgor and Becer, 2015; Saini et al., 2015). A number of lignocellulosic biomasses such as sugarcane bagasse, wheat straw, rice straw, waste from food and fruit industries etc. mainly include three main components i.e. cellulose, hemicellulose and lignin (Bhatt et al., 2018; Bhatt et al., 1992).. After cellulose, lignin is important most plentiful renewable biopolymer found in nature. Lignin is a complex aromatic polymer that associated with cellulose and hemicellulose and considered to be one of the most recalcitrant or non-biodegradable component of plant cell wall (Bhatt et al., 2018; Isikgor and Becer, 2015; Saini et al., 2015). During the past few years, physical (milling and grinding), physicochemical (steam pretreatment/autohydrolysis, hydrothermolysis, and wet oxidation), chemical (alkali, dilute acid, oxidizing agents, and organic solvents) and biological methods have been developed to degrade lignocellulosic materials (Bhatt et al., 2018; Janusz et al., 2017; Kumar et al., 2009). However, use of biological methods such as utilization of lignin-degrading microbes and their enzymes has gained immense interest owing to its cost effectiveness, safety and eco-friendliness (Janusz et al., 2017).

In soil and forest environments, a few groups of organisms are capable of degrading complex lignin polymers and best examples are white rot fungi, brown rot fungi, soft-rot fungi and deuteromycetes (Madadi and Abbas, 2017; ; Janusz et al., 2017). Although, fungi are known as the main degraders of the lignin macropolymer but bacterial degradation of lignin is usually preferred as they grow and divide rapidly, withstand to high pH and temperature conditions, can be easily maintained, need less space and are accessible for genetic manipulations (Janusz et al., 2017; Bholay et al., 2012). Bacteria are worthy of being studied for their lignolytic potential and production of bacterial ligninolytic enzymes which are involved in the process of lignin degradation has grown remarkably in the last two decades (Brink et al., 2019; Bholay et al., 2012). Recently, a large list of bacteria which are able to degrade polymeric lignin and lignin-related compounds have been isolated from different environmental niches such as caves and mines, compost, pulp and paper mills, soils with a rich biodiversity, decaying lignocellulosic materials, lab-made derivative, wastewater sludge and gut of wood-eating insects etc. (Brink et al., 2019; Suman et al. 2016). In addition, bacterial species that degrade lignin include *Comamonas* sp. B-9, *Streptomyces viridosporus* T7A, *Bacillus pumilus*, *Bacillus atrophaeus*, *Nocardia autotrophica*, *Sphingobium* sp. SYK-6, *Pseudomonas* strains, *Amycolatopsis* sp., *Acinetobacter* ADP1, *Rhodococcus jostii*., *Burkholderia cepacia*, *Klebsiella* sp., *Microbacterium* sp., *Rhodococcus*

opacus., *Serratia.*, *Sphingomonas paucimobilis* SYK-6 and *Citrobacter* sp (Tian et al. 2016; Salvachúa et al. 2015; Wei et al. 2015; Masai et al. 2014; Huang et al. ; Kosa and Ragauskas 2012; Chen et al. ; Bugg et al., 2011; Ahmad et al. 2011; Xu et al. 2018). In bacteria, a range of extracellular lignolytic enzymes have been reported including laccases, lignin peroxidases (LiPs) and manganese peroxidases (Datta et al., 2017). Laccase and manganese peroxidase cannot directly oxidize the major non-phenolic structures of lignin. Hence, LiP (EC 1.11.1.14) is one of the important lignolytic enzyme belongs to the family of oxidoreductases that oxidize both phenolic as well as non-phenolic structures of lignin (Christopher et al., 2014). LiP is useful in the pretreatment of recalcitrant lignocellulosic biomass, textile dye degradation, dye decolorization, sewage treatment and biofuel production etc (Xu et al. 2018; Christopher et al., 2014; Bugg et al., 2011). Hence, keeping in view the potential utility of LiPs, an investigation was attempted to isolate and screen lignin degrading bacteria from cold deserts of HP and optimization of LiP production by the hyperproducer bacterial isolate.

3. Material and Methods

Collection of samples

In the present study, various samples (*viz.*, soil, dung and water) were collected from different areas of Lahaul-Spiti district of HP, India. The samples were collected and brought to the lab for further processing.

Isolation of bacteria

Serial dilution agar plate technique was used for the isolation of bacterial isolates from collected samples and a total of 41 bacteria were isolated and purified by repeated streaking and maintained at 4°C for further use.

Screening of lignolytic bacteria

The bacterial isolates were screened for LiP activity using methylene blue (MB) dye as an indicator. The isolated bacteria were streaked onto MB containing agar plate and observed for bacterial growth and decolourization of the MB dye (Sasikumar *et al.*, 2014). Further screening of LiP producers was done by spectrophotometric assay method which is based on the demethylation of the MB dye (Bholay et al., 2012; Sasikumar *et al.*, 2014).

Optimization of process parameters for LiP production

The various parameters that may influence the production of LiP were optimized. Different process parameters that were standardized include the effect of different growth media, different nitrogen sources, pH, temperature, inoculums size, incubation time etc.

Effect of media

Five different growth media (i.e. M1 – lignin amended NB M2 - Yadav *et al.*, 2010; M3 - Sasikumar *et al.*, 2014; M4 - lignin amended LB broth; M5 - Sivakami *et al.*, 2012) which have been reported earlier to support the growth of lignolytic bacteria were screened for the production of LiP enzyme in order to find out the best suitable medium for maximum LiP production. The best selected medium was used for further studies.

Effect of carbon source

The effect of carbon supplement on production of LiP enzyme was determined by incorporating different carbon precursors such as glucose, fructose, galactose, lactose, sucrose and starch (1%) into the production medium.

Effect of carbon source concentration

The effect of carbon source concentration on LiP production by bacterial isolate L2 was determined by varying the concentration of glucose from 0.2 to 2.0%.

Optimization of nitrogen source

The effect of different nitrogen sources was determined by incorporating tryptone, peptone, beef extract, yeast extract, ammonium sulphate, ammonium nitrate and urea into the production medium.

Effect of nitrogen source concentration

The effect of nitrogen source concentration on LiP production by bacterial isolate L2 was determined by varying the concentration of yeast extract from 0.5 to 2.5%.

Effect of temperature

Effect of temperature on LiP production was determined by varying different temperatures ranging from 20-50 °C (20, 25, 30, 35, 40, 45 and 50 °C).

Effect of pH

In order to select an appropriate pH for LiP production, bacterial isolate L2 was grown in optimized production medium with varied pH ranging from 5.5-9.0.

Effect of production time

In order to study the effect of production time, potential bacterial isolate was grown at 30°C in production medium and LiP production was measured after every 4 h interval upto 64 h post inoculation.

Optimization of reaction conditions for LiP production

Reaction conditions also play a very important role in LiP production. So in order

to get maximum LiP production various reaction parameters such as buffer pH and molarity, substrate concentration, reaction temperature and incubation time were optimized and the results were recorded in each case.

4. Results and Discussion

Ligninolytic enzymes are involved in the degradation of the complex and recalcitrant polymer lignin (Paliwal et al., 2019), therefore are being used for plethora of industrial as well as biotechnological purposes. Considering their multifaceted application potential in varied industries, it is essential to explore a wide array of microbes for searching new and potential LiP producers as there are several applications for a variety of purposes. In the present study, total 41 lignin degrading bacteria were isolated from the samples collected from different types of soils, water and animal dung through serial dilution method and screened for the LiP activity. However, out of them only 18 were found LiP producer (Table 1, Fig. I & 2). Results of this study are in agreement with earlier works which demonstrating that LiP producing bacteria are widely distributed in forest litter, cow dung, different soils, roots of plants and agro-industrial wastes etc. (Janusz et al., 2017; Sasikumar et al., 2014; Woo et al., 2014; Huang et al., 2013). Further screening of LiP producers was done using basal medium containing methylene blue as the lignin polymeric dye. Changes in color of the medium from blue to clear were observed for 18 isolates and out of which, isolate L2 which showed maximum **decolourization** of dye (18.20%) was selected for optimized production of LiP.

The influence of physical and chemical parameters on the production of LiP enzyme has been reported by several investigators (Janusz et al., 2017; Sasikumar et al., 2014; Woo et al., 2014; Huang et al., 2013). These **investigations** demonstrate that the production of LiP is rigorously influenced by different process parameters such as media components, especially carbon and nitrogen sources, substrate concentration, growth temperature, pH of medium, incubation period and others. Therefore, in present study, various production parameters are optimized in order to provide best conditions required for the growth of the organism.

Optimization of production parameters for LiP production

Effect of nutritional medium

In the present investigation, isolate L2 grown in 5 different nutritional media (M1, M2, M3, M4 and M5) to achieve maximum LiP production. Among these media, maximum LiP production was achieved in M2 i.e. lignin amended basal medium (Fig. 3). In earlier studies, Yadav and co-workers (2014) also optimized different media and reported that NaCl and K_2HPO_4 act as main constituents in

LiP enzyme production (Yadav *et al.*, 2014).

Effect of carbon sources

The effect of different carbon sources like glucose, galactose, fructose, lactose, sucrose and starch each with 1% (w/v) concentration in media was observed on LiP production. Among the various carbon sources tested, glucose was found to be best carbon source followed by galactose and sucrose (Fig. 4). This result was in correlation with the finding of Vandana et al (2018) who reported the enhanced production of LiP by white rot fungi *LPSI* when using glucose as carbon source.

Effect of varied concentration of glucose

Among the different concentration of glucose used, maximum decolourization of dye 29.8% was observed with 1.4% concentration of glucose but thereafter, a decrease in activity was recorded with increasing glucose concentration (Fig. 5). A uniform decline in LiP production was noted when concentration of glucose was increased from 1.4% to 1.8%.

Effect of nitrogen sources

Nitrogen is most important element for enzyme production and makes up about 14% of dry weight of microbial cells. Among the different nitrogen sources used in the present study, yeast extract emerged as best nitrogen source with maximum decolourization of dye (56%) followed by peptone (Fig. 6). Johnsy and Kaviyaran (2014) showed the best nitrogen sources for ligninolytic enzymes production were peptone during *Neolentinus kauffmanii* cultivation followed by beef extract and yeast extract.

Effect of varied concentration of yeast extract

In the present study, the effect of different concentration of yeast extract was examined at different concentration ranging from 0.5-2.5%. Among the different concentration of yeast extract used, maximum decolourization of dye (i.e. 58.8%) was observed with 1.5% concentration of yeast extract (Fig 7). A uniform decline in LiP production was recorded when concentration of yeast extract was increased from 2% to 2.5%.

Effect of inoculum age and size

Inoculum age plays a major role determining viability of cells and also in the metabolism which affects the production of the enzymes. In the present study, maximum decolourization of dye (60%) was recorded with 9 h old culture and thereafter a decrease in LiP production was observed (Fig. 8). This decrease in the production of LiP might be due to depletion of nutrients and accumulation of secondary metabolites in medium (Janusz *et al.*, 2017). Similarly, inoculum size also influences production of enzymes. In the present study, optimum inoculum

size was found to be 8% and after that a decrease in LiP production was observed (Fig. 9).

Effect of temperature

In the present study, the effect of incubation temperature on LiP production was examined and maximum decolourization of dye was recorded at 30°C (60.2%) as compared to other temperatures (Fig. 10). The temperature range of 25–35°C had little influence on LiP production but further increase beyond 35°C showed a sharp decline in the LiP production with least activity at 50°C. The results of other researchers collaborate with our findings, for example, Vandana et al (2018) reported optimal temperature of 30°C for LiP production.

Effect of pH

pH is one of the most important parameter that strongly affects several enzymatic processes and transport of different components across the cell membrane (Kuhad, 2008). In the present study, different pH ranges (5.5–9) were tested and maximum decolourization of dye was observed at pH 7.0 (62.1%) while least at pH 9 (Fig. 11). Our findings are in line with Patil (2014) who reported maximum LiP production by *Bacillus megaterium* at pH 7.

Effect of production time

Effect of production time was also studied to determine the optimum period for maximum LiP production and maximum decolourization of dye was recorded at 48 h of incubation (62.6%) (Fig.12). Mehboob et al (2011) reported 96 h of production period for maximum production of LiP from *Ganoderma leucidum* in solid state fermentation. Results indicated that bacterial isolate L2 was able to produce LiP in lesser time period. These features such as short incubation time (48 h) at low temperature indicated that isolate L2 can become a good candidate for scale-up of LiP enzyme production as well as use in various *industrial* applications.

Optimization of reaction parameters for LiP production

Apart from the culture conditions, the reaction conditions also affect the relative activity of the enzymes and maximum activity was recorded in 50 mM Na-phosphate buffer of pH 6, using 0.5% methylene blue as a substrate at 30°C for 50 min (Table 2). In the present study, LiP production was increased by 44% after optimization of production and reaction parameters. Hence, L2 is a potential candidate for variety of industrial applications such as treatment of lignin degradation, textile dye degradation, dye decolorization, sewage treatment and biofuel production etc.

Conclusion

In the present study, several lignin degrading bacteria were isolated from various

locations in the cold desert region of Lahaul-Spiti, HP, India and hyperproducer isolate L2 was selected for optimized production of LiP. After optimization, 44% increase in LiP enzyme production was achieved and optimized conditions were 30°C, pH 7, 1.4% (w/v) glucose as carbon source and 1.5% (w/v) yeast extract as nitrogen source in **lignin amended basal medium**. Thus, this study revealed the presence of lignin-degrading bacteria in the cold desert region of HP, India and found that potential isolate L2 was a good LiP producer. Keeping in view about potential utility of LiP enzyme it can be harnessed for a variety of industrial as well as biotechnological applications such as in textile, paper and pulp, cosmetics to lighten the skin tone and in biofuel production etc.

5. Acknowledgments

Financial assistance from Ministry of Environment, Forest and Climate Change (MoEF&CC), Govt. of India, New Delhi, under 'National Mission on Himalayan Studies' (NMHS) is gratefully acknowledged.

6. References

- Ahmad, M., Roberts, J.N., Hardiman, E.M., Singh, R., Eltis, L.D. and Bugg, T.D. 2011. Identification of DypB from *Rhodococcus jostii* RHA1 as a lignin peroxidase. *Biochemistry*, 50: 5096–5107.
- Bhatt, A. K., Bhalla, T. C., Agrawal, H. O., and Sharma, N. 1992. Effect of gamma irradiation pretreatment on biodegradation of forest lignocelluloses by *Aspergillus niger*. *Biotechnology Techniques*, 6: 111-114.
- Bhatt, A. K., Bhatia, R. K., Thakur, S., Rana, N., Sharma, V. and Rathour R. K., 2018. Fuel from waste: A review on scientific solution for waste management and environmental conservation. In *Prospects of alternative transportation fuels*. Singapore: Springer, pp 205-234.
- Bholay, A.D., Borkhataria, B.V., Jadhav, P.U., Palekar, K.S., Dhalkari, M.V. and Nalawade, P.M. 2012. Bacterial lignin peroxidase: a tool for biobleaching and biodegradation of industrial effluents. *Universal Journal of Environmental Research & Technology*, 2: 58-64.
- Brink, D.P., Ravi, K., Lidén, G. and Gorwa-Grauslund, M.F. 2019. Mapping the diversity of microbial lignin catabolism: experiences from the eLignin database. *Applied Microbiology and Biotechnology*, 103: 3979-4002.
- Bugg, T.D., Ahmad, M., Hardiman, E.M., Singh, R. 2011. The emerging role for bacteria in lignin degradation and bio-product formation. *Current Opinion of Biotechnology*, 22: 394–400.
- Chen, Y.H., Chai, L.Y., Zhu, Y.H., Yang, Z.H., Zheng, Y. and Zhang H. 2012. Biodegradation of kraft lignin by a bacterial strain *Comamonas sp.* B-9 isolated from eroded bamboo slips. *Journal of Applied Microbiology*, 112: 900–906.
- Christopher, L.P., Yao, B. and Ji, Y. 2014. Lignin biodegradation with laccase-mediator systems. *Frontiers in Energy Research*, 2: 12.

<https://doi.org/10.3389/fenrg.2014.00012>.

- Datta, R., Kelkar, A., Baraniya, D., Molaei, A., Moulick, A., Meena, R. and Formanek, P. 2017. Enzymatic degradation of lignin in soil: A review. *Sustainability*, **9**: 1163. <https://doi.org/10.3390/su9071163>.
- Huang XF, Santhanam N, Badri DV, Hunter WJ, Manter DK, Decker SR, Vivanco JM, Reardon, K.F. 2013. Isolation and characterization of lignin-degrading bacteria from rainforest soils. *Biotechnology Bioenergy*, **110**: 1616–1626.
- Isikgor, F.H. and Becer, C.R. 2015. Lignocellulosic Biomass: a sustainable platform for production of bio-based chemicals and polymers. *Polymer Chemistry*, **6**: 4497–559.
- Janusz, G., Pawlik, A., Sulej, J., Świdarska-Burek, U., Jarosz-Wilkolazka, A. and Paszczyński, A. 2017. Lignin degradation: microorganisms, enzymes involved, genomes analysis and evolution. *FEMS microbiology reviews*, **41**: 941–962.
- Johnsy, G. and Kaviyaran, V. 2014. Effect of physico-chemical parameters on ligninolytic enzyme production of an indigenous isolate of *Neolentinus kauffmanii* under submerged culture condition. *World Journal of Pharmaceutical Sciences*, **2**: 464–468.
- Kosa, M. and Ragauskas, A.J. 2012. Bioconversion of lignin model compounds with oleaginous Rhodococci. *Applied Journal of Microbiology and Biotechnology*, **93**: 891–900.
- Kumar, P., Barrett, D.M., Delwiche, M.J. and Stroeve, P. 2009. Methods for pretreatment of lignocellulosic biomass for efficient hydrolysis and biofuel production. *Industrial and Engineering Chemistry Research*, **48**: 3713–3729.
- Kapoor, M., Nair, L.M. and Kuhad, R.C. 2008. **Cost-effective xylanase production from free and immobilized *Bacillus pumilus* strain MK001 and its application in saccharification of *Prosopis juliflora***. *Biochemical Engineering Journal*, **38**: 88–97.
- Madadi, M. and Abbas, A. 2017. Lignin degradation by fungal pretreatment: a review. *Journal of Plant Pathology and Microbiology*, **8**: 2. DOI: 10.4172/2157-7471.1000398.
- Masai, E., Sasaki, M., Minakawa, Y., Abe T., Sonoki, T., Miyauchi, K., Katayama, Y. and Fukuda, M. 2004. A novel tetrahydrofolate-dependent O-demethylase gene is essential for growth of *Sphingomonas paucimobilis* SYK-6 with syringate. *Journal of Bacteriology*, **186**: 2757–2765.
- Mehboob, N., Asad, M.J., Imran, M., Gulfraz, M., Wattoo, F.H., Hadri, S.H. and Asghar, M. 2011. Production of lignin peroxidase by *Ganoderma leucidum* using solid state fermentation. *African Journal of Biotechnology*, **10**: 9880–9887.
- Patil, S.R. 2014. Production and purification of lignin peroxidase from *Bacillus megaterium* and its application in bioremediation. *CIB Techology Journal of Microbiology*, **3**: 22–28.
- Saini, J. K., Saini, R. and Tewari, L. 2015. Lignocellulosic agriculture wastes as biomass feedstocks for second-generation bioethanol production: concepts and recent

- developments. *3 Biotech*, **5**, 37-353.
- Salvachúa, D., Karp, E.M., Nimlos, C.T., Vardon, D.R. and Beckham, G.T. 2015. Towards lignin consolidated bioprocessing: simultaneous lignin depolymerization and product generation by bacteria. *Green Chemistry*, **17**: 4951–4967.
- Sasikumar, V., Priya, V., Shankar, C.S. and Sekar, D.S. 2014. Isolation and preliminary screening of lignin degrading microbes. *Journal of Academia and Industrial Research*, **3**: 291-294.
- Sivakami, V., Ramachandran, B., Srivathsan, J., Kesavaperumal, G., Smily, B. and Kumar, D.M. 2012. Production and optimization of laccase and lignin peroxidase by newly isolated *Pleurotus ostreatus* LIG 19. *Journal of Microbiology and Biotechnology Research*, **2**: 875-881.
- Suman, S.K., Dhawaria, M., Tripathi, D., Raturi, V., Adhikari, D.K. and Kanaujia, P.K. 2016. Investigation of lignin biodegradation by *Trabulsiella* sp. isolated from termite gut. *International Journal of Biodeterioration and Biodegradation*, **112**: 12–17.
- Tian, J.H., Pourcher, A.M. and Peu, P. 2016. Isolation of bacterial strains able to metabolize lignin and lignin-related compounds. *Letter of Applied Microbiology*, **63**: 30–37.
- Vandana, T., Rao, R.G., Kumar, S.A., Swaraj, S. and Manpal, S. 2018. Enhancing Production of Lignin Peroxidase from White Rot Fungi Employing Statistical Optimization and Evaluation of its Potential in Delignification of Crop Residues. *International Journal of Current Microbiology and Applied Sciences*, **7**: 1-23. <https://doi.org/10.20546/ijcmas.2018.701.xx>.
- Wei, Z., Zeng, G., Huang, F., Kosa, M., Huang, D. and Ragauskas, A.J. 2015. Bioconversion of oxygen-pretreated kraft lignin to microbial lipid with oleaginous *Rhodococcus opacus* DSM 1069. *Green Chemistry* **17**: 2784–2789.
- Woo, H.L., Hazen, T.C., Simmons, B.A. and DeAngelis, K.M., 2014. Enzyme activities of aerobic lignocellulolytic bacteria isolated from wet tropical forest soils. *Systematic and Applied Microbiology*, **37**: 60-67.
- Xu, C., Arancon, R.A.D., Labidi, J. and Luque, R. 2014. Lignin depolymerisation strategies: towards valuable chemicals and fuels. *Chemical Society Reviews* **43**: 7485–7500.
- Yadav, M., Singh, S.K., Yadav, K.S. and Yadav, K.D.S. 2010. Purification of lignin peroxidase from *Hexagona tenuis* MTCC-1119 and its kinetic properties in aqueous medium containing miscible organic solvents. *Indian Journal of Chemistry*, **49**: 489-494.

7. Tables

Table 1: Description of bacterial isolates collected from diverse habitats of Lahaul-Spiti, HP, India.

| Site of sample collection | Type of sample collected | No. of isolate | Isolate code | Lignin producer (LiP) |
|---------------------------|--------------------------|----------------|--------------|-----------------------|
| Lahaul-Spiti | Soil, cow dung and water | 41 | L1 to L41 | 18 |

Table 2: Optimization results of reaction parameters for LiP production.

| S. No. | Reaction Parameters | Optimized Values |
|--------|----------------------|----------------------------|
| 1. | Buffer System and pH | Na-phosphate buffer (pH-6) |
| 2. | Buffer Molarity | 50mM |
| 3. | Substrate Conc. | 0.5% |
| 4. | Temperature | 30 °C |
| 5. | Incubation Time | 50 min |

8. Figures

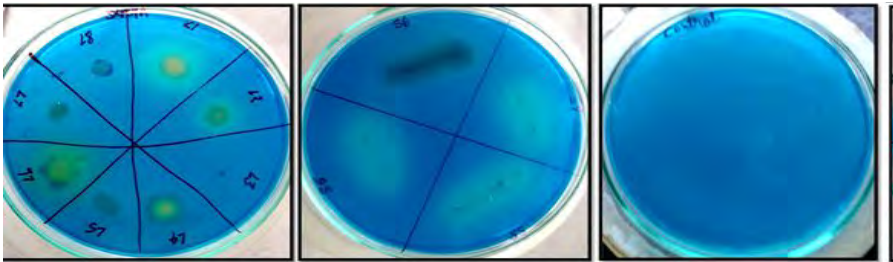


Fig. 1 Screening of LiP producing bacterial isolates on methylene blue agar plates.

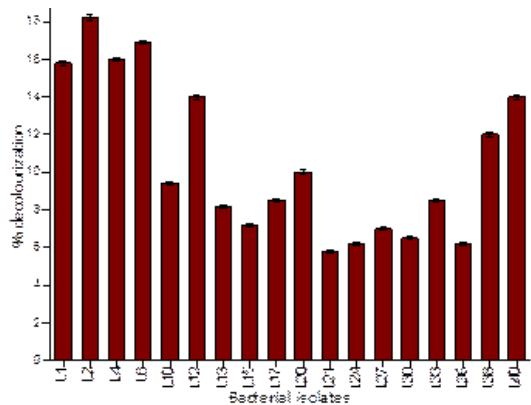


Fig. 2 Lip activity of bacterial isolates isolated from Lahaul-Spiti district of HP, India

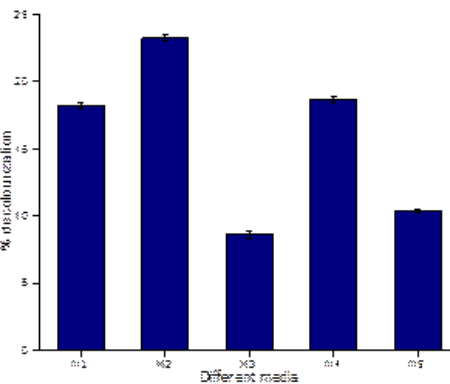


Fig. 3 Effect of nutritional media

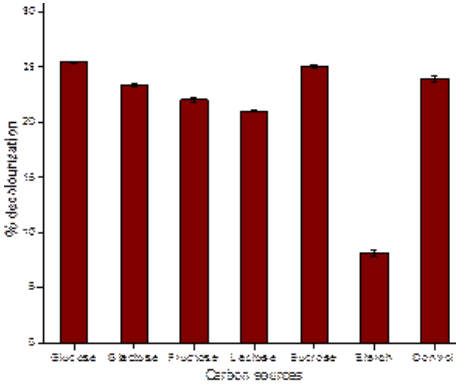


Fig. 4 Effect of carbon sources

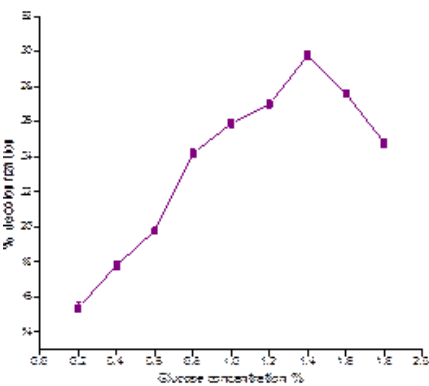


Fig. 5 Effect of carbon source concentration

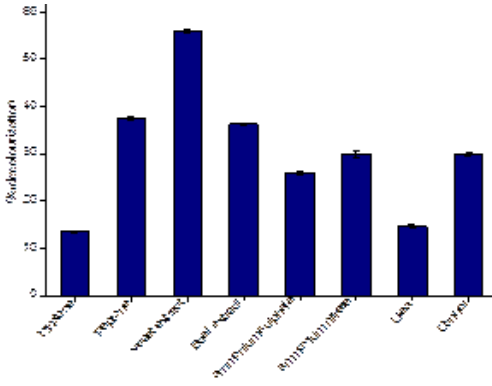


Fig. 6 Effect of nitrogen sources

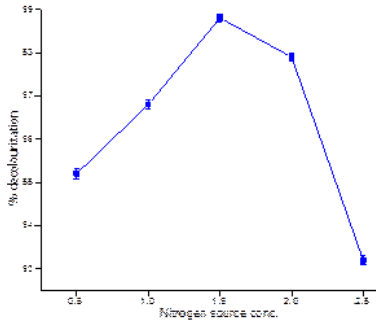


Fig. 7 Effect of nitrogen source concentration

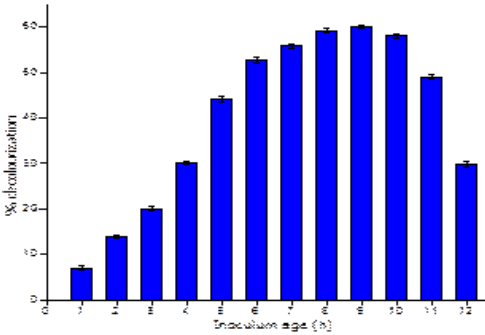


Fig. 8 Effect of inoculum age

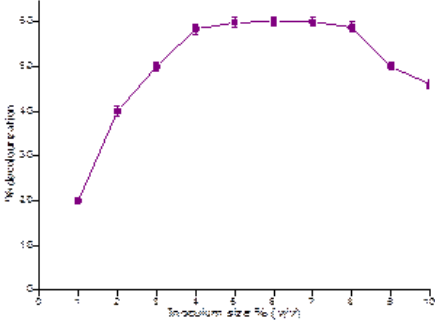


Fig. 9 Effect of inoculum size

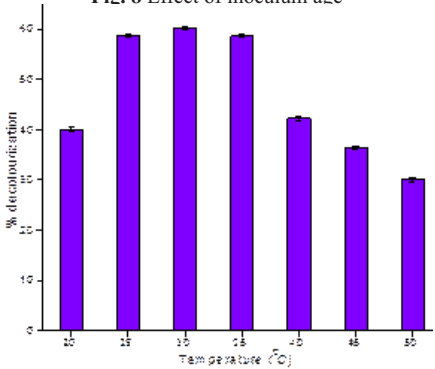


Fig. 10 Effect of temperature

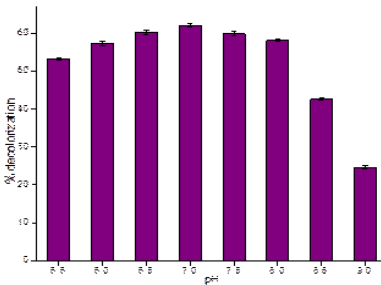


Fig. 11 Effect of pH

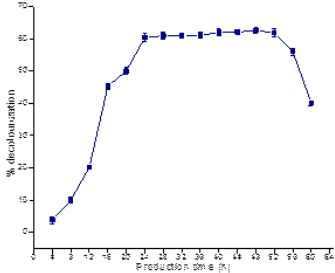


Fig. 12 Effect of production time

Isolation, screening and optimization of extracellular cellulase producing bacterial isolate

Vaishali Sharma, Amit Nadda, Nidhi Rana,
Ravi Kant Bhatia and Arvind Kumar Bhatt

Abstract

CELLULOSE is the most abundant, inexpensive biomass outside human the food chain and it is best to utilize the biomass for the various applications. In an attempt to reduce load over fossil fuels resources, ethanol production from cellulosic resources is being extensively carried out. Enzymatic hydrolysis of pre-treated lignocellulosic biomass is an essential process for the production of fermentable sugars for industrial use. So, a better understanding of bacterial cellulase systems will provide clues for maximizing the hydrolysis of target biomass

In the present study, cellulose producing microorganisms were isolated from the forest soil sample of Shimla, Himachal Pradesh. Total 37 isolates were isolated and were screened to have cellulolytic zones on congo red agar plates. The maximum zone of clearance was observed in case of CPS-7. The growth of cellulase producer microorganism (CPS-7) and subsequent extracellular cellulase production were measured while growing it under varied conditions of pH (5-11), temperature (25-70°C) and different concentrations of carbon and nitrogen sources. The bacterial isolate (CPS-7) with initial cellulase activity of 0.40U/ml was inoculated with 5% (v/v) of a 24h old seed culture (pH-7) at 30°C under continuous shaking (150 rpm) in CMC broth for 24h. Meat extract 0.2% (w/v) and CMC (1.25% w/v) emerged as best suited nitrogen and carbon source respectively for optimal cellulase production. After optimization of production conditions the cellulase activity was found to be 8.12 U/mg protein. At the end, 21 fold increases in specific activity was observed. So, this microorganism acts as highly efficient of cellulose to degrade the cellulosic biomass and various

industrial applications.

Keywords: Carboxymethyl cellulose, cellulose, lignocellulosic biomass

INTRODUCTION

Cellulose is unarguably one of the most abundant organic macromolecules in the ecosystem (Ross *et al.*, 1991; Tewari, 1990). It is the principal constituent of cell wall of plants. Technically, cellulose is a polymer of D-glucose units linked by β -1,4 glucosidic bonds that form large crystalline fibrils. In order to meaningfully utilize this biological macromolecule, its hydrolysis into simpler forms and finally to D-glucose is essential, which is achieved by cellulase enzyme hydrolysis. Cellulases refer to a multi-component enzyme system involving synergistic action of three major components; endo- β -glucanase (EC 3.2.1.4) (Beguín *et al.*, 1994; Miyamoto, 1997), exo- β -glucanase (EC 3.2.1.91) and β -glucosidase (EC 3.2.1.21) (Behera *et al.*, 2014) which act together to hydrolyze cellulose into soluble sugars. Successful bioconversion of cellulosic materials mainly depends on the nature cellulose, sources of cellulolytic enzyme and optimal conditions for catalytic activity and production of enzyme (Immanuel *et al.*, 2006). Microorganisms are considered to be the main source for cellulases with novel and high specific activities (Sharma, 1991 and Ingale *et al.*, 2014). Microbial cellulases are the most economic sources due to their easy availability and further they are easy to grow on various inexpensive media such as agriculture waste, forestry waste and by-products of food industries (Berlin *et al.*, 2005).

Despite the advantages of enzyme-catalyzed processes there are many biotechnological challenges in this field including novel producer strains, improvement of the catalytic efficiency of available strains and enzymes by optimizing various production parameters for increasing yield and utility. Therefore continuous efforts are required to look for new isolates from various habitats and to engineer the already available strains for better yields/efficacy.

Materials and Methods

Isolation and screening of cellulolytic bacteria

Cellulolytic bacterial strains were isolated from soil by using serial dilutions and pour plate technique. The medium used for isolation of cellulolytic bacteria contains 1.0 % peptone, 1.0 % carboxymethylcellulose (CMC), 0.2 % K_2HPO_4 , **0.2% KH_2PO_4** , 1 % agar, 0.03 % $MgCl_2$, 0.25 % $(NH_4)_2SO_4$ at pH 7 for 48 hours of incubation at 30°C. Bacterial colonies were purified by repeated streaking. The purified colonies were preserved at 4°C for further identification and screening for cellulase production. Screening of cellulolytic bacteria pure cultures of bacterial isolates were individually transferred in CMC agar plates. After

incubation for 48 hours, CMC agar plates were flooded with 1 % congo red and allowed to stand for 15 min at room temperature. One molar NaCl was thoroughly used for counterstaining the plates. Clear zones were appeared around growing bacterial colonies indicating cellulose hydrolysis (Doi, 2008). The bacterial colonies having the largest clear zone were selected for further optimisation.

Cellulase enzyme production

Newly isolated strains were screened for cellulase enzyme production in CMC media. The 100ml production medium was inoculated with 1 ml of selected bacterial isolate in a 250ml conical flask, incubated in a shaker at 30°C for 24 h at 150 rpm. After 24 hours broth was centrifuged at $14000 \times g$ for 10 min at 4°C to obtain the supernatant that served as a source of crude enzyme.

Estimation of cellulase activity:

Cellulase activity was quantitatively assayed by determining the reducing sugars produced as a result of enzymatic hydrolysis of CMC following the method developed by Miller, 1959. The assay system contained 4.5 ml having 1% carboxymethyl cellulose (CMC) in 0.055 M citrate buffer (pH-5.0) and 0.5 ml of enzyme preparation. Reaction mixture was incubated at 70 °C for 30 minutes and the reaction was stopped by adding DNS reagent. Absorption of reaction mixture was recorded at 540 nm. Concentration of reducing sugars was calculated using a standard curve of glucose (20-200 µg/ml). One unit of CMCase is defined as the amount of enzyme required to produce one µmole of D-Glucose from substrate per min under the assay conditions

Optimization of culture conditions for the production of cellulase enzyme

The culture conditions *i.e.* inoculum size, inoculum age, medium, pH of medium, effect of temperature, substrate concentration, nitrogen source and time of enzyme production was optimized for cellulase enzyme producing bacterial isolate.

RESULTS

Screening of isolates for extracellular cellulose

Total 37 bacterial isolates were isolated from various soil samples after spreading on nutrient agar plates containing CMC as substrate. Out of these, only 11 showed the zone of clearance on the CMC agar plate after the congo red staining. These isolates were further screened for the cellulase activity and it was observed that among all the isolates CPS-7 shown the maximum specific activity (0.40 U/mg protein).



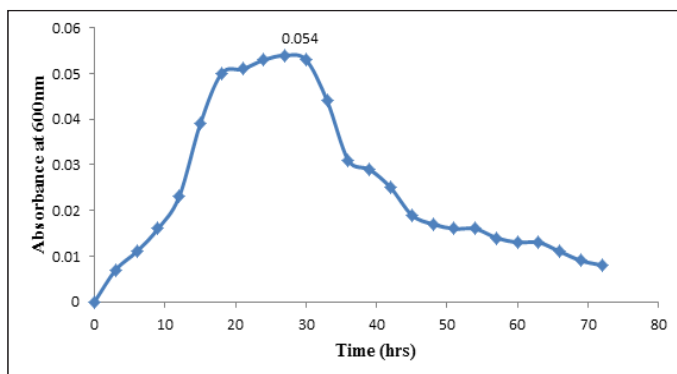
Figure.1: Showing (a) Growth of Isolate CPS-7 on Nutrient agar plate (b) Gram staining (Gram negative) of 12h old culture

The bacterium when grown on agar medium containing CMC showed creamy yellow, smooth colonies mostly round with little elevation on agar surface. The Gram staining showed gram negative rods.

Optimization of culture conditions for cellulase production by isolate CPS-7

Growth profile of bacterial isolate CPS-7

The growth profile of the selected bacterium CPS-7 was determined by growing it in nutrient broth at 30 °C and the optical density (absorbance) of the broth was recorded at a regular interval of 3 hrs. A very slow growth was observed from 0-9 hrs but thereafter a sharp increase in the growth after 9 to 21 hrs indicating the log phase. From 21 hrs onwards very slow growth was observed upto 30 hrs indicating the stationary phase and abrupt decline in growth beyond 30 hrs was recorded isolate which may be due to the less availability of nutrients and accumulation of toxic substances i.e. onset of decline phase as shown in Fig.2.



Inoculum age

Inoculum plays a very vital role in product formation, lower inoculum level in the production medium requires a longer time for bacteria to grow and utilize the substrate and form the desired product. The results demonstrated that the age of inoculum has a strong relation with the growth of the organism and cellulase production by it. It was found that the culture that was inoculated with 9 hr inoculum age resulted in maximum cellulase activity of 0.99 U/mg protein (Fig 3) as it was in its fastest growing phase i.e. the log phase.

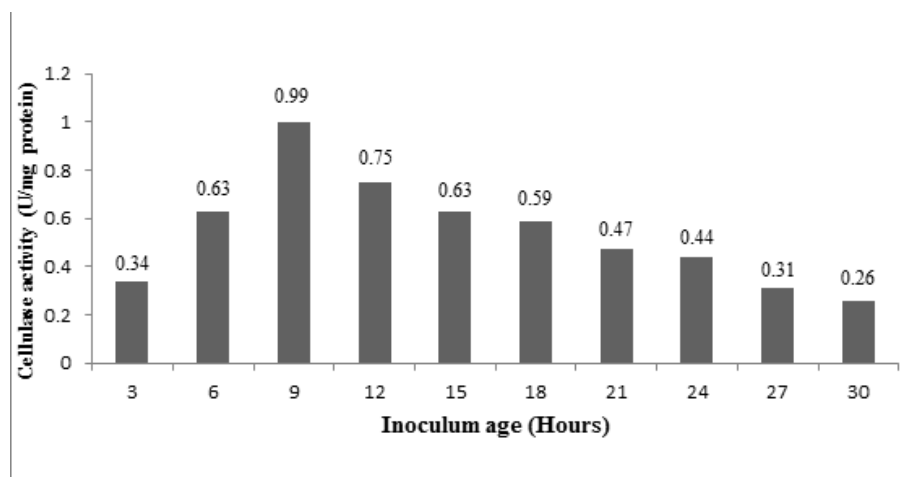


Fig.3: Optimization of inoculum age for the production of cellulase

Inoculum size

Cellulase production from CPS-7 was studied with different inoculum sizes ranging from 1% to 10% as shown in Fig. 4. It was found that the cellulase production increased with the inoculum size up to 6%, with maximum activity of 1.31 U/mg protein. The activity varies because increasing biomass and the availability of nutrients greatly influence the enzyme production. After the optimal inoculum concentration, the enzyme activity was reduced because microbial growth was decreased due to increase in competition for space and nutrients among cells. These factors also affect the length of stationary phase, which results in loss of enzyme activity due to accumulation of toxic products and secondary metabolites.

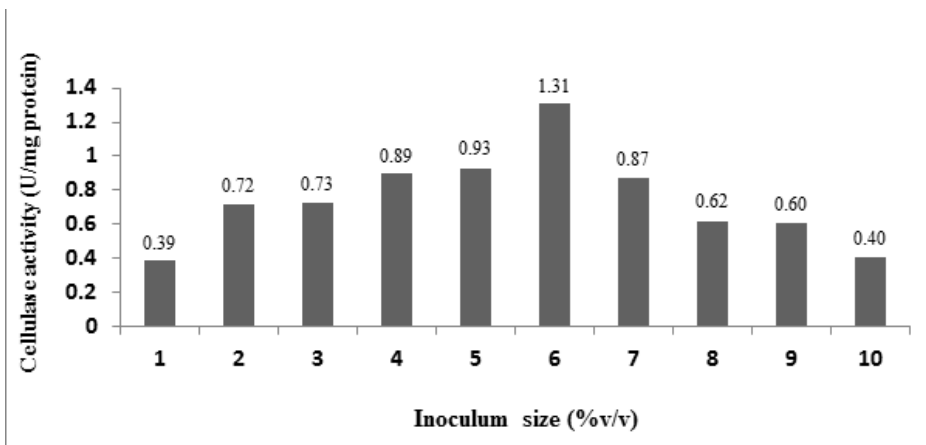


Fig.4: Optimization of inoculum size for the production of cellulase

Time course of enzyme production

To study the optimal time of enzyme production, isolate was subjected to the growth medium and enzyme activity was recorded after every 3 hrs upto 51 hrs. The results recorded for each sample are shown in Fig.5 indicated that cellulase production increased exponentially from 12 hrs up to 30 hrs with maximum activity of 2.01 U/mg protein protein , but beyond 30 hrs, the cellulase activity initially decreased gradually up to 42 hrs (1.12 U/mg protein) thereafter abruptly with least (0.52 U/mg protein) at 51 hrs. This may be due to the fact that the cells enter decline phase and thus show low metabolism and hence less enzyme production.

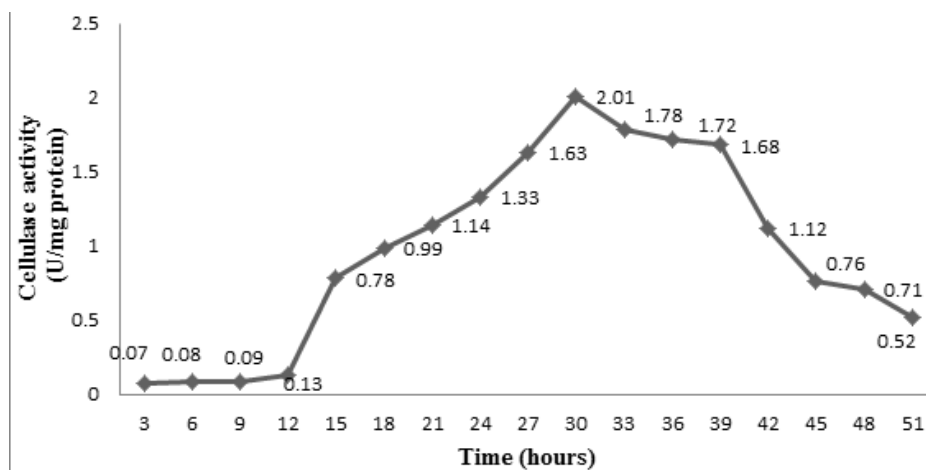


Fig.5: Time course of cellulase production

Selection of medium

The isolate CPS-7 when grown in six different media (M1, M2, M3, M4, M5, M6) resulted in maximum cellulase activity of 2.50 U/mg protein protein in M6 and lowest was recorded in M3 (Fig.6). This may be due to the presence of calcium chloride. Since medium M6 emerged as best, this growth medium was selected for future experiments.

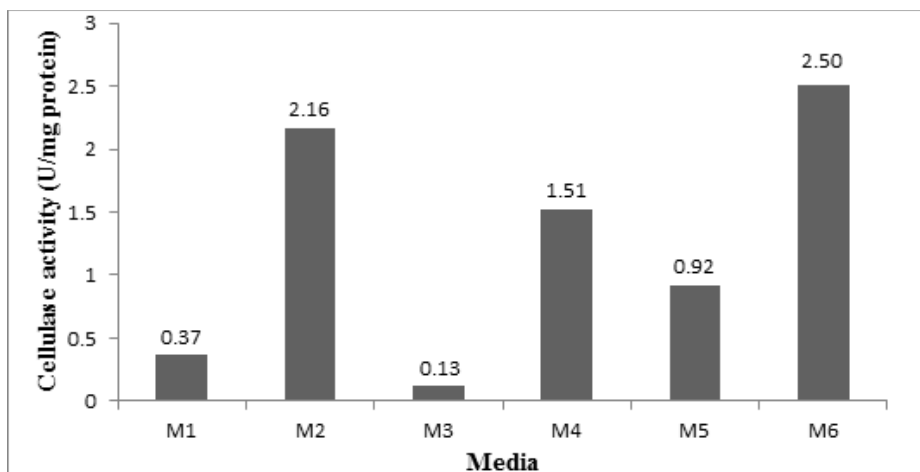


Fig.6: Screening of different media for cellulase production

CMC concentration

Production of cellulase by CPS-7 was studied by growing it in M6 medium (pH-7, temperature 30 °C) containing different concentrations of purified substrate i.e. CMC. As CMC acts as carbon source so its concentration varied from 0.25 to 2.5 % (w/v) and cellulase activity recorded in each case has been shown in Fig.7. Of different concentrations of CMC used, an increasing trend in the activity of cellulase was observed till 1.25% concentration, with maximum specific activity of 3.62 U/mg protein and further there is a decrease. This decrease in cellulase production might be due to the increase in the viscosity of culture medium which eventually affects the uniform circulation of nutrients and oxygen transfer, and decreased microbial growth leading to a decline in enzyme production.

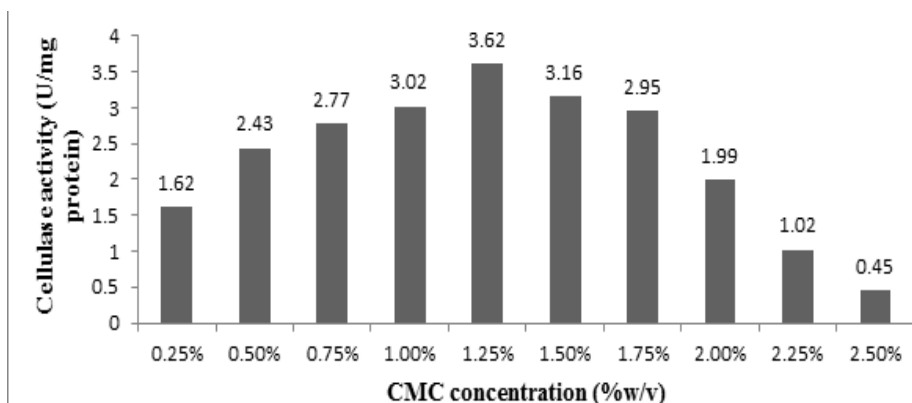


Fig.7: Effect of CMC concentration on cellulose production

Nitrogen sources

Effect of various organic nitrogen sources like meat extract, tryptone, yeast extract, beef extract, peptone, malt extract and inorganic nitrogen sources includes ammonium nitrate, potassium nitrate, sodium nitrate, ammonium sulphate, ammonium chloride, ammonium dihydrogen orthophosphate was studied to evaluate their role in cellulase production. The presence of external nitrogen source is essential in the fermentation media during extracellular enzyme production for effective utilization of soluble carbohydrates. The activity recorded as shown in Fig. 8 showed that the meat extract emerged as the most appropriate nitrogen source for cellulase production with maximum enzyme yield of 4.68 U/mg protein followed by peptone, malt extract, tryptone, yeast extract and sodium nitrate.

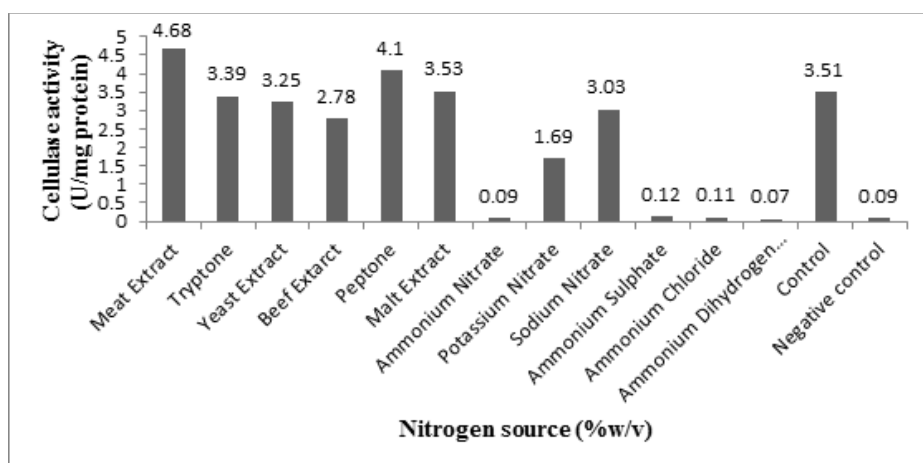


Fig.8: Effect of nitrogen sources on the cellulase production

Different concentrations of meat extract

The isolated bacterium was grown on production medium with varied concentrations of meat extract i.e. 0.2%-2% (w/v) to check their effect on relative yield of enzyme. Results of cellulase activity as shown in Fig.9 revealed that different concentrations of meat extract used, the maximum cellulase activity of 5.13 U/mg protein was recorded.

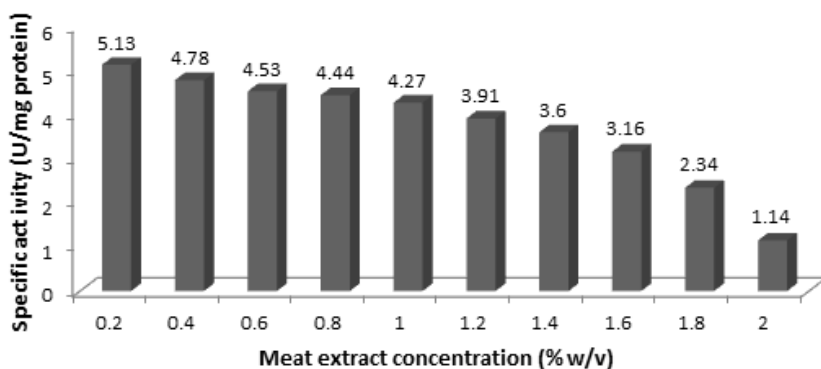


Fig.9: Effect of meat extract concentration on the cellulase production

Temperature

Temperature is a vital environmental factor controlling the growth of microbes and subsequent production of metabolites. To study the effect of temperature on the production of cellulase by isolate CPS-7, it was grown at different temperature ranging from (25 to 70 °C) and the results have been summarized in Fig.10. The results indicate that enzyme production increased with increasing temperature and was maximum at 40°C with an enzyme activity of 6.10 U/mg protein afterwards there is decrease enzyme activity was observed. The increase in temperature, above the optimum values, results in loss of enzyme activity due to thermal denaturation of enzymes, hence low enzyme activity was observed above 45°C.

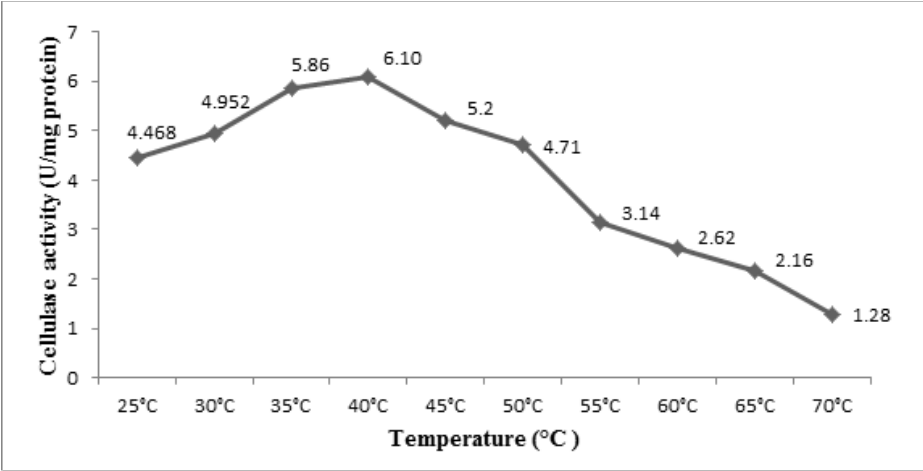


Fig.10: Effect of temperature on the cellulase production

Effect of medium pH

The isolate CPS-7 when grown in the optimal medium at a pH range of 4.0- 12.0, in order to select the optimal pH for the growth medium for cellulase production as reported in Fig.11. Maximum enzyme activity of 8.12 U/mg protein was observed at pH 9.5 and least at pH 4 (0.68 U/mg protein). This change in activity with respect because optimum pH is required to maintain the three dimensional shape of the active site of enzyme and the change in pH results in loss of functional shape of enzyme due to alteration in the ionic bonding of enzyme.

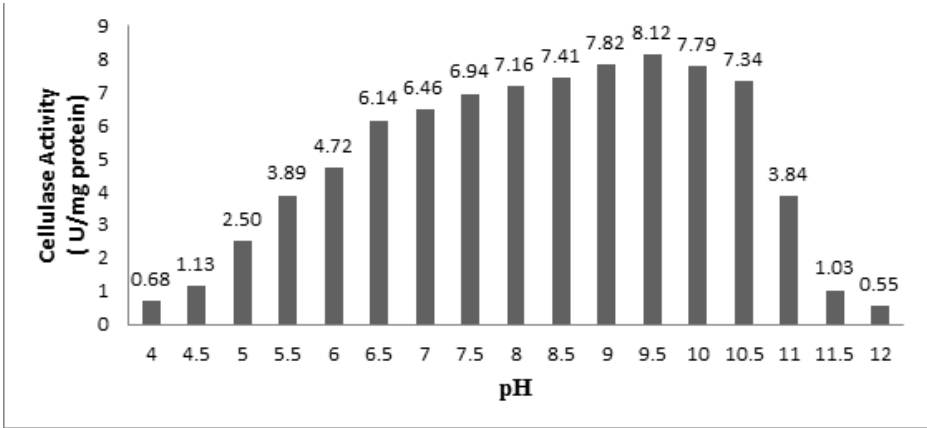


Fig.11: Effect of pH on the cellulase production

Discussion

Cellulases are the important enzymes with utility in various industrial processes including detergent, brewing, textile, paper and pulp, fruit industry and many others. So, keeping in view total 37 isolates were isolated and screened from the soil sample. Among these CPS-7 gave the clearance zone after the congo red screening and maximum specific activity (0.40 U/mg protein). Similar method was also used by some other workers for the selection of best cellulase producing bacteria on the basis of clear zone diameter (Ahmed *et al.*, 2013; Rasul *et al.*, 2015; Gautam and Sharma, 2015). The isolate was gram –ve in nature. Acharya and Chaudhary, 2011 reported to have maximum cellulase activity with 2%(v/v) inoculum size and it was 6%(v/v) incase of CPS-7. The production time for CPS-7 was 30 hours, afterwards the activity was decreased. In a similar experiment by Das et al, (2010) maximum cellulase production of 2.8 µg/mg/min from thermophilic *Bacillus* sp. after 96 hours of incubation. Taking the CMC as a sole carbon source CPS-7 shown to have maximum specific activity of 3.62 U/mg protein with 1.25% concentration. But it varies with type of microorganism, and habitat etc. Similar observations were also made by some other workers in the past. The maximum enzyme activity of 3.028 µg/mg protein was achieved from *Bacillus* sp. when CMC (1%) was utilized as carbon source by Das et al., 2010. Singh et al., (2014) showed similar results with maximum cellulase production from *Bacillus* sp. in basal medium supplemented with CMC (2%) as a substrate at 40°C after 72 hours of incubation. The maximum cellulase production has also been reported with *Bacillus amyloliquefaciens* SS35 by using 1.9% CMC (Arrifin *et al.*, 2008). The use of organic nitrogen sources as compared to inorganic sources for maximum cellulase production was found to be more suitable for maximum cellulase production (Arrifin *et al.*, 2008; Ray *et al.*, 2007). For CPS-7 meat extract (0.2%) emerged as the best nitrogen source. As the temperature and pH plays the significant role in cellulase production, for CPS-7 these were 40°C and 9.5 pH at which the maximum specific activity was 8.12 U/mg protein. In similar study For the production of cellulase by *Bacillus subtilis* and *Bacillus circulans*, the temperature was 35°C and pH in the range of 7.0-7.5 was found to be optimum by Ray et al. (2007). A very high cellulase production of 104.68 U/ mL was reported with *Bacillus* sp. BSS3 at pH 9, 37°C with 1% CMC (Padilha *et al.*, 2015).

Conclusion

This study provides the evidence for the production and optimization of cellulase production using the isolate CPS-7 from the soil samples. The maximum cellulase production CMCase activity of 8.12 U/mg protein, respectively, was found CPS-7 in a M-3 media of pH 7.5 containing CMC (1.25%, w/v) and meat

extract (0.2%, w/v) inoculated with 6% (v/v) inoculum and incubated at 40°C for 30 hours at 150 rpm. The present study has proved that CMC and meat extract are good carbon and nitrogen source, respectively for maximum production of cellulase enzyme from CPS-7.

References

- Acharya S, Chaudhary A (2011) Effect of nutritional and environmental factors on cellulases activity by thermophilic bacteria isolated from hot spring. *J Sci Ind Res* 70: 142-148.
- Ahmad B, Nigar S, Shah SSA, Bashir S, Ali J, et al. (2013) Isolation and identification of cellulose degrading bacteria from municipal waste and their screening for potential antimicrobial activity. *World Appl Sci J* 27: 1420-1426.
- Ariffin H, Hassan MA, Shah UK, Abdullah N, Ghazali FM, et al. (2008) Production of bacterial endoglucanase from pretreated oil palm empty fruit bunch by *Bacillus pumilus* EB3. *J Biosci Bioeng* 106: 231-236.
- Bai S, Ravi Kumar M, Mukesh Kumar DJ, Balashanmugam P, Bala kumaran MD, et al. (2012) Cellulase production by *Bacillus subtilis* isolated from cow dung. *Arch Appl Sci Res* 4: 269-279.
- Beguin, P and Aubert J P (1994). The biological degradation of cellulose. *FEMS Microbiol. Rev* 13, 25-58.
- Behera B C, Parida S, Dutta S K and Thatoi H N (2014). Isolation and identification of cellulose degrading bacteria from mangrove soil of mahanadi river delta and their cellulase production ability. *Am. J. Microbiol. Res* 2: 41-46.
- Berlin A, Gilkes N, Kurabi A, Bura R and Tu M (2005). Weak lignin-binding enzymes - A Novel approach to improve activity of cellulases for hydrolysis of lignocellulosics. *Applied Biochem Biotechnol* 121: 163-170.
- Das A, Bhattacharya S, Murali L (2010) Production of cellulase from thermophilic *Bacillus* sp. isolated from cow dung. *AM Eurasian J Agric Environ Sci* 8: 685-691.
- Gautam R, Sharma J (2012) Optimization, purification of cellulase produced from *Bacillus subtilis* subsp. *inaquosorum* under solid state fermentation and its potential applications in denim industry. *Int J Sci Res* 3: 1759-1763.
- Haq IU, Hameed U, Shahzadi K, Javed M, Ali S, et al. (2005) Cotton saccharifying activity of cellulases by *Trichoderma harzianum* UM-11 in shake flask. *Int J Bot* 1: 19-22.
- Immanuel G (2008). Isolation and characterization of lipase producing *Bacillus* strain from oil mill waste. *Afr. Jour. Biotechnol* 7: 2728-2735.
- Immanuel M, Dhanusha R, Prema P and Palavesam A (2006). Effects of different growth parameters on endoglucanase enzyme activity by bacteria isolated from coir retting effluents of asturine environment. *International Jour.of Enviromental Science and Technol* 3: 25-34.

- Ingale S, Sanket J J and Gupte A (2014). Production of bioethanol using agricultural waste: Banana pseudo stem. *Braz. J. Microbiol* 45: 885-896.
- Miller G L (1959). Use of dinitrosalicylic acid reagent for determination of reducing sugar. *Analytical Chemistry* 31: 426-428.
- Miyamoto K (Ed.) (1997). Renewable biological systems for alternative sustainable energy production. *FAO Agricultural Services Bulletin-128*, Italy.
- Nasr SA, Abozaid AA, Hussein NA, Al-Salemi FA (2011) Cellulase production by local bacteria isolated from Taif in Saudi Arabia. *J Agri Sci* 19: 163-170.
- Padilha QM, Carvalho LCT, Dias PVS, Grisi TCSL, da Silva FLH, et al. (2015) Production and characterization of thermophilic carboxymethyl cellulase synthesized by *Bacillus* sp. growing on sugarcane bagasse in submerged fermentation. *Braz J Chem Eng* 32: 35-42.
- Paudel YP, Qin W (2015) Characterization of novel cellulase-producing bacteria isolated from rotting wood samples. *Appl Biochem Biotechnol* 177: 1186-1198.
- Rasul F, Afroz A, Rashid U, Mehmood S, Sughra K, et al. (2015) Screening and characterization of cellulase producing bacteria from soil and waste (molasses) of sugar industry. *Int J Biosci* 6: 230-238.
- Ray AK, Bairagi A, Ghosh KS, Sen SK (2007) Optimization of fermentation conditions for cellulase production by *Bacillus subtilis* CY5 and *Bacillus circulans* TP3 isolated from fish gut. *Acta Ichthyologica ET Piscatoria* 37: 47-53.
- Miyamoto K (Ed.) (1997). Renewable biological systems for alternative sustainable energy production. *FAO Agricultural Services Bulletin-128*, Italy.
- Ross P, Mayer R and Benziman M (1991). Cellulose Biosynthesis and Function in Bacteria. *Microbiological Reviews* 55: 35-58.
- Shankar T, Isaiarasu L (2011) Cellulase production by *Bacillus pumilus* EWBCM1 under varying cultural conditions. *J Sci Res* 8: 40-45.
- Singh S, Moholkar VS, Goyal A (2014) Optimization of carboxymethylcellulase production from *Bacillus amyloliquefaciens* SS35. *3 Biotech* 4: 411-424.
- Tewari and Yadu B (1990). Thermodynamics of Industrially-Important, Enzyme-Catalyzed Reactions. *Applied Biochemistry and Biotechnology* 23: 187-203.

Validity of principle of exchange of stabilities of Walters' B fluid permeated with suspended particles in porous medium under the effect of rotation with variable gravity field by using operator method.

Pushap Lata Sharma

Abstract

The Thermosolutal Convection in Walter's B elastico-viscous fluid in porous medium is considered to include the effect of suspended particles and rotation under variable gravity. In the present paper to establish the Principle of Exchange of Stabilities (PES) by using a method of a Positive Operator, a generalization of a positive matrix. Wherein, the resolvent of the linearized stability operator is analyzed which is in the form of a composition of certain integral operators. Motivated by the analysis of Weinberger and the works of Herron, our objective here is to extend this analysis of positive operator to establish the PES. *It is established by the method of positive operator of Weinberger that PES is valid for this problem under sufficient conditions and $g(z)$ is nonnegative throughout the fluid layer.*

Keywords : Walter's B fluid, Positive Operator, Exchange of Stabilities, Linearized Stability Operator, Suspended Particles.

Introduction

Convection in porous medium has been studied with great interest for more than a century and has found many applications in underground coal gasification, solar energy conversion, oil reservoir simulation, ground water contaminant transport, geothermal energy extraction and in many other areas. With the growing importance of non-Newtonian fluids in modern technology and industries, the investigations of such fluids are desirable. If we take glance at the literature, we find that there are many models for considering fluids that have both elastic and viscous properties. One of these models is Walters' B fluid that has been used in studies and for modelling many phenomena, study of the flow problems of this class of fluids not only is important technologically, but is also challenging to Engineers, and applied mathematicians who are interested in obtaining accurate solution.

Keeping in mind the importance of non-Newtonian fluids in modern technology, industries, chemical engineering and owing to the importance of variable gravity field in astrophysics etc. Our objective here is to extend the analysis of Weinberger & Rabinowitz's [1969] based on the method of positive operator to establish the PES for a more general convective problems from the domain of non-Newtonian fluid, namely, Thermal convection of a Rivlin - Ericksen fluid in porous medium heated from below with variable gravity. Lata [2010, 2012, 2013, 2015, 2016] has exclusively worked for the validity of principle of exchange of stabilities by using Positive Operator Method.

The present work is partly inspired by the above discussions, and the works of Herron [2000,2001] and the striking features of convection in non-Newtonian fluids in porous medium and motivated by the desire to study the above discussed problems. Our objective here is to extend the analysis of Weinberger & Rabinowitz's [1969] based on the method of positive operator to establish the PES to these more general convective problems from the domain of non-Newtonian fluid. In the present paper, the problem of Thermal convection of a Rivlin- Ericksen fluid layer heated from below in porous medium under the effect of suspended particles with variable gravity $g(z)$ is positive throughout the fluid layer in porous medium heated from below with variable gravity is analyzed and using the positive operator method, when $g(z)$ (the gravity field) It is established from the present analysis that PES is valid .

Mathematical Formulation of the Physical Problem

Consider an infinite horizontal *Walter's B elasto-viscous fluid* layer of thickness d bounded by the horizontal plane $z=0$ and $z=d$ in porous medium permeated with suspended particles. This layer is heated from below so that a uniform temperature gradient $\beta \left(= \left| \frac{dT}{dz} \right| \right)$ is maintained across the layer. This layer is acted upon by a vertical variable gravity field $\vec{g}(0,0 - g(z))$.

Basic hydrodynamical equations governing the physical configuration

The basic hydrodynamic equations that govern the physical configurations (c.f. *Walter's B elasto-viscous fluid*), Spiegel and Veronis [1960], Stokes [1966] and Scanlon and Segal [1973]) under Boussinesq approximation [1903] are given by;

Equation of Continuity

$$\nabla \cdot \vec{v} = 0 \quad (1)$$

Equations of Motion

$$\begin{aligned} \frac{1}{\varepsilon} \left[\frac{\partial \bar{v}}{\partial t} + \frac{1}{\varepsilon} (\bar{v} \cdot \nabla) \bar{v} \right] = & -\frac{\nabla p}{\rho_0} + \bar{X} \left(1 + \frac{\delta \rho}{\rho_0} \right) - \frac{1}{k_1} \left(v - v' \frac{\partial}{\partial t} \right) \bar{v} \\ & + 2(q \times \Omega) + \frac{SN}{\rho_0 \varepsilon} (\bar{u} - \bar{v}) \end{aligned} \quad (2)$$

The equations of motion and continuity for the particles

The force exerted by the fluids on the particle is equal and opposite to the force exerted by the particles on fluid, there must be an extra force term, equal in magnitude but opposite in sign, in the equations of motion for the particles. The buoyancy force on the particles are neglected. Inter-particle reactions are ignored for we assume that the distances between particles are quite large as compared with their diameter. If mN is the mass of particles per unit volume, then the equation of motion and continuity for the particles, under the above assumptions are :

$$mN \left[\frac{\partial \bar{u}}{\partial t} + \frac{1}{\varepsilon} (\bar{u} \cdot \nabla) \bar{u} \right] = SN(\bar{v} - \bar{u}) \quad (3)$$

$$\varepsilon \frac{\partial N}{\partial t} + \nabla(N \cdot \bar{u}) = 0 \quad (4)$$

The equation of heat conduction

Since the volume fraction of the particles is assumed small, the effective properties of the suspension are taken to be those of the clean fluid. Assuming that the particles and fluid are in thermal equilibrium, the equation of heat conduction is given as;

$$\begin{aligned} & [\rho_0 c_v \varepsilon + \rho_s c_s (1 - \varepsilon)] \frac{\partial T}{\partial t} + \rho_0 c_v (\bar{v} \cdot \nabla) T + mN c_{pt} \left(\varepsilon \frac{\partial}{\partial t} + \bar{u} \cdot \nabla \right) T = q \nabla^2 T \quad (5) \end{aligned}$$

The equation of state

$$\rho = \rho_0 [1 - \alpha(T - T_0)] \quad (6)$$

In the above equations, p , ρ , v , v' , ε , k_1 , α , $\bar{v}(u, v, w)$, T and \bar{X} denote respectively the pressure, density, temperature, viscosity, viscoelasticity, medium

porosity, medium permeability, thermal coefficient of expansion, the external force field, gradient operator; and velocity of the fluid; $S=6\pi\mu\eta'$, (η' being particle radius), is the Stokes' drag coefficient, $\bar{x}=(x,y,z)$, ρ_s , c_s , ρ , c_v denote the density and heat capacity of solid (porous) matrix and fluid respectively, c_{pt} the heat capacity of the particles and q the "effective" thermal conductivity of the fluid. $\bar{u}(x,t)$ and $N(x,t)$ denote the filter velocity and number density of the suspended particles, respectively.

Following the usual steps of the linearized stability theory, it is easily seen that the non-dimensional linearized perturbation equations governing the physical problem described by equations (1)-(4) can be put into the following forms, upon ascribing the dependence of the perturbations of the form $\exp[i(k_x x + k_y y) + \sigma t]$, ($\sigma = \sigma_r + i\sigma_i$) (c.f. Chandrasekhar [1961] and Siddheshwar and Krishna [2001]);

$$\left[\frac{\sigma}{\varepsilon} \left(\frac{\Gamma\sigma + B}{\Gamma\sigma + 1} \right) + \frac{1}{P_l} \{1 + F\sigma\} \right] (D^2 - k^2)w = -R_T k^2 g(z)\theta$$

(7)

$$(\Gamma\sigma + 1)[D^2 - k^2 - (E + h\varepsilon)\text{Pr}\sigma]\theta = -R_T (H + \Gamma\sigma)w$$

(8)

together with following dynamically free and thermally and electrically perfectly conducting boundary conditions

$$w = 0 = \theta = D^2 w \quad \text{at } z = 0 \text{ and } z = 1$$

(9)

In the forgoing equations, z is the real independent variable, $D \equiv d/dz$ is the differentiation with respect to z , k^2 is the square of the wave number, $\text{Pr} = \frac{\nu}{\kappa}$ is the

thermal Prandtl number, $P_l = \frac{k_1}{d^2}$ is the dimensionless medium permeability, Where

$$\Gamma = \frac{m\nu}{Sd^2} \text{ and } H=h+1 \text{ and } B=b+1 \text{ where } b=\Gamma S\sigma, R_T = R^2 = \frac{g_0 \alpha \beta d^4}{\kappa \nu} \text{ is the}$$

thermal Rayleigh number, $P_t = \frac{k_1}{d^2}$ is the dimensionless medium permeability and

$Pr = \frac{\nu}{\kappa}$ is the Prandtl number and $F = \frac{v'}{d^2}$ is the dimensionless Rivlin-Ericksen

parameter, $R^2 = \frac{g_0 \alpha \beta d^4}{\kappa \nu}$ is the thermal Rayleigh number, $\sigma (= \sigma_r + i\sigma_i)$ is the

complex growth rate associated with the perturbations and w, θ are the perturbations in the vertical velocity, temperature, respectively.

Hence, the system of equations (7) and (8) together with boundary conditions (9) constitutes an eigen value problem for σ for given values of the parameters k^2 , R , F , Pr , H , B and Γ for the present problem. The system of equations (7)-(8) together with the boundary conditions (9) constitutes an eigenvalue problem for σ for the given values of the parameters of the fluid and a given state of the system is stable, neutral or unstable according to whether σ_r is negative, zero or positive. It is remarkable to note here that equations (7)-(8) contain a variable coefficient and an implicit function of σ , hence as discussed earlier the usual method of Pellew and Southwell is not useful here to establish PES for this general problem. Thus, we shall use the method of positive operator to establish PES.

Method of Positive Operator

We seek conditions under which solutions of equations (7)-(8) together with the boundary conditions (9) grow. The idea of the method of the solution is based on the notion of a 'positive operator', a generalization of a positive matrix, that is, one with all its entries positive. Such matrices have the property that they possess a single greatest positive eigenvalue, identical to the spectral radius. The natural generalization of a matrix operator is an integral operator with non-negative kernel. To apply the method, the resolvent of the linearized stability operator is analyzed. This resolvent is in the form of certain integral operators. When the Green's function Kernels for these operators are all nonnegative, the resulting operator is termed positive. The abstract theory is based on the Krein -Rutman theorem [1962], which states that;

"If a linear, compact operator A , leaving invariant a cone \tilde{h} , has a point of the spectrum different from zero, then it has a positive eigen value λ , not less in modulus than every other eigen value, and this number corresponds at least one eigen vector $\phi \in \tilde{h}$ of the

operator A , and at least one eigen vector $\varphi \in \tilde{h}^*$ of the operator A^{**} . For the present problem the cone consists of the set of nonnegative functions.

To apply the method of positive operator, formulate the above equations (7) and (8) together with boundary conditions (9) in terms of certain operators as;

Mathematical Analysis By Using the Method of Positive Operators

In the following analysis, we shall first of all construct an equivalent eigen-value problem to the eigen-value problem described by equations (7) and (8) together with boundary conditions (9) in terms of certain operators.

$$\text{Let } (-D^2 + k^2)w = mw$$

and define

$$\begin{aligned}\tilde{M}w &= mw, & w &\in \text{dom}\tilde{M} \\ \tilde{M}^2w &= m^2w, & w &\in \text{dom}(\tilde{M}\tilde{M}) \\ \tilde{M}\theta &= m\theta, & w &\in \text{dom}\tilde{M}\end{aligned}$$

We have the following forms of equations (2A.38) and (2A.39)

$$\left[\frac{\sigma}{\varepsilon} \left(\frac{\Gamma\sigma + H}{\Gamma\sigma + 1} \right) + \frac{1}{p_1} \{1 + F\sigma\} \right] M w = R k^2 g(z) \theta$$

(10)

$$(\Gamma\sigma + 1)[D^2 - a^2 - (E + h\varepsilon)p_1\sigma]\theta = -R(H + \Gamma\sigma)w$$

(11)

The above define domains are contained in cone $\tilde{\lambda}$, where

$$\tilde{\lambda} = L^2(0,1) = \left\{ \phi \mid \int_0^1 |\phi|^2 dz < \infty \right\} \text{ is a Hilbert space with a finite magnitude, by}$$

definition [],

with scalar product

$$\langle \phi, \varphi \rangle = \int_0^1 \phi(z) \overline{\varphi(z)} dz, \quad \phi, \varphi \in \tilde{\lambda}$$

where, $g(z, \xi, (E + \varepsilon h) \text{Pr} \sigma)$ is Green's function kernel for the operator $(M + \sigma\{E + \varepsilon h\} \text{Pr})$, and is given as

$$g(z, \xi, \text{Pr} \sigma\{E + \varepsilon h\} P_r) = \frac{\cosh[r(1 - |z - \xi|)] - \cosh[r(-1 + z + \xi)]}{2r \sinh r}$$

where, $r = \sqrt{k^2 + \sigma(E + \varepsilon h) \text{Pr}}$.

In particular, taking $\sigma = 0$, we have $M^{-1} = T(0)$ is also an integral operator.

$K(\sigma)$ defined in (12), which is a composition of certain integral operators, is termed as *linearized stability operator*. $K(\sigma)$ depends analytically on σ in a certain right half of the complex plane. It is clear from the composition of $K(\sigma)$ that it contains an implicit function of σ .

$$[I - K(\sigma)]^{-1} = \{I - [I - K(\sigma_0)]^{-1}[K(\sigma) - K(\sigma_0)]\}^{-1}[I - K(\sigma_0)]^{-1} \quad (14)$$

If for all σ_0 greater than some a ,

(1) $[I - K(\sigma_0)]^{-1}$ is positive,

(2) $K(\sigma)$ has a power series about σ_0 in $(\sigma_0 - \sigma)$ with positive coefficients; i.e., $\frac{d^n K(\sigma)}{d\sigma^n}$ is positive for all n , then the right side of (13) has an

expansion in $(\sigma_0 - \sigma)$ with positive coefficients. Hence, we may apply the methods of Weinberger [1969] and Rabinowitz [1969], to show that there exists a real eigenvalue σ_1 such that the spectrum of $K(\sigma)$ lies in the set $\{\sigma : \text{Re}(\sigma) \leq \sigma_1\}$. This result is equivalent to PES, which was stated earlier as "the first unstable eigenvalue of the linearized system has imaginary part equal to zero."

Principle of Exchange of Stabilities (PES)

It is clear that $K(\sigma)$ is a product of certain operators. Condition (1) can be easily verified by following the analysis of Herron [2000, 2001] for the present operator $K(\sigma)$. The operator $M^{-1} = T(0)$ is an integral operator whose Green's function $g(z, \xi; 0)$ is nonnegative so $M^{-1} = T(0)$ is a positive operator. It is mentioned above that $T(\{E + \varepsilon h\} \Pr \sigma)$ is an integral operator its Green's function kernel $g(z, \xi, \{E + \varepsilon h\} \Pr \sigma)$ is the Laplace transform of the Green's function

$$\frac{1}{(E + \varepsilon h) \Pr} G\left(z, \xi; \frac{t}{(E + \varepsilon h) \Pr}\right) \text{ for the boundary value problem}$$

$$\left(-\frac{\partial^2}{\partial z^2} + k^2 + (E + \varepsilon h) \Pr \frac{\partial}{\partial t}\right) G = \delta(z - \xi, t),$$

where, $\delta(z - \xi, t)$ is Dirac -delta function in two-dimension,

with boundary conditions $G(0, \xi; t) = G(1, \xi; t) = G(z, \xi; 0) = 0$

Following Herron [2000], by direct calculation of the inverse Laplace transform, we can have Green's function kernel $g(z, \xi; \sigma(E + \varepsilon h) \Pr)$ is the Laplace transform of

the Green's function $\frac{1}{(E + \varepsilon h) \Pr} G\left(z, \xi; \frac{t}{(E + \varepsilon h) \Pr}\right)$, thus by definition [] of Laplace transform,

$$g(z, \xi; \sigma(E + \varepsilon h) \Pr) = \int_0^\infty e^{-(E + \varepsilon h) \Pr t} \frac{1}{(E + \varepsilon h) \Pr} G\left(z, \xi; \frac{t}{(E + \varepsilon h) \Pr}\right) dt$$

$$\left(-\frac{d}{d\sigma}\right)^n$$

$$g(z, \xi; \sigma(E + \varepsilon h) \Pr) = \int_0^\infty t^n e^{-(E + \varepsilon h) \Pr t} \frac{1}{(E + \varepsilon h) \Pr} G\left(z, \xi; \frac{t}{(E + \varepsilon h) \Pr}\right)$$

$$dt \geq 0$$

for all l, n and for all real $\sigma_0 > -\frac{k^2}{(E + \varepsilon h)Pr}$. So, $T((E + \varepsilon h)Pr\sigma)$ has a power series about σ_0 in $((\sigma_0 - \sigma))$ with positive coefficients for all real $\sigma_0 > -\frac{k^2}{(E + \varepsilon h)Pr}$.

Theorem. The PES holds for (7)-(8) when $g(z)$ is nonnegative throughout the layer

$$\sigma > \max\left\{-\sqrt{\left\{\frac{P_1 H + \varepsilon F + \varepsilon \Gamma}{2(\Gamma P_1 + \Gamma \varepsilon F)}\right\}^2 - \frac{\varepsilon}{(\Gamma P_1 + \Gamma \varepsilon F)} - \frac{(P_1 H + \varepsilon F + \varepsilon \Gamma)}{2(\Gamma P_1 + \Gamma \varepsilon F)}}, -\frac{k^2}{(E + \varepsilon h)}\right\},$$

for $(P_1 H + \varepsilon \Gamma + \varepsilon F)^2 > 4\Gamma \varepsilon (P_1 + \varepsilon F)$.

Proof: As $[I - K(\sigma)]$ is a nonnegative compact integral operator for

$$\sigma_0 > \max\left\{-\sqrt{\left(\frac{P_1 H + \varepsilon F + \varepsilon \Gamma}{2\Gamma P_1 + \Gamma \varepsilon F}\right)^2 - \frac{\varepsilon}{(\Gamma P_1 + \Gamma \varepsilon F)} - \frac{(P_1 H + \varepsilon F + \varepsilon \Gamma)}{2(\Gamma P_1 + \Gamma \varepsilon F)}}, -\frac{k^2}{(E + \varepsilon h)}\right\},$$

for $(P_1 H + \varepsilon \Gamma + \varepsilon F)^2 > 4\Gamma \varepsilon (P_1 + \varepsilon F)$. Thus all the conditions of the Krein-Rutman theorem are satisfied, therefore $[I - K(\sigma)]$ has a positive eigen value σ_1 , which is an upper bound for the absolute values of all the eigenvalues, and the corresponding eigen function $\phi(\sigma)$ is nonnegative. We observe that

$$[I - K(\sigma)][\phi(\sigma)] = (1 - \sigma_1)\phi \geq 0,$$

Thus, if $[I - K(\sigma)]$ is nonnegative, then $\sigma_1 \leq 1$, so the methods of Weinberger[] and Rabinowitz [] apply and showing that "there exists a real eigenvalue $\sigma_1 \leq a$ such that the spectrum of $K(\sigma)$ lies in the set " $\{\sigma \mid \text{Re}(\sigma) \leq \sigma_1\}$ ". This is equivalent to the PES.

Conclusion:

It is established from the present analysis that PES is valid for Rivlin- Ericksen fluid layer heated from below in porous medium under the effect of suspended particles with variable gravity $g(z)$ is positive throughout the fluid layer and $(P_1 H + \varepsilon \Gamma + \varepsilon F)^2 > \Gamma \varepsilon (P_1 + \varepsilon F)$. The

References

1. Chandrasekhar, S. [1961], '*Hydrodynamic and Hydromagnetic Stability*', Oxford University Press, London
2. Drazin, P.G. and Reid W.H. [1981], '*Hydrodynamic Stability*', Cambridge University Press, Cambridge.
3. Garg, A., Srivastava, R. K. and Singh, K. K., (1994), 'Proc. Nat. Acad. Sci;' India, 64A (III), 355.
4. Herron, I.H. [2000], On the principle of exchange of stabilities in Rayleigh-Benard Convection, Siam J. Appl. Math., 61(4), 1362-1368.
5. Lata, Pushap. [2013], Study on the principle of exchange of stabilities in thermal instability of Walter's fluid in porous medium with variable gravity by positive operator, *International Journal of Physical and Mathematical Sciences*. 4 (1): 496-511
6. Lata, Pushap. [2013], On the principle of exchange of stabilities in Oldroydian fluid in Porous Medium with Variable Gravity using Positive Operator method, *Advances in Applied Research Sciences* ,4 (6) : 68-74
7. Lata, Pushap. [2013]. Thermal Instability of Walter's (MODEL B') fluid Permeated with suspended particles in porous medium with variable gravity using Positive Operator , *International Journal of pure and applied Mathematical Sciences*, 6(3) :261-2725.
8. Lata, Pushap. [2013], On the principle of exchange of stabilities in Rayleigh- Benard Convection in Porous Medium with Variable Gravity using Positive Operator method, *Journal of Applied Mathematics and Fluid Mechanics* , 5 (2) :45-51
9. Lata, Pushap. [2013], Instability of Rivlin- Ericksen Elastico – Viscous fluid in porous medium with variable gravity by Positive Operator, *International Journal of Physical and Mathematical Sciences*, 4(1):512-52
10. Lata, Pushap. (2014). On the principle of exchange of stabilities in Thermohaline problem of Veronis type with Variable Gravity using Positive Operator method, *International Journal of physical & mathematical sciences* ,5(1):723-738.
11. Lata, Pushap. (2016). On the principle of exchange of stabilities in the Magnetohydrodynamic Benard Problem with Variable Gravity by Positive Operator method, *International Journal of Advance Research, Ideas and Invotation and Technology* ,2(6):1-6.
12. Lata, Pushap. (2016). Onset of Convection of Maxwellian fluid in Porous Medium with variable Gravity using Positive Operator method, *International Research Journal of Engineering and Technology* ,4(1):79-185.
13. Rivlin, R. S. & Ericksen, J. L. (1955), Stress-deformation relations for isotropic materials. J. Rational Mech. and Analysis, 4, 323.
14. Weinberger, H.F (1969), 'Exchange of Stabilities in Couette flow' in Bifurcation Theory and Nonlinear eigenvalue problems, J.B Keller and S. Antman, eds., Benjamin, New York.

Community Healthneeds Assessment in a Northern Hilly State of India

Amit Sachdeva, Satyawan Pundir, O.P Bhuretia,
Reena Singh, Jiyanand Sharma

Abstract

Background: Community health assessment is a core function of public health. It is a combination of information gathering, community engagement and focused action with the goal of community improvement. We conducted this survey to obtain baseline information of socio-economic conditions like household expenditure, sanitation, education, health, substance abuse, livelihood of the households in the various parts of Himachal Pradesh

Key words: Community health needs assessment, Himachal Pradesh

Material & methods: This was an exploratory descriptive research design using Quantitative methods of investigation by Multi-stage Sampling Technique to select 800 households divided among six randomly selected districts in ratio to their population size.

Results: We take a total Sample Size of 800 households with mean age of the respondents was 40.25 ± 13.4 years. Among them 63.5% were male. Most of these belong to Hindu religion (96.5%) and have joint family 61.4%. Maximum belong to general caste (60.1%). Among them, only 15.8% have a member of family in the govt. service and most of them have their source of income from Agriculture 20.3%. In 93.5 % of households, any member fell ill due to any illness in last year. The most common diseases were respiratory tract infection (19%). 66.5% seek treatment from government facilities. Only 58.3% have complete staffing pattern while 53.5% of participants found their services were good. Average income of the families of participants was 89k (50k-4.5l). The Average debt was 15k(1k-2L) .75.4% use ambulance service108 in case of emergency. Almost all respondents have good knowledge about various health issues. Source of health information was ASHA (43.6%) and FHW

(28.25%). Only 8.5% have complete knowledge on various health schemes by govt. Substance/drug abuse was prevalent in 38.8% among households. The most common among substance abuse were bidi/ cigarette 50.9%. 74.5 % have their source of drinking water from IPH/Municipal co-operation but still 37.8% still didn't use any method of purification. 96.4 % use toilet for defecation. 45.8% use burning method for refuse disposal. 35.9% have Problems of long queue at Health Facilities. Only 21.25% did regular health checkup and 12.75 % done regular diagnostic /screening tests.

Conclusion: Despite good knowledge about health and having adequate health services in state still there is problem of drug abuse, out of pocket expenditure and inappropriate health behavior. We recommend developing a comprehensive program to combat this problem.

Introduction

A community health needs assessment is a combination of information gathering, community engagement and focused action with the goal of community improvement. This assessment produces information that is relevant to groups and is not focused on the needs of individuals so that the improvement plans can be developed accordingly.¹ A community health needs assessment identifies the strengths and weaknesses (needs) within a community. This assessment is also unique and specific to the needs within a community and is usually an extension of a community's strategic planning process. Community leaders, local government, advocacy groups or a combination of these then address these identified needs through policy change or development.

A community health needs assessment can be broadly categorized into three types based on their respective starting points: First, needs assessments which aim to discover weaknesses within the community and create a solution (Community Needs Assessment I). Second, needs assessments which are structured around and seek to address an already known problem or potential problem facing the community (Community Needs Assessment II). Third, needs assessments of an organization which serves the community (domestic violence centers, community health clinics etc.) (Community Needs Assessment III). In the present study we tried to assess all these three types.²

Community health needs assessments are executed in four steps: planning and organizing, data collection, coding and summarizing the needs assessment results, and sharing the results with the community to facilitate action planning. The objective of the present study were as under:

1. To obtain baseline information of socio-economic conditions like household expenditure, sanitation, education, health, substance abuse,

livelihood of the households in the various parts of Himachal Pradesh

2. To assess the present situation and obtain information about the health facilities and services available to them
3. To assess the needs of the households to understand the major areas of interventions from their point of view
4. To understand the levels of availability and accessibility to various services and facilities in and around their area.
5. To understand the critical areas or challenges and find out the possible areas of interventions.

Materials and methods

Research Approach -Descriptive

Research Design- *exploratory research design* using quantitative methods of investigation

Setting of the study- Six randomly selected districts of Himachal Pradesh.

Study duration- Between January- December 2018.

Study population- Randomly selected household population of six districts namely Mandi, Shimla, Kullu, Kangra, Sirmaur and Solan.

Sample size- 800 households divided among six districts in ratio to their population size.

Sampling Technique- Multi-stage Sampling Technique.

Sampling criteria- Systematic Random Sampling method was employed with the help of existing enumeration lists (Voters' list) obtained from local authorities.

Study tool: Household Questionnaire having thematic areas under:

1. Socio-demographic and Housing Characteristics
2. Literacy, Livelihood and Educational Status
3. Health profile
4. Health care Services and Facilities: Availability and Accessibility
5. Water Resources, Sanitation and Hygiene
6. Substance Abuse
7. Knowledge about various Health Issues

Validity of tool - by the experts in this field

Ethical Consideration- Data was collected from the respondent in the selected

household after explaining the purpose of the study. Informed consent was taken from those respondents and confidentiality of the selected respondent was also maintained.

Data collection: By team members of Jan SwasthyaAbhiyan, HimachalPradesh and Himachal Gyan Vigyan Samiti under the guidance of supervisors and almost 30 minutes was given to every household to complete that questionnaire.

Data Entry:After the completion of questionnaire,the data was entered in MS Excel

Data analysis: With appropriate statistical test in terms of frequencies, percentage, mean, standard deviation.

Results

Table 1: Socio Demographic Profile of the Respondents

| Age Groups (Years) | Frequency (n=800) | Percentage (%) |
|-----------------------|-------------------|----------------|
| 18-30 | 124 | 15.5 |
| 31-45 | 477 | 59.6 |
| 45-60 | 136 | 17.0 |
| > 60 | 63 | 7.9 |
| Mean Age | 40.25 \pm 13.44 | |
| Gender | | |
| Male | 508 | 63.5% |
| Female | 292 | 36.5% |
| Religion | | |
| Hindu | 772 | 96.5 |
| Muslim | 4 | 0.5 |
| Sikh | 8 | 1 |
| Christian | 0 | 0 |
| Buddhist | 16 | 2 |
| Caste | | |
| General | 481 | 60.1 |
| SC | 98 | 12.3 |
| OBC | 145 | 18.1 |
| ST | 76 | 9.5 |
| Type of Family | | |
| Joint | 491 | |

| | | |
|------------------------------|-----|------|
| | | 61.5 |
| Nuclear | 309 | 38.5 |
| Respondents Education | | |
| Illiterate | 9 | 1.1 |
| Primary | 51 | 6.4 |
| High School | 116 | 14.5 |
| Secondary Education | 384 | 48 |
| Senior secondary | 164 | 20.5 |
| Graduate or Above | 76 | 9.5 |

Source: Primary Survey conducted by Jan Swasthya Abhiyan HP, 2018-19

We take a Total Sample Size of 800 households from 6 districts of Himachal Pradesh. The Mean Age of the respondents was 40.25 ± 13.4 years. Among the respondents 63.5% were male and 36.5% were female. Most of these belong to Hindu religion (96.5%) and have joint family 61.4%. Maximum belong to general caste (60.1%) while OBC, SC & ST were 18.1, 12.3 & 9.5% respectively. 61.5% have joint family and almost all of the respondents were educated.

Table 2: Livelihood of Family

| | | |
|--------------------------------------|------------------------|------|
| Family Member in Service | | |
| Government | 126 | 15.8 |
| Private | 21 | 2.6 |
| Source of Income | | |
| Salary | 147 | 18.4 |
| Business | 98 | 12.3 |
| Pension | 39 | 4.9 |
| Agriculture | 162 | 20.3 |
| Others | 354 | 44.3 |
| Average Income | = 89k(50k-4.5l) | |
| Expenditure on various issues | | |
| Exp On Food | = 35k(12k-1.2 L) | |
| Exp On Education | = 40k(4k-1.5l) | |
| Exp On Treatment | = 36k(1k-2l) | |
| Exp On Festival | = 18k(1k-1.1l) | |
| Exp On Drugs/Smoke/Alcohol | = 8k(1k-40k) | |
| Exp On Future Investment | = 26k(0-1.5l) | |
| Exp On Other | = 25k(10k-50k) | |

Source: Primary Survey Conducted by Jan Swasthya Abhiyan HP, 2018-19

Among the participants only 15.8% have a family member in the govt. service and most of them have their source of income from agriculture 20.3%. Average Income of the families of participants was 89k(50k-4.5l). Among this the average exp. on Food was 35k (12k-1.2 L), Exp On Education was 40k (4k-1.5l) while exp. on Treatment was 36k (1k-2l).

Table 3: Health Profile in the Households

| | | |
|--------------------------------------|-----|------|
| Ill Last 1 Years | | |
| Yes | 748 | 93.5 |
| No | 52 | 6.5 |
| Type of Disease | | |
| Fever | 66 | 8.3 |
| Jaundice | 3 | 0.4 |
| Headache | 52 | 6.5 |
| Thyroid | 16 | 2.0 |
| Asthma/ Allergy | 18 | 2.3 |
| Skin Disorders | 45 | 5.6 |
| Respiratory Disorders Including RTI | 152 | 19.0 |
| Eye Problem | 58 | 7.3 |
| Ear Problem | 36 | 4.5 |
| Dental Problems Including Toothache | 23 | 2.9 |
| Hypertension | 69 | 8.6 |
| Diabetes | 43 | 5.4 |
| Stroke | 2 | 0.3 |
| Heart Problem Including MI | 3 | 0.4 |
| Kidney Problem Including Renal Stone | 6 | 0.8 |
| Liver Disorder Including Hepatitis | 4 | 0.5 |
| Gall Stone | 14 | 1.8 |
| GIT Problems Including Acidity | 94 | 11.8 |
| Musculoskeletal Disorders | 64 | 8.0 |
| Others | 225 | 28.1 |

Source: Primary Survey conducted by Jan Swasthya Abhiyan HP, 2018-19

93.5 % of households, a family member ill due to some disease in last year. The most common diseases were respiratory tract infection (19%) while they suffer from both communicable and non-communicable diseases equally.

Table 4: Status of Health Services

| | | |
|-----------------------------|-------|------|
| Treatment Taken | | |
| Government Institution | 532 | 66.5 |
| Private Institution | 268 | 33.5 |
| Mean Distance | 4.8km | |
| Staff At Facility | | |
| Yes | 466 | 58.3 |
| No | 334 | 41.7 |
| Services At Facility | | |
| Good | 428 | 53.5 |
| Bad | 135 | 16.9 |

| | | |
|---|-----|-------|
| Satisfactory | 116 | 14.5 |
| Un-Satisfactory | 121 | 15.1 |
| Problems At Health Facilities | | |
| Bad Behavior | 35 | 4.4 |
| Documentation | 68 | 8.5 |
| Many Test | 99 | 12.4 |
| Long Queue | 287 | 35.9 |
| No Doctor/Staff | 30 | 3.8 |
| Costly Medicine | 116 | 14.5 |
| No Medicine | 70 | 8.8 |
| Others | 95 | 11.9 |
| Debt For Treatment | | |
| Yes | 89 | 11.1 |
| No | 711 | 88.9 |
| Average Debt = 15k(1k-2l) | | |
| Boarding To Health Facility | | |
| Bus | 135 | 16.9 |
| Private Taxi | 62 | 7.8 |
| Ambulance/108 | 603 | 75.4 |
| Suffered Due to Absence of Treatment | | |
| Yes | 103 | 12.8 |
| No | 697 | 87.2 |
| Routine Check Up | | |
| Yes | 170 | 21.25 |
| No | 630 | 78.75 |
| Routine Tests | | |
| Yes | 102 | 12.75 |
| No | 698 | 87.25 |

Source: Primary Survey Conducted by Jan Swasthya Abhiyan HP, 2018-19

Almost 2/3rd (66.5%) seek treatment from government facilities. The mean distance of health facilities was 4.8 km. Only 58.3% have complete staffing pattern while 53.5% of participants found their services Good. 35.9% have a problem of long queue at Health Centres while rest have problem of many tests, no bed, no medicine, bad behavior and no staff etc. 11.1% of participants took debt for treatment. The Average Debt was 15k (1k-2L) 75.4% use ambulance service/108 services, 16.9% use bus while 7.8% use private taxi service for transport to health facilities. Only 21.25% did regular health check up and 12.75 % done regular diagnostic /screening tests.

Table 5: Knowledge on Various Health issues

| | | |
|---|-----|-------|
| Knowledge About ANC Check Up | | |
| Yes | 705 | 88.1 |
| No | 95 | 11.9 |
| Preferred Place For Delivery | | |
| Government Institution | 724 | 90.5 |
| Private Institution | 48 | 6 |
| Home Delivery | 28 | 3.5 |
| Knowledge About Breast Feeding | | |
| Yes | 752 | 94 |
| No | 48 | 6 |
| Knowledge About Time of Marriage | | |
| Yes | 716 | 89.5 |
| No | 84 | 10.5 |
| Knowledge About Time of Becoming Mother | | |
| Yes | 708 | 88.5 |
| No | 92 | 11.5 |
| Knowledge About Gap Between Two Children | | |
| Yes | 688 | 86 |
| No | 112 | 14 |
| Knowledge About Menstruation | | |
| Yes | 642 | 80.25 |
| No | 158 | 19.75 |
| Source of Health Information | | |
| AWW | 118 | 14.75 |
| ASHA | 349 | 43.6 |
| FHW | 226 | 28.25 |
| TV/Print Media | 52 | 6.5 |
| Internet | 46 | 5.75 |
| Others | 9 | 1.1 |
| Knowledge About Health Scheme | | |
| Good | 68 | 8.5 |
| Fair | 685 | 85.6 |
| Poor | 47 | 5.9 |

Source: Primary Survey Conducted by Jan Swasthya Abhiyan HP, 2018-19

Among the participants 88.1% have knowledge about ANC Check up, 90.5% have knowledge about place of delivery, 94 % have knowledge about breast feeding, 89.5% have knowledge about time of marriage while 88.5% have knowledge about time to become mother. 86% have knowledge about time difference between two birth. 80.25% have complete knowledge about menstrual hygiene. Source of health information was ASHA (43.6%) and FHW (28.25%) among most of participants. Only 8.5% have complete knowledge on various health schemes by govt while 85.6% have fair knowledge

Table 6 : Substance Abuse in Households

| Substance Abuse in households | | |
|--------------------------------------|-----|-------|
| Yes | 310 | 38.75 |
| No | 490 | 61.25 |
| Type of Substance Abuse | | |
| Alcohol | 105 | 33.9 |
| Cigarette /Bidi | 158 | 50.9 |
| Gutka/Khaini | 91 | 29.4 |
| Chita | 4 | 1.3 |
| Others | 42 | 13.5 |

Source: Primary Survey conducted by Jan Swasthya Abhiyan HP, 2018-19

Substance/drug abuse was prevalent in 38.8% among households. The most common among substance abuse were bidi/cigarette 50.9%, alcohol 33.9%, khaini/jarda 29.4% while 1.3 % use chitta.

Table 7: Water Resources, Sanitation and Hygiene in Households

| Source Of Drinking Water | | |
|--|-------------------------------|------|
| IPH/MC | 596 | 74.5 |
| Public Tap | 60 | 7.5 |
| Spring/Bowri | 88 | 8 |
| Hand Pump | 56 | 7 |
| Mean Distance Of Drinking Water | Mean Distance =150 M (0 -3 Km | |
| Method Of Water Purification | | |
| Boiling | 251 | 31.4 |
| Filtration | 212 | 26.5 |
| Direct | 302 | 37.8 |
| Others | 35 | 4.4 |
| Sanitary /Privy Use | | |
| Use Toilet | 771 | 96.4 |
| Open Defecation | 29 | 3.6 |
| Method Of Refuse Disposal | | |
| Burning | 366 | 45.8 |
| Digging | 88 | 11 |
| Common Dustbin | 65 | 8.1 |
| Home Collection | 167 | 20.9 |
| Open Disposal | 114 | 14.3 |

Source: Primary Survey conducted by Jan Swasthya Abhiyan HP, 2018-19

In the present survey 74.5% household have their source of drinking water from IPH/MC, 7.5% use public tap, 8% use bowdi while 7 % use handpump. 26.5 % participants use filter while 31.4% use boiling as Method of Water Purification. But still 37.8% still DON'T use any method of purification. 96.4 % use toilet for defecation. 45.8% use burning method for refuse disposal, 11 % use digging, 14.3 % use open disposal, 8.1% common dustbin while 20.9 % have home to home collection.

Discussion

In the present study 800 households from 6 districts of Himachal Pradesh namely Mandi, Shimla, Kullu, Kangra, Sirmaur and Solan were included depending upon their population size. Most of these belong to Hindu religion (96.5%) and have joint family 61.4%. Maximum belong to general caste (60.1%) while OBC, SC & ST were 18.1, 12.3 & 9.5% respectively which is according to the demographic profile of Himachal Pradesh.³

Among the households, only 15.8% had a member of family in the govt. service and most of them have their source of income from Agriculture (20.3%) which is also matched with the data of labour and employment of Himachal Pradesh.⁴

In 93.5 % of households, have a member of family ill due to some illness last year. The most common diseases were respiratory tract infection (19%). They suffer from both communicable and non communicable disease equally. This shows the epidemiological transition and double burden of disease.

66.5% seek treatment from government facilities. Only 58.3% have complete staffing pattern while 53.5% of participants found their services were good. 35.9% have Problems of long queue at Health Facilities while rest have problem of many tests, no bed, no medicine, bad behavior and no staff etc. So, the health service and facilities need to be strengthened.

Average Income of the families of participants was 89k (50k-4.5l). Among this the average exp on food was 35k (12k-1.2 L), exp on Education was 40k (4k-1.5l) while exp on Treatment was 36k (1k-2l). This out of pocket expenditure on health and education needs to be addressed by government by reforms and taking corrective actions.

11.1% of participants take debt for treatment. The Average Debt was 15k (1k-2L). This debt may be reduced by strengthening the primary and secondary health services in Himachal Pradesh.

Only 21.25% respondents did regular health checkup and 12.75 % have done regular diagnostic /screening tests. So public should be made aware about the importance of regular health check up and preventive aspects of the diseases.

75.4% use ambulance service/108 services, 16.9% use bus while 7.8% use

private taxi service for transport to health facilities in case of emergency which shows the 108 services are working very good all over Himachal Pradesh. Similar results were seen in the study done by Rao et al in Shimla.⁵

Almost all respondents have good knowledge about various health issues. Source of health information was ASHA (43.6%) and FHW (28.25%), which shows that ASHA were doing their work efficiently.

Only 8.5% have complete knowledge on various health schemes by government while 85.6% have fair knowledge. So the public should be made aware by organizing awareness camp about various health related scheme running in Himachal Pradesh.

Substance/drug abuse was prevalent in 38.8% among households. The most common among substance abuse were bidi/ cigarette 50.9%, alcohol 33.9%, khaini/jarda 29.4% while 1.3 % use chitta. Similar results were seen by survey done by Dharamshala based Gunjan organization in Himachal Pradesh. We recommend developing a comprehensive program to combat this problem.⁶

74.5 % have their source of drinking water from IPH/Municipal co-operation, 7.5% use public tap, 8% use bowdi while 7 % use handpump. 26.5 % participants use filter while 31.4% use boiling as Method of Water Purification. But 37.8% still didn't use any method of purification. So the public must be made aware about the water borne disease like hepatitis A/E, Gastro-enteritis etc. as many such outbreaks frequently occur in the state.

96.4 % use toilet for defecation which is more than as reported in NFHS 4 survey.⁷ It signifies that sanitation has been improved all over the state after Swachhta Abhiyan and various sanitation schemes.

45.8% use burning method for refuse disposal, 11 % use digging, 14.3 % use open disposal, 8.1% common dustbin while 20.9 % have home to home collection. So, the public must be informed about the ill health effect of open disposal and provision of common dustbin or home to home collection should be made by the government.

Acknowledgements

Working on these sensitive issues like problems of drug addictions we would like to acknowledge the support and co-operation of *Gyan Vigyan Samiti, Himachal Pradesh and Himachal Jan Swasthya Abhiyan and their committed and dedicated volunteers*. We like to express our sincere gratitude for providing all financial and logistic assistance and other support to carry out the study smoothly. We also acknowledge all the respondents for their kind support during the field study in providing valuable information.

References:

1. Ahari SS, Habibzadeh S, Yousefi M, F, and Abdi R. 2012 .Community based needs assessment in an urban area; A participatory action research project.BMC Public Health. 2012; 12: 161
2. Community health Need Assessment. Available at C:/Needs assessment - Wikipedia.html. (Assessed on 12 May, 2019)
3. Demographic Profile of Himachal Pradesh. Available at <https://hplanning.nic.in/Demographic%20Profile%20of%20Himachal%20Pradesh.pdf>(Assessed on 15 May, 2019)
4. Department of Labour and employment of Himachal Pradesh. Available at https://himachal.nic.in/showfile.php?lang=1&dpt_id=14&level=1&lid=9897&sublinkid=9477 (Assessed on 10 May, 2019)
5. Rao R, SachdevaA , Rao M, Lal P, Chaudhary A. 2019. Performance Evaluation of 108 Ambulances in Northern Hilly City of India. Scholars Journal of Economics, Business and Management; 6 (2): 83–87
6. Nationwide survey on substance abuse to cover 3 districts of himachal-pradesh.Available at: <https://www.thestatesman.com/cities/nationwide-survey-on-substance-abuse-to-cover-3-districts-of-himachal-pradesh-1502633516.html>(Assessed on 18 May, 2019)
7. NFHS 4. Fact sheet of Himachal Pradesh. Available at: http://rchiips.org/nfhs/pdf/NFHS4/HP_FactSheet.pdf (Assessed on 17 May, 2019)

Mental Health of Male and Female Senior Secondary Students of District Shimla

Surender Kumar Sharma

Abstract

The present study investigated the mental health of male and female senior secondary students of Himachal Pradesh. Descriptive research design was used to accomplish the objective of the study. A sample of 300 government school students was taken from one district of Himachal Pradesh by random sampling technique. For this paper researcher used mental health inventory constructed by Dr. Jagdish and Dr. A.K. Srivastava. Researcher finds out Mean, S.D. and t-value for testing null hypothesis. The finding of the study revealed that there is no significant difference and exists a significant difference in between mental health of male and female Senior Secondary student.

Key Words: Mental Health, Gender and Senior Secondary Students.

INTRODUCTION

Evidence from the world Health organization suggests that nearly half of the world's populations are affected by mental illness. Mental health can also impact physical health and poor mental health can lead to problems such as substance abuse. Maintaining good mental health is crucial to living a long and healthy life. Good mental health can enhance one's life, while poor mental health can from living an enriching life. It is well known and established fact that the proper development of a person in life long and continuous process which is affected by various influences a person experiences in the form of his immediate and extended environment.

This show that the important of studying the various influences and their effects on the mental health of school going adolescents, as they are the future of their country.

OBJECTIVES

- (1) To study the difference among male and female Senior Secondary students with respect to their Mental Health.
- (2) To study the difference among male and female Senior Secondary students with respect to their Group Oriented Attitude.
- (3) To study the difference among male and female Senior Secondary students with respect to their Environmental Mastery.

HYPOTHESES

- (1) There is no significant difference between mental health of male and female Senior Secondary student with respect to their Mental Health.
- (2) There is no significant difference between mental health of male and female Senior Secondary student with respect to their Group Oriented Attitude.
- (3) There is no significant difference between mental health of male and female Senior Secondary student with respect to their Environment Mastery.

DELIMITATION

1. Present study is confined to the male and female senior secondary student studying in Govt. schools of District Shimla.
2. Present study is confined to the 150 male and 150 female Senior Secondary student of District Shimla.

METHOD USED

Survey method was used under the descriptive method of study.

SAMPLE

In the present research paper total of twelve schools were selected randomly through the random sampling technique. For each school a sample of 30 students of +2 grades was selected. From co-educational school 15 boys and 15 girls and from school exclusively meant for either boys or girls only 30 boys or girls respectively were selected randomly.

TOOL USED

For the present Research paper, the investigator used mental health inventory constructed by Dr. Jagdish and Dr. A.K. Srivastava. This inventory was used because this inventory was most suitable and convenient tool for data collection

for present research work. The inventory covers the six dimensions of sound mental health.

STATISTICAL TECHNIQUE

Statistical tools are used to convert the qualitative responses into quantitative responses. So that it may be easy to make calculation. The process is known as quantification of data. In the presented study, the tabulated data was analyzed in form of mean, standard deviation, and t-value. 't' value was calculated with the help of following formula :- $t = \frac{|M_1 - M_2|}{\sqrt{\frac{(SD_1)^2}{N_1} + \frac{(SD_2)^2}{N_2}}}$

GENDER WISE DIFFERENCE IN MENTAL HEALTH OF MALE AND FEMALE STUDENTS.

The means and standard deviation of scores of mental health of male and female students along with 't' values are given in table 1

Means, standard deviation and 't' value of mental health scores of male and female senior secondary students.

| | Number | Mean | S.D | df | 't' value | Levels of Significance |
|-------|--------|--------|-------|-----|-----------|------------------------|
| Boys | 150 | 164.73 | 11.52 | 298 | 2.60 | S |
| Girls | 150 | 161.22 | 11.92 | | | |

S= Significant NS = Not Significant Table value with degree of Freedom 298 at 0.01 level of significance = 2.59 0.05 level of Significance = 1.97 Table 1 shows that mean mental health scores of male and female senior secondary students came out 164.73 and 161.22 respectively. Degree of freedom came out to be 298. The 't' value testing the significant of means difference came out to be 2.60 which is significant even at 0.05 level of significance. This indicates that male and female senior secondary students differ significantly with respect to their mental health.

“There is significant difference between mental health of male and female senior secondary students“ is rejected. Also trends of means shows that mean of mental health scores of male (164.73) are higher than mean mental health scores of female (161.22)

GENDER WISE DIFFERENCE IN GROUP ORIENTED ATTITUDES SCORES OF MALE AND FEMALE STUDENTS.

Mean, standard deviation and 't' value of group oriented attitudes scores of male and female of senior secondary school students

| Gender | Number | Mean | S.D | df | 't' value | Levels of Significance |
|--------|--------|-------|------|-----|-----------|------------------------|
| Boys | 150 | 24.59 | 3.12 | 298 | 0.48 | NS |
| Girls | 150 | 24.76 | 2.80 | | | |

S = Significant NS = Not Significant Table value with degree of freedom 298 at 0.01 level of significance = 2.59 0.05 level of significance = 1.97 Table 2 shows that mean group oriented attitudes of male and female senior secondary students came out to be 24.59 and 24.76 respectively. Degree of freedom came out to be 298. The 't' value testing the significance of means difference came out to be .48, which is non-significant even at 0.05 level of significance . This indicates that male and female senior secondary students do not differ significantly with respect to their group oriented. **“There is no significant difference between male and female senior secondary student with respect to their oriented attitudes” is retained.** Also, trends of means shows that group oriented attitudes that group oriented attitudes scores of female (24.59) are lower than group oriented attitudes scores of male (24.76)

GENDER WISE DIFFERENCE IN ENVIRONMENTAL MASTERY SCORES OF MALE AND FEMALE STUDENTS.

TABLE 3

Mean, standard deviation and 't' value of environmental mastery scores of male and female of senior secondary school students.

| Gender | Number | Mean | S.D | df | 't' value | Levels of Significance |
|--------|--------|-------|------|-----|-----------|------------------------|
| Boys | 150 | 27.94 | 3.39 | 298 | 0.41 | NS |
| Girls | 150 | 27.77 | 3.53 | | | |

S = Significant NS = Not Significant Table value with degree by freedom 298 at 0.01 level of significance = 2.59 0.05 level of significance = 1.97

Table 3. Shows that mean environment mastery of male and female senior secondary student came out to be 27.94 and 27.77 respectively. Degree of freedom came out to be 298. The 't' value testing the significance of means difference came out to be 0 .41, which is non –significant even at 0.05 level of significance. This indicates that male and female senior secondary students do not differ significantly with respect to their environmental mastery.

“There is no significant difference between male and female senior secondary

students with respect to their environmental mastery” is retained. Also, trends of means show that environment mastery scores of female (27.77) are lower than environmental mastery scores of male (27.94).

FINDINGS AND CONCLUSION

1. There is significant difference between mental health male and female senior secondary students. Male and females are equally mentally healthy however mean mental health scores reflect that males are slightly better than Females. This can be because of better adapt perception of reality, understanding of male students.
2. There is no significant difference between male and female senior secondary students with respect to their 'group oriented attitudes' on the basis of mean score female have better group oriented attitudes as compared to male. This can be because they have ability to get along with other and ability to find recreation. Male have not such an attitude to get along with others and not such ability to find recreation like female.
3. There is no significant difference between male and female senior secondary students with respect to their 'environment mastery'. On the basis of means scores males have better environment mastery as compared to females. This can be because males have ability to do any type of work and play. They have ability to take any responsibility and capacity for adjustment. They have efficiency in meet situational requirement. Female have not such ability to do any type of work and play also female have not capacity for adjustment anywhere as compared to male.

EDUCATIONAL IMPLICATIONS

The implications are as below.

Provide more and equal opportunity to male and female students. Provide proper guidance services for both male and female students. There should be established guidance cells in school. There should be provision for guidance cells for pre-service teacher. Debates, discussions and seminars should be organized in schools for students. There should be a provision for proper guidance worker in school. There is need of properly trained teachers who can guide and motivate students so as to develop appropriate interest. Orientation speeches and lecture should be arranged for students.

References

Anand (2011) “Researcher in psychology of education of: A trend report.” IVth survey of research in education', vol.3, P425.

Anand. S.P. (1989) mental health of high school students and Indian education review, Vol. 24.

Bhattacharge M. (2011) The need Frustration intolerance and mental health of adolescence girls reading in certain urban secondary school in west Bengal phd.kal. vol. 1985.

Ciarrochi, J.F.P, Dean and S, Anderson (2002) "Emotional moderated the relationship between stress and mental health" Personality and individual difference vol. 232 (2) pp 197-209.

Dalta Naven (2007) "A study of mental health of senior secondary students in relation to their gender, social category and family" M.ed dissertation, H.P.U.

Fourth survey of research in Education, p.p.329.

Horwitz, A.V., and White H.R. (2012), the relationship of cohabitation and mental health : A study of a young adult cohort, journal of marriage and family vol.21(3).

Mathur, S, S., (2010) "Education psychology" Agra, Vinod Pustak Mandir. Pp. 510-511.

Offord, David R, (2001) "Reducing the impact of poverty on children mental health". Current opinion in psychiatry-vol. 14(4).

Pareekh, U, and T.V Rao (2009) "Motivational training for mental health. A survey of teacher behavior and student's mental health.

Passmore, A. (2011)"the occupation of leisure. Three typologies and their influence on mental health in adolescence." OTJR: occupation, participation and Health, Vol.23 (2), pp.76-83.

Prassana, K.C. B., (2011) "A study of certain mental health variables associated with high and low perceiving adolescents."

Roney and Cinabas (2005). "State mental health conditions in developing countries: India and Turkey," Journal of mental health counseling, vol. 27 (2), pp 149-160.

Sanchez M., Esteban and Barron L., Ana (2013) social psychology of mental health. The social structure and personality perspective; spavins journal of psychology, Vol.6 (1).

Sharma R.K (2010) "Self Concept, level of aspiration and mental health as factors in academic achievement" Third survey research in education, pp 687-688.

Ventis, (1995) "Conducted study on the mental health. The means dimension showed predominately negative relationship with mental health India's. M.Ed Dissertation, HPU.

Wetzel, J.W. (NY); (2009) “Women and mental health. A globe perspective”. International social work vol. 42 (2) pp. 2005-2015.

SEARCH ENGINES VISITED:

- www.google.com
- www.yahoo.com

WEBSITES VISITED:

- www.shodaganga.com
- www.wikipedia.com
- www.questia.com
- www.ncert.nic.com

Deendayal Upadhyaya: Man, Mission and Message

Suresh Kumar Soni

DEENDAYAL UPADHYAYA was a simple person, a committed worker, an organizer par excellence, and a vibrant thinker. Though he got much reputation in his life but he did not receive attention from public in general and academia in particular like that of other leaders and thinkers of India. He has led his life with engagement, dedicated to establish the values which he has held moral and ethical in his life. He faced many difficulties struggled very hard to attain his goals. Deendayal was a brilliant student and during his studies he got influenced by the RSS and decided to dedicate himself for the work and mission of this organization, as pracharak - full time worker, to make India that is Bharat a strong, vibrant and scintillating country. Disturbed by the situations prevailing in the country even after independence, he took over the responsibility to provide an alternative political ideology in the form of a political party- Jan Sangh in 1951. He was the founder General Secretary of Jan sangh, worked hard to spread the base and net work of the party and became the party supremo after the death of Shyama Prasad Mukherjee. He advocated a philosophy of Integral Humanism, which brought him in lime light as a thinker. In this paper an attempt has been made to examine and analyse Deendayal's life, mission and message for the people in general and academia in particular.

Deendyal Upadhyaya was born (September 25, 1916) in a poor family and he faced many difficulties in his early life. Became orphan, and also lost his sole brother at very early stage of his life. Arrangements for his schooling could not be made at proper time and his school level education started late¹. He was a brilliant student, set new records in studies for which he was awarded scholarships and was specially honoured by the Maharaja of Sikar for his achievements in 1937 when he passed intermediate board examinations with distinction in every subject. After his schooling, Deendayal went to Kanpur for further studies where

he joined 'Sanatan Dharam College'. He stayed in the college hostel, and was befriended by Sunder Singh Bhandari² and Balwant Mahashabde³. Motivated by the latter, Deendayal joined Rashtriya Swayamsevak Sangh (RSS) in 1937. He came in contact with Dr. Hedgewar, the founder of the RSS. Gradually his interest in RSS activities grew and he started devoting time to this organization. He passed his BA in 1939 with first class and joined St. Joan College at Agra for post graduation in English but his studies were discontinued because of the illness of his cousin Rama Devi, who could not be saved despite of all the efforts. Radha Raman was not happy with the discontinuation of Deendayal's studies and he asked Deendayal to appear in the Administrative Services Examinations. Deendayal successfully took the examination and went for interview. Other candidates dressed in fine suits made a fun of Deendayal who was the only one dressed in 'dhoti' 'kurta' and a cap on his head by saying 'Panditji has come'⁴. This was the first time he was called Panditji. He was at the top of the list of the selected candidates but did not join the service. He got other opportunities too to get jobs and lead a comfortable life. There was a lot of churning in his mind, finally he decided to accomplish something extraordinary in his life and government job did not remain a fascination for him.

Now question arises as to what led him to decline the offer of job and what was the objective of his life. It is observed that Deendayal was influenced by the RSS and remained attached with its activities from his college days. He made up his mind to work for this organization. Initially, he wanted to do a job as well as utilize his energies for the organizational work of the RSS. He wrote "I too was first thinking of taking up a job in some school and also attending to the Sangh work of the place simultaneously. I was thinking on those lines when I came to Lukhnow"⁵. He added, "But in Lucknow, I was able to study the current situation and to form an idea of the vast field of work ahead, and I got the advice that instead of working in one particular town I would have to work in a whole district. That is how the paucity of available workers in the dormant Hindu Samaj has to be made up"⁶.

Disturbed by the conditions, which were prevailing in the country at that time, Deendayal remarked, "Take the case of highest personality in India and then consider the actual situation in which he finds himself. Muslim goondas may at single stroke, besmirch the honour and reputation of the highest citizen ... Our sisters and daughters are carried away by the Muslims, they were victims of assaults by British soldiers in broad day light and we, who are never tired of boasting of our honour and our exalted position in society, are obliged to look on in utter helplessness. We can do nothing to check all this. The utmost we can do is to publish it in papers as a sensational news item under banner headlines. Or, it

may be reflected in an article by Mahatmaji in the 'Harijan'". According to Deendayal our society was "weak and degenerate, devoid of power and steeped in selfishness. Every one of us is engrossed in his personal interests and is inclined to think about himself alone. If a man is sailing in a leaking boat, he may carry his load as high above his head as possible, but it is bound to sink along with him. This is exactly the situation in which the Hindu Samaj finds itself today."⁸ Emphasizing the need of the hour he stated, "Today, begging bowl in hand, the Samaj is seeking alms from us. If we continue to be indifferent to its demands a day may come when we may, willy nilly, have to part with a great deal that we most dearly love."⁹

In view of the above adverse circumstances, Deendayal wanted to provide his services for the upliftment of the country to make her virile, valiant, strong and prosperous. According to him, the only way to strengthen their country was to organise the society in accordance with the ideas and principles of RSS. Greatly influenced and inspired by the ideology of RSS, Deendayal was determined to work for this organization. When he realized that he could not discharge both the responsibilities of a job and RSS work simultaneously in a satisfactory manner then with a specific objective in life, he dedicated his entire life fully for the work and mission of the RSS. He left the idea of doing a job and the work of the RSS became his priority and an objective of life. Shanti Bhushan has written, "Deendayalji always wanted to dedicate his life to the country, because he believed that service of the country was not possible after taking up a government job while the country was in bondage. So he dedicated his life to the service of the country, and for this he chose the medium of the Rashtriya Swayamsevak Sangh."¹⁰

In the year 1940, Muslim fundamentalism was very intense. The Muslim League demanded separate state for the Muslims. Deendayal opposed the demand for partition of India. He worked to combat Muslim fundamentalism and to integrate the Hindu society.¹¹ The founder of RSS, Dr. Hedgewar died in 1940. Madhav Sadashivrao Goalwalkar became the supremo of RSS. Deendayal worked under his leadership. He worked as *Pracharak* (organiser) of RSS in district Lakhmipur of Uttar Pradesh till 1944 and was promoted to joint provincial organiser in the organisational hierarchy of RSS in Uttar Pradesh and continued till 1951. He worked and strove very hard to strengthen RSS While remaining on various positions of organisational hierarchy, he earned reputation and acclaim in the organization because of his hard work, dedication, sincerity, organizing skills and capacity, loyalty and commitment towards the RSS. Nanaji Deshmukh has written, "Deendayal was gifted with a many-faceted personality. He was an extraordinary successful organizer and had the knack of keeping people together. His role in the growth and development of the Rashtriya Swayamsevak Sangh in

Uttar Pradesh was very significant."¹²

Deendayal also steered and geared up the organisational work by professing the ideas of RSS by exhibiting his academic talent through different journals. In 1945,¹³ he founded "Rashtra Dharam Prakashan" in Lucknow and launched a monthly journal *Rashtra Dharma*. He also launched the weekly *Panchajanya* in 1948 and daily *Swadesh* during 1949-50. Of these periodicals only *Panchajanya* achieved the status of an all-India weekly Journal and is now published from Delhi. The monthly, *Rashtra Dharma* continued to be published from Lucknow but the daily *Swadesh* is replaced by *Tarun Bharat* and is published from Lucknow.¹⁴ Deendayal Upadhyaya wrote two books namely *Samrat Chandaragupta* and *Jagat Guru Sankracharya*, which were published in 1946 and 1947 respectively. Later, he expressed his ideas in a number of philosophical essays and speeches¹⁵, which are contained in the books and booklets such as *Integral Humanism*, *Rashtra Jeevan Ki Disha*, *Bharatiya Arth Niti Vikas Ki Ek Disha*, *Akhand Bharat Aur Muslim Samasaya*, *Hindu Sanskriti Ki Visheshta*, *The Two Plans*, *Political Diary*, *Devaluation: A Great Fall*, *His Presidential Address*, etc.

In 1947, India got independence. The Congress Party headed the government. Differences between Congress and RSS surfaced on some issues. After the death of Mahatma Gandhi, the relation between Congress and RSS became highly soured. The latter was accused of murdering Mahatma Gandhi, but its leaders disclaimed any involvement in this heinous crime. The government imposed a ban on RSS and ordered an inquiry. The accusation was not proved; therefore, the ban on RSS and its activities was lifted. But differences between RSS and Congress still continued to worsen, and the climax came in 1950. On April 8, 1950 the Nehru Liaquat Ali agreement was signed.¹⁶ RSS dubbed the pact as unilateral. The Government was accused of surrendering Indian interests to Pakistan. RSS opposed the agreement tooth and nail.

Dr. Shyama Prasad Mukherji, the minister of industries in the Nehru government also opposed the agreement strongly. He resigned from the cabinet and joined the opposition. Dr. Mukherji started criticising the government vehemently and demanded that Kashmir be declared as an integral part of India without the special privileges guaranteed under the instrument of accession. He began to realize the necessity of forming an alternative to the Congress on all India basis. RSS too felt a need to form a political party in India, which could protect its interests in political field in general and in legislature in particular. Vasant Nargolker has written, "it seems that those who wanted to protect the Hindu interests and promote the Hindu culture exclusively, began to feel the need for a political front to propagate their views through elections and representation in the legislature. Deendayal himself was one of them."¹⁷ There was a need of

dedicated young men to take up this work. Deendayal was regarded as very important person in the RSS. He was considered the future architect and a vehicle of carrying out and promoting the principles and programmes of the RSS in political field. Therefore, Deendayal and a handful of other selected workers were put at the disposal of Dr. S.P. Mukherji.¹⁸ It is observed that Deendayal was uninterested in politics. Highlighting this fact, M.S. Golwalkar has remarked, "Deendayalji had not the slightest inclination towards politics. In the past years he said to me several times: 'This is a nasty affair into which you have placed me. Permit me again to do work of a pracharak'. I said, 'whom else can I put into this nasty affair. Only a man, with such deep and unfaltering faith in organization work, can remain in this nasty affair and still be unaffected by it; he only can clean it up. None else can do it.'"¹⁹ Nevertheless, at the insistence of M.S. Golwalkar, he joined a political party. In September 1951, Deendayal Upadhyaya and Dr. S.P. Mukherji launched the Uttar Pradesh unit of B.J.S. in Lucknow. A month later, on October 21, 1951 an all India convention was held in Delhi to form an All India Bharatiya Jan Sangh. Dr. S.P. Mukherji was elected as its founder president. The first national level conference of B.J.S. was held in Kanpur from Dec. 29-31, 1952.²⁰ Deendayal was made its General Secretary. In this session of B.J.S., Deendayal was also entrusted with the responsibility of running the *Satyagraha*²¹ on Kashmir. The movement started with the slogan — *Ek Vidhan, Ek Nishan, Ek Pradhan* (One constitution, One flag and One Prime Minister). This movement was against the Act 370 of Indian constitution, which guarantees special status to Jammu and Kashmir. Dr. Mukherji led a batch of *Satyagrahis* towards Jammu and Kashmir. He was arrested and put in Srinagar jail where he died after a few days.

Deendayal also contested a parliamentary election during his tenure as General Secretary of B.J.S. He contested 1963 by-elections from Jonpur parliamentary constituency unsuccessfully.²² During this year he also toured the United States, U.K. and some European and African countries.²³ During his tour he met various people and addressed press conferences. He addressed the annual function of RSS in Nairobi in Africa.²⁴ In August, 1964 he released a significant document "Integral Humanism, The basis of B.J.S programme"²⁵ in the five days study camp of B.J.S. held in Gwalior. The statement of "Principles and Policy", which contains extracts from the document drafted by Deendayal Upadhyaya was adopted by the *Akhil Bhartiya Pratinidhi Sabha* of B.J.S. in its meeting at Vijayawada held w.e.f. 23-25 Jan., 1965.²⁶ The various tenets of his Integral Humanism were contained in the four lectures delivered by him in Mumbai from 22-25 April 1965.²⁷

On June 30, 1965 India and Pakistan signed the Kutch Agreement.²⁸ Deendayal

opposed the pact and organised a 'Delhi Chalo' campaign against the agreement to impress upon the government. He demonstrated against this in Delhi on August 16, 1965.²⁹ He said, "It was an act of gross betrayal of national rights and interests. Its terms are derogatory to a self-respecting nation."³⁰ He added, "What will the government do if the Tribunal gives a verdict against India? Will they go back upon the agreement or surrender 3500 square miles of Indian territory to Pakistan."³¹

Deendayal Upadhyaya remained the General Secretary of B.J.S. for fifteen years (1953-67). After the death of the founder President, Deendayal was elevated to the position of President in the Calicut session of B.J.S., held in December 29-31, 1967.³² B.J.S. could not get his steward leadership as a President for a long time. He was found dead on February 11, 1968 at Mughal Sarai. He was allegedly murdered and the mystery of his death still remains unsolved. Deendayal remained President of B.J.S. for only forty-three days.

Deendayal's efforts are widely acclaimed in political life of India. He earned repute not only as a sincere and dedicated worker but also as a foremost ideologue of the party. His life of activism, engagement and academic pursuits is a clear message for humanity to dedicate efforts for a comprehensive cause in life. He was not an armchair philosopher in an ivory tower but also an important activist and ideologue of a political party, who was interested in converting his ideas into the stuff of reality. He said, "we do have before our eyes a vision of a great future of this country; we are not mere visionaries but are *karmayogis*, resolved to translate our vision into reality."³³ He dedicated his life with specific mission as an activist and as a vibrant thinker he also advocated a philosophy of Integral Humanism to weave in a harmonious, complimentary and integral model of human fulfillment along with the development of society in particular and whole humanity in general. Through this philosophy of Integral Humanism, he envisions intrinsic integral relations among the various apparent forms of Nature. This opens up new horizons of thinking and concerns for academicians to examine and analyse the various facets of Deendayal's philosophy of Integral Humanism.

Notes and References

¹ For details see Mahesh Chander Sharma, *Deendayal Upadhyaya: Kartritva Evam Vichar* (New Delhi: Vashudha Publication, 1994), pp.4-5.

² Sunder Singh Bhandari is a resident of Udaipur in Rajasthan. A teacher turned *Pracharak* of R.S.S., who joined politics. He became General Secretary of B.J.S. after Deendayal's death and remained Vice-president of B.J.P. for a long time. He remained the Governor of Bihar and Gujarat.

³ Sh. Balwant Mahashabde a college fellow of Deendayal, had contacts with R.S.S. He permanently settled at Vileparle in Mumbai.

⁴ “Life in Outline,” in *Pandit Deendayal Upadhyaya: A Profile*, ed. Sudhakar Rajé (New Delhi: Deendayal Research Institute, 1972), p. 7.

⁵ For details see, “Letter to Maternal Uncle,” *Organiser*, 21, No.36 (April 14, 1968), 9-10. Also see, the letter written by Deendayal Upadhyaya to his uncle Radha Raman, “A Memorable Letter,” in *Pandit Deendayal Upadhyaya: A Profile*, ed. Sudhakar Rajé (New Delhi: Deendayal Research Institute, 1972), pp.161-166.

⁶ *Ibid.*

⁷ *Ibid.*

⁸ *Ibid.*

⁹ *Ibid.*

¹⁰ Shanti Bhushan, “Vicharak and Pracharak,” in *Destination*, ed. Sudhakar Rajé (New Delhi: Deendayal Research Institute, 1978), p. 77.

¹¹ For details see “Letter to Maternal Uncle,” *Organiser*, *op. cit.* Also see, the letter written by Deendayal Upadhyaya to his uncle Radha Raman, “A Memorable Letter,” in *Pandit Deendayal Upadhyaya: A Profile*, ed. Sudhakar Rajé, *op. cit.*

¹² Nanaji Deshmukh, “The Man and the Thought,” in *Destination*, *op. cit.*, p. 32.

¹³ Mahesh Chander Sharma, *op.cit.*, pp. 30-31.

¹⁴ “Life in outline,” in *Pandit Deendayal Upadhyaya: A Profile* ed. Sudhakar Rajé, *op.cit.*, p. 9.

¹⁵ Mahesh Chander Sharma, *op.cit.*, p. 30.

¹⁶ Nehru-Liaqat Pact, also called Delhi Pact, made on April 8, 1950, following the state of tension that had arisen between India and Pakistan in East Pakistan (now Bangladesh) after economic relations between the two countries had been severed in December 1949. An estimated 1,000,000 people - Hindus from East Pakistan and Muslims from West Bengal - crossed the borders during 1950. In spite of the opposition of his colleague Vallabhbhai Patel, Jawaharlal Nehru, the Prime Minister of India, concluded a Pact with Liaqat Ali Khan, Prime Minister of Pakistan, whereby refugees were allowed to return unmolested to dispose of their property, abducted women and looted property were to be returned, forced conversions were unrecognised, and minority rights were confirmed. Minority commissions were established to implement these terms, and confidence was, in fact, restored for a time.

¹⁷ Vasant Nargolkar, "Gandhi, Lohia and Deendayal," in *Gandhi, Lohia & Deendayal*, ed. P. Parameswaran (New Delhi: Deendayal Research Institute, 1978), p. 10.

¹⁸ "Life in Outline," in *Pandit Deendayal Upadhyaya: A Profile*, ed. Sudhakar Raje, *op. cit.*, p. 11.

¹⁹ D.B. Thengadi, *Pandit Deendayal Upadhyaya Ideology and Perception: An Inquest* (New Delhi: Suruchi Prakashan, 1988), p. 12.

²⁰ Mahesh Chander Sharma, *op. cit.*, p. 70.

²¹ "Life in Outline," in *Pandit Deendayal Upadhyaya: A Profile*, ed. Sudhakar Raje, *op. cit.*, p. 11.

²² Mahesh Chander Sharma, *op. cit.*, p. 97.

²³ D.B. Thengadi, *His Legacy: Our Mission* (Calicut: The Jayabharat Publications, 1973), p.7.

²⁴ For details see, Mahesh Chander Sharma, *op. cit.*, pp.99-101.

²⁵ For details see, Deendayal Upadhyaya, *Organiser*, 18, No.2 (August 24, 1964), 7-10.

²⁶ For details see, Deendayal Upadhyaya, "Principles and Policies," in Deendayal Upadhyaya's *Integral Humanism: Basic Documents, Interpretations, Contextualisation & Comparison*, *Manthan*, 12, Nos. 7-9 (July-Sept. 1991), 7-16.

²⁷ *Ibid.*

²⁸ In 1965 a dispute arose over the India-Pakistan boundary line towards the western end of the Rann of Kutch. Fighting broke out in April and ended only when Great Britain intervened to secure a cease-fire. On June 30, 1965 at 12.40 P.M. an agreement between India and Pakistan was signed at New Delhi. This agreement has been called a cease-fire agreement. It was also related to the settlement of the future boundary of the Kutch-Sindh area. It prescribed the method of arbitration for the settlement of boundary dispute. According to the agreement the dispute was referred to an international tribunal. Deendayal Upadhyaya was against the pact and described it as an act of great betrayal with the interests of India. For details see, Deendayal Upadhyaya, "The Great Betrayal," *Organiser*, 18, No. 48 (July 11, 1965), 2-15. Also see, Deendayal Upadhyaya, "Delhi Chalo," *Organiser*, 18, No. 52 (Aug., 8, 1965), 1-2.

²⁹ For details see, Deendayal Upadhyaya, "Throw out the Kutch Pact," *Organizer*, 18, No. 52 (Aug. 8, 1965), 1-2.

³⁰ *Ibid.*

³¹ For details see, Deendayal Upadhyaya, "The Great Betrayal," *Organiser*, 18,

No.48 (July 11, 1965), 2-15.

³²For details see, Deendayal Upadhyaya, "Full Text of B.J.S. Presidential Address," *Organiser*, 21, No.21 (Dec.31, 1967), 7-14.

³³For details see, Deendayal Upadhyaya, "Full Text of B.J.S. Presidential Address," *Organiser*, *op.cit.*

Problems Faced by Women Deserted by Non Resident Indian Bridegrooms

Ruchi Sapahia

THE PROBLEMS of Indian women deserted by Non-Resident Indian (NRI) Bridegrooms is a hot-debating issue prevalent amongst myriads of a large number of issues confronting women in India like dowry deaths, domestic violence, trafficking, reproductive issues, cruelty, rehabilitation, illiteracy, employment, sexual violence, bigamy, declining sex-ratio etc.

Keyword: Associate Professor of Law, Himachal Pradesh National Law University, Shimla

The term Non-Resident refers to a person who is not resident in India. Following the repeal of the *Foreign Exchange Regulation Act, 1973* (FERA), there are two clear but separate definitions - one under the *Foreign Exchange Management Act, 1999* (FEMA), and the other under the *Income Tax Act, 1961*. The *Foreign Exchange Management Act, 1999* (FEMA), replaced the *Foreign Exchange Regulation Act* (FERA) with effect from June 1, 2000.

In India, a girl's right to take birth is decided by her parents more specifically by her father, grand-parents and the society. At many places in India, preference is given to a male-child's birth only and the girl-child is considered to be a burden and a curse on the family. Once the girl child is born, she is discriminated throughout her life and is considered subordinate in each and every field. She is not allowed to be a part of decision-making process in any of the family-matters or otherwise and is relegated to a second-class citizen. The decision to get married, when to get married, how to get married or to whom to get married to, all is decided upon, not by her but by her father. Even in this modern era, women continue to be burdened by their own 'womanhood'.

There are many factors contributing to the present status of women in India. The

strongest of them all is the patriarchal value system wherein the society is male-dominated. The other factors are backwardness of women in education, economy, politics, increase in crime rate, media-images of violence, poor enforcement of legal provisions, rising rate of alcoholism and drug addiction, erosion of traditional values (where women were considered equal to men and were placed high in the society).

A marriage in India is considered as a union of two families and not a union of two individuals. Therefore, the parents of both the girl and boy, before getting their children married off look for the suitable match in respect of status, fitness, earning capacity, religious faith, adjustability etc. Marriage is still considered to be a onetime affair like a person takes birth and dies only once. *NRI marriages*, as generally understood, are between an Indian woman from India and an Indian man residing in another country (thus NRI – Non-Resident Indian), either as Indian citizen (when he would legally be an 'NRI') or as citizen of that other country (when he would legally be a PIO – Person of Indian Origin). In the eagerness not to let go of such lucrative marriage offer, the families totally ignore even the common cautions that are observed in traditional matchmaking. They also ignore that in case of things going wrong in an NRI marriage, the woman's recourse to justice is greatly constrained and complex. The aggravated risk in such marriage is the woman is being 'isolated' far away from home in an alien land, facing language constraints, communication problems, lack of proper information about the local criminal justice, police and legal system. The situation is worsened by lack of support network of friends and family and monetary constraints which leaves the deserted wife completely helpless and stranded.

But the Indian laws and the personal laws provide for divorce in exceptional circumstances. The focus is on the permanent durability of the marriage but provision is there when the marriage becomes null and void or is ended in exceptional circumstances under the personal or Indian Laws.

According to Indian Laws, before a couple is granted divorce, an effort is made to reconcile them (a union of two souls). But if the problem persists and reconciliation is impossible, court grants them with the relief of ending their marriage by giving them divorce. Once the divorce is given, both the parties become independent to marry again. Today the step of courts in granting time to reconsider about their failing marriage and ordering of restitution of conjugal rights under Hindu Marriage Act, 1956 has been challenged in the court of law as violative of their constitutional rights.

What is Desertion

Desertion means the intentional permanent forsaking and abandonment of one spouse by the other without the other's consent and without any reasonable cause. Desertion is not the withdrawal from a place but from a state of things, for what the law seeks to enforce as the recognition and discharge of the common obligations of the married state, the state of things may be termed as 'the home'. There can be desertion without previous cohabitation by the parties, or without the marriage having been consummated at all.

The person who actually withdraws from cohabitation is not necessarily the deserting party. Desertion as a ground of divorce differs from the statutory ground of adultery (which is still a matrimonial offence despite being declared as no offence under Indian Penal Code) and cruelty. In that the offence founding the cause of action of desertion is not complete, but is inchoate, until the suit is instituted. Desertion is a continuing offence.

The offence of desertion is a course of conduct which exists independently of its duration, but as a ground for divorce it must exist for a period of at least two years immediately preceding the presentation of the petition or where the offence appears as a cross-charge of the answer. The period of marital life among the deserted women varies from a few days to many years. The reasons for desertion are many.

However, the most important reason for desertion of women irrespective of their socio-economic, religious and cultural status is the extramarital relationship or bigamy of husbands. Moreover, demand of excess dowry after marriage and ill treatment of wives without any reason also leads to desertion. Desertion is a matter of inference to be drawn from the facts and circumstances of each case. The inference may be drawn from certain facts which may not, in another case, be capable of leading to the same inference; that is to say, the facts have to be viewed as to the purpose which is revealed by those acts or by conduct and expression of intention, both interior and subsequent to the actual acts of separation.

One of the essential ingredients of desertion is separation of one spouse from another and there can be no desertion while the parties are living together. In certain cases there may be desertion, although husband and wife are living in the same house, if there is such forsaking and abandonment by one spouse of the other that the court can say that the spouse had ceased to be one household and become two households. For the offence of desertion, so far as the deserting spouse is concerned, two essential conditions must be there, namely: (i) factum of separation, and (ii) the intention to bring cohabitation permanently to an end (*animus deserendi*).

Similarly two elements are essential so far as the deserted spouse is concerned: (i) the absence of consent, and (ii) absence of conduct giving reasonable cause to the spouse leaving the matrimonial home to form the necessary intention aforesaid. A husband or a wife cannot claim divorce or judicial separation if desertion is by him or her even if a marriage has irretrievably broken-down. No relief can be given to such a party as nobody can take the benefit of his or her own wrongs.

The reasons of deserting Indian women by Non-Resident Indians as has been observed by various agencies (governmental or non-governmental) is that the marriage solemnized is

generally due to greed of both the parties. The brides' side looks in the bridegroom a ticket to settle or visit abroad and the bridegroom and his family is greedy for getting the huge amount of cash, gold and other valuables in the form of dowry from the girls' side or the marriage may be done for getting a free servant who would look after the family of the boy left behind in India or marriage is done under parental pressure of getting married to an Indian only although he might be in love or might have married a girl of his own choice abroad or such marriage may take place with the intention of taking it as a "holiday affair" or a "holiday-fun" or "holiday-marriage".

It is not bad to get married to an NRI. But women face problems when the marriage is not solemnized with the intention of remaining committed to each other throughout their lives as husband and wife. Otherwise, the lady has to make a large number of adjustments and compromises to adjust to the new environment, new country, new customs and traditions. She feels lonely and isolated. The husband and his family gets more opportunity to harass and commit violence (physical, mental or sexual) against her knowing the fact that there is no body to help her and she is at their mercy. There is always a fear in her mind of desertion and abandonment by the boy and his family.

Issues in NRI marriages

Various issues may arise in an NRI marriage and few of them are discussed below:

1. Woman married to an NRI is abandoned even before being taken by her husband to the foreign country of his residence.
2. She is brutally battered, assaulted, abused both mentally and physically, malnourished, confined and ill treated and forced to flee or is forcibly sent back.
3. Sometimes after a quick engagement, followed by a massive wedding, a huge dowry and a honeymoon, the NRI husband flies out of India while

the wife waits for her visa. The menace of 'honeymoon brides' is a big problem as innumerable brides have not seen their husbands after their honeymoon.

4. In some cases, the children are abducted or forcibly taken away from these deserted women.
5. Women who manage to reach the foreign country of their husband's residence find that their husbands have abandoned them in the foreign country with absolutely no support or means of sustenance or escape and without even the legal permission to stay on in that country.
6. Some women have to cope up with the reality that their NRI husbands were already married in the other country to another women.
7. Many bridegrooms give false information regarding their jobs, immigration status, earning, property, marital status and other material particulars, to con them into the marriages.
8. Many grooms, take advantage of more lenient divorce grounds in other legal systems and obtain ex-parte decree of divorce in the foreign country through fraudulent representations behind their back, without their knowledge.
9. They are denied maintenance in India on the pretext that the marriage had already been dissolved by the court in another country.

Suggestions to Curb this Menace

1. When a girl is married off, the family should check the credentials of the prospective bride-groom. A full detailed enquiry should be made without any kind of fear and hesitation of losing the prospective bridegroom.
2. Dowry in any form should be avoided. Generally cash, gold or other valuables are demanded by saying that it is needed for the betterment of the bride and for sending her abroad with her husband for getting all the formalities and paper-work done for her. This practice or such situation is taken advantage of by scrupulous bride-groom or his family-members, agents or lawyers etc.
3. Once the problem of abandonment or desertion is found out, help from the police or concerned officials or embassy or from the family members should be immediately taken.
4. The police should not shun registering such complaints. Instead it should play a positive role in catching such bridegrooms.
5. The bride and her family should go for legal advice and counseling which should be provided at the police-stations and at other places also so that they

can start their lives afresh.

6. People should be sensitized to such issues. There should be legal awareness amongst the masses. Most of the families don't know how to proceed against the bridegroom who has deceived them.
7. Women should be educated, independent in thoughts, actions and financially strong so that they can stand on their own feet.
8. The society should change its view or opinion. Generally when a woman is deserted, society looks down upon her without any fault of hers. She is made to reconcile with such husband, or to make compromise with him or to wait for him to return to her even for whole of her life. She is not allowed to divorce him or to get married again to a better person. Due to such social pressure, parents also force their daughters to adjust with such husbands and succumb to the pressure exerted by the society and its customs.
9. Whenever, the police get a complaint in this regard, it should come in action immediately. The Look Out Notice (LON) to concerned immigration authorities should be immediately sent so that such husband can be apprehended and dealt within time without giving him an opportunity to escape from India or from Indian legal system.
10. The laws should be strictly implemented to do justice with deserted women. They also have a right to get maintenance from their husbands who are residing abroad and are not returning to India.
11. There should be a provision in the *Indian Penal Code*, 1860 (IPC) that the husband could be convicted for committing rape of his wife, if the marriage was not solemnized with the intention of remaining with each other as husband and wife for whole of their lives but with an intention to dupe her.
12. The wife should have a right in the property of her husband.
13. The NRI marriage registration should be made compulsory and the marital status and the photograph should be put on the passport also. His official and residential address, phone number, social security number and other information should be provided to the girl and her family.
14. The processing of passport for one of the partners especially a female should be at a faster pace to ensure that the bridegrooms don't dump and dupe the brides in the pretext of taking them abroad alone only after the passport and visa formalities were done.
15. The Indian government, the policy-makers and the law should take a step further to protect the rights of such deserted women of NRI.
16. Ex-parte divorce should not be granted by foreign courts. The wife should

be given an opportunity to defend herself.

17. If the wife lodges an FIR against her NRI husband, he should be declared 'proclaimed -offender' and his passport should be impounded and he should be called back to India to face the music.
18. Memorandum of Understanding should be signed with the countries who receive Indians and there should be an agreement to take criminal action against such offenders on the basis of reciprocity which will help in enabling recognition and enforcement of foreign divorce decrees, maintenance orders, child's custody and other foreign orders.
19. The media should play a vital role in educating the masses and highlighting the adverse consequences of marrying an NRI without checking his credentials in haste.
20. The imaginary prestige of elevating the family status by marrying their daughters to NRI bride-grooms needs to be checked and controlled by media, vernacular newspapers, television, radio, drama, plays, movies etc. by creating awareness amongst the masses.
21. A special cell in the Ministry of External Affairs or Ministry of Overseas Indian Affairs should be set up which attends to the problems of NRI marriages.
22. Along with government, the NGOs and other civil society organizations should play an active role to curb the menace of desertion of women by NRI men.
23. Generally the family of the girl supports her. But if there is no such support then rehabilitation and other support services should be provided like shelter homes, legal-aid, counseling sessions, training programmes, vocational skills etc.
24. Family courts and women's protection cells should be established in each state, and each district of the state.
25. The central government should nominate an agency which should maintain a cyber data base for serial offenders.
26. Fast track courts should be set up to dispose of the cases relating to NRI marriages.

Conclusion

The Parliamentary Standing Committee has recommended the government to enact a comprehensive law or to suitably amend the existing laws for the protection of women against the fraudulent NRI marriages.

In its report on “*Problems relating to Overseas Indian Marriages: Scheme for providing Legal/Financial Assistance/ Rehabilitation to Indian Women deserted by their Overseas Indian Spouses*”, the Parliamentary Standing Committee on External Affairs has said that a special NRI matrimonial law that deals comprehensively with marriage, divorce, maintenance, child custody and related issues would provide the distressed and abandoned brides with much needed remedial armor to reclaim their fundamental rights to property, equality in marriage, protection of family, freedom from inhuman or degrading treatment and above all, dignity.

These marriages enter the sphere of private international law where there is conflict of laws of different countries, which makes the issue therein a lot more complex. An appropriate approach to address this problem can be aimed at two major incentives of social change, state and Civil Society. At state level, bilateral agreements for protection of such marriages, international helpline services, government monitored conciliation for settlement of matrimonial disputes, extradition treaties for criminal actions against grooms suppressing their marital status as well as compulsory provisions for mobile phones to the spouses etc. can be there. The NRI who wants to marry must provide his detailed bio-data and other information, duly attested by the government of the country of his residence before marriage. He should also be made to provide verification of documents such as voter registration card, social security number etc. His financial and marital status also needs to be checked.

References

- Shandilya Akshay and Tiwari Shaleen, *NRI Marriages: The Evolving Societal Malaise in India*, IOSR Journal Of Humanities And Social Science, Volume 12, Issue 6 (Jul-Aug 2013).
- Malhotra Anil and Ranjit , *Indians, NRIs and the Law*, Deep Publishers, 2010.
- Peshawaria Anu , *Lives on the Brink*, Diamond Books , 2011.
- Malhotra Anil and Ranjit , *Indians, NRIs and the Law*, Deep Publishers, 2010.
- Malhotra Anil , *NRI Divorces and Anti-suit injunctions: No Bull in a China Shop*, Lawyers Update, March 2011.
- Malhotra Anil, *Indian NRIs and The Law*, Universal Law Publication, New Delhi, 2008.
- Bimal N. Patel, *India and International Law*, MartinusNijhoff Publishers, 2013.
- Family Law Lectures-Family Law-I*, LexisNexis Butterworths Wadhawa, 2011.
- Flavia Agnes, *Marriage, Divorce and Matrimonial Litigation*, Oxford University Press, 2011.
- Jonnalagadda Kondaiah, *Law relating to NRI Marriages*, S.Gogia& Co., Hyderabad, 2005.
- Marriages to NRIs: A Wakeup Call* available at: [http://www.vakilno. 1. com/Legal Views](http://www.vakilno.1.com/Legal Views).
- Jabbia M.K., *Diagnostic Study of Wives Deserted by NRIs* on wcd.nic.in/research/diagnostic_study.doc
- Morris, *The Conflict of Laws*, Sweet & Maxwell, 2010.
- Marriage & Divorce Laws (Legal Manual on Personal Laws)*, Universal Law Publishing Co., 2011.
- National Seminar on *Issues Relating to NRI Marriages*, 15th February 2011, Vigyan Bhawan, New Delhi.
- NRI Guide 2012/2013* by Virendar Chand.
- NRI Commission Report
- Nowhere Brides: Strict Laws Alone Can Bring Succor*, The Tribune, June 4, 2012, Chandigarh.
- Diwan Paras , *Law of Marriage and Divorce*, Universal Law Publishing Co., 2011.
- Prakash, *Waiting for NRI husbands*, the Tribune, Chandigarh, 20th July, 2002.
- Narain Pradeep, *A Handbook on Taxation of Non-Residents* , Asia Law House, 2009.
- Punjab NRI Commission Report.
- Report on *Marriage to Overseas Indians* published by Ministry of Overseas

Indian Affairs, Government of India, New Delhi.

Report on *Problems relating to NRI Marriages* published by National Commission for Women, New Delhi.

Sapahia Ruchi, Associate Professor of Law, Himachal Pradesh National Law University, Shimla.

The Nowhere Brides, India Today, October 12, 1998.

Thakur Vinay, *Are marriages made in heaven?* Speaking Tree, <http://www.speakingtree>.

Govindaraj V.C., *The Conflict of Law in India-Territorial and Interpersonal Conflict*, Oxford University Press, 2011.

Role of SHGs in Women's Empowerment: A Socio-economic and Psychological Analysis

Randhir Singh Ranta

ABSTRACT

Women empowerment is the initiative to strengthen women for gender parity and justice to promote psychological well-being such as self-confidence, self-efficacy and self-esteem. This initiative is taken in different forms and modes including political involvement, social recognition and economic well-being. The participation of women in Self Help Groups (SHGs) is one of such initiatives which has a significant impact. Studies have although focused on economic conditions of SHGs yet women empowerment is still generally encompassed by social and psychological influences. Psychological empowerment is considered sometimes merely as personal empowerment built on control over oneself and the situations on the other hand. Women empowerment programmes like self-help groups have been designed in developing countries as a means for women empowerment. The present study seeks to identify the socio-economic profile of SHGs and psychological well being and decision making skills of women's participation in these informal groups in the study area. The study was carried out at kandaghat block of Solan district, Himachal Pradesh. Empowerment theory and symbolic interactionism theory were used as the basis. In all, the study targeted 50 women aged 18 and above who are registered with self help group members in DRDA. The non probability method was used with snow ball sampling technique. The data was collected through focused group discussion, interview and questionnaire. The collected primary data was tabulated, computerized simple statistical tools such as percentages were used. At the same time, a substantial part of this research paper is based on table analysis.

Keywords: Self Help Groups, Women Empowerment, Psychological Well-Being.

Introduction

The term empowerment is defined as the opinion of people having the ability to understand and control themselves and their environments—including social, economic, and political factors—expanding their capabilities and horizons and elevating themselves to greater levels of achievement and satisfaction (Wilson, 1996). Empowered individuals are described as having high self-esteem, feelings of self-efficacy, feelings of control over his/her life, increased critical awareness, and increased civic participation (Zimmerman, 1995; 2000). The Swiss agency for Development and Cooperation defined empowerment as a process of emancipation in which the disadvantaged are empowered to exercise their rights, to obtain access to resources and to participate actively in the process of shaping society and making decisions. The activities of SDC are designed to strengthen the poor in bolstering their self-esteem, identity, self-confidence and ability to analyze problems and develop potential solutions of their own (SDC, 2004).

Psychological Empowerment

Psychological empowerment is highly related with happiness of the individual. Happiness is a scientifically unwieldy term and that its study involves dissolving the term into at least three distinct and better-defined routes to “happiness”: the pleasant life, the engaged life and the meaningful life (Seligman, 2002). Engaging one in the organization for empowerment can lead to happiness once they are able to engage themselves, find pleasure in the activities engaged and thereby experience meaning in life.

Diener and Biswas-Diener (2005) view psychological empowerment as a facet of psychological well-being. Certain aspects of psychological wellbeing, such as positive emotions, are often accompanied by or lead to psychological empowerment. Psychological empowerment consists both in the ability to control the environment and the feeling one can do so. Well-being is a dynamic concept that includes subjective, social, and psychological dimensions as well as health-related behaviours. Well-being is also a multifaceted concept. Seifert (2005) based on Ryffs Scale of Psychological Well-Being (1995), noted that well-being is a dynamic concept that includes subjective, social, and psychological dimensions as well as health-related behaviours. The Ryff Scales focuses on multiple facets of psychological well-being. These facets include self-acceptance, the establishment of quality ties to other, a sense of autonomy in thought and action, the ability to manage complex environments to suit personal needs and values, the pursuit of meaningful goals and a sense of purpose in life and continued growth and development as a person. Ryff has focused on six areas of psychological well-being including autonomy, environmental mastery,

personal growth, positive relations with others, purpose in life, and self acceptance (Seifert, 2005). Every culture has its own more specific definition of psychosocial well-being like how it should be represented, maintained and acquired (Becker and Weyermann, 2006).

Rowlands (1997) and Desmukh-Ranadive and Murthy (2005) emphasized the importance of mental process for empowerment. Weide and Waslander (2007) noted that mental processes are hard to measure. They focused on aspects of psychological well-being which are better suitable for quantitative measurement and distinguish five central elements of psychological wellbeing viz., self-esteem, self-efficacy, happiness, power and isolation, as crucial for individual psychological empowerment. Huppert (2009) on the basis of review of different studies concluded that psychological well-being is associated with creative thinking, pro-social behaviour, and good physical health. An individual's level of mental capital and psychological well-being is powerfully influenced by her/his early environment. Though external circumstances affect well-being, but actions and attitudes may have a greater influence. Interventions which encourage positive actions and attitudes have an important role to play in enhancing the well-being. For the individuals, empowerment is concerned with the transformation of individuals' lives in achieving goals and reaching targets, which they had thought impossible (i.e. to gain authority, skills, status, self-belief and image, progressing to greater things and increasing rewards).

This highlights the importance of psychological empowerment in the empowerment process. A person cannot be empowered unless the belief that one can change the situation of one's own and will be willing to engage in activities that are geared towards changing one's situation. It is clear that lack of psychological empowerment will render all other forms of empowerment ineffectively. Psychologically empowered women will have the necessary motivation to pursue things on their own and this may be critical in their integral development.

Women's Empowerment

There are four basic assumptions which seem to be generally accepted in the literature on women's empowerment. In order to be empowered, an individual must have been disempowered. In this respect, women empowerment is in question assuming them disempowered especially when compared to men. Secondly, empowerment cannot be provided by a third party, but by creating conditions favourable to empowerment. Thirdly, the definitions of empowerment usually include a sense of people making decision on matters which are important in their lives. Fourthly, empowerment is an ongoing process (Mosedale, 2005).

The architects of the Indian constitution were conscious of the problem of

women empowerment and hence they ensured the Principle of Gender Equality enshrined in the Indian Constitution in its Preamble, Fundamental duties and Directive Principles. Article 15 declares that government shall not discriminate any citizen on the ground of sex and article 15 (3) makes a special provision, enabling the State to make affirmative discriminations in favour of women. Through Article 15 (A) (e), the Constitution imposes a fundamental duty on every citizen to renounce the practices derogatory to the dignity of women.

UNICEF's (1993) woman empowerment framework argued that women's development can be viewed in terms of equality at five levels: welfare, access, conscientization, participation and control, of which empowerment is an essential element. The United Nations Development Fund for Women (UNIFEM) includes acquiring understanding of gender relations and the ways in which these relations can be changed, developing a sense of self worth, a belief in one's ability to secure desired changes and the right to control one's own life, gaining the ability to generate choices and exercise bargaining power, developing the ability to organize and influence the direction of social change to create a more just, social and economic order, nationally and internationally as dimensions of empowerment (Derbyshire, 2002).

The issue of women empowerment has been mainly approached from the economic and political angles and seems to neglect an influential factor necessary for successful empowerment i.e. psychological empowerment because:

- There have been different economic and social empowerment programs that have failed to yield the expected results, most probably because the psychological makeup of the people who are being empowered has not been put into consideration.
- Human beings are psychological entities and must be considered as such in the formulation of policies that are directly or indirectly related to them. Failure to do this may yield a negative result.
- Without psychological empowerment, wrong attitudes and behaviours may be exhibited by the masses which may eventually hamper good government policies.
- Development will be enhanced, since majority will see the need for patriotism and commitment to national development (Oladipo, 2009).

The reaction of the scholars in respect to empowering rural women through SHGs is mixed in nature either in positive or negative aspects. Some positive aspects are:

Sebstad and Cohen(2001) have found in their studies at Uganda, Bangladesh,

Bolivia and Philippines that “lending groups provide a means for women to know and be known by other women; a forum for learning leadership and public speaking skills; and a basis for development of trust, friendship and financial assistance”. Empirical works have shown that participation in groups and economic contribution has increased decision making ability of women within the society as well as in household in Bangladesh (Hashemi et al. 1996, Pitt and Khandker, 1995). It has increased their bargaining power regarding children's marriage, buying and selling of properties, sending their girl child to school in Bangladesh (Hashemi et al., 1996; Mayoux, 1998, 2000). This has also empowered Bangladeshi women politically and has reduced domestic violence (Hashemi et al., 1996). Thus participation in Self Help Groups assures freedom, equality, self reliance, self confidence and empowerment (Hashemi et al 1996, Krishnaraj and Kay 2002) which is through the process of capacity building and collective identity as it was identified by Larence (2001) in Bangladesh.

Oladipo (2009) argued that when people are psychologically empowered there will be a change in attitude, cognition and behaviour, which most assuredly will lead to a positive change in value orientation, increased patriotic actions, ability to postpone gratification of one's desires, improved self-esteem, self-efficacy, self-consciousness as well as better psychological well-being which will culminate in a peaceful and developing society. Researches witness that women groups variedly lead to strengthen and empower women. In context to India, Self Help Groups have been emerged to support and empower women. However, how far Self Help Groups succeeded to play its role with regard to the women belonging to the rural areas necessitating such support in the form of encouraging them in income generating activities and their involvement in decision-making. The research paper is a modest attempt in this direction with the following objectives.

Objectives

1. To study the socio-economic profile of rural women.
2. To explore the IGA (income generating activities) undertaken by beneficiaries.
3. To examine participation of women in SHGs influences their access to psychological well-being and decision making skills.

Research Design

To seek the answers of the research question, a descriptive research design was used to clearly state the characteristics of the particular situation of group or individuals with known variables.

Selection of the district

The present study was conducted in Solan district where Himachal Pradesh State Rural Livelihood Mission project is also running since 2016 for improving the livelihood of women beneficiaries.

Selection of the block

At present the HPSRLM is running in the twelve blocks of Himachal Pradesh (each block is taken from one district), namely Kandaghat (Solan), Mandi Sadar (Mandi), Nurpur (Kangra), Haroli (Una), Basantpur (Shimla), Tissa (Chamba), Bhorang (Hamirpur), Nichar (Kinnuar), Kullu (Kullu), Paonta Sahib (Sirmour), Ghumarwin (Bilaspur) and Keylong (Lahul) as an Intensive Blocks. Out of these blocks Khandaghat Development Block was selected for the present study.

Selection of the villages

A list of villages of Kandaghat Development Block was obtained from the Zilla Parishad/DRDA Office and 5 villages were selected.

Selection of the respondents

The researcher used non probability snowball sampling method. It was used to identify registered Self Help Groups in the villages. The researcher planned to work with a woman guide from the village. Through the woman guide who lives in village the researcher identified one registered group. After meeting with this registered group the researcher asked the group members if they knew about any other registered group within the village. This went on until the desired sample size of five women groups was met. After the selection of the groups, the researcher went ahead and distributed the questionnaires to the women in the selected groups that was filled with the guidance of the researcher and research assistant. 10 registered self help groups were identified and 5 each SHG members filled the questionnaire; therefore the total sample size was 50 respondents.

Sources of Data

Both primary and secondary data were collected. Primary data was collected from women in Self Help Groups with the help of pre-structured interview schedule, a Focus Group Discussion and observation. Secondary data was collected from Reports and records available at the offices namely Department of Economics and Statistics Government of Himachal Pradesh, District Rural Development Agencies (DRDA), and through discussion with the officers of these agencies working at various level and other published and unpublished Reports.

Analysis and interpretation of data

1. Socio-economic Profile

1.1. Age Wise Classification of the Respondents

Out of 50 respondents 82% were aged 32 years and above. When they settle down and begin having different financial responsibilities with full contribution and respondents aged between 18-31 years were very few.

Table-1: Socio-economic profile of the respondents

| | Number of Respondents n=50 | Percentage |
|---------------------------|---------------------------------------|-------------------|
| Age | | |
| 18-23years | 2 | 4.0 |
| 24-31years | 7 | 14.0 |
| 32-39 years | 26 | 52.0 |
| Over 40 years | 15 | 30.0 |
| Marital Status | | |
| Single | 12 | 24.0 |
| Married | 35 | 70.0 |
| Divorced | 1 | 2.0 |
| Widowed | 2 | 4.0 |
| Education | | |
| None | 4 | 8.0 |
| Primary | 19 | 38.0 |
| High School | 15 | 30 |
| Secondary | 9 | 18.0 |
| College or University | 3 | 6.0 |
| Residential Status | | |
| Own House | 50 | 100.00 |
| Rented House | Nil | 00.0 |
| Nature of House | | |
| Kutcha | 20 | 40.0 |
| Semi Pucca | 17 | 34.0 |
| Pucca | 13 | 26.0 |

Source: Primary Data

1.1.2 Marital Status of the Respondents

According to table-1 it was evident that majority of the respondents (70%) were married, followed by 24% single, 4% widowed and 2 % divorced.

1.1.3 Level of Education

The present study looked at the education level of the respondents. Table-1 shows that majority of the respondents (38%) had a primary school certificate, 30% had completed high school education, and 18% had completed secondary school, while 6% had college education. This illustrates that majority of the respondents have low level of education but could read simple texts on their own and write.

1.1.4 Type of Houses of the Respondents

The house is believed to be the most prestigious asset for the family in Indian culture. The responses with regard to have rented or owned house are shown in table-1 under the head residential status followed by the responses regarding nature of house.

The study shows that all the respondents (100%) live in their own houses. Further, 40 percent of the respondents were living in kutchra houses; 34 percent in semi pucca house; and 26 percent were living in pucca houses. Thus, majority of the sample respondents have their own concrete houses.

2. Income Generating Activities

This section identified if participation and joining of women in SHGs affects their access to economic resources. The respondents were asked if they have savings in the financial institutions that they operated and most of the respondents stated that they saved their contribution in financial institutions. As per table-2, 96% of respondents replied that they contribute regularly. Only 4% didn't respond.

Table-2: Income Generating Activities of the respondents

| | Number of Respondents n=50 | Percentage |
|---|-------------------------------|------------|
| Contribute regularly | | |
| Yes | 48 | 96.0 |
| No responses | 2 | 4.0 |
| Income Generating Activities | | |
| Jute bags | 50 | 100.0 |
| School bags | 50 | 100.0 |
| Knitwear | 50 | 100.0 |
| Jhoomar | 50 | 100.0 |
| Baskets | 50 | 100.0 |
| tailoring | 15 | 30.0 |
| Dairy | 19 | 38.0 |
| Account in a bank | | |
| Yes | 45 | 90.0 |
| No | 5 | 10.0 |
| Problem faced for availing Funds | | |
| Yes | 50 | 100.0 |
| No | 0 | 0.00 |

Source: Primary Data

2.1. Income Generating Activities Inter Group Wise

Table-2 reveals the different income generating activities undertaken by women beneficiaries. The result reveals that all women respondents preferred Jute bags (100%), school bags (100%), knitwear (100%), jhoomar (100%) and Baskets (100%) as preferred income generating enterprises except dairy (38%), and tailoring (30%).

2.1.2. Bank Account

From the table-2, majority of the respondents (90%) mentioned that they have their bank account in their name while 10% don't have it. The findings clearly show that the participation of women in SHGs helps them access in financial resources from financial facilities, both informal and formal.

Over half percentage of the respondents (68%) had their account in a savings, and credit co-operative bank and 32% had savings accounts in their bank. It clearly shows that there is a saving culture among the members that goes a long way in influencing the kind of life they will have

in the future. Below are the different saving plans the members are involved in;

- Savings accounts,
- Cooperative/NGO savings/Microfinance account,
- A savings and credit co-operative,
- Post office savings account and current account.

2.1.3 PROBLEMS FACED BY SHGs

Table-2 describes that all the respondents faced problems while availing loans, subsidy and credit from banks. The SHGs facing problems stated that the bank officials sometimes delayed the transaction of funds that created problems for those who had to travel long distances and resulted in waste of time and increased their travel expenses. It also delayed their initiation of economic activities.

3. Psychological Well-being

The respondents were asked if they were satisfied with how people around them generally treat them, majority of the respondents (68%) replied that they were satisfied with people who treated them. Only 16 % of the respondents were neither satisfied nor unsatisfied while 12 % stated that they were somewhat satisfied.

Table-3: Psychological well-being of the respondents

| | Number of Respondents n=50 | Percentage |
|--|-------------------------------|------------|
| Satisfaction people treat you | | |
| Somewhat unsatisfied | 2 | 4.0 |
| Neither satisfied nor unsatisfied | 8 | 16.0 |
| Somewhat satisfied | 6 | 12.0 |
| Very satisfied | 34 | 68.0 |
| Satisfaction with your current income | | |
| Not satisfied at all | 4 | 8.0 |
| Somewhat unsatisfied | 1 | 2.0 |
| Neither satisfied nor unsatisfied | 5 | 10.0 |
| Somewhat satisfied | 10 | 20.0 |
| Very satisfied | 30 | 60.0 |
| Has been improved in your life? | | |
| More or less the same | 6 | 12.0 |
| Improved | 44 | 88.0 |
| Expect that your life will be better? | | |
| Worse | 1 | 2.0 |
| More or less the same | 3 | 6.0 |

| | | |
|---|----|------|
| Better | 46 | 92.0 |
| Satisfaction on your members in SHGs | | |
| Somewhat dissatisfied | 1 | 2.0 |
| Fairly happy | 5 | 10.0 |
| Very happy | 12 | 24.0 |
| Extremely happy | 32 | 64.0 |
| Economic Motivation | | |
| Low | 4 | 8.0 |
| Medium | 34 | 68.0 |
| High | 12 | 24.0 |
| Achievement motivation | | |
| Low | 14 | 28.0 |
| Medium | 28 | 56.0 |
| High | 8 | 16.0 |

Source: Primary Data

3.1 Satisfaction Levels of Current Income

Table-3 shows that 60% of the respondents who were joining the SHGs said that they were very satisfied with their current income and 20% of the respondents stated that they were somewhat satisfied.

3.1.2. Level of Improved way of Life after joining SHGs

Table-3 shows that majority of the respondents (88%) stated that their lives have improved while only 12% said that their lives were more or less the same. The group members felt that participation in SHGs boosted their life at all levels. It helped them to extend their business or meet their day to day needs.

3.1.3. Improved Livelihood in the Future

For the question whether life would improve in one year as per table-3, 92% of the respondents replied that their lives will be better and only 2% said they feared it will be worse than the current situation. The findings show that people who are joining the SHGs felt that their life is settled and stable, and that they expect their life will improve in the near future.

3.1.4. Level of Satisfaction with Membership in the SHGs

According to table-3, 64% of the respondents were extremely satisfied their membership in SHGs. Twenty four percent of the respondents responded that they were very satisfied from their membership. Only 2% said somewhat dissatisfied in their group membership. From the findings, it shows that group members encourage each other to maintain their life and the group activities. It can also be seen that the participation of SHGs helps people's social cohesion and solidarity in their community.

Table-3 showed that out of 50 respondents 68 percent had medium economic

motivation, 24 per cent had high economic motivation while 8 per cent had low economic motivation.

Table-3 reveals that out of 50 respondent, 56 percent of the respondents had medium achievement motivation, 28 percent had low achievement motivation whereas only 16 percent had high achievement motivation.

4. Decision Making Skill Perspective

Group members agreed that the participation of SHGs is beneficial to their family running. The respondents were asked that who in their family makes the final decision on family issues. 60 percent of the respondents replied that they had the final decisions on what happened to their children. 18 percent of the respondents said both respondents and partner jointly made decisions. 10 percent of the respondents said Husband was the one who made final decisions. Improving women's accessibility to economic and financial recourses empower women to make decision on their own as they no longer have to get permission from their husbands.

Table-4: Decision making skill perspective of the respondents

| | Number of Respondents n=50 | Percentage |
|--|-------------------------------|------------|
| Final decision about child(ren) | | |
| Respondent | 30 | 60.0 |
| Husband/partner | 6 | 12.0 |
| Respondent & husband/partner jointly | 9 | 18.0 |
| Extended family | 3 | 6.0 |
| Respondent & extended family jointly | 2 | 4.0 |
| Decision on your children's schooling | | |
| Respondent | 29 | 58.0 |
| Husband/partner | 6 | 12.0 |
| Respondent & husband/partner jointly | 9 | 18.0 |
| Extended family | 5 | 10.0 |
| Decision on family falls sick | | |
| Respondent | 28 | 56.0 |
| Husband/partner | 7 | 14.0 |
| Respondent & husband/partner jointly | 10 | 20.0 |
| Extended family | 2 | 4.0 |
| Respondent & extended family jointly | 2 | 4.0 |
| Decision not made/not applicable | 1 | 2.0 |
| Children's discipline | | |
| Respondent | 27 | 54.0 |

| | | |
|--------------------------------------|----|------|
| Husband/partner | 7 | 14.0 |
| Respondent & husband/partner jointly | 12 | 24.0 |
| Extended family | 1 | 2.0 |
| Respondent & extended family jointly | 2 | 4.0 |
| Decision not made/not applicable | 1 | 2.0 |

Source: Primary Data

4.1. Decision on Children's Schooling

Regarding children's schooling as the table-4 shows 58% of the respondents said respondents made decision on children's schooling. Eighteen percent of the respondents said both respondents and partner jointly made decisions. Twelve percent of the respondents said the Husband was the one who made final decisions.

The table-4 show that, 56% of the respondents said respondents made decision on what to do when a child in the family falls sick. Twenty percent of the respondents said both respondents and partner jointly made decisions. Fourteen percent of the respondents said Husband had decision what to do on child's sickness.

The table-4 shows that, 54% of the respondents stated that respondent discipline their children. Twenty four percent of the respondents said both respondents and partner jointly made decisions. Fourteen percent of the respondents said Husband had decision what to do on child's discipline.

The respondents were asked which household they had control whether to purchase or not. Majority of respondents (68%) stated that respondents could procure all the items they required in their households. Only 2% of the respondents said they weren't involved in buying items. 30% of the respondents replied that they could procure some items while the rest were left to their partners.

4.1.2 Family Life Decisions

The respondents also were asked what area of their family life they would like to decide. More than half of the respondents (68%) replied that they would like to make decision on all areas of their lives. And other respondents said they would like to control their children's school fee, food, discipline children, buying assets, parenting, dressing, feeding, house responsibility, basic need, hospital etc.

Decision making can be a key point to measure if people have been empowered. The respondents were asked that after joining SHGs they have improved in terms of decision making. 100% of the respondents illustrated that their life had improved. The areas of their life that had improved included; family planning, children's marriage, children's education, especially the girl child's education ,

purchasing and selling of property, and other decisions affecting the family.

Recommendations

From the findings the present study made the following recommendations;

1. The Government under the fund set aside for women should support self help groups by partially paying for the registration fee and even partially fund some of their income generating activities. To encourage more women to join the self help groups because the women gain more from the SHGs in terms of income generating activities.
2. The government and other stakeholders should develop modules covering business, financial management and different crafts to equip the women with skills necessary to accord them better opportunities at earning a better income and SRLM should provide the demand based training to these SHGs.
3. Psychological well-being; apart from the women being given taught different ways of ensuring that they have a better income. They should also be taught on communication skills, simplified counseling skills, capacity building, and self-efficacy enhancement so that they are in a position to know when one of them has a problem and what intervention method to use in order to give them some form of psychological support.

Conclusion

Women's Empowerment has become a significant component of human development in India. The last decades have witnessed significant changes in the status and role of women in our society. There has been shift in policy approaches from the concept of welfare in the seventies to development in the eighties and now to empowerment in the current scenario. In a nutshell, SHGs help the members to improve the socio-economic conditions, standard of living, women literacy level, decision making, participation of social awareness programs, participation of training programs, participation of political activities, offer employment opportunities to neighbours etc. The study concluded that SHGs have played a great role in women empowerment. The study finds out that the SHGs proved beneficial for socio-economic and psychologically empowerment of women. Women's access to economic resources not only increased their access to financial resources, but they were enabled to grow in their businesses and they could get involved in more income generating activities. Investments that the women were involved in generate income with interest rate and it increases their purchasing power and decision making skills.

Through consultations with fellow group members about issues that they face on their day to day lives, women are able to learn different problem solving skills

that would help them not escalate the problem at hand. Women are also able to stand in solidarity with each other during good and bad times. For example, when they have a sudden financial crisis, group members make contributions to support their own. It's easy for the women to not only lend a shoulder to each other as a group but to also communicate to the community in a united voice. The SHGs created social and economic support between group members. It improved their psychological well-being like self confidence, self esteem and self reliance, through interaction and advice from fellow group members.

References

- Becker, D. and Weyermann, B. (2006). 'Gender, conflict transformation and the psychosocial approach: toolkit.' Swiss Agency for Development and Cooperation. www.deza.admin.ch, Accessed 12 September, 2016.
- Derbyshire, H. (2002). 'Gender manual: a practical guide for development policy makers and practitioners.' <http://webarchive.nationalarchives.gov.uk/+/http://www.dfid.gov.uk/Documents/publications/gendermanual.pdf> Accessed 19 August, 2016.
- Deshmukh-Ranadive, J. and Murthy, R.K. (2005). 'Introduction: linking the triad,' in N. Burra, J. Deshmukh-Ranadive and R.K. Murthy (Eds.) *Micro-credit, poverty and empowerment: linking the triad* (pp. 31-60). New Delhi: Sage Publications India.
- Diener, E. and Diener, B.R. (2005). 'Psychological empowerment and subjective well-being,' in D. Narayan (Ed.). *Measuring empowerment: cross-disciplinary perspectives* (pp. 125-140). Washington, DC: World Bank.
- Hashemi, S.M., Schuler, S.R., and Riley, A.P., (1996). *Rural Credit Programs and Women's* <http://www.liberalarts.wabash.edu/ryff-scales/> Accessed 10 November 2016.
- Huppert, F.A. (2009). "Psychological well-being: evidence regarding its causes and consequences." *Applied Psychology: Health and well-being*, 1(2):137–164.
- Krishnaraj, M. and Kay, T., (2002). *Report of review of IFAD gender mainstreaming projects in Asia*.
- Larence, L.Y., (2001). "Fostering social capital through NGO design: Grameen Bank Membership in Bangladesh", *International Social Work*, Vol. 44, No. 1 : pp. 7-18.
- Mayoux, Linda (1999). Questioning virtuous spirals: Microfinance and women's empowerment in Africa. *Journal of International Development*, (11), 957-984.
- Mosedale, S. (2005). "Assessing women's empowerment: towards a conceptual framework." *Journal of International Development*, 17(2): 243–257.
- Oladipo, S.E. (2009). "Psychological empowerment and development." *Edo Journal of Counselling*, 2(1): 118-126.

- Pitt, Mark, and Khandker, S. (1998). The impact of group-based credit programs on poor households in Bangladesh: Does the gender of participants matter? *Journal of Political Economy*, 106 (5): 958 – 96.
- Rowlands, J. (1997). *Questioning Empowerment: Working with Women in Honduras*. Oxfarm, UK: Oxford.
- Sebstad, Jennefer and Monique Cohen. 2001. *Microfinance, Risk Management and Poverty*. Washington, D.C: Consultative Group to Assist the Poorest.
- Seifert, A. T. (2005) 'The Ryff Scales of psychological well-being.'
- Seligman, M. (2002). *Authentic happiness*. New York: Free Press.
- Weide, M. V. and Waslander, S. (2012). "Can microcredit empower" an exploratory study on the impact of microcredit programmes on psychological empowerment of women." *Development Entrepreneurship Journal*: [http://www.boouldermicrofinance.org / insti/biblio.php](http://www.boouldermicrofinance.org/insti/biblio.php). Accessed 20 April 2016.
- Wilson, T. (1996). *The empowerment manual*. Hampshire, England: Grower Publishing Limited.
- Zimmerman, M. A. (2000). 'Empowerment theory: psychological, organizational and community levels of analysis,' in J. Rappaport and E. Seidman (Eds.), *Handbook of community psychology* (pp.43-63). New York: Kluwer Academic/Plenum Publishers.
- Zimmerman, M.A. (1984). "Taking aim on empowerment research: on the distinction between individual and psychological conceptions." *American Journal of Community Psychology*, 18(1): 169-177.
- Zimmerman, M.A. (1995). "Psychological empowerment: issues and illustrations." *American Journal of Community Psychology*, 23(5): 581-599.

VAS (Value Added Service) - Rise of mCommerce: Technology, Business and Society

Varun Bhardwaj

Abstract:

mCommerce (Mobile commerce) in recent years has emerged as a frontier not only for doing global business and trade but also offers multiple benefits to the business, government and consumers on massive scale. Many companies, organizations, and communities in India are running business using eCommerce but are also adopting mCommerce for managing business. This article presents the growth of mCommerce (Value Added Service) among the mobile users in India. It includes the different business needs related to mobile commerce and the benefits that can be derived therefrom. It also presents the USP's (Unique Selling Propositions), challenges faced by mCommerce and SWOT analysis.

Keywords: Commerce, Applications, USP of mCommerce, SWOT analysis.

Introduction:

Over the past ten years, mobile phones have changed the way, we live and work as is evident from a wide variety of mobile phones available and the myriad ways of transforming each phone into a truly personal device as these are considered as extensions of ourselves. The tremendous growth in mobile phone penetration shows that major Indian population has adopted mobile phones and advancement in mobile technology. A large number of mobile phone manufacturers have developed mobile devices that can serve many functions beyond voice communication such as taking photographs and listening to music. Mobile network operators are offering services that give greater value to subscribers such as portable email for business users. Mobile phones are now equipped with cameras with the potential to turn these into portable bar code scanners. The use of mobile phones is not limited for making basic phone calls but is being used virtually in every sector of human activity—private, business

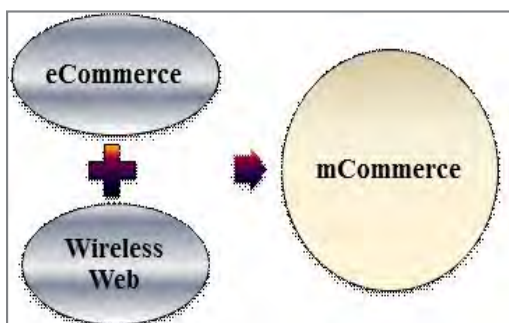
and government. The handset manufacturers are developing RFID (Radio-frequency identification) chips turning mobile phones into mobile wallets which enable to carry and exchange electronic money secured manner and help to make other transactions with RFID readers.

Mobile commerce, often referred to as m-Commerce- an advancement over eCommerce (Manzoor 2010; Laudon et al. 2015) (such as automated, electronic processes) makes interactions available to a larger people in a more personalized way (Bandyopadhyay 2013; Skeldon 2012). India has seen an impressive rise in everyday commerce conducted via mobile devices because of an increasing access to smart phones, mobile internet usage and several government-led digital inclusion initiatives. A recent market report by the firm Zinnov (Zeal in Innovation) estimated that India's market for mobile commerce was worth \$2 billion in 2014 and may grow up to \$19 billion by 2019. In fact, India is now one of the top five regions for the Google Play store as more of its 1.2+ billion people look to search, interact and shop on the go via their smart phones and other mobile devices (Hayden 2014). The market for the mobile transactions is theoretically as big as the economy of India as it has the potential of moving all payments on mobile phones (Jong 2007). In particular, the consumer spends approximately \$500bn annually; 80% of which are done at unorganized retail. Mobile money is a very fragmented market right now in terms of service types, geographic regions, enabling technologies and participating players. Consequently, efforts are made to determine the individual business strategies and to select the preferred technological approach to support those strategies by leading operators. In view of above, it is of utmost importance to understand different business needs relevant to mobile commerce, maximum benefits to be derived, mobile commerce implementation based upon a basic set of standards and SWOT analysis.

Discussion

At Global Mobile Commerce Forum (1997) Kevin Duffey gave the preliminary definition of mCommerce as "the delivery of electronic commerce capabilities directly into the consumer's hand, anywhere via wireless technology." Kevin also

explained that service companies might like to think of mobile commerce as "*a retail outlet in your best customer's pocket*" (Vanderhoof 2007) mCommerce through mobile phones is becoming very fast and easier every day as it gives instant satisfaction to customers and allows business to create urgency and drive



sales through short term discounts to keep pace with the development. All the transactions made by m-Commerce technology are completely safe and secure. The e-Payment allows a fully interactive experience that can encourage business in between businesses and their customers. As android devices are ruling the mobile technology in India, many people even with low income afford a smart phone which is then utilized as an internet device. According to IAMAI (Internet & Mobile Association of India), 65 per cent of internet users are e-commerce customers.

The mobile service operators undoubtedly are an ideal means for banks to take their services to remote areas of the country as part of their financial inclusion programs. RBI has amended the rules for banking correspondents in September 2010 to allow 'for profit' companies to do the job, besides individuals, non-governmental organizations, cooperative societies, and post offices. The success in the mobile banking market has helped mobile operators to shore up their ARPU (average revenue per user/ unit) even when the mobile voice traffic slows down.

An abundance of potential of mCommerce has resulted from much heralded efforts of mobile industry & service providers by developing technology i.e. device and data source, companies providing content and transact through relevant applications, enablers and regulators providing regulations, standards and guidelines and consumers who interact with businesses through mobile phones (Fig.-2).

USP (Unique Selling Propositions) of mCommerce

“Unique Selling Propositions” of mCommerce giving an advantage to the stakeholders of mCommerce and providing a cutting edge over eCommerce include use of cheaper basic handsets, simple authentication, (SIM, PIN), instant and last mile connectivity all time and everywhere independent of the geographic location. Better offers may be given for location based services and efforts should be made to explore the rural market.

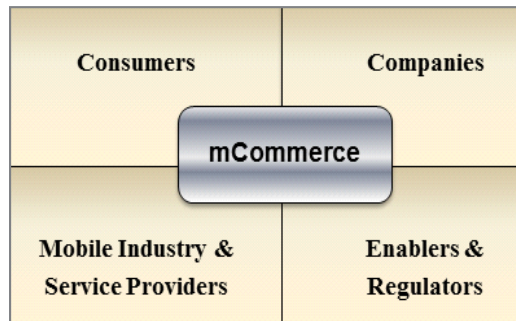


Fig.-2: Lead actors of mCommerce

Applications & Services of mCommerce

The mCommerce offers numerous applications and services (Mennecke et al. 2003). The common mCommerce applications include mobile marketing-

mobile vouchers, coupons and loyalty cards, organization of mobile events, mobile newsletters; mobile banking –accounting, brokerage and financial information; mobile shopping-purchasing of goods and services; mobile information services-current affairs (financial, sports)and news, travel information; mobile ticketing-public transport, sports and cultural events,air and rail traffic;mobile entertainment –download of music and ring tones, videos and digital images, gaming etc.; mobile telematics services- vehicle tracking and theft protection, navigation and emergency services.

Challenges to mCommerce

The growth of mobile commerce in India is about 2% but it can be increased by taking some appropriate steps and making some relevant policies. A number of challenges faced by mCommerce viz. high cost of phones, slow access speed, non- availability of wireless network coverage, technical mismatching among various devices (wireless) and security issues directly or indirectly affect the growth of mCommerce.

In addition, most of the people feel insecure while effecting transactions through smart phones and many do not know how to make the best use of it. There are unevenly distributions of connectivity as the services of 3G & 2G are not similar by each service provider. A simple, standardized payment mechanism is lacking. Apart from ATM or credit card no other mode of payment is popular in India. There is imbalance between service providers & network providers. Many small service providers face problems of dependency on others for providing their services to the customer/user at right time with relevant speed. It increases further when there is a gap between the large network operators & small service providers as network operator's interest is to attract large number of buyers rather than to increase the charge per subscriber to earn more. The development of a wide range of applications is a great challenge for every service provider. Also, the 3G & 4G network with higher speed to access information is very fragmented. It has been observed that while doing some transaction users lose their money so security system is a challenge. The hacking of some secret information while performing monetary transactions is also a great challenge.

Swot Analysis

SWOT analysis-a strategic planning method (Jain 2015) is used for identifying the strengths, weaknesses, opportunities and threats in business in order to

achieve the objectives set forth. The SWOT analysis of mCommerce can be represented as in Table.1

Table 1: SWOT analysis of mCommerce

| | |
|---|---|
| Strengths <ul style="list-style-type: none"> • Innovative business models • Consumer adoption • High speed internet connectivity and always on connection through GPRS,3G,UMTS,Bluetooth • Third world citizens communicate easily without geographical limitations • Portability • Payment gateways • Ticketing, M-vouchers, multimedia information, shopping, marketing and advertising | Weaknesses <ul style="list-style-type: none"> • In long term, lack of interoperability and higher operating costs • WLAN transmission can be captured by untrusted parties • No built-in encryption capabilities in WLAN • Limited memory • Limited Computational power • Antivirus solutions are difficult to implement |
| Opportunities <ul style="list-style-type: none"> • mCommerce security and privacy risk • Wireless infrastructure security risks • Mobile middleware security risk • Wireless user infrastructure security risks • Mobile application security risks • Mobile viruses can spread quickly through the network • Multiple means of infection | Threats <ul style="list-style-type: none"> • Risk related to theft of mobile device • Third world citizens uncomfortable with English • No privacy of data • Small screen size of mobile terminal • Relies on proprietary solutions |

The above points are likely to impart valuable inputs to amateur businessmen to overcome the challenges encountered in mCommerce. Service providers need to make efforts towards harnessing the advancements in technology to accomplish their business effectively and efficiently.

Conclusions

In today's world, mCommerce- a sub set of eCommerce has become increasingly important as it has made life easy and comfortable. The tremendous advancements in information and communication technologies viz. wireless application protocol (WAP), SMS services, global system for mobile communications (GSM), interim standard 95 (IS95), code division multiple access (CDMA), wideband code division multiple access (W-CDMA), bluetooth, 2G, 2.5G, 3G, 4G, Wi-Fi etc. and easy availability of affordable smart phones whereby a large number of electronic commerce transactions can be made using mobile device and Wi-Fi network have opened up new possibilities of mCommerce. The extent to which mCommerce has provided business opportunities to entrepreneurs, business innovations and strategies and its vast services available in digitized world are much beyond mobile bill payments.

Suggestions

Necessary steps need to be taken to include growth factors such as wireless network technology, building of infrastructure to internet connectivity, giving proper awareness of internet. More and more people should be acquainted about the uses and security of mCommerce applications. Government of India should frame proper policies towards the growth of mCommerce related to low tariffs, security, mobile internet connectivity, mobile payments and above all affordability of cost effective mobile devices (Word 2015-16).

References:

- Bandyopadhyay. K. 2013. Mobile commerce, Prentice Hall of India.
www.binarymantrasystems.com
www.cacci.org
GSI Standards key in border procedure management .2015. pp 1-45.
Hayden, T and Webster, T. 2014. The mobile commerce revolution: Business success in a wireless world, Que Biz-Tech.
www.hipc.org
www.isg.rhul.ac.uk
Jain S. 2015 A review of SWOT analysis of mCommerce in India Vol. 3, Issue 1, pp: 712-716,
Jong, C.D. 2007. Breakthroughs in the european mobile payment market, ATOS Origin. Inter J, Manag. Com. Innov.
Laudon K.C. and Traver, C.G E- Commerce 2015. Pearson Edu. Ltd.
Manzoor .A. 2010. E-Commerce-An introduction. Lambert Publication.
Mennecke, BE Strader, TJ. 2003. Mobile commerce: Technology, theory and applications. IRM press.
Skeldon. P. 2012. : m-Commerce. Pentagon Press, Great Britain.
2016: The future value chain global commerce initiative, Capgemini, Intel, 2006.
Vanderhoof, R Waugh, G Jackson, M Verdesca, M Anand, S Contactless payments: The retailer experience , Smart Card Alliance, 2007.
Word, T.M. 2015-2016. Intellectual property in commerce.
Wolf, M and Wheelock, C.J. 2007. Digital content unleashed, ABI research, digit.asset. manag. 3, (5) 247-258.

excel in every field, from earth crust to space. The funny thing is that few people have not moved forward from old mentality. Obviously it will take time.

According to Confederation of Indian Industries, which is a premier business association, the numbers of skilled and efficient women are increasing in India and it is also observed that females are better than males for service sector in India. Among Graduates 38% females and 34% males are eligible for service sector.³

According to Oxfam International, whose aim was to work together for greater impact on the international stage to reduce poverty and injustice, India is on second rank from bottom among G-20 countries in reference of women's participation in workforce.⁴

According to World Economic Forum report, India is leaving its women behind. The country ranked a lowly 108 out of 144 in the global gender gap report

| Country | Overall rank |
|------------|--------------|
| Bangladesh | 47 |
| Maldives | 106 |
| India | 108 |
| Sri Lanka | 109 |
| Nepal | 111 |
| Bhutan | 124 |
| Pakistan | 143 |

Within the country itself, there are wide regional disparities.⁵

Indrani Mazumdar who is associated with Centre for Women's Development Studies says that in future job opportunities for women will decrease. There are only 18% females in government jobs.⁶

Human rights principles and obligations are laid out in the Universal Declaration of Human Rights and made more specific to women's rights in the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), covering their rights in society and at work place. There are number of provisions to integrate women into development.

The Status of Women

A few enlightened Indian thinkers such as Raja Ram Mohan Roy, Swami Dayanand Saraswati, Ishwar Chandra Vidyasagar, Swami Vivekananda, Acharya Vinoba Bhave, Savitribai Phule, Rabindranath Tagore etc. who worked

for the upliftment of women in India. For instance, the Raja Ram Mohan Roy is known for efforts made for The Bengal Sati Regulation of 1829, which banned the Sati practice. The Widow Remarriage Act of 1856 was the result of Ishwar Chandra Vidyasagar's movement for improving the conditions of widows. Current Scenario on Women Empowerment based on the ideas championed by our founding fathers for women empowerment, many social, economic and political provisions were incorporated in the Indian Constitution. Women in India now participate in areas such as education, sports, politics, media, art and culture, service sector and science and technology. But due to the deep-rooted patriarchal mentality in the Indian society, women are still victimized, humiliated, tortured and exploited.

Women are the target of varied types of violence and discriminatory practices done by others not in our country but all over the world. India is a complex country. We have, through centuries, developed various types of customs, traditions and practices. These customs and traditions, good as well as bad, have become a part of our society's collective consciousness. We worship female goddesses; we also give great importance to our mothers, daughters, sisters, wives and other female relatives or friends. But at the same time, Indians are also famous for treating their women badly both inside and outside their homes.

Indian society consists of people belonging to almost all kinds of religious beliefs. In every religion women are given a special place and every religion teaches us to treat women with respect and dignity. But somehow, the society has so developed that various types of ill practices, both physical and mental, against women have become a norm since ages. For instance, sati pratha, practice of dowry, parda pratha, female infanticide, wife burning, sexual violence, domestic violence, acid attacks, sexual harassment at work place and other varied kinds of discriminatory practices; all such acts consist of physical as well as mental element. The reasons for such behaviour against women are many but the most important one are the male superiority complex and patriarchal system of society. Pt. Jawaharlal Nehru has said that you can tell the condition of a nation by looking at the status of its women.⁷

Though to eliminate these ill practices and discrimination against women various constitutional and legal rights are there but in reality there is lot to be done. Several self-help groups and NGOs are working in this direction; also women themselves are breaking the societal barriers and achieving great heights in all dimensions: political, social, cultural and economic. But society as a whole has still not accepted women as being equal to men and crimes or abuses against women are still on the rise. For that to change, the society's age-old deep-rooted mind set needs to be changed through social conditioning and sensitization

programmes. Therefore, the concept of women empowerment not only focuses on giving women strength and skills to rise above from their miserable situation but at the same time it also stresses on the need to educate men regarding women issues and inculcating a sense of respect and duty towards women as equals.

There are number of Laws and provisions for the protection and betterment of women such as from domestic violence, dowry cases, sexual harassment and other such wrong doing. There are legal and constitutional provisions for empowerment of females such as reservation of women in legislative assembly; reservation in education and jobs and on such issues voices has been raised from time to time in society and or at national level. Government also plays an important role in security for women in houses, offices, factories, school, colleges etc.

“There is no chance for the welfare of the world unless the condition of woman is improved. It is not possible for a bird to fly on only one wing. There is no hope for that family or country where there is no estimation of women, where they live in sadness. For this reason, they have to be raised first.”

– Swami Vivekanada⁸

In modern era Women rights are the cornerstones of any civilization – as only women rights can ensure the freedom, justice and peace in the society along with development. So they find a special mention in case of India – the cradle of the most ancient and largest civilization of the world.

Talk of women rights is necessary in India which is the largest democracy of the world. India has the foremost responsibility to inculcate the respect for women rights in its government agencies and citizens.

Moreover, India is the second most populated country of the world. It is believed that by 2050 India will be the most populous country on this earth. So, ensuring women Rights in India will automatically lead to grant, women Rights to a larger section of the world population. This is the reason that the condition of women Rights in India has attracted the eye of the world in general and women Rights protection agencies in particular.

Indian Government has duly recognized the importance and urgency of women Rights. Just at the dawn of independence, by recognizing the rich diversity of caste, religion, language culture, economic and social factors. India has taken all necessary – constitutional, legal and practical measures to protect the human dignity.

Constitutional Framework

India's constitution makers and our founding fathers were very determined to provide equal rights to both women and men. The Constitution of India is one of the finest equality documents in the world. It provides provisions to secure equality in general and gender equality in particular. Various articles in the constitution safeguard women's rights by putting them at par with men socially, politically and economically. The Preamble, the Fundamental Rights, Directive principles of State Policy and other constitutional provisions provide several general and special safeguards to secure women's human rights.

Preamble

The Preamble to the Constitution of India assures **justice**, social, economic and political; **Liberty** of thought, expression, belief, faith and worship; **Equality** of status and opportunity and **Fraternity** assuring the dignity of the individual and the unity and integrity of the Nation; thus it treats both men and women equal.

Fundamental Right

Fundamental **Rights** are enshrined in Part 3rd of the Constitution. The policy of women empowerment is well established in the Fundamental Rights for instance:

- Article 14 Equality before Law ensures to women the right to equality.
- Article 15(1) specifically prohibits discrimination on the basis of sex.
- Article 15(3) empowers the State to take affirmative action in favour of women.
- Article 16(2) provides for equality of opportunity for all citizens in matters relating to employment or appointment to any office. There should be no discrimination on the basis of sex.

These rights being fundamental rights are justiciable in court and the Government is obliged to follow the same.

Directive Principles

Directive principles of State Policy are enshrined in Part 4th of the Constitution. It also contains important provisions regarding women empowerment and it is the duty of the government to apply these principles while making laws or formulating any policy. Though these are not justiciable in the Court but these are essential for governance nonetheless. Some of them are:

- Article 39 (a) provides that the State to direct its policy towards securing for men and women equally the right to an adequate means of livelihood.
- Article 39 (d) mandates equal pay for equal work for both men and women.

- Article 42 provides that the State to make provision for securing just and humane conditions of work and for maternity relief.

Fundamental Duties

Fundamental duties are enshrined in Part IV-A of the Constitution and are positive duties for the people of India to follow. It also contains a duty related to women's rights:

Article 51 (A) (e) expects from the citizen of the country to promote harmony and the spirit of common brotherhood amongst all the people of India and to renounce practices derogatory to the dignity of women.

Other Constitutional Provisions

Through 73rd and 74th Constitutional Amendment of 1993, a very important political right has been given to a woman which is a landmark in the direction of women empowerment in India. With this amendment women were given 33 percent reservation in seats at different levels of elections in local governance i.e. at Panchayat, Block and Municipality elections. In some states this proportion has been exceeded up to 50 percent such as in Rajasthan, Himachal Pradesh. This provided a golden opportunity for the formal involvement of women in the development of the country through political process at the grassroots level. This kind of participation of women is a kind of silent revolution.

Thus it can be seen that these Constitutional provisions are very empowering for women and the State is duty bound to apply these principles in taking policy decisions as well as in enacting laws.

Specific Laws for Protection of Women Rights in India

Some specific laws which were enacted by the Parliament in order to fulfil Constitutional obligation of women empowerment are:

- The Equal Remuneration Act, 1976.
- The Dowry Prohibition Act, 1961.
- The Immoral Traffic (Prevention) Act, 1956.
- The Maternity Benefit Act, 1961.
- The Medical termination of Pregnancy Act, 1971.
- The Commission of Sati (Prevention) Act, 1987.
- The Prohibition of Child Marriage Act, 2006.
- The Pre-Conception & Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994.
- The Sexual Harassment of Women at Work Place (Prevention,

Protection and) Act, 2013.

Above mentioned and several other laws are there which not only provide specific legal rights to women but also gives them a sense of security and empowerment.

In our country Muslim personal law governs legal relations in all matters regarding marriage, divorce, maintenance, child custody etc. of Muslim women. Earlier it was thought that government and political parties retains personal law for reasons of political expediency. The government doesn't want to interfere with personal matters of minority communities. Fortunately, the declaration of triple talaq unconstitutional by Supreme Court in August 2017 is a remarkable decision.

There is nothing permanent except change. As we have studied in our junior classes that nothing in this world is static everything keep on changing. But to take change in desired direction Awareness is essential.

Nathaniel Branden was a Canadian-American Psychotherapist and writer known for his work in the Psychology of self-esteem. He was the father of modern self-esteem movement. One of his famous Quotes is “The first step toward change is awareness, the second step is acceptance”⁸

So, to be aware about their rights is the basic condition for females to protect themselves from injustices, social inequities and economic disadvantages. If they are not aware about their rights then how they can be benefited or can know moral pressures concerning the relief, remedy and prevention of injustices to women. To know that how much aware our young generation, a project was planned.

The current study aims at knowing the awareness of women rights among female scholars of HPU. Through this project, I want to explore how women can invoke legal rights to operate legal and political systems for the remedy of legal injustices, social inequities and economic disadvantages from which they suffer. If they are not aware of the rights they have. To conduct this survey project steps taken in the sequential manner.

Objective of the study

The objective for this study decided: -

1. To know the level of awareness about Women's Rights in female scholars.
2. To know the level of political, educational and administrative understanding about Women's Rights in female scholars.

Scope of the study

The scope of the study is limited to female Scholars of Himachal Pradesh University. The study had its respondents from the students of social science and applied Sciences.

Methodology

The present study is an empirical study keeping in view, the nature of study it was decided to carry on this study based on survey method through field investigation. It is descriptive in nature. It is quantitative research; multi-layered random sampling technique is used. At the end analysis is done.

Sample

To conduct the present study small sample size that is of 30 respondents was taken. Fifteen respondents were from social science and rest fifteen respondents were from applied sciences. Sample taken was purposive and equal representation was given to students of both streams. The students were from departments of Political Science and Computer Science of Himachal Pradesh University. The exclusion of male scholars was done intentionally as this was apprehended that their inclusion may affect the result.

Sources of Data Collection

The study used both primary as well as secondary sources. Data collection was done with the help of primary source. To collect data questionnaire was used. The primary data collected through field investigation from the respondents have been used in the present study primarily. However, to provide theoretical framework to the study it was essential to use secondary sources. Various books of different authors were consulted on the subject under investigation.

Tools of Data collection

For collection of data a questionnaire was framed. To extract relevant and meaningful information in limited time period both close ended questions were framed. After that, questionnaire was distributed among the respondents to get the information regarding the study undertaken.

Questionnaire

(For female scholars only)

Personal details: -

1. Name
2. Education and Age

Q.1) Women reservation Bill not passed yet; do you feel, women politically

ignored

(a) Yes

(b) No

Q.2) 33% women reservation in Panchayat Raj Institutions raises women ambitions for political power.

(a) Yes

(b) No

Q.3) Mental, Physical and Sexual harassment in addition to gender discrimination is the part of women's life.

(a) Yes

(b) No

Q.4) Crimes against women occur every minute in India, legal rights are set to protect you. Ten Legal Rights for women, about which you are aware.

1. Right to free aid

(a) Yes

(b) No

2. Right to privacy

(a) Yes

(b) No

3. Right to Untimely registration

(a) Yes

(b) No

4. Right to no arrest

(a) Yes

(b) No

5. Right to Zero FIR

(a) Yes

(b) No

6. Right to not being called to Police station

(a) Yes

(b) No

7. Right to Confidentiality

(a) Yes

(b) No

8. Right towards crime and not to a medical condition

(a) Yes

(b) No

9. Right to No sexual harassment

(a) Yes

(b) No

10. Right to Virtual Complaints

(a) Yes

(b) No

Q.5) Graduate women better than graduate men's for service sector

- | | | |
|------|--|--------|
| | (a) Yes | (b) No |
| Q.6) | Job opportunities decrease for women | |
| | (a) Yes | (b) No |
| Q.7) | Efficient and Genius women number increases in India | |
| | (a) Yes | (b) No |
| Q.8) | Women role is effective in the process of Decision making in politics and Administration. | |
| | (a) Yes | (b) No |
| Q.9) | Are you satisfied with practical perspectives of civil society and popular government towards women right. | |
| | (a) Yes | (b) No |

Signature of scholar

[Above information will be kept confidential and will be used for research and academic purpose only]

Signature of Researcher

Tabulation of the Data

The data collected was tabulated under various heads of tables. Data was analysed by using simple method of tabulation.

Interpretation of the Data

The data collected was analysed and interpreted accordingly and conclusions were drawn from what the data suggested.

Limitations of the study

One of the major limitations of the study was budget and time constraint due to which small sample was taken for the study and the number of respondents was also limited.

Findings

1. Awareness about political rights is very high in students and surprisingly it is equal among the students of both Political Science and Computer Science.
2. 80% students of Political Science and 66.66% students of Computer Science believe that mental, Physical and Sexual harassment in addition

to gender discrimination is the part of women's life.

3. 80% students of Political Science and 73.33% students of Computer Science believe that Graduate women better than graduate men's for service sector this shows their high confidence level.
4. Surprisingly 100% awareness among students of Political Science is observed regarding #Right to free aid.
5. Surprisingly 100% awareness among students of Computer Science is observed regarding #Right to Zero FIR # Right to No sexual harassment
6. 80% students of Political Science and 73.33% students of Computer Science believe that Job opportunities decrease for women.
7. 100% student believes that number of efficient and genius women increases day by day in India.
8. 86.66% students of Political Science and 100% students of Computer Science believe women role is effective in the process of decision making in politics and Administration.
9. Satisfaction level with practical perspective of civil society and popular government towards women right are highly different in both groups.
10. 33.34% students of Political Science and 80% students of Computer Science agree with practical perspective of civil society and popular government towards women right.

Conclusion

Each respondent participated and contributed significantly. Level of awareness is very high in the female students about Women Rights of Himachal Pradesh University, this shows they are moving ahead in the direction of Women Empowerment. This success story doesn't end here even our educated society and government has toiled up to empower women. But still domestic protection of women right is usually the first line of defence for women. Earlier the women's group working to reform discriminatory laws and practices are dismissed by many people 'as misguided elite women aping western concepts'.¹⁰

Earlier this situation was compounded by a general lack of awareness among women about the law and the lack of opportunities for them to meet and discuss their legal status and map out strategies.

Men of justice temperament will be satisfied that the rights they enjoy from time immemorial will be available to their wives, daughters, sisters and mothers. We should respect that women have distinctive characteristics, their innate capacities, their needs, their wishes and their rights. The survey result raises hope

for all of us that we are moving in the direction from the world's largest democracy to the world's best democracy.

References

- Groves, Don (14 Sep. 2016). "Amitabh Bachchan Thriller set to Clash with Horror movie starring Emraan Hashmi". Forbes Retrieved 2017
- Human Development reports 2016
- <https://wheebox.com/wheebox/resources/IndiaSkillsReport.pdf>
- https://www.oxfam.org/sites/www.oxfam.org/files/file_attachments/the_g20_and_gender_equality_en.pdf
- <https://qz.com/1119312/wef-global-gender-gap-report>
- https://wheebox.com/static/wheebox_pdf/india-skills-report-2017.pdfpg-46
- www.azquotes.com/quote/10599
- <http://www.picturequotes.comquote-521155>
- http://www.azquotes.com/author/1819-Nathaniel_Branden
- Human Rights of women national and international perspective, chapter Women's International Human Rights Law: The Way Forward by Rebecca J. Cook. Publisher: University of Pennsylvania Press, USA pg.18

Job Satisfaction of the Employees in Himachal Road Transport Corporation with Reference to Financial Aspects

Vijay Singh and Simmi Agnihotri

Abstract

JOB SATISFACTION constitutes the inner contentment that a job holder gets by performing the job well. It is an amount of pleasure associated with a job. It influences the behaviour, attendance and the length of service. Job satisfaction reflects the overall attitude of workers towards the work, co-workers, the organization, the culture, the environment and the social group at large. It can be viewed as the result of various attitudes that the worker holds towards his job, towards other related factors and towards life in general. The objectives of the study were to study the satisfaction level of the operational staff working in Himachal Road Transport Corporation in financial aspects, to know the perception of the employees regarding economic incentives provided to them by the Himachal Road Transport Corporation management and State Government and to give the valuable suggestions. Road transport forms the life-line of the economy in the hilly terrains, like that of Himachal Pradesh. In Himachal Pradesh road transport is only mean of transportation. Other ways like water way and railways are negligible in the state. The corporation has done commendable job to provide the transportation facilities to the people of the state. The operational employees of the corporation were not satisfied. A shocking result from the study was some (32 percent) of the employees were ready to leave their present job if any other organisation offer them good salary and other financial incentives. It causes adverse effect on the performance of the corporation.

Key words: Job Satisfaction, Himachal Road Transport Corporation, Financial Aspects

Introduction

Job satisfaction is the extent of positive feelings of attitudes that individuals have towards their job. When a person says that he has high job satisfaction, it means that he really likes his job, feels good about it and values his job highly. Job

satisfaction is an important technique used to motivate the employees to work harder. It is often been said that “a happy employee is a productive employee.” A happy employee is generally that employee who is satisfied with his job. Job satisfaction is very important because most of the people spend a major portion of their working place. Moreover, job satisfaction has its impact on the general life of the employees also, because a satisfied employee is a contented and happy human being. A highly satisfied worker has better physical and mental well being. Though it is a debatable point as to which one is the cause and which the effect is, but these are correlated to each other.

Job satisfaction or dissatisfaction is a function of perceived relationship between what one expects and obtained from one's job and how much importance and value he attributes to it (Kemelgor, 1982; Locke, 1976; Mobley and Locke, 1970). However a number of studies suggest that job facet satisfaction scores weighted by importance are no better indicators of overall job satisfaction than are unweighted job facets (Mikes and Hulin, 1968; Wanous and Lawer, 1972). Owing to these inconclusive findings Landy and Trumbo (1982) have stressed the need for further data from a wide variety of settings before the generality of the findings concerning the influence of perceiving importance of job facets on overall job satisfaction can be accepted.

Himachal Road Transport Corporation

Road transport forms the life-line of the economy in the hilly terrains, like that of Himachal Pradesh. Since 1949, the transport in Himachal Pradesh, whether it was of bus service or goods transport services, was fully nationalized in whole Himachal Pradesh. The name of operating institute was Himachal Government Transport. After this, in 1959 Mandi-Kullu Road Transport Corporation was established. Himachal Government, Punjab Government and Central Government (Railway Department) were the shareholder of the corporation. Their capital investments were 40% and 20% respectively. This corporation used to operate on Pathankot-Manali routes mainly, later on some other routes in the districts of Kullu and Lahaul Spiti. On the 1st November 1966, the hill areas of Punjab State were merged into Himachal Pradesh. On these hill areas the bus service were governed by Private promoters. Gradually

Himachal Government transport also started its own services in new integrated areas. Later on Himachal State Government adopted the nationalization policy of bus services. It was felt while considering all these consequences that in place of two State Road Corporation, there should be one system of integrated Road Corporation, as a result of this, on 2nd October 1974 Himachal Road Transport Corporation Came into existence by uniting Mandi-Kullu Transport Corporation and Himachal Government Transport. Before this there were two different

transports named as Himachal Government Transport (H.G.T.) and Mandi-Kullu Road Transport.

Since its inception, the activities of the Himachal Road Transport Corporation have increased manifold. The corporation is only organization providing passenger transport services barring a few routes, in the states. Himachal Pradesh is a land of plains and sky scraping mountains. Himachal Road Transport Corporation runs its routes from plains to high altitude which is more than 4,725 meters. The hindrances in the operation of Himachal Road Transport Corporation, the roads are too hairpin handed and steep sloping, especially the oldest (Annual Administrative Report, HRTC, 1974-75).

Review of Literature Related to Job Satisfaction

Ishwara and Laxamana (2008) have studied what University teachers feel about their job, organization and their expectation from job and also to identify major determinants of their job satisfaction by taking a sample of 152 respondents from six conventional Universities in the Karnataka state. The analysis of data reveals that $2/3^{\text{rd}}$ of the respondents perceived reported to have moderate and above moderates' level of overall job satisfaction. As for as specific job satisfaction concern, respondents reported lower level of satisfaction, for supervision, monitoring, library facility, clerical assistance and team work. It is also found that there is positive association between overall job satisfaction and specific job satisfaction. Organizational, individual and career aspects of the university teacher tend to determine the perceived levels of overall job satisfaction.

Remus and David (2009) have examined the role of employees work family integration in the spillover of daily job satisfaction on to daily material satisfaction and effective states experienced by employees at home. The spillover linkage are modeled at the individual level, and results support the main effects of daily job satisfaction on daily material satisfaction and effect at home, as well as the moderating effect of work family integration on the strength of the within-individual spillover effects on positive and negative effects at home.

Kanwar, Singh & Kadwani (2009) examined the impact of work life balance and burnout on job satisfaction in the context of the Information Technology and Information Technology Enables Services Industries. Burnout is measured through three dimensions, i.e., meaninglessness, exhaustion and de-motivation. The findings related that while work-life balance and job satisfaction were positively related to each other, de-motivation, exhaustion and meaninglessness were negatively related to job satisfaction. The significant contribution to job satisfaction came from work life balance in the Information Technology and information technology enabled services industries. However it was higher in

Information Technology enabled services group compared to Information Technology group. Further findings show that job satisfaction was higher among the male respondents in comparison to the female respondents.

Sharma (2013) conducted a study on Job Satisfaction among Women Employees of Punjab Telecom Circle of Bharat Sanchar Nigam Limited, Chandigarh. She concluded that the women employees of Punjab Telecom Circle of BSNL have been satisfied with their job and male employees and customers were also found satisfied with the working of women employees. However, BSNL has not been showing good results in terms of profit and provided services.

Sharma (2014) conducted a study on Job Satisfaction among nurse of Sir Sunderlal Hospital, Banaras Hindu University Varanasi. The study concluded that the overall job satisfaction of nurses working in Sir Sunderlal Hospital, Banaras Hindu University Varanasi is of medium or average level. The influence of personal condition on job satisfaction of nurses was significant with most of the variables. The work condition had also a significant influence of job satisfaction. The organisational variables had also significance on job satisfaction. Intensive care nurses were more satisfied than non-intensive care nurses in relation to organisational condition and work condition variables.

Review of Literature Related to Himachal Road Transport Corporation

Mahajan (1993) made an effort to evaluate the performance of public undertakings in Himachal Pradesh with special reference to HRTC. In this study three types of performance evaluations have been attempted to examine the overall performance. These include operational efficiency, financial performance and perception of passengers towards the quality of service being provided by the corporation. Operational efficiency has been evaluated on the basis of physical performance and quality of service. In the physical performance fleet utilization has been fluctuating during the study period. Productivity per vehicle has shown marginal improvement in terms of coverage of kilometers per year. Vehicle staff ratio has shown improvement in terms of utilization of man power and is much less in comparison to Calcutta State Transport Corporation. Financial performance was studied with the help of important financial ratios. The study has concluded that the corporation is incurring heavy losses. The main reasons pointed out were hike in the prices of inputs relatively inflexible fare structure, geographical constraints, poor condition of roads, frequent accidents and breakdowns and to meet the social obligations etc. The passenger's opinion was sought towards the functioning of HRTC on the selected indicators. It has been found that the majority of the respondents have expressed their dissatisfaction. It is concluded in the study that the HRTC is taking undue advantage of its near monopoly position in the state.

Raj (2014) conducted a study on Progress and Impact of Himachal Road Transport Corporation. He concluded that Himachal Road Transport Corporation is playing a significant role in the developing of Himachal Pradesh. It has shown enormous growth in all parts of the state. HRTC has been provided transport facility all parts of the state, especially in rural areas, because private operators are not much interested to provide transport services in these areas. So, Govt. of Himachal Pradesh has taken many steps to improve the road transportation. It is also concluded that development in Himachal Pradesh only possible by roads, because other means of transportation cannot be develop in this hilly state. In short, HRTC has been played a vital role in economical, social and cultural development of state.

Inferences Drawn From the Review of Literature

The review of above literature revealed that two studies have been conducted on Himachal Road Transport Corporation. However there is no study in the field of Job Satisfaction among the employees in HRTC. The area of Job Satisfaction among employees has remained neglected from the research point of view. Himachal Road Transport Corporation is a well established public sector which must probe its strengths and weakness continuously concentrating on improving human resources which are considered to be a vital asset for any organisation and the progress of any organisation depends on the job satisfaction of its employees. The present study has analysed the job satisfaction level of the employees working in Himachal Road Transport Corporation in financial aspects.

Selection of the Problem

The process of development through implementation of plans has been on the anvil about 69 years in Himachal Pradesh. But the outcome is very far from the set goals. Having come to know that the progress towards the achievement of set goals have been tardy. One has to investigate the rezones for such a state affair. The blame for gloomy picture is to a certain extent, is of the administrative systems with which we have been working. So the need is to gear up administrative machinery, which can as curtained by providing job satisfaction to the employees of the organization. Roads have great importance in hilly states particularly in Himachal Pradesh. Because the roads are the only life line of the people of Himachal Pradesh as there are only two railway lines which cater to the need of very small area of the Pradesh and particularly no water ways to cater the needs of transportation of men and material. The hills terrain and the topographic conditions of the Pradesh amply describe the importance of road transport. Other means of transportation are negligible in the state, hence road transportation assumed a greater importance. Presently the employees working in HRTC are going on strikes continuously regarding their some pressing demands. People are

suffering with the strikes and work to rule system adopted by the employees again and again. They are not satisfied with the present policies of state government and HRTC management. Development of any organization is not possible if the employees are not satisfied and are not willing to work. Public sector undertakings play a major role. The researcher is taken to keep in to the depth of the problem of morale, motivation and dissatisfaction. Through this research study and for this purpose the investigator has selected HRTC. The performance and effectiveness of the organization depends upon the level of morale and satisfaction of the employees. This study is a step to the explore field of morale and job satisfaction of the employees of HRTC.

Scope of the Study

Present study deals with the job satisfaction of the employees in HRTC with special reference to financial aspects. The study intended to find out the satisfaction level of the operational employees working in Himachal Road Transport Corporation with regard to the financial aspects. It is one of the major public sector undertakings in the state providing passenger transportation facilities to the people. To provide good transportation facilities, it has employed a large number of employees. The study was restricted to operational staff only. Ministerial staff was excluded from the study, because the problems of the operational staff are much different as compare to ministerial staff.

OBJECTIVES

- Ø To study the satisfaction level of the operational staff working in HRTC in financial aspects.
- Ø To know the perception of the employees regarding economic incentives provided to them by the HRTC management and State Government.
- Ø To give the valuable suggestions.

Hypothesis

The present study hypothesized that the employees working in HRTC are not satisfied with their job and going on strikes continuously and many times they are going through work to rule system which is harmful for public and our economy. The hypothesis based on the selected financial indicators has been accepted.

Research Methodology

Methodology involves choice of approach, tools and techniques. The problem of method has to be handled at two distinct levels, first in the problem of approach,

of data. To achieve the various objectives of the present study, the data has been collected from primary as well secondary sources.

Primary Data

The primary data was collected from the tested questionnaire/ schedules. The data was also collected through personal interviews and discussion conducted with respondents. The researcher has also conducted open ended interview in which the researcher allow the respondents to speak truly on the issue in our survey. Much valuable informations were obtained through these interviews.

Secondary Data

The secondary data was obtained from different libraries, books, journals and magazines. Apart from this various memo graphs and project reports were consulted. The secondary data was also obtained from the Head Office of the HRTC. Various publications of Government of India and Government of Himachal Pradesh were also consulted.

Selection of Sampling

The basic objective of the present study was to work out the level of job satisfaction of the employees working in HRTC. The corporation has 8492 operational and ministerial employees divided in to seven different categories i.e., administrative, inspector, store, others, workshop, driver and conductor. Therefore it is not possible to take the opinion from all the employees. The researcher has used the random-cum-purposive sampling method for the investigation. Under this method a small group was taken as a representative of the whole. This group, which is the part of an aggregate, was selected to represent the whole. The corporation operates throughout the state and for administrative purposes has been divided in to four divisions, which has 21 depots and three major workshops under their control. The researcher has selected 2 divisions randomly Shimla and Mandi. In Shimla Division total number of employees is 2784 including all the seven categories and in Mandi division total number of employees is 1606 including all the seven categories. The total number of employees of all the seven categories in Shimla Division and Mandi Division is 4390. The researcher has taken 20 percent respondents from administrative, inspector, store and other categories from both the divisions. Because these four categories include least number of employees and from rest of three categories workshop, conductor and driver includes large number of employees. So the researcher has taken 10 percent respondents from these three categories. Selection of samples has been included only from the staff which is engaged in the operational activities and ministerial staff has been excluded from the study. Because the problems of the operational staff is very high and different as

compare to the ministerial staff. In administrative category Shimla division has 116 and Mandi division has 85 numbers of employees, in inspector category 47, 24, in store 48, 29, in others 67, 39, in work shop 389, 240, in driver 1014, 597, in conductor 1103, 592, number of employees respectively. I have selected 500 samples from both the Divisions through random-cum-purposive sampling method. Shimla is biggest division among other divisions and is covers most of the hilly area of the state. Mandi division is plain as compare to Shimla division. The data was collected from the respondents with the help of questionnaire, interview and discussion etc. The table of the selected samples is given below:

Table No. 1 Detail of Selected Samples from Different Categories

| Category | No. of Selected Samples | Percentage to Total Samples |
|----------------|-------------------------|-----------------------------|
| Administrative | 47 | 9.4 |
| Inspector | 18 | 3.6 |
| Store | 24 | 4.8 |
| Other | 27 | 5.4 |
| Workshop | 76 | 15.2 |
| Driver | 151 | 30.2 |
| Conductor | 157 | 31.4 |
| Total | 500 | 100.00 |
| Mean | 71.428 | |
| SD | 59.65 | |

Analysis of Data

With the help of pre-tested questionnaire and scheduled the required information have been collected from the selected respondents in the HRTC. Percentage and average has been used to effectively treat the data by using tabulation. The effects of the different independent variables like age, gender, educational status, rural, urban, length of service in the organisation etc. have been analysed against the dependent variables based on different aspects of job satisfaction of the employees working in Himachal Road Transport Corporation. Mean deviation i.e. 71.428 is supporting the study, SD i.e. 59.65 is found more than it indicates very large variation among the selected variables regarding job satisfaction of the employees working in Himachal Road Transport Corporation.

Satisfaction with the Wages and Salary

The information related to the satisfaction with the wages and salary is given below:

Table No. 2 Satisfaction with the Wages and salary

| Response | No. of Respondents | Percentage |
|------------------|---------------------------|-------------------|
| Highly Satisfied | 84 | 16.80 |
| Satisfied | 82 | 16.40 |
| Not Satisfied | 334 | 66.80 |
| SD | 144.9184 | |
| Mean | 166.6667 | |
| Total | 500 | 100.00 |

Source: Primary Prove

The data in the above table reveals that only 16.80 percent of the total respondents are highly satisfied with wages and salary. 16.40 percent respondents are satisfied and 66.80 percent of the respondents are not satisfied with wage and salary. Mean deviation i.e. 166.666 which is supporting the study but the value of SD is more than 1 (i.e. 144.91) which indicates the large variations among the perception of the respondents regarding the satisfaction about the job satisfaction of the employees working in Himachal Road Transport Corporation.

Satisfaction with Different Allowances

The information regarding the satisfaction with different allowances is given in the table below:

Table No. 3 Satisfaction with different Allowances

| Response | No. of Respondents | Percentage |
|------------------|---------------------------|-------------------|
| Highly Satisfied | 65 | 13.00 |
| Satisfied | 142 | 28.40 |
| Not Satisfied | 293 | 58.60 |
| SD | 115.9842 | |
| Mean | 166.6667 | |
| Total | 500 | 100.00 |

The table number 3 depicts that out of 500 respondents only 13 percent are highly satisfied with the different allowances. 28.40 percent are satisfied with allowances and 58.60 percent are not satisfied. Mean deviation i.e. 166.666 which is supporting the study but the value of SD is more than 1 (i.e. 115.98) which indicates the large variations among the perception of the respondents regarding the satisfaction about the Satisfaction with different Allowances in Himachal Road Transport Corporation.

Extra Wages or Benefits for Extra Work or Overtime

The information regarding extra wages or benefits for extra work is given in the table below:

Table No. 4 Extra Wages or Benefits for Extra Work or Overtime

| Response | No. of Respondents | Percentage |
|-----------------|---------------------------|-------------------|
| Always | 308 | 61.60 |
| Sometimes | 97 | 19.40 |
| Never | 95 | 19.00 |
| SD | 122.4023 | |
| Mean | 166.67 | |
| Total | 500 | 100.00 |

The data in the table 4 shows that 61.60 percent of the respondents always get extra wages or benefits for extra work or overtime. 19.40 percent respondents get sometime and 19 percent respondents never get extra wages or benefits for extra work or overtime. Mean deviation i.e. 166.666 which is supporting the study but the value of SD is more than 1 (i.e. 122.4023) which indicates the large variations among the perception of the respondents regarding Extra Wages or Benefits for Extra Work or Overtime in Himachal Road Transport Corporation.

Delays in Payment of Extra Wages, Benefits and Overtime

The information regarding the late payment of extra wages or benefits for extra work or overtime is furnished in the table below:

**Table No. 5 Delay in Payment of Extra Wages or Benefits for
Extra Work or Overtime**

| Response | No. of Respondents | Percentage |
|-----------------|---------------------------|-------------------|
| Always | 389 | 77.80 |
| Sometimes | 16 | 3.20 |
| Never | 95 | 19.00 |
| Total | 500 | 100.00 |

The data in the above table depicts that 77.80 percent of the respondent responded that there is a delay in payment of extra wages or benefits for extra work of overtime. 3.20 percent responded sometimes delay and 19 percent of the respondents responded that there is never delay in the payment of extra wages or benefits for extra work or overtime.

Want to Leave Present Job

The information related to leave the present job is furnished in the table below:

Table No. 6 Want to Leave Present Job

| Response | No. of Respondents | Percentage |
|-----------------|---------------------------|-------------------|
| Yes | 163 | 32.60 |
| No | 282 | 56.40 |
| No Opinion | 55 | 11.00 |
| Total | 500 | 100.00 |

The data in the table number 6 depicts that 32.60 percent of the total respondents want to leave their present job. 56.40 percent respondents do not want to leave their present job and 11 percent of the respondents have no opinion regarding leave the present job. Mean deviation i.e. 166.666 which is supporting the study but the value of SD is more than 1 (i.e. 122.4023) which indicates the large variations among the perception of the respondents regarding **Leave** in present job in Himachal Road Transport Corporation.

Finding of the Study

1. Lack of satisfactory wages and salary.
2. Maximum employees are not satisfied with the different allowances.
3. Maximum number of employees gets extra benefits for extra work or overtime.
4. There is always delay in the payment of extra benefits or overtime allowances.
5. More than 32 percent of the respondents want to leave their present job if any other organisation offers them good salary.

Suggestions

1. Satisfactory remuneration should be provided to them.
2. The amount of allowance should be increased with the passage of time.
3. There should not be delay in the payment of extra benefits or overtime allowances.
4. There is a need to formulate a special policy to deal with the financial matters of the employees to avoid leaving the present job.

Conclusion

Job satisfaction or dissatisfaction is a function of perceived relationship between what one expects and obtained from one's job and how much importance and value he attributes to it. Job satisfaction is determined by a comparison of one's prior expectations about the job and the actual experience of the job. Road transport forms the life-line of the economy in the hilly terrains, like that of Himachal Pradesh. In Himachal Pradesh road transport is only mean of transportation. Other ways like water way and railways are negligible in the state. Since its inception, the activities of the Himachal Road Transport Corporation have increased manifold. The corporation is only organization providing passenger transport services barring a few routes, in the states. Himachal Pradesh is a land of plains and sky scraping mountains. Himachal Road Transport Corporation runs its routes from plains to high altitude which is more than 4,725 meters. The hindrances in the operation of Himachal Road Transport Corporation, the roads are too hairpin handed and steep sloping, especially the oldest. The operational employees of the corporation are not satisfied in financial aspects. Employee attitude is very important for management to determine the behavior of workers in the organization. The usually judgment about employees is that "A satisfied worker is a productive worker". If employees are satisfied then it will create a pleasant atmosphere within the organization to perform in a better and efficient manner.

References

Annual Administrative Report, 1974-75

Gupta, Shakshi K. and Joshi, Rosy 2006. Organisational Behaviour, Kalyani Publishers, Head Office B-I/292, Rajinder Nagar, Ludhiana-141008, p. 5.27.

Ishwara, P., and Laxamana, P., 2008. Indian Journal of Commerce. Job Satisfaction at Higher Education- A Case study of University, The Vol. 61, No. 3.

Kanwar, Y. P. S., Singh, A. K. and Kadwani, A. D., 2009. The Journal of Business perspective. Work life balance and burnout as predictors of job satisfaction in the IT and ITES Industry Vision. Vol. 13, No. 2.

Lies Remus and Wagner T. David 2009. Academy of Management Journal. The Spillover of daily Job Satisfaction on to employee's family lives: The Facilitating role of work-family integration, Vol. 52, No. 1, pp. 87-102.

Mahajan ,S. K., 1993. Performance of Public Undertakings in Himachal Pradesh with Special reference to Himachal Road Transport Corporation, Ph. D. Thesis Submitted to the Panjab University, Chandigarh.

Nazir, A., 1998. Indian Journal of Industrial Relations. Perceived importance of job facetsm and overall job satisfaction of Bank Employees. Vol. 33, No. 4, P. 480

Raj, D., 2014. Confluence of knowledge. Progress and impact of Himachal Road Transport Corporation. Vol. 2. Issue 3. Pp. 32-38.

Sharma, Itika, 2013. JOB SATISFACTION AMONG WOMEN EMPLOYEES- A CASE STUDY OF PUNJAB TELECOM CIRCLE OF BHARAT SANCHAR NIGAM LIMITED, CHANDIGARH, Submitted to Faculty of Arts, Department of Public Administration, Panjab University Chandigarh.

Sharma, P. Jayoti, 2014. Job Satisfaction among Nurses: A Case Study of Sir Sunderlal Hospital, Banaras Hindu University Varanasi, Ph. D. Thesis, Submitted to the Panjab University, Chandigarh.

SHGs as Dependable Vehicles for Inclusive Growth of Rural People

Vijeta Sharma, O.P Verma

ABSTRACT

INDIAN GOVERNMENT has taken several steps for alleviating poverty ever since Independence. However, in spite of the various efforts, almost one-third of total population in India is still below the poverty line. It has been observed that the majority of the poor are in the rural areas. Further, along with this poverty scenario, no adequate employment has been generated in the labour market in India. Self help groups (SHGs) are playing a major role in removing poverty in the rural India today. The group based model of self help is widely practiced for rural development, poverty alleviation and empowerment of women. The rural people have a positive approach towards self help groups in Himachal Pradesh. The common working of rural SHG specially was taken in order to know the general conditions and standard of living among rural people. They are contributing towards the growth of economy and improvement of their socio-economic conditions. Development of rural people can occur only when there is education and financial freedom. This study has attempted to find out the changes in rural people by studying the overall functioning of SHGs in rural areas of Himachal Pradesh.

Key words: Rural, Poverty alleviation, SHGs

Introduction:

Self Help Groups are now being viewed as dependable vehicles for rural credit delivery. They offer a unique opportunity for dispensing cheap credit at the doorstep of the poor with almost assured repayment at the terms and requirements of the poor, The SHGs follow collective decision-making on issues

like meetings, thrift, and credit and repayment decisions. Further, the most critical, which stands out, is that lending through SHGs focuses only on the poor, who have been defrauded by the formal system.

They initiate an empowerment process to the poor, especially the women.¹ Microfinance sector in India had been widely recognised as a vital tool for poverty reduction. The movement started with the idea to connect a group of villagers, usually a group of 15-20 women, to commercial banks, which became widely known as the SHG-Bank-Linkage Model. In recent years, a new model of micro finance has emerged, closer to institutions (MFIs) specialised institutions created specifically to distribute credit to the poor, rural and un-banked population. MFIs are those which provide thrift, credit and other financial services and production of very small amounts mainly to poor. Agencies like NGOs, federation of SHGs, cooperatives and (NBFCs) non bank financial corporation's which provide specified financial services targeted to the poor, at least at the entry level, are classified as MFIs, while banks which provide micro finance along with their usual banking services are termed as micro finance service providers.²

Review of Literature:

M. Gurulingaiah (2002) concluded that NGOs have been conducting social and health campaigns to eliminate superstitious customs and attitude and taking steps to eliminate poverty which is a hurdle in the progress of tribal women in Tumkar district of Karnataka.³ **Valsamma Antony (2005)** observed that regional rural banks are suitable to the rural areas to provide funds along with regional development. In spite of this, RRBs face many problems such as poor recovery rate, delay in decision making, capital inadequacy and restrictions in respect of deposit mobilisation.⁴ **Mahendra Varman (2005)** reveals that there is a growth of SHGs with increase in bank deposit accounts. It tries to develop banking habits in formal banks among individual and households. Banking habits have a positive impact on microfinance programmes through SHGs.⁵ **Panday (2008)** concludes that there is a need to change the informal credit system with assistance from formal financial institutions to help the poor by mobilising the savings and in order to meet their financial needs.⁶ **Mansuri (2010)** finds that SHG-Bank Linkage programme of NABARD is the largest micro financing programme in the world and it is moving in the right direction for the empowerment of women. So, it should keep on micro financing programs through SHGs for poverty alleviation in rural areas.⁷ **Udoh and Udejaja (2011)** find that microfinance is the main source of employment generation for the rural poor and mobilises its own resources, apply appropriate lending technology, provides attractive loan products, manage risk and increase in savings and loan

repaying capacity of rural areas.⁸ **Durrani (2011)** concludes that microfinance is a very helpful tool to generate income and achieve improvement in the standard of living of poor people.⁹ **Gupta (2011)** finds micro finance as an effective instrument but still, there is a need of designing economically sustainable models and increase outreach to the Indian poor.¹⁰ **Baruah (2012)** finds that the amount of loans provided under microfinance programme are not so sufficient for its members to fight against poverty. There is a need of large amount of loans to its members to reduce poverty.¹¹ **Singh and Singh (2012)** point out to the positive social impact of microfinance on SHGs members in terms of self confidence, decision making, social responsibility, skill development and social facilities etc.¹² **Rasna and Singla (2015)** conclude that SHGs are one of the effective poverty alleviation tools in rural areas.¹³ **Shukla (2015)** finds that microfinance is the helm of financial inclusion and poverty eradication initiative by the government in the future.¹⁴ **Selvi & Shanmughun (2016)** observed that there has been tremendous progress in the social and cultural environment in india. It was suggested that it is necessary to empower more and more women in social, cultural, economic, political and legal matters for the betterment of the nation¹⁵. **Kamla (2018)** found that SHGs has been contributing significantly to poverty alleviation programmes in developing countries.¹⁶

Need and Scope of the Study:

A well planned financial system is lacking in our country. There is a dire need to know and to improve the financial status of poor by way of systematic credit delivery system. In order to expand credit system, formation of self help groups for rural unemployed women would ensure the best satisfaction of the poor in a credit programme. The membership in a group activity gives them a feeling of cooperation and protection. The approach towards poverty alleviation is based on the formation of self help groups at the grass root level. This brings about the necessity for organising them in a group by which they set the benefit of collective perception, collective decision making and collective implementation of programme for common benefits. This organisation holds the power and provides strength and acts as an antidote to the helplessness of the poor. The group savings of self help groups serve a wide range of objectives other than immediate investment.

The study is mainly focused to evaluate the development of rural poor by self help groups through micro credit. The purpose of this study is to explore the micro credit management and impact of micro-credit on emancipating rural people and their perception towards SHGs.

The present paper aims to study the following objectives

1. To study the structure and conduct of self help groups.
2. To study the perception of rural people towards the saving approaches of SHGs.
3. To analyse the attitude of respondents towards the role of SHGs for the inclusive growth of rural people.

Hypotheses:

1. There is no significant difference in the structure and conduct of SHGs on the basis of different administrative blocks.
2. There is no significant difference in the perception of people of two districts regarding the saving approaches and role of SHGs for the inclusive growth of rural people.

Research Methodology:

The present study is descriptive as well as exploratory in nature. Both primary and secondary data have been used to study the objectives. Primary data has been collected from a sample of 540 members of self help groups through multistage sampling. Questionnaire was prepared for the collection of data. To meet the objectives of the study, a five point likert scale has been developed for certain identifying variables. These statements on five point scale are as i.e., (1) Strongly agree (2) agree (3) neutral (4) disagree (5) strongly disagree. The collected data have been analysed by using mean, standard deviation, skewness, kurtosis and chi-square test.

Sampling: The universe of the present study is the entire state of Himachal Pradesh. Two districts namely Kangra and Mandi have been selected out of twelve districts. Three administrative blocks from each district have been selected considering maximum number of SHGs. Thus, Bhawarna, Nurpur and Indora from Kangra and Balh, Sundarnagar and Seraj from Mandi have been included in the sample.

1. Structure and Conduct of SHGs:

The structure of self help group presents the economic status of SHGs, age of the self help groups, number of members in SHGs, operational area of self help groups and leader of the self help groups. Conduct of self help groups includes number of meeting conducted by the SHGs to explain what is going on, place of meeting, participation in decision making at meeting, marketing outlets of SHGs, saving of SHGs etc.

1.1 Economic Status of Self Help Groups:

The (APL) above poverty line members are not eligible for the subsidy under the various schemes. The BPL families must actively participate in the management and decision making which should not ordinarily be entirely in the hands of the APL families. Further, APL members of the SHG shall not become office bearers of the group. The table: 1.1 exhibits regarding the economic status of SHGs.

**Table -1.1: Economic Status of SHGs:
Administrative Block-Wise Distribution**

| Administrative Block | Economic Status of SHGs | | | Total |
|----------------------|-------------------------|---------------|---------------|---------------|
| | BPL | APL | Mixed | |
| Balh | 22 (27.2) | 16 (19.8) | 43 (53.1) | 81 (100.0) |
| Sundarnagar | 40 (40.8) | 21 (21.4) | 37 (37.8) | 98 (100) |
| Seraj | 38 (42.2) | 25 (27.8) | 27 (30.0) | 90 (100) |
| Bhawarna | 29 (31.2) | 30 (32.3) | 34 (36.6) | 93 (100) |
| Nurpur | 40 (44.9) | 17 (19.1%) | 32 (36.0) | 89 (100) |
| Indora | 46 (51.7) | 22 (24.7) | 21 (23.6) | 89 (100) |
| Total | 215 (39.8) | 131 (24.3) | 194 (35.9) | 540 (100) |

Note: Figures in Parentheses represent Percentage

Source: Data collected through Questionnaires

$\chi^2 = 25.177P = 0.005$

C = 0.005

The responses got from Balh block of Mandi district as shown in the table-27.7% SHGs are BPL, 19.8% are APL and 53.1% of SHGs are mixed i.e., comprised of BPL and APL families. In Sundarnagar block, 40.8 percent are BPL SHGs followed by 37.8 percent mixed and 21.4 percent APL groups. Almost, same picture has been found for Seraj block of district Mandi. Further, SHGs of different economic status have been found in all the administrative blocks of district Kangra. However, BPL and mixed SHGs have been found in higher proportion as compared to APL groups. The calculated value of Chi-Square has been found significant at 1 percent level of significance which leads to the conclusion that economic status of SHGs vary from place to place. The economic

status of majority SHGs falls below the poverty line since SHG is one of the flagship programme of the Govt. of India to reduce poverty through building strong institutions for the poor, particularly women and enabling these institutions to access a wide range of financial and livelihood services. The Majority of the actual poor women are able to get the benefits of the scheme which are implemented especially for BPL lists. A poor person being a member of SHG can enjoy the facilities of safe savings, affordable credit and suitable insurance at an affordable cost.

1.2 Participation in Decision Making at Meeting:

Members make decisions collectively, SHG concept offers the opportunity for participative decision making in the conduct of meetings, thrift and credit decisions. The participative process makes the group a responsible borrower. It depicts from the table-1.2 that in Balh block, 66.7 percent members are keen to participate in the decision making of self help group while 19.8 percent have reported that decisions in the meetings are taken by few members only. 13.6 percent respondents have reported that decisions are only taken by the heads of SHGs. It shows that in majority SHGs, decisions are taken jointly by all the members of SHGs.

In Sundarnagar block, majority of respondents perceive that all members participate in decision making whereas 20.4 percent and 25.5 percent respondents feel that decision are taken by few influential members and heads of SHGs respectively.

In the third block which is known as Seraj block of Mandi district shows that only 37.8 percent decisions are taken jointly by all members as against 36.7 percent and 25.6 percent which are taken by few members and heads of groups respectively. As far as Bhawarna block is concerned, only 39.8 percent respondents admit their involvement in decision making .However, a big chunk of respondents has been ignored to participate in the decision making process of SHGs. Thus, the basic purpose of women empowerment through financial inclusion by SHGs seems to be defeated.

The next block is Nurpur block which presents the same ratio that is 39.8 percent both in case of all members as well as a few members of SHGs in the decision making. It leads to the conclusion that a significant proportion of members are still deprived of participating in the decision making of SHGs. The last block is an Indora block of Kangra district which shows the same picture as is being revealed by Nurpur block. Overall view of this table shows that 45.7 percent respondents admit their participation in the decision making whereas the remaining perceive that decisions in the meetings of SHGs are either taken by few influential members or by the heads of the respective groups.

**Table &: Participation in Decision Making at Meeting:
Administrative Block-Wise Distribution**

| Administrative Block | Participation in Decision Making at the Meeting | | | Total |
|----------------------|---|---------------|---------------|--------------|
| | Only head | Few Members | All Members | |
| Balh | 11 (13.6) | 16 (19.8) | 54 (66.7) | 81 (100) |
| Sundarnagar | 25 (25.5) | 20 (20.4) | 53 (54.1) | 98 (100) |
| Seraj | 23 (25.6) | 33 (36.7) | 34 (37.8) | 90 (100) |
| Bhawarna | 19 (20.4) | 37 (39.8) | 37 (39.8) | 93 (100) |
| Nurpur | 19 (21.3) | 35 (39.8) | 35 (39.8) | 89 (100) |
| Indora | 25 (28.1) | 30 (33.7) | 34 (38.2) | 89 (100) |
| Total | 122 (22.6) | 171 (31.7) | 247 (45.7) | 540 (100) |

Note: Figures in Parentheses Represent Percentage

Source: Data Collected through Questionnaire.

$\chi^2 = 30.160$ $P = 0.001$
 $C = 0.001$

On applying the chi-square test, its calculated value is highly significant at 1 percent level of significance, which rejects the null hypothesis. Thus, it can be concluded that participation in decision making differs from block to block.

1.3 Marketing Outlets of SHGs:

Marketing of goods is very important factor which largely contributes to the success of business or SHGs. But in self help groups, there is no particular place of marketing. An analysis of the marketing outlet of the SHGs with their current position of the market has been undertaken separately on the basis of their

administrative blocks in table-1.3 along with the figure-1.3.

In the first block, i.e., Balh block, around 50.6 percent of the samples have to sell their products from their home, whereas 32.1 percent of the respondents have their selected shops to sell the product. Only 17.3 percent respondents reported street vending for selling their goods. In Sundarnagar block, 45.9 percent respondents sell their products from home, 29.4 percent at selected shops and 24.5 percent street vending.

The third block is Seraj block shows that (63.3 percent) majority of respondents sell their products from home while 21.1 percent respondents sell out their products in selected shops and 15.6 percent respondents vend their products in street thereby leads to the conclusion that there is no special shops to sell products of SHGs. Another block, i.e., Bhawarna block, 40.9 percent respondents sell their products from home, 32.3 percent respondents sell at selected market and 26.9 percent respondents vending their product in street thereby leads to the conclusion that the majority of the respondents sell out their products such as dairy products, allied products easily at their door due to local demand for such products.

**Table& 1.3: Marketing Outlets of SHGs:
Administrative Block-Wise Distribution**

| Administrative Blocks | Marketing Outlets of Self Help Groups | | | Total |
|-----------------------|---------------------------------------|---------------|----------------|--------------|
| | Street vending | Sold at home | Selected shops | |
| Balh | 14 (17.3) | 41 (50.6) | 26 (32.1) | 81 (100) |
| Sundarnagar | 24 (24.5) | 45 (45.9) | 29 (29.6) | 98 (100) |
| Seraj | 14 (15.6) | 57 (63.3) | 19 (21.1) | 90 (100) |
| Bhawarna | 25 (26.9) | 38 (40.9) | 30 (32.3) | 93 (100) |
| Nurpur | 25 (28.1) | 29 (32.6) | 35 (39.3) | 89 (100) |
| Indora | 19 (21.3) | 46 (51.7) | 24 (27.0) | 89 (100) |
| Total | 121 (22.4) | 256 (47.4) | 163 (30.2) | 540 (100) |

Note: Figures in Parentheses Represent Percentage
Source: Data Collected through Questionnaire

$\chi^2 = 20.995$
 $C = 0.021$

$P = 0.021$

Next block i.e., Nurpur block, 39.3 percent sell their products at selected shops, 32.6 percent sell at home and 28.1 percent street vending. This depicts that a good number of members of SHGs are selling their products at selected shops or make a market in different village fairs and national and international fairs in Himachal Pradesh i.e., Shivratri international fair in Mandi district, National or state level Nalward Mela local fairs in different villages under study.

In case of Indora block, 51.7 percent sample members sell their product from home, 27.0 percent at selected shops and 21.3 percent street vending. It leads to the conclusion that the majority of the respondents sell out their products from home due to suitability of place for selling those products e.g., dairy products, knitting cloths, etc.

The value of chi-square test shows significant results at 5 percent level of significance and gives reasons for concluding that the maximum number of members (SHGs) sell out their products from home.

1.4 Savings of SHGs:

For this purpose of the study, the different saving approaches have been grouped under four main heading viz retained earnings by the secretary, loans to members, deposited into the bank and both (including loans to members and deposited into bank).

In the context of Balh block, one can easily admit from the table-1.4 and that the members of SHGs who deposit their savings into bank have been just 30.9 percent, while 29.6 percent members have been utilising their savings for both purposes, i.e., providing loans to members and also deposit into bank for future and 22.3 percent of respondents keep saving with secretary of the SHGs. 17.3 percent respondents reported that saving is distributed as loan to the members of SHGs. It leads to the conclusion that in majority cases saving is deposited into bank to earn interest and is not retained with the SHGs for meeting any kind of contingencies which may arise in the future.

Accordingly the next block i.e., Sundarnagar block, 40.8 percent of the respondents deposit their saving in the banks and also provide loans or financial help to the members for income generating activities and household expenditure e.g. child education, marriage, etc. It is most likely that secretary is able to reach the bank to deposit SHGs savings and providing internal loan facilities to members followed by 24.5 percent respondents give loans to members.

In Seraj block, the greater part (28.9 percent) of the respondents have been concentrated in the both (loan to members and deposited into the bank) followed by the deposited into bank (26.7 percent), loans to members (25.6 percent) and retained in the SHGs through secretary (18.9 percent).

Table 1.4: Savings of SHGs: Administrative Block-Wise Distribution

| Administrative Block | Saving of SHGs | | | | Total |
|----------------------|--|------------------|-------------------------|---|--------------|
| | Retained in the SHGs through Secretary | Loans to members | Deposited into the bank | Loans to members & deposited into the bank (Both) | |
| Balh | 18 (22.2) | 14 (17.3) | 25 (30.9) | 24 (29.6) | 81 (100) |
| Sundarnagar | 12 (12.2) | 24 (24.5) | 22 (22.4) | 40 (40.8) | 98 (100) |
| Seraj | 17 (18.9) | 23 (25.6) | 24 (26.7) | 26 (28.9) | 90 (100) |
| Bhawarna | 28 (30.1) | 22 (23.7) | 23 (24.7) | 20 (21.5) | 93 (100) |
| Nurpur | 23 (25.8) | 28 (31.5) | 20 (22.5) | 18 (20.2) | 89 (100) |
| Indora | 18 (20.2) | 26 (29.2) | 22 (24.7) | 23 (25.8) | 89 (100) |
| Total | 116 (21.5) | 137 (25.4) | 136 (25.2) | 151 (28.0) | 540 (100) |

 $\chi^2=23.332$

P=0.077

C = 0.077

Note: Figures in Parentheses Represent Percentage

Source: Data Collected through Questionnaire

A careful look at the Bhawarna block lays bare that 30.1 percent of the respondents out of total strength of the sample consists of members who keep the amount of saving in SHGs through secretary. Analysis carried out with respect to the amount of saving reveals that 24.7 percent of respondents deposit their saving in the banks followed by 23.7 percent loans to members and 21.5 percent both (including loans to members and deposited into the bank) thereby leads to the conclusion that savings of the members are used by them according to their requirements. The analysis of the data tabulated in the table for Nurpur makes it apparent that 31.5 percent of the respondents give loans to members from savings of SHGs, 25.8 percent keep it in the SHGs through secretary, 22.5 percent respondents deposit it in the banks, 20.2 percent respondents reveal loan to members and deposit into the banks.

Indora block gives the impression that a large number of respondents in the SHGs scheme (29.2 percent) have been providing loans to members while 25.8 percent respondents are utilising it for providing loans to members and deposited into the bank. It is clear from the table that the overwhelming number of the respondents (28.0) has been utilising their savings in order to provide loans to members & deposited into banks followed by 25.4 percent loan to members, 25.2 percent deposited into the banks and 21.5 percent keep it with secretary. The value of chi-square test shows insignificant results at the 5 percent level of significance and gives reasons for concluding that the utilisation of savings of members of SHGs has no way related to their development blocks.

1.5 Repayment of Loan:

Repayment of the loan amount within a stipulated time is the soul of any financial system. Micro financing through self help groups also emphasizes on timely repayment of the loan amount taken by the members. On the basis of the results derived from table-1.5, in Balh block, 44.4 percent respondents have revealed a good repayment of a loan. Nearly 33.3 percent of the respondents have shown poor status of loan repayment and only 22.2 percent respondents are very good in their repayment of the loan to the bank, thereby leads to the conclusion that there is a good recovery of loan because of pressure of interest to repay the loan in time by self help groups.

Table -1.5: Repayment of Loan: Administrative Block-Wise Distribution

| Administrative Block | Repayment of Loan | | | Total |
|----------------------|-------------------|---------------|---------------|--------------|
| | Very Good | Good | Poor | |
| Balh | 18 (22.2) | 36 (44.4) | 27 (33.3) | 81 (100) |
| Sundarnagar | 33 (33.7) | 39 (39.8) | 26 (26.5) | 98 (100) |
| Seraj | 32 (35.6) | 34 (37.8) | 24 (26.7) | 90 (100) |
| Bhawarna | 37 (39.8) | 36 (38.7) | 20 (21.5) | 93 (100) |
| Nurpur | 27 (30.3) | 37 (41.6) | 25 (28.1) | 89 (100) |
| Indora | 40 (44.9) | 23 (32.6) | 19 (22.5) | 89 (100) |
| Total | 187 (34.6) | 211 (39.1) | 142 (26.3) | 540 (100) |

Note: Figures in Parentheses represent Percentage

Source: Data Collected through Questionnaire

$\chi^2 = 16.852$ $P = 0.078$

$C = 0.078$

One is able to see from the table that in Sundarnagar, 39.8 percent respondents have good capacity to pay their loan, whereas 33.7 percent respondents are in very good position to repay loan and 26.5 percent respondents in very poor condition. It leads to the conclusion that majority of respondents claim good recovery of loan because of their good earning capacity.

Seraj block, presents the capacity to repay its loan and shows that 37.8 percent good, 35.6 percent very good and 26.7 percent poor status to refund their indebtedness to the bank, thereby leads to the conclusion that majority members of SHGs have good capacity to repay their debt in time because benefit of interest on savings.

The fourth block, i.e., Bhawarna block, shows the debt repayment status of SHGs members and it is observed that 39.8 percent responded very good, 38.7 percent good and 21.5 percent poor. It leads to the conclusion that capacity to repay debt is very good because majority of the respondents support this statement.

In the case of Nurpur block, 41.6 percent reveal it good, 30.0 percent very good and remaining 28.1 percent reveal it poor. It leads to the conclusion that majority of SHGs are performing very well. In Indora block, it is depicted from the table that majority of respondents consider repayment of loan good. However, 22.5 percent respondents have shown dismal picture of the SHGs with regard to repayment of loan. It is clear from the above analysis that the overwhelming majority of the respondents (39.1 percent) have been good in terms of repayment of the loan. Though, 34.6 percent very good and 26.3 percent poor in terms of debt capacity repayment. It leads to the conclusion that SHGs work with great effectiveness as is being reflected by repayment of loan. If any one member among group cannot pay loan in time then another member pay her loan. If, repayment of loan is poor, no one SHG can get borrowing amount from the bank in future.

Thus, it can be identified from the analysis made and by the value of chi-square test that there has been an insignificant difference at the 5 percent level of significance in the distribution of the sample on the basis of administrative blocks and repayment of loan status thereby leading to the conclusion that the respondents views are the same regarding repayment of loan.

1. Saving approaches and attitude of Rural People towards self help groups

Table-1.6 depicts the descriptive statistics for the different variables affecting the saving approaches and attitude of people towards self help groups. The table presents the values of mean, standard deviation, skewness and kurtosis for ten variables. Further, the table shows that the mean value is highest in the case of

variables i.e., group strengthen by unity of members and opportunities to get information. Therefore, it can be said that group strengthen by unity of members and opportunities to get information are most important variables which affect the attitude of rural poor towards self help groups.

Table-1.6: Descriptive Statistical Analysis of Statements Related to the Saving Approaches and Attitude of Rural People towards Self Help Groups

| S. No. | Statements | N | Min. | Max. | Mean | Std. deviation | Skewness | Kurtosis |
|--------|--|-----|------|------|------|----------------|----------|----------|
| 1 | Proper attention from government | 540 | 1 | 5 | 3.22 | 1.294 | -0.284 | -1.01 |
| 2 | No demand of collaterals and guarantee | 540 | 1 | 5 | 3.36 | 1.235 | -0.393 | -0.844 |
| 3 | Gaining education and training | 540 | 1 | 5 | 3.34 | 1.115 | -0.573 | -0.375 |
| 4 | Opportunity of savings | 540 | 1 | 5 | 3.20 | 1.282 | -0.233 | -1.02 |
| 5 | Awareness of social issues | 540 | 1 | 5 | 3.09 | 1.177 | -0.201 | -0.887 |
| 6 | Good opportunities of interaction | 540 | 1 | 5 | 3.35 | .987 | -0.470 | -.192 |
| 7 | Gaining marketing & entrepreneurship qualities | 540 | 1 | 5 | 3.11 | 1.235 | -0.079 | -1.00 |
| 8 | Low rate of interest | 540 | 1 | 5 | 3.29 | 1.145 | -0.461 | -0.569 |
| 9 | Poverty reduction | 540 | 1 | 5 | 3.08 | 1.202 | -0.207 | -0.840 |
| 10 | Minimising the gap of social classes | 540 | 1 | 5 | 3.05 | 1.167 | -0.164 | -0.813 |

Source : Data collected form Questionnaire

Further, the calculated values of standard deviation reveal high variation in the factors affecting the saving approaches and attitude of rural poor towards self help groups. In case of skewness most values are concentrated on the right of the mean with extreme values to the right, so it can be said that distribution is negatively skewed. In case of kurtosis, the calculated values are less than three which depicts that distribution is platykurtic i.e., flatter than normal distribution with a wider peak. Further, the mean scores for all variables have been found more than three at 5-point likert scale which reveals more than moderate satisfaction of rural people with regard to SHGs.

Table: 1.7-Correlation Matrix

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|----|--------|--------|--------|--------|--------|--------|--------|--------|--------|----|
| 1 | 1 | | | | | | | | | |
| 2 | .089* | 1 | | | | | | | | |
| 3 | -.018 | .133** | 1 | | | | | | | |
| 4 | .050 | .153** | .055 | 1 | | | | | | |
| 5 | .155** | .172** | .201** | .155** | 1 | | | | | |
| 6 | .120** | .354** | .250** | .194** | .394** | 1 | | | | |
| 7 | .053 | .263** | .274** | .112** | .326** | .267** | 1 | | | |
| 8 | -.027 | .193** | .302** | .054 | .149** | .214** | .347** | 1 | | |
| 9 | .029 | .100* | .210** | .067 | .192** | .190** | -.009 | .294** | 1 | |
| 10 | .047 | .104* | .237** | .194** | .409** | .261** | .369** | .518** | .210** | 1 |

*Significant at 5 percent level

** Significant at 1 percent level

1=Proper attention from government, 2= No demand of collaterals and guarantee, 3=To gain education and training, 4= Opportunity of savings, 5= Awareness of social issues,6= Good opportunities of attention,7= To gain marketing and entrepreneurship qualities, 8= Low rate of Interest, 9= Poverty reduction, 10= Minimising the gap of social issues.

Table-1.7presents the correlation matrix of ten statements show in table -1.6. It is revealed from the table that statements 2, 3, 5, 6 are positively correlated with each other at 5 & 1 percent level of significances. These statements are related to saving approaches of SHGs through financial inclusion and attitude of rural poor towards self help groups. Further, saving approaches has been showing positive relationship with attitude of rural poor towards SHGs. Further, Majority of statement relating to saving approaches have been showing significant positive correlation with statements relating to other statements of rural poor. Statements numbering from 7 to 10 relating to attitude of rural poor towards SHGs have positively correlated within their groups and also between the groups.

Conclusion:

It can be concluded that economic status of SHGs is BPL, APL and mixed i.e.BPL &APL. However, BPL and mixed SHGs have been found in majority. Participation of members in meetings to discuss different issues regarding the activities of the group indicates their personal and social empowerment. As far as marketing of product is concerned, either by the SHGs or at their own level. The profit from the sale of the products is either given as loans to the members or deposited into the bank in the respective accounts of members. It can be

concluded that membership in SHGs has been enabling the members in generating more income, which in turn increases their capacity to save and spend. Consequently, It is serving as an effective measure for reducing poverty. Members are benefited through education and training by various agencies including government which in turn making them aware about various social issues as well as acquiring marketing and entrepreneurship qualities.

References:

- Zubair Meenai (2010) "Women's Empowerment and Microcredit: Emerging Spaces for Social Work Practice". *The Indian Journal of Social Work*, Vol. 71, No.1, P.32.
- B.L.Vaishnav, "Microfinance: The Emerging Horizons" Role of Microfinance in changing the face of Rural India, *The Indian Journal of Commerce*, October-December, 2008, Vol.61, No.4, P.165.
- M. Gurulingaiah, "Role of NGO in Empowerment of Tribal Women in Karnataka", Kurukshetra, *A Journal on Rural Development*, Vol. 51, No. 1, December 2002, PP.30-33.
- Valsamma Antony, "Regional Rural Banks as Champions of Rural Credit", Kurukshetra, *A Journal on Rural Development*, Vol. 53, No. 3, January, 2005, PP.20-22.
- Mahender Varman P, "Impact of Self Help Groups in Formal Banking Habits", *Economic and Political Weekly*, Vol. XL, No. 17, April 2005, PP.1705-1713.
- Manas Panday, "Micro financing: A Blessing for the Poor: A Case Study of Eastern Uttar Pradesh", *The Indian Journal of Commerce*, Vol. 6, No. 3, July-September 2008, PP.48-52.
- B.B. Mansuri, "Micro Financing through Self Help Groups-A Case Study: Bank Linkage Programme of NABARD", *APJRS*, Vol. 1, No. 3, December 2010, PP.142-149.
- Elijah Udoh and Elias A. Udejia, "Microfinance, Rural Employment and Poverty Reduction in Nigeria: Promoting Sustainable Access to Credit for Rural Enterprises", *The Indian Journal of Economics*, Part III, Vol. XIC, No. 362, 2011, PP.491-505.
- Muhammed Kashif Khan Durrani etc., "Role of Micro Finance in Reducing Poverty: A Look at Social and Economic Factors", *International Journal of Business and Social Science*, Vol. 2, No. 21, 2011, PP.138-144.
- Gaurav Gupta, "Micro-Finance as a Poverty Reduction Tool-A Critical Aspects of India", *The Indian Journal of Political Science*, Vol. LXXII, No. 1, January-March 2011, PP.259-271.
- Prasenjit Bujar Baruah, "Impact of Micro Finance on Poverty: A Study of Twenty Self Help Groups in Nalbari District, Assam", *A Journal of Rural Development*, Vol. 31, No. 2, April-June 2012, PP.223-234.
- N. Dhaneshwar Singh, Dr. H. Ramananda Singh, "Social Impact of Microfinance on SHG Members: A Case Study of Manipur", *Prabandhan: Indian Journal of Management*, Vol. 5, No. 3, March 2012, PP.43-50.

- Rasna Pathak, S.K. Singla, "Impact of Self Help Group activities concerning Microfinance for Economic Sustainability and Growth-An Empirical Study in Ludhiana", *International Journal of Emerging Research in Management and Technology*, Vol. 4, No. 5, May 2015, PP.248-252.
- Shakula P., "Microfinance for Rural Transformation: Social Change in Rural India", Kurukshetra, *A Journal on Rural Development*, Vol. 64, No. 02, December 2015, PP.21-24.
- R.Selvi & R. Shanmughan "A study on women empowerment through self help groups in Erode District". *International Journal of Multidisciplinary Research and Modern Education*, Vol.II, No.1, 2016, PP.383-387.
- Sarah Kamala & Uma Jyoti, "Dynamics and performance of women self help groups in Telangana state", *International Journal of Educational Science and Research*, Vol.8, issue.3, June 2018, PP.1-6.

Social Media, Mobilization and Political Communication

Vikas Singh

COMMUNICATION is a reciprocal process between at least two humans, in which symbols are exchanged and all interaction partners give meaning to these symbols. Communication is a basic feature of all societies and all human activities. We cannot live and survive without communication, just like we cannot survive without food and water. Communication takes place routinely in every life. All computing system, and therefore all web applications, as well as all forms of media can be considered as social because they store and transmit human knowledge that originates in social relations in society. They are objectifications of society and human social relations. Whenever a human uses a computing system or a medium also if s/he is alone in a room, s/he cognizes based on objectified knowledge that is the outcome of social relation.¹

The field of political communication has largely emerged from and been consolidated around three main areas: political studies/science; media and mass communications; and social psychology. Underlying these diverse entry points to analyses, there are too competing narratives which make normative statements about the impact and desirability of this relationship. A negative narrative draws attention to the deleterious effects of the media on our political life. In this view, the media are responsible for: an increased cynicism towards our politics; an increasingly apathetic public; severing the link between citizens and the political process; dumping down our news and cultural content- style over substance; marginalizing particular view-points which do not fit the dominant narrative; shoring up power; reinforcing the status quo. In contrast, the positive trope or narrative suggests opportunities for: emancipation and empowerment; increasing accountability of elites and exposure of corrupt power structures. Often, positive narratives are linked to the advancement and development of new technologies, as solutions not only to the technical problem of the past but also the political ones too.²

With regard to media development, the general understanding has been a focus on governments and Institutions collaborate to develop media and communication systems that consolidate new democracies. Power as an analytical paraxis again looms large, because it enables us to focus on how media and communication system of Donor countries influence and determine the kind of media projects that are funded and supported as well as the level of multi-stakeholderism in the design and implementation of media projects and politics. When it comes to participatory and community communication, again, the paraxis of power enables us to think of how development, communication and donor aid policies influence the way the instrumental or empowerment approaches to participation are conceived and implemented.³

The products of the culture industry, moreover, possess ulterior motives to repress imagination and render 'the masses' socially and politically inactive. The culture industry is owned and controlled by the capitalist classes who enjoy the prerequisite economic and technological power that enables them to spread their ideas and values- their advertising- driven ideology- through the popular consciousness. Theories of media and cultural imperialism argue that one nation can dominate and control the economic and cultural values of another in the same way that one Nation can invade and colonize another through political and military power.⁴

The biggest advantage of using social media is that it can lower barriers to entry to the political process for the groups who do not hold power- especially with emphasis on user-generated content- instead of just being a receiving audience or consumer of media. It connotes the viral spreading of ideas and re-tweets, not just broadcasting from one source. Major segments of audiences who have previously remained uninterested in political communication and election campaigns are younger generations, who can be attracted through social media. They may not be reading or watching traditional news sources, but are receiving most of their information and political messages through social media sources. However, in actual practice social media uses and purposes are dominated by large organisations advancing their agenda, such as political parties, advertising firms, publications and media firms, and entertainment personalities with tailored political content.⁵

The diffusion of communication media and an increasing level of education have been the most important factors in the worldwide revival of the moments for civil rights and democracy during the 1980 and 1990. The spread of international networks of Mass-Communication and telecommunication had a big impact on the collapse of the communist regimes in Eastern Europe and on the rise of moments fighting for democracy in developing countries. Considering

the daily broadcasts of Western radio and television programs and the increase in international telephone calls, it seems like the fall of the Berlin Wall and the collapse of the Soviet Union were inevitable in the long run. No traditional totalitarian regime can remain in power after the massive introduction of PCs, diskettes, faxes and all sorts of new audio visual equipment. On the other hand, several new types of rule with a totalitarian flavours are conceivable using this new technology, as one of its capacities is to enable central management, surveillance and control.⁶

Contribution of blogs and other social media to the political process may be a more subtle one. Generally participating in online social media, introduce changes in the persons themselves. New media introduce important changes in the ways in which our identities and subjectivities are constructed. Often these changes are associated with political changes. For politicians and political parties, the new media seen as a great opportunity to communicate directly with potential voters. Political parties seek to develop a disintermediated relationship with citizens, in which they have more control and in which they do not need the media to put their message across. Revolution that have been credited to social media have now collapsed into civil war or dictatorship. On the other hand it may be that the new media introduced subtle changes that may shape the political process in the years to come. For sure, there is a greater demand for accountability, as political actions and statements are scrutinized in social media.⁷

To attribute spin to changes in media technology is to belie a history of attempts to manage messages and create a favourable impression in the eyes of the public (the essence of spin). In this sense, manipulation is not a new phenomenon for governmental politics. Nor is it simply a phenomenon triggered by increasing capacity to manage new media forms. While Technology may advanced, underlying these changes is a set of ideals and processes which influences how such technologies are put to use. The ancient Greeks recognises the importance of persuasion in politics and the power of rhetoric. But it was Machiavelli who linked the art of persuasion and the nature of political leadership with the recognition that this necessarily involve manipulation.⁸

To draw support from the public all political parties relied on the use of mass-media for public communication during election campaign. When the political parties and candidates directly connect with potential voters through social media, and give them the option to 'like' the posts and 'comment' on messages and pictures in an interactive manner, it creates an element of personalization.⁹ Communications multi-tasking has become a natural states of affairs for many people in the world's middle class. The ability to simultaneously manage

multiple Technologies, multiple mediated torrents of information and emotion, and the local jumble of un-medicated persons and things makes up the overall complex of communication skills that life today requires. Today's expanded communication environments thus necessitate innovative and more Complex skills of cultural assembly and code switching. People navigate endless archipelagos of cultural representation, integrating fresh symbolic forms into familiar, local cultural routines and materials to create new culture formations, understandings, and activities. Developing such skills is not only a matter of acquiring new communication tools and literacies. It also requires cultivating a mentality and lifestyle that can accommodate the incessant, multi tributary flows.¹⁰

The boon in the economy and the massive expansion of print, television, and internet media have both fest and helped create a massive new appetite for information on society, economy and politics.¹¹ New technology in the form of offset printing and photo composition of type transformed these conditions.¹² Political modernization involves the rationalisation of authority, the differentiation of structures, and the expansion of political participation.¹³

Media communication and development has contributed a lot in this field. New technology is playing a vital role in shaping the society in which we are living. It is also having a significant impact in changing the nature and scope of news. The emergence of print media has impacted a lot for challenging the orthodox nature of society and explore an opportunity for the common people to obtain the information and knowledge in a significant manners. With the dawn of the digital era, the last two decades have witnessed an enormous growth in the volume of information exchanged across the world. This has provided impetus to the economic counterpart of information societies, often termed as 'knowledge economies', whereby information and knowledge are transacted to produce wealth. Regulation may be either positive or negative. It is positive when it intends to promote particular objectives like the development agenda of the state, and it is negative when it intends to block specific content for being undesirable in a given context. Both of these are the aspects of controlling the media.¹⁴

Today it is not an exaggeration that the new communication media has covered almost all the arena of social, economic and political life of the people rural as well as urban. Political parties often use the social media to highlight their programs of action, to implement their policies and for the propaganda for their programme of action during elections. With the use of Twitter, Facebook, Instagram and WhatsApp the political leaders try to woo the voters in their favour. The political parties and candidates thrive on the same tools and have started using the same strategy to reach out their voters. If the general public uses social media to express their liking for a particular political party or electoral

candidate, it can be a good indicator of their interest in politics generally and for a political party or candidate specifically.¹⁵

The use of internet and other social media of the people during elections indicates their interest through the kind of content they access. It is an indicator of their interest in the politics. The comments on social media, their liking and disliking are taken as an expression and interest in the political activities. To create and make an interest in the use of internet and social media it needs an enabling and favourable environment in any country to play an important role in encouraging political participation among people. Today the content of traditional media is influenced by the use of social media. The social media has changed the way of communication of the people about the politics.

In the last few years, social and political movements in India have found a new alley in new media including social media which is new buzz world in the circle of activists and social movements. It is claimed that new media, especially social media, has changed the rules of the game as it is playing a very crucial role in awakening, organising and mobilising people on the issues of public concern and inviting them to protest demonstrate on those causes.¹⁶ Of course, the people cannot entirely decide what is advertised to them or what products are offered to them by industries under the dominant influence of white, patriarchal capitalism. We can choose not to watch a television program or not to see a film, but we cannot choose what we want to watch on television or at the cinema¹⁷ in the era of new social media.

Different forms of mediated communication and interaction are so central to social life, if flows that different media throughout history have affected both how people relate to the world and the ways in which we have understood social transformations. Different media make it possible to carry out certain social actions, while disabling others. The media that we use will affect what we see, how we speak, and what we do.¹⁸ Thus media serves both way by engaging us as an instrument manipulated and deployed by the politicians for their benefit. It also provides a stage and an environment for the political leaders to play politics, and on the other hand media itself also have a different motive to fulfill. It may be concern with speaking truth to the people and exposing wrongdoing. Its aim is also to attract the audience to gain more and more profit. This complexity needs a densely structured and complex environment where consequences intended and unintended takes place to communicate wider ideas of politics and power structure. Be that politicians or media the focus is always on the elites and their actions. It is also a way and means of propaganda to encourage the masses what elites want to get. Public opinion, its identification and its opportunity for manipulation to achieve the ends of elites form a key strand of political communication analysis.¹⁹

Technology plays an important role in shaping the society in which we live in. It

is also able to shape our thinking of society and the way to know the society. It also significantly alter the nature of news around us. It also works as a messenger to carry out the message regarding the services provided to the people by the government. India has launched digital India program to ensure the knowledge and availability of the services to the people provided by the government. It also works as a platform to make people aware and give a chance to them in participating in governance through various means. It is also used by the government to provide information and invite suggestions from the citizens on various current and diverse issues. Means like Twitter, blogs, Whatsapp, Facebook are a means of connectivity between the people and the government to develop and create new ideas, suggestions and a way for development. Central as well as state department are also using it as a platform to share the data. If transparency is provided among people, government and media in the system the scope for corruption can be minimized.

References

1. Christian Fuchs, *Social Media A Critical Introduction*, Sage Publications India Pvt. Ltd., New Delhi, 2017, PP 6-7
2. Heather Savigny, *Political Communication A Critical Introduction*, Palgrave, London, 2017, P. 4
3. Linje Manyozo, *Media, Communication and Development-Three Approaches*, Sage Publications, India Pvt. Ltd., New Delhi, 2012, P.204
4. Dan Laughey, *Key Themes in Media Theory*, Rawat Publications, Jaipur, 2008, PP. 123, 127
5. Awais Saleem and Stephen D. Mc Dowell, *Social Media and Indian Politics in the global context: Promise and Implications*, in Sunetra Sen Narayan and Shalini Narayanan (ed.), *India Connected- Mapping the Impact of New Media*, Sage Publications, New Delhi, 2016, PP 80-81
6. Jan Van Dijk, *The Network Society*, Sage Publications India Pvt. Ltd., New Delhi, 2012, PP 104-105
7. Eugenia Siapera, *Understanding New Media*, Sage Publications India Pvt. Ltd., New Delhi, 2018, PP 61, 257
8. Heather Savigny, *Political Communication A Critical Introduction*, Palgrave, London, 2017, P. 72
9. Awais Saleem and Stephen D. Mc Dowell, *Social Media and Indian Politics in the global context: Promise and Implications*, in Sunetra Sen Narayan and Shalini Narayanan (ed.), *India Connected- Mapping the Impact of New Media*, Sage Publications, New Delhi, 2016, P. 91
10. James Lull, *Media, Communication, Culture A Global Approach*, Rawat Publications, Jaipur, 2003, P. 266

11. Steven I. Wilkinson, Data and the Study of Indian Politics, in Niraja Gopal Jayal and Pratap Bhanu Mehta (ed.), *The Oxford Companion to Politics in India*, Oxford University Press, New Delhi, 2019, P. 587
12. Robin Jeffrey, Media and Modernity- Communications, Women, and the State in India, Permanent Black, 'Himalyana' Mall Road, Ranikhet Cantt, Ranikhet, 2010, P.171
13. S.P. Huntington, Political Order in Changing Societies, Adarsh Enterprises, New Delhi, 2017, P.93
14. Vikram Aditya Narayan and Raka Arya, Regulation of New Media: The Indian Scenario in Sunetra Sen Narayan and Shalini Narayanan (ed.), *India Connected- Mapping the Impact of New Media*, Sage Publications, New Delhi, 2016, PP 143, 146
15. Awais Saleem and Stephen D. Mc Dowell, Social Media and Indian Politics in the global context: Promise and Implications, in Sunetra Sen Narayan and Shalini Narayanan (ed.), *India Connected- Mapping the Impact of New Media*, Sage Publications, New Delhi, 2016, P.93
16. Shalini Narayanan and Anand Pradhan, New Media and Social-Political Movements, in Sunetra Sen Narayan and Shalini Narayanan (ed.), *India Connected- Mapping the Impact of New Media*, Sage Publications, New Delhi, 2016, P. 107
17. Dan Laughy, Key Themes in Media Theory, Rawat Publications, Jaipur, 2008, P. 170
18. Simon Lindgren, Digital Media and Society, Sage Publications India Pvt. Ltd., New Delhi, 2017, P, 290
19. Heather Savigny, Political Communication A Critical Introduction, Palgrave, London, 2017, P. 11

National Rural Livelihood Mission in Himachal Pradesh: A Study of Development Block Sadar Mandi

Baldev Sing Negi

Sandeep Thakur

Abstract

Deendyal Antodaya Yojana-National Rural Livelihood mission popularly known as DAY-NRLM took its present shape and started its journey after the recommendations of Hashim Committee (1997), which was constituted by then planning commission to review and rationalize various centrally sponsored schemes for poverty alleviation and employment generation. The prime suggestion of the report formed the basis for shifting from an individual beneficiary approach to a group-based approach for poverty alleviation and based on the recommendations of the Planning Commission, the schemes of Training of Rural Youth for Self-Employment (TRYSEM, 1979), Supply of Improved Toolkits to Rural Artisans (SITRA, 1992), Ganga Kalyan Yojana (GKY, 1997), Development of Women & Children in Rural Areas (DWCRA, 1982-83), and Million Wells Scheme (MWS) were merged into a single self-employment programme namely Swarnjayanti Gram Swarozgar Yojana (SGSY), to be implemented by the states, with effect from April, 1999. The SGSY was further converted in to Deendyal Antodaya Yojana-National Rural Livelihood Mission (DAY-NRLM) when Government of India constituted another Committee to examine the various aspects of implementation of the scheme under Prof. R. Radhakrishna and recommended adoption of 'Livelihoods Approach' to rural poverty elimination. In this backdrop the DAY-NRLM has been started in the year 2013 in its full strength. The present paper is an effort to examine its implementation in a North Western State i.e. Himachal Pradesh on the basis of secondary sources and then after highlighting challenges has explored some opportunities as well.

Keyword: Deendyal Antodaya Yojana-National Rural Livelihood Mission,

State Rural Livelihood Mission Himachal Pradesh, performance

1.1 Introduction

India is a country which is basically rural in nature and the bulk of the population live in rural areas. About 68.84 per cent of the total population lives in rural areas. India is home of one-third (1.2 billion) of the extreme poor of this world, followed by China, Nigeria, Bangladesh and Democratic Republic of the Congo (DRC) and around 25 percent of the world's poor live in India. They have very limited access to education, health, communication and other amenities of life. But a nation cannot achieve all round development unless its villages are developed. Thus, the development of rural areas is crucial to the process of development of India. Rural Development is a multidimensional concept which covers all the various aspects of life. Rural development means overall development of rural areas which ultimately improve the quality of life of rural people. It aims at both the economic betterment of people as well as greater social transformation by providing opportunities to the rural masses to improve their income and generate employment.

However, India has been a welfare state ever since her independence and the primary objective of all the governmental schemes is welfare oriented. In this context, planning has occupied a significant place. Since independence policies and programmes of the different five years plans have been designed with the aim of alleviation of rural poverty. It was also realized that a sustainable strategy of poverty alleviation has to be based on increasing the productive employment opportunities in the process of growth itself. In addition to this, rural people should provide better prospects for economic development. Along with this, there should be decentralization of planning, better enforcement of land reforms and greater access to credit for the rural poor people.

The Government has been, since country's independence, formulating policies, programs, projects and schemes and investing significant financial resources through every Five Year Plan to accelerate the rural development. All these programs and schemes being implemented by the concerned ministries and departments of the union and state governments in the area of education, health, drinking water, sanitation, transport and communication and supporting infrastructure, among others, have shown varying degree of response and performance at the grassroots level, and of course, much less than expected in respect of measureable indicators of human development index.

1.2 Evolution of DAY-NRLM

Integrated Rural Development Programme (IRDP) was the first major self-employment programme sponsored and funded by the Government of India (GoI) that commenced in 1978–1979 and was under implementation till 31st

March, 1999. The programme aimed at providing assistance to the beneficiaries under the Below Poverty Line (BPL) category, in the form of bank credit and subsidy so as to help them take up sustainable self-employment activities. With the objective of further strengthening the IRDP, a few allied/sub programmes were also launched. The scheme for Training of Rural Youth for Self-Employment (TRYSEM), (started in August, 1979) was intended to meet the training requirements of the people who were selected and assisted under the IRDP. There was a programme to focus particularly on the rural poor women namely Development of Women & Children in Rural Areas (DWCRA, started in 1982–1983). Another sub-scheme, namely Supply of Improved Toolkits to Rural Artisans (SITRA, started in July, 1992) was introduced to modernize and improve the efficiency and productivity of the poor rural artisans. In order to focus on the land-based activities, particularly irrigation requirement of the small and marginal farmers another sub-scheme known as Ganga Kalyan Yojana (GKY) was implemented during 1996– 1997. The GKY, however, had some operational problems in its implementation and it was discontinued with effect from 1998–1999.

The Planning Commission set up a committee under the chairmanship of Prof. S. R. Hashim in 1997, to review and rationalize various centrally sponsored schemes for poverty alleviation and employment generation. The report formed the basis for shifting from an individual beneficiary approach to a group-based approach for poverty alleviation. Based on the recommendations of the Planning Commission, the schemes of TRYSEM, SITRA, GKY, DWCRA and Million Wells Scheme (MWS) were merged into a single self-employment programme namely Swarnjayanti Gram Swarozgar Yojana (SGSY), to be implemented by the states, with effect from April, 1999. SGSY moved back from the individual oriented approach of the earlier programmes like the IRDP to an institution-based approach, with Self Help Groups (SHGs) of rural Below Poverty Line (BPL) families as the unit of assistance. Although need for institutions of people was understood at the implementation level, focus remained limited to the structural orientation of these SHGs.

1.3 NRLM/SRLM in Himachal Pradesh

In Himachal Pradesh, HP State Rural Livelihood Mission (HPSRLM) has been launched w.e.f. 1st April, 2013. The Government of India expected that NRLM would reach out to all Districts and Blocks of the State by the end of 2020-2021 in a phased manner. Initially, as per the guidelines of GOI, the strategy of Intensive and Non-intensive Blocks has been adopted. At present, resource blocks strategy is being implemented in Development Block Haroli in District Una and development Block Basantpur in District Shimla of the State. Besides this, 3

Development Blocks viz. Kandaghat (Solan), Mandi Sadar (Mandi) and Nurpur (Kangra), have been selected as “Intensive Blocks” in the first phase of NRLM implementation. The remaining 'Non- intensive Blocks' would be covered in a phased manner subsequently. In 2nd and 3rd phase total intensive blocks are 32. In the state, District of Shimla and Mandi (In 2nd phase Una and Kangra are also under in Category-1) have been selected in the category-I where additional interest subvention of 3% will be available to all women SHGs whereas, in the remaining 10 Districts all the NRLM compliant SHGs irrespective of the agencies which have formed them will be eligible for the interest subvention of 7%. The effective rate of interest for women SHGs in category 1 district will be 4% and in II category districts it will be 7% but it would be applicable only to those WSHGs which are prompt in their repayment. Based on NRLM core belief that poor have innate capabilities and strong desire to come out of poverty, it aims to reduce poverty by enabling the poor households to access gainful self employment and skilled wage employment opportunities resulting in appreciable improvement in their livelihoods on a sustainable basis, through building strong and sustainable grass root institutions of the poor i.e. SHGs and their federations for which NRLM will provide dedicated & sensitive support structure for building their capacities, enabling them access to finance and other livelihood resources, skilling the unemployed rural poor youths for providing employment or self employment / micro- enterprise opportunities and making the institutions of poor strong so that this programme of the poor become the programme by the poor. NRLM is being implemented in Himachal Pradesh since April, 2013 through intensive approach strategy at least one-woman member from each identified rural poor household is to be brought under the Self-help Group (SHG) network in a time bound manner. The beneficiaries, i.e. target groups, are identified through the Participatory Identification of Poor (PIP) method. DAY-NRLM provides Revolving Fund (RF) and Community Investment Fund (CIF) as resources in perpetuity to the institutions of the poor, to strengthen their institutional and financial management capacity and build their track record to attract mainstream bank finance. It has to be admitted that SHG is a right approach to address the issues of rural women particularly who live below the poverty line.

1.4 Organisation Structure of State Rural Livelihood Mission

There is well structured organisation for the implementation of NRLM in the state with the coordination of DRDA at district level and BDO at block levels.



1.5 Performance of NRLM/SRLM in Himachal Pradesh

Institution building is the prime concern under NRLM, the poor are mobilized into Self-help Groups (SHGs) then these SHGs are to be federated at the village and higher levels such as cluster, block/sub-district and district. The existing institutions of the poor are strengthened and integrated into the institutional architecture of the poor. Members organized under different SHGs are trained to manage their institutions, linking up with markets, managing their existing livelihoods, enhancing their credit absorption capacity and credit worthiness, etc.

There are 80 Development Blocks in Himachal Pradesh and SHG's entry has started in all the blocks. Each SHG consists of 10-15 women, they are homogenous groups, with the members belonging to the same community and living in the vicinity of each other. SHGs of vulnerable persons such as PwDs, elderly, etc. may consist of both women and men. Their size may also be smaller (5-15). NRLM adhere to the Panchasutra – *regular weekly meetings, regular weekly savings, regular inter-lending, regular repayment and regular weekly bookkeeping* at SHGs level. The profile of SHGs in the state is as under:

Table: 1 Self Help Groups Profile of Himachal Pradesh under SRLM

| Sr. No. | SHGs Profile | Number | Percent |
|---------|----------------------------------|--------|---------|
| 1. | Total Blocks | 80 | - |
| 2. | Total SHGs | 15721 | - |
| 3. | SHGs (Members count less than 5) | 995 | 6.3 |
| 4. | SC SHGs | 5056 | 32.2 |
| 5. | ST SHGs | 725 | 4.6 |
| 6. | Minority SHGs | 240 | 1.5 |
| 7. | Other SHGs | 8920 | 56.7 |
| 8. | PWD | 1274 | 8.1 |
| Total | | 15721 | |

Table depicts that there are total 15721 self help groups formed under SRLM in the state across the 80 Development Blocks. Among them there were 6.3 per cent of groups having less than five members. However, as per the provision there could be 10-15 members. Further this table also shows the social background of these groups by bifurcating the information that among all SHGs there were 32.2 percent from Schedule Caste, 4.6 per cent from Schedule Tribe and 1.5 per cent from minority communities. It also gives the information that the more than fifty i.e. 56.7 per cent SHGs belongs to others means the general categories of groups and small but significant percentage i.e. 8.1 per cent SHGs belongs to the *divyang* category.

There is a provision under SRLM that after the formation of SHG, within three months the group has to open the bank account by a resolution in its meeting. Mission staff helps them in completing the formalities to open the bank accounts. Presidents and Secretaries of the SHGs are authorised as signatory and further transactions. The status of SHGs with or without bank account is as given in the next table.

Table: 2 SHGs with and without Bank Account under SRLM in Himachal Pradesh

| Sr. No. | Status | Total No. SHGs | Percent |
|---------|------------------------|----------------|---------|
| 1. | Having No Bank Account | 2587 | 16.5 |
| 2. | Having Bank Account | 13134 | 83.5 |
| | Total | 15721 | 100 |

Table shows that out of total 15721 SHGs, there are 13134 SHGs having bank account which constitutes around 83.5 percent. However, a significant number of SHGs around 2587 SHGs (16.5 per cent) were without bank account.

There is provision in the SRLM; Village Organization (VO) is a federation of SHGs at village or Panchayat level (depending on the number of SHGs). All the SHGs which are following Panchsutra are members of the VO. The VO consists

of a General body (there may be a Representative General Body), and an Executive Committee.

**Table: 3 Village Organization Formations
under SRLM in Himachal Pradesh**

| Sr No. | Particular | Total Number of VO/ First Level Federation |
|--------|-----------------------------|--|
| 1. | Promotion of SHG Federation | 253 |

In Himachal Pradesh under SRLM there are 253 Village Organisations formed under promotion of Self-Help Group Federation.

There is provision of different funds to be provided to the SHGs directly or indirectly its formation, strengthening and investment such as start-up fund, revolving fund and community investment fund. A Revolving Fund is provided to the eligible SHGs as an incentive to inculcate the habit of thrift. These savings are then used to meet their credit needs in the long-run and immediate consumption needs in the short-run. The fund is used to meet the credit needs of the members and can also be used as security for repeat bank finance. The Mission gives our SHGs one instalment of CIF before the CLF/VO is formed. SHGs that have completed six months and have developed Micro Credit Plans (MCPs) are eligible to receive the first instalment CIF.

Table: 4 Fund Disbursements to CBOs under SRLM in Himachal Pradesh

| Sr No. | Particular | Start-up fund | | Revolving Fund | | Community Investment fund | |
|--------|---------------------------|---------------|---------------|----------------|---------------|---------------------------|---------------|
| | | No. | Amount (Lakh) | No. | Amount (Lakh) | No. | Amount (Lakh) |
| 1. | Fund Disbursement to SHGs | 691 | 20.00 | 2699 | 554.81 | 313 | 199.60 |
| 2. | Fund Disbursement to Vos | 48 | 21.45 | 0 | 0 | 73 | 283.44 |

There were 691 Self Help Groups and 48 Village Organisations who have availed the amount 20.00 and 21.45 lakh as start up fund. The revolving funds have been received by 2699 SHGs amounting rupees 554.81 lakh. However, 313 SHGs have received Community Investment Fund around rupees 199.60 lakh, as well as 73 VOs directly received Community Investment Fund around rupees 283.44 lakh.

1.6 Status of Development Block Sadar, District Mandi-(w.e.f. 1st April 2013- to 31st March 2019)

Sadar Block Mandi was among the five development blocks selected under

SRLM in the year 2013. Since then this block has performed comparatively good. The brief performance of Development Block Sadar Mandi is as under:

Table: 5 Block Indicators under SRLM in Sadar, Mandi

| Sr. No | Indicator | Achievements |
|--------|---------------------------------------|------------------------|
| 1. | Total number of SHG under NRLM Fold | 876 |
| 2. | Household covered | 7292 |
| 3. | Village Organization Formed | 62 |
| 4. | Cluster Formed | 01 |
| 5. | Credit Mobilization (Via Bank Loan) | 5 cr* |
| 6. | Revolving fund Disbursed | 51.45 lakh to 411 SHGs |
| 7. | Community Investment Fund | 73.95 lakh to 27 VOs |
| 8. | Community Resource Person Trained | 38 |
| 9. | Block Resource Person Trained | 12 |
| 10. | Participatory Resource Person Trained | 4 |
| 11. | E-CRPs Trained | 2 |

There were total 876 SHGs formed under SRLM since 2013 in which 7292 households were covered, these SHGs were further formed in 62 Village Organisations. Total credit mobilised by SHGs were more than 5 crores. Rupees 51.45 lakh revolving fund have been disbursed among 411 SHGs. Out of 62 Villages Organisations, 27 have utilised Rs. 73.95 lakhs of community investment fund for their different activities.

1.7 Livelihood promotion strategies –a case study of Development Block Sadar Mandi

As per the strategy in first three-year Development Block Sadar under SRLM had concentrated on promotion and strengthening existing livelihood activities through convergence, bank linkage, capacity building and institution building for creation of potential social capital for implementation of livelihood intervention and achieves sustainability. Under the Livelihood implementation strategy following activities has been promoted by Development Block Sadar:

Table: 6 Activities promoted under SLRM in Sadar, Mandi

| Sr No. | Activities | Participation (2017-218) | Impacts |
|--------|--|---|---|
| 1. | Participation in SARAS fairs for promotion and marketing of rural product at different places. | 25 SHGs (across India) | Exposure, Promotion to build-up market knowledge, value creation for product value chain creation |
| 2. | Participation in Red Cross fairs and district level fairs, exhibition and sales | 18 SHGs participated at different Places | Exposure, Promotion to build-up market knowledge, value creation for product value chain creation, brings down consumer and producer gap. |
| 3. | Trainings programme through RSETI & line department | <ul style="list-style-type: none"> ➤ 59 SHGs trained through RSETI in different trades, through training camps they are making various products such as <i>woollen caps, mufflers, gloves, sweater, coat, shawl</i> etc ➤ 37 SHGs trained through Aachar Chatni entrepreneur. ➤ 54 active women trained in Block level. ➤ 22 SHGs trained for Mushroom Cultivation through Himalayan Research Institute Shimla. | To help beneficiaries become self-reliant entrepreneurs and become a decisive force by enhancing their vocational skills through comprehensive training via simultaneous earning. |
| 4. | Daily Haat | Every Saturday, in Seri Manch Mandi, products sold that are popular among the people. The people of this area have placed | Marketing Platform for Rural poor |
| 5. | Convergence with Tourism Department | A Sale counter provided for SHG at Hotel Tourist INN Rewalser, under Himachal Pradesh tourism development Corporation. | Exploring new ventures for marketing. |

The main focus of Development Block Sadar Mandi under SRLM is on livelihood sustainability by providing demand-based training to SHGs through line departments on various aspects such as Handicrafts, RSETI & Apiculture etc. In this block the emphasis is also being laid on Branding and Packaging of existing products made by SHGs because many groups are doing remarkable works by making many things. It would be a great help to these groups as SRLM could do some efforts to provide market venture by Gramin bhandhar/Rural Haat (rural stores) and tie up with online market. With the use of ICT, these SHGs can increase their profit and gain popularity by expanding their market from local to global.

1.8 Conclusion

It can be concluded that the conventional livelihood strategies being followed by the people of the State are highly vulnerable to the suffering from tough mountainous terrain, highly fragile environment and erratic behaviour of the weather, especially in high hills. Difficult climatic conditions, geographical conditions and small market size make large scale application of production technology difficult. High cost of creating and maintaining physical infrastructure act as constraints which result in high transportation costs and prolonged transit period in movement of various goods. Further, the SHGs formation is not a new concept but under NRLM there are scientific provisions for making these groups active and inclusive for livelihood generation. The formation of SHGs, VO's and Clusters are just a preliminary task of institutions building that has already been done in Development Block Mandi and other block selected in the initial stage of this programme. Further, the focus is to keep these groups active by using start-up, revolving fund and then by using community investment funds. Making these SHGs independent and able to repay the loan and SHGs business profitable for sustainable livelihood generation is important task. Identification of activities for the production of local goods based on locally available raw material and if required providing the demand-based training to the members of SHGs is important.

References:

- Census of India, 2011, http://censusindia.gov.in/2011-prov-results/paper2/data_files/india/Rural_Urban_2011.pdf retrieved on 14/05/2019
- Status of NRLM Implementation in Himachal Pradesh <http://hprural.nic.in/ppp5.pdf> retrieved on 15/05/2019
- <http://www.nrlm.gov.in>
- Institute of Rural Management Anand, Independent Assessment of Design, Strategies and Impacts of DAY-NRLM, 2017. https://rural.nic.in/sites/default/files/IRMA-NRLM_Web.pdf retrieved on dated 12/05/2019
- Kalkoti, Gopal, Accelerating Pace of Rural Development— Some Critical Aspects for Success, Kurukshetra February 2014

http://yojana.gov.in/Recent_archive_english/February-14.pdf retrieved on 15/05/2019

Khan, Radha, Negi, Ruchika and Sarkar, Ritwik, Social Observatory for Livelihood Projects, The World Bank, A Case-Study of the National Rural Livelihoods Mission's Resource Block Strategy,

<http://pubdocs.worldbank.org/en/707621477331600197/NRLP-Resource-Block-Study.pdf> dated: 15/05/2019.

Kumar, Kavita & Sharma, Vijay Kumar, Progress of SHG formation under NRLM in Himachal Pradesh, International Journal of Research, e-ISSN: 2348-6848 p-ISSN: 2348-795X Volume 05 Issue 12 April 2018, file:///C:/Users/admin/Downloads/13529-13557-1-PB.pdf retrieved on 15/05/2019.

National Rural Livelihoods Mission, Briefing Book, Ministry of Rural Development Government of India, December, 2012

<http://drdakangra.com/guidelines/Briefing%20book%20NRLM.pdf> retrieved on 15/05/2019

Roy, Jayashree, IRDP to NRLM: A Brief Review of Rural Development Initiatives in India, International Journal of Humanities and Social Science Invention ISSN (Online): 2319 – 7722, ISSN (Print): 2319 – 7714 www.ijhssi.org Volume 3 Issue 4 April. 2014) PP.05-08

<https://pdfs.semanticscholar.org/ae02/ffee8d432bacb601f07d6f98cd361b323bf6.pdf> retrieved on dated: 15/05/2019

Singh, Vikram, Promotion of Sustainable livelihood through Skill Development among Rural Youth : Role of Micro-finance in Developmental paradigm, Journal of Economic & Social Development, Vol. - XII, No. 1, June 2016 ISSN 0973 - 886X <http://iesd.org.in/jesd/Journal%20pdf/2016-XII-1%20Promotion%20of%20Sustainable%20livelihood%20through%20Skill%20Development%20among%20Rural%20Youth%20Role%20of%20Micro-finance%20in%20Developmental%20pa~1.pdf> retrieved on 14/05/2019

Sundaram, A. Impact of Self-help Group in Socio-economic development of India, IOSR Journal Of Humanities And Social Science (JHSS) ISSN: 2279-0837, ISBN: 2279-0845. Volume 5, Issue 1 (Nov. - Dec. 2012), PP 20-27

Www.Iostjournals.Org

<https://pdfs.semanticscholar.org/f27e/e7d81e6bb4c88582ebd28665e31ca5b8b70b.pdf> dated: 15/05/2019

United Nation, The Millennium Development Goals Report 2014,

<https://www.un.org/millenniumgoals/2014%20MDG%20report/MDG%202014%20English%20web.pdf> retrieved on dated 15/05/2019

United Nations Development Programmes, November, 2013 The Challenges of implementation and capacity building,

https://aajeevika.gov.in/sites/default/files/nrlp_repository/The%20Challenge%20of%20implementation_0.pdf retrieved on 14/05/2019

Perceptions of Government Senior Secondary School Teachers Towards in-service Training: A Study of Hamirpur District of Himachal Pradesh

Sunil Kumar

Abstract

IN-SERVICE teacher education is a programmed, systematized, attentive, needful and scientific planning with a definite purpose in view. It is a continuous process which contributes to the behavioural changes of teachers in terms of acquisition of knowledge and insights, development of right attitudes and interests. This study is an attempt to investigate the views of Trained Graduate Teachers (TGTs) and Post Graduate Teachers (PGTs) which were selected from Hamirpur district of Himachal Pradesh and for this questionnaire was also developed by the investigator himself. It was found that the investigated teachers were aware about in-service training and it is mandatory for teachers to attend. The teachers were not provided training to use modern teaching technology and they had counted the difficulties of training as well as had given suggestions for organizing in-service training in a better way.

Key Words: In-service Training, Teachers, Difficulties, Suggestions.

INTRODUCTION:

Teachers are a nation's great assets. It is the quality of teachers on which the population of a country mainly depends for excellence. Teachers' credibility depends on how they take up the rights and responsibilities, which are associated with the position. Teachers' education programmes are designed to prepare effective teachers by providing theoretical awareness of teaching and developing teaching competency and teaching ability. Tagore has aptly said, "A lamp can never light another lamp unless it continues to burn its own flame; a teacher can never truly teach unless he is still learning himself." In-service

teacher education refers to the education a teacher receives after he has entered the teaching profession. It includes all the programmes, educational, social and others, in which the teacher plays a vital role, all the extra education which he receives at different institutions by way of refresher and other professional courses, and all the travel and visits which he undertakes. All these things enlarge his experience and vision. In-service training is the term used to describe a set of activities and requirements generally falling under the heading of professional development. It is an organized effort to improve the performance of all personnel already holding assigned positions in a school setting to implement a specified innovation or programme.

In-service education is not the responsibility of the teacher alone. It is a cooperative enterprise. It has to be promoted by several agencies. These agencies are schools, teachers' college, governments' and teachers' organizations. Self development of professional competencies by individual teacher has a large part to play in in-service teacher growth.

LITERATURE REVIEW:

Sharma (1989) discusses that teacher education programmes and practice could not prepare effective teachers. One of the main reasons is that in planning the syllabus of Teacher education, main emphasis is given to psychological foundations which do not help in preparing effective-teachers. Teacher must know the teaching acts and acquire teaching competencies rather than understanding of learn-in theories. This book is an attempt to suggest a core programme for prospective teachers. Under this book efforts are made to include all those concepts, innovations, practices and research which would assist the teacher to develop the competencies to bring the excellence in his job. This book includes 19 chapters. In-service education, current trends, innovative practices instructional designs, devices for modification of teacher –behavior and researches on teacher education have been discussed.

Garg (2000) advocates that the teacher education holds the key position not in the educational system only but also in developing the social system in that particular country. India is no exception to this fundamental principle. The great responsibility goes for this great task to the teachers themselves on one hand and on their education on the other hand which is more important than any other national task. The compilation in this book is an effort to arouse the conscious of the teacher educators who are working in the colleges of education in our country. This book has revealed the ground realities of the professional preparedness.

Sarita (2004) that a teacher's role in a society is one of tremendous responsibility and importance. If a child is future, and a teacher gave shape to future; in such

circumstances, teacher education becomes important. It is a process that needs elaborate planning followed by action. Training of teachers today has assumed more importance than even before. It has become a continuous process that goes on even during the service period of a teacher. This book discusses different dimension of varied importance connected with teacher training. Coordination among different teachers is one such dimension which has great importance and has not been emphasised much in the past. This book, being highly information, should serve on an important references tool for teachers, educators and policy planners.

Kothari et al. (2009) in, "Teacher Education Programme at Secondary Level: Some Issues" critically evaluates the Secondary Teacher Education Programme in the country. According to them the present state of secondary teacher education in the country presents a mixed picture of far-sighted intentions and innovations coupled with learning distortions and structural shortcomings. Looking back, from past to present it appeared that although, nomenclature has undergone a change from 'training to education', the system by and large remained unchanged. Moreover it was also found that practice teaching programme was far from satisfactory. There was no integration among pre-primary, primary and secondary teacher education institutions. It was suggested that an association of teacher education institutions and teacher educators at State / National level should be established.

Piwowar et al. (2013) examine the effectiveness of a training program for In-service secondary school teachers in classroom management. In a non-randomized pre-post-design, 19 teachers participated in a newly developed training (the intervention group) and 18 teachers participated in a control training (the control group). All participants reported better knowledge of classroom management after training. However, hypothesized positive effects on teachers' competencies and increased student engagement occurred only in the intervention group. These findings are supported by participants' reported high subjective validity of the training. Further research is needed to study sustainability of the observed effects.

Jain et al. (2018) this volume examine how the public and private domains in school education in india are informed and mediated by current market realities. It moves beyond the simplistic dichotomy of pro-state versus pro-market factors that define most current debates in the formulations of educational reform agendas to underline how they need to be interpreted in the larger context. This book in rich in primary data and supported by detailed case studies, this volume will be of interest of teachers, scholars and researchers dealing with education, educational policy, school education and public policy. It will also interest policy

markets, think tanks and civil society organizations.

OBJECTIVES

- 1) To study the In-service Teachers' Education in Government Sr. Sec. Schools.
- 2) To study the perceptions of Teachers with regards to in-service training.
- 3) To suggest measures for the improvement of HRD practices at various levels on the bases of the suggestion given by the teachers for organizing in-service teacher training in an effective way.

METHOD

Descriptive Survey Method of research has been used for this study.

• SAMPLE

150 In-Service School Teachers were selected from 30 Government Senior Secondary Schools of Hamirpur district of Himachal Pradesh.

• Tools Used

The researcher himself developed the questionnaire for in-service teachers.

• Statistical Technique Used

The tabulated data was analyzed in terms of percentage method.

ANALYSIS

Ages of Senior Secondary Schools Teachers: Ages of In- Service Senior Secondary School Teachers are represented in table 5.1 as:

Table 5.1 Ages of Teachers

N=150

| Sr. No. | Age(in years) | Number of Respondents | Percentage |
|---------|---------------|-----------------------|------------|
| 1 | 21-30 | 14 | 09.33 |
| 2 | 30-40 | 46 | 30.66 |
| 3 | 40-50 | 73 | 48.66 |
| 4 | 50 and above | 17 | 11.33 |

Data in table 5.1 depicts that 14 teachers (9.33 percent) were from the age group of 21-30 years, 46 teachers fall in the 30-40 group, the maximum number of teachers 73(48.66 percent) were from 40-50 age group and 17 teachers were more than 50 years of age.

5.2 Qualification of Teachers: Academic qualification of in- service Teachers is represented in table 5.2 as:

Table 5.2
Qualification of Teachers

| Sr. No. | Qualification | Number of Respondents | Percentage |
|---------|---------------|-----------------------|------------|
| 1 | B.A. B.Ed. | 18 | 12.00 |
| 2 | B.Sc. B.Ed. | 22 | 14.66 |
| 3 | M.A., B.Ed. | 39 | 26.00 |
| 4 | M.Sc., B.Ed. | 31 | 20.66 |
| 5 | M.Com., B.Ed. | 30 | 20.00 |
| 6 | Any Other | 10 | 06.60 |

It is pertinent from the analysis of the above table 5.2 that 18 teachers (12 percent) had B.A. B.Ed. degree, 22 teachers (14.66 percent) had qualification B.Sc. B.Ed., the maximum number i.e. 39 teachers (26 percent) had M.A., B.Ed. followed by 31 teachers who had M.Sc., B.Ed. qualification, 30 teachers (20percent) had M.Com., B.Ed.;10 teachers had higher degrees irrespective of above mentioned qualification.

5.3 Teaching Experience: Teaching Experience of Teachers is given in table 5.3:

Table 5.3
Teaching Experience

| Sr. No. | In Years | Number of Respondents | Percentage |
|---------|--------------|-----------------------|------------|
| 1 | 01-10 | 27 | 18.00 |
| 2 | 10-20 | 66 | 44.00 |
| 3 | 20 and above | 57 | 38.00 |

Table 5.3 indicates that 27 teachers had 01-10 years of teaching experience, the maximum no. of teachers 66 had 10-20 years of teaching experience and 57 teachers had more than 20 years experience as teachers in Government Schools.

5.4 Nature of recruitment: The nature of recruitment of in- service teachers is represented in table 5.4 as:

Table 5.4
Nature of recruitment

| Sr. No. | Recruitment | Number of Respondents | Percentage |
|---------|-------------|-----------------------|------------|
| 1 | Regular | 135 | 90.00 |
| 2 | Contract | 15 | 10.00 |

On the basis of data in table 5.4 it is found that maximum number of teachers i.e. 135 were working on regular basis while only 15 teachers were working on contract.

5.5 Nature of Selection: Nature of selection of in- service senior secondary school teachers is represented in table 5.5:

Table 5.5
Nature of Selection

| Sr. No. | Selection | Number of Respondents | Percentage |
|---------|-----------|-----------------------|------------|
| 1 | Promotion | 60 | 40.00 |
| 2 | Direct | 90 | 60.00 |

Table 5.5 reveals that 60 teachers were working at the present post by promotion while 90 teachers posted to the present post by direct examination conducted by HPSSSB/HPPSC as per the Govt. norms to TGT/PGT in schools.

5.6 Training Programmes Attended: Number of Training Programmes attended by Teachers (TGTs & PGTs) is tabulated in table 5.6 as:

Table 5.6
Training Programmes Attended

| Sr. No. | Sessions | Total Teachers |
|---------|----------|----------------|
| 1 | 2016-17 | 96 |
| 2 | 2017-18 | 114 |

Table 5.6 shows that 96 teachers had attended in-service teacher training programmes in the session 2016-17 this no. increased to 114 in the following session i.e. 2017-18.

5.7 Participation of Teachers in Different Training Programmes : The responses of Senior Secondary Schools teachers regarding their participation in different in-service training programmes for professional development are presented in table 5.7 as:

Table 5.7
Participation of Teachers in Different Training Programmes

| Sr. No. | Training Programmes | Number of Respondents | Percentage |
|---------|---------------------|-----------------------|------------|
| 1 | Seminar | 45 | 30.00 |
| 2 | Conference | 15 | 10.00 |
| 3 | Workshop | 55 | 36.67 |
| 4 | Refresher Course | 35 | 23.33 |

It is clear from table 5.7 that 45 teachers had attended Seminar, 15 teachers had attended Conferences, while the maximum number of teachers i.e. 55 had attended workshops and 35 teachers had attended refresher courses as a part of in-service training.

5.8 In-service Teacher training programmes are attended by Teachers at different levels:

Table 5.8
In-service Teacher training programmes are attended

| Sr. No. | At Level | Number of Respondents | Percentage |
|---------|------------|-----------------------|------------|
| 1 | DIET Level | 55 | 36.67 |
| 2 | BRC Level | 42 | 28.00 |
| 3 | SCERT/GCTE | 53 | 35.33 |

Table 5.8 indicates that 55 teachers had attended In-service training at DIET level, 42 teachers had attended In-service training at Block level and 53 teachers had attended In-service training at SCERT/GCTE level.

5.9 Attitude of Principal regarding participation in training programmes:

Table 5.9
Attitude of Principals for in-service training

| Sr. No. | Attitude of head | Number of Respondents | Percentage |
|---------|-------------------|-----------------------|------------|
| 1 | Very Co-operative | 90 | 60.00 |
| 2 | Co-operative | 60 | 40.00 |

It is pertinent from the analysis of the above table 5.9 that 90 teachers hold their head/ Principals very co-operative for relieving them to participate in training programmes whereas 60 teachers were of the view that their heads are co-operatives.

5.10 Benefits of in-service training: Benefits of in-service training are most important to teachers for the following reasons are given in table 5.10:

Table 5.10
Benefits of in-service training to teachers

| Sr. No. | Response of Teachers | Number of Respondents | Percentage |
|---------|---------------------------------------|-----------------------|------------|
| 1 | Meeting other teachers during courses | 14 | 09.33 |
| 2 | Visiting other places | 10 | 06.66 |
| 3 | Obtaining a higher qualification | 46 | 30.66 |
| 4 | Improving professional skills | 50 | 33.33 |
| 5 | Improving career prospects | 30 | 20.00 |

Table 5.10 reveals that 14 teachers counted meeting other teachers during as benefits of training, only 10 teachers preferred visiting other places, 46 teachers were in favour of obtaining higher qualification during in-service training and 30 teachers wanted to improve their career prospects by training whereas the maximum no. i.e. 50 teachers were of the view that in-service training helps in improving professional skills.

5.11 Satisfaction with the present system of in-service teacher training:

Table 5.11
Satisfied with the present system of in-service teacher training

| Sr. No. | Response of Teachers | Number of Respondents | Percentage |
|---------|----------------------|-----------------------|------------|
| 1 | Yes | 60 | 40.00 |
| 2 | No | 90 | 60.00 |

Table 5.11 shows that 60 teachers were satisfied with the present teacher training whereas 90 teachers were not satisfied with the present teacher training.

5.12 Preference for timing of in-service training: Preference for timing of in service training to be provided is resented in table 5.12 as:

Table 5.12
Preference of in-service training to be provided

| Sr. No. | Response of Teachers | Number of Respondents | Percentage |
|---------|------------------------|-----------------------|------------|
| 1 | During school holidays | 45 | 30.00 |
| 2 | After school time | 15 | 10.00 |
| 3 | During weekends | 35 | 23.33 |
| 4 | During school time | 55 | 36.66 |

It is evident from the analysis of above table 5.12 that 45 teachers had preferred school holidays for in-service training to be provided, 15 teachers were in favour of after school time, 35 teachers had ticked during weekends whereas the maximum no. of teachers i.e. 55 had preferred during school time for in-service training to be provided.

5.13 Venue Preference for training: Venues preference for in-service training by teachers is represented in table 5.13 as:

Table 5.13
Venues preference for in-service training

| Sr. No. | Response of Teachers | Number of Respondents | Percentage |
|---------|----------------------|-----------------------|------------|
| 1 | Your school | 66 | 44.00 |
| 2 | Local venues | 57 | 38.00 |
| 3 | Distant centre | 27 | 18.00 |

Table 5.13 depicts that the maximum no. of teachers had preferred their school as suitable venue for in-service training to be provided and 57 teachers had preferred local venues for in-service training whereas 27 teachers had preferred distant venues for in-service training to be provided.

5.14 Provided training for use of modern teaching technology:

Table 5.14
Provided training for use of modern teaching technology

| Sr. No. | Response of Teachers | Number of Respondents | Percentage |
|---------|----------------------|-----------------------|------------|
| 1 | Yes | 65 | 43.33 |
| 2 | No | 85 | 56.66 |

Table 5.14 depicts that 65 teachers had obtained training for use of modern teaching technology in their teaching while 85 teachers had not obtained training for use of modern teaching technology.

5.15 Difficulties of in-service training programmes:

Table 5.15
Difficulties

| Sr. No. | Difficulties of in-service training programmes | Number of Respondents | Percentage |
|---------|--|-----------------------|------------|
| 1 | Classes get affected | 50 | 33.33 |
| 2 | Trained resource persons are not available | 30 | 20.00 |
| 3 | Training during peak months/ days of studies | 15 | 10.00 |
| 4 | Longer duration of the training. | 12 | 08.00 |
| 5 | Obsolete technology used for training | 43 | 28.67 |

The Table 5.15 pointed out that 50 teachers (33.66 percent) were of the view that classes get affected, 30 teachers (20 percent) were in favour of trained resource persons are not available, 15 teachers (10 percent) gave their opinion that training during peak months/ days of studies affects the studies in schools, 12 teachers (8 percent) took longer duration of the training as a difficulty and 43 teachers (28.66 percent) thought that obsolete technology used for training the in-service teachers is a difficulty of in-service training programmes.

5.16 Suggestions for organizing the teacher training programmes in an effective way:

Table 5.16
Suggestions for organizing teacher training programmes

| Sr. No. | Suggestions for organizing the teacher training | Number of Respondents | Percentage |
|---------|---|-----------------------|------------|
| 1 | Training should be organized in the beginning of the session | 40 | 26.66 |
| 2 | Training programmes should be organized during vacations. | 25 | 16.66 |
| 3 | Trained resource persons/ trainers should be appointed | 30 | 20.00 |
| 4 | Emphasis on solving the problems faced by the teachers. | 20 | 13.33 |
| 5 | 1. Use of modern technologies should be involved in training. | 35 | 23.33 |

The table 5.16 shows the suggestions made by teachers for organizing the teacher training programmes in a better way. 40 teachers (26.66 percent) suggested that in-service training should be organized in the beginning of the session while 25 teachers (16.66 percent) thought that training programmes should be organized during vacations, 30 teachers (20 percent) opinioned that trained resource persons/ trainers should be appointed, 20 teachers (13.33 percent) laid emphasis on solving the problems faced by the teachers whereas 35 teachers (23.33 percent) advocated the use of modern technologies for organizing the teacher training programmes in a better way.

CONCLUSION:

The findings of the study suggest that the majority of teachers are from 40-50 age group, the maximum no. teachers had M.A., B.Ed. degree and majority of teachers had 10-20 years of teaching experience. The maximum number of teachers were working on regular basis and posted to the present post by direct examination conducted by HPSSSB/ HPPSC as per the Govt. norms to TGT/PGT in schools

All the teachers had participated in different In-service training programmes held at different levels. Although the teachers had admitted that that attitude of their heads was very co-operative while relieving them for training and they were benefited of in-service training but they were not satisfied with the present system of teacher training; maximum no. of teachers had preferred to during school timing and in their schools in-service training to be provided. The teachers responded strongly that they were not provided training for use of modern teaching technology.

The teachers were facing numerous difficulties due to in-service training and majority of the teachers reported that classes get affected because of unplanned training schedules and obsolete technology used for training the in-service teachers. To reduce the difficulties they had also suggested that training should be organized in the beginning of the session, trained resource persons should be organised and use of modern technologies should be involved in training. For organizing the teacher training programmes in a better way it can be concluded that training programmes should be organised nearby schools in the beginning of teaching session so that the classes don't get much disturbed and well trained resource persons should be appointed to teach in-service teachers with the use of modern technology.

REFERENCES:

- Sharma, R.A., (1989): Teacher Education: Theory, Practice and Research. International Publishing House, Meerut, UP, India.
- Garg, B.R., (2000): Issues in Teacher Education. The Indian Publishers, Ambala Cantt, India.
- Sarita, (2004): Teacher Education : Making Education Effective. Isha Publishers, New Delhi.
- Kothari, R.G. and Shelat, Prerana, (2009): Teacher Education Programme at Secondary Level: Some Issues. University News, AIU, New Delhi.
- Piwowar, Valentina, Thiel, Felicitas and Ophardt, Diemut, (2013): Training In-Service Teachers' Competencies in Classroom Management. Elsevier Ltd,

xxx, February 2013, 1-12.

Jain, Manish Mehendale, Archana, Mukhopadhyay, Rahul and Winch, Christopher, (2018): School Education in India: Market, State and Quality. Routledge Publication, New Delhi.

Importance of Value Education in Higher Education

Jai Parkash Sharma

Abstract

EDUCATION is considered as an instrumental factor to the development of human resource of a country. It should be transformed to the needs of the time and changing scenario of the world. It provides an opportunity to critically reflect upon the social, economic, cultural, moral and spiritual issues facing humanity. Since we have got independence we are facing challenges to establish a great and strong education system. Various governments come and gone. Off course they tried to establish new education policies in the system but this is very sad that they were not sufficient for our country. Still we are facing lot of problems and challenges in our higher Education System. These include inadequate infrastructure and facilities, large vacancies in faculty positions, low student enrolment rate, outdated teaching methods, declining research standards, unmotivated students, and overcrowded classrooms. In the last few years every individual, a parent, guardian, teacher, administrator or nation is concerned with the problem of student unrest i.e. participation of students in demonstrations, strikes, processions, mass meetings, walk outs, damaging laboratories and university properties, indulging in ragging like activities on campus. The younger generation's dissatisfaction and revolt is the outcome of a decaying system of values. **This paper focuses on the importance of value education of problems higher education is faced in it.**

KEY WORDS: Higher Education, Demonstrations, Issues, challenges, value education.

Introduction

Mankind is passing through a crisis. The tremendous emphasis on the scientific and mechanical ways of life is fast reducing man to the status of a machine. Moral and religious values are being undermined (Aneja,2014). The

fundamental principles of civilization are being ignored. Due to globalization various complex issues such as live- in relationship, same sex marriages, surrogacy etc, are posing great challenges to our society. Conflicts of ideas, manners and habits are pervading the atmosphere. Disregard for everything old is the fashion of the day. At this situation, the solution of all these social and global evil is through education.

Education is considered as an instrumental factor to the development of human resource of a country. The present status of higher education in India has witnessed tremendous expansion. Education is such a process to develop skills and inculcating values. The objective of ongoing education is to literate people. Present misdirected education system has adversely affected the education scenario in India as it deals with external world around us and not to the inner self of an individual. Instead of developing a person as a humane human being it is only directed towards superficial, surface level achievements (Chakraborty,2012). It is mainly designed for money making and not for man making and only promotes negative qualities like rivalry, hatred and jealousy instead of virtues like love, kindness and honesty. It should be transformed to the needs of the time and changing scenario of the world.

Since independence we are facing challenges to establish a great and strong education system. Various governments come and gone. Off course they tried to establish new education policies in the system but this is very sad that they were not sufficient for our country. Still we are facing lot of problems and challenges in our higher Education System. These include inadequate infrastructure and facilities, large vacancies in faculty positions, low student enrolment rate, outdated teaching methods, declining research standards, unmotivated students, and overcrowded classrooms.

In the last few years every individual, a parent, guardian, teacher, administrator or nation is concerned with the problem of student unrest i.e. participation of students in demonstrations, strikes, mass meetings, walk outs, damaging laboratories and university properties, indulging in ragging like activities on campus. These are the nationwide issues which emerged out of students' unrest. The younger generation's dissatisfaction and revolt is the outcome of a decaying system of values. Emphasis should be laid on such education through which moral values can be developed among the students so that they can conduct their life morally. They can decide what is right or wrong; what is good or evil; what is justice or injustice.

Education has become a business today. There is supposedly more 'education' now, but there is also more Corruption, more greed, more selfishness, more poverty and lack of sincerity and integrity. This has changed the outlook of the

students as well as the parents and it has further resulted in deterioration of respect for teachers and all those who are a part and parcel of education system.

Value Education: Need of the Hour

Swami Vivekananda said that education is the manifestation of the perfection already in man. The prime aim of education is to make a perfect man. To become a perfect man one should develop his physical and mental state. Swamiji believed in self-education. One should be a teacher of his own. Classroom teacher teaches the subjective matters but inner teacher teaches about self. Swamiji believed in positive education because negative thought weaken men (Chakraborty 2012). It is an essential thought in modern education in India. If we want to make a student a good human being, the development of moral values within him is the prior task of education. They are the foundation of human existence. They make our life meaningful. Due to dearth of values in the present generation the curriculum must give prominence to value education.

Education, Commission, 1964-66 rightly pointed out, saying, 'The destiny of India is being shaped in her classrooms' (Chahal 2015). In fact, classrooms are the places where the future citizens of the country are reared, trained, educated and motivated to accept the new challenges and to face the changing situations. "Indian higher education, has grown dramatically in the past more than six decades but this expansion has been largely unaffected by the many plans and proposals to guide it. At the same time that expansion has been the hallmark of higher education and systemic reforms have largely failed, there has been much change in Indian Higher Education of this change has been negative deteriorating standards for much of the system, student political activism, the like and there is little doubt that these characterizations are correct...." (Mishra 2006).

We have outstanding doctors who are in to organ robbery, brilliant engineers whose bridges collapses soon after their bills are passed, accountants who rob government treasury by manipulation, civil servants who rule as emperors, politicians with fake promises. All of them are the best educated and trained but their intellectual dishonesty is horrifying. Hence, the need of development of moral values is very significant (Aneja 2014).

VALUE:

By value we mean 'an affection, love, desire and attraction towards an object like book, flower, group or an individual' (Pandey 2006). The thing dear to any one values to him or her. It means the object 'to be of worth'. 'Value' is 'enduring belief, specific mode of conduct or an end state of existence, along a continuum of relative importance'. Value can be realized and even transplanted. Values

cannot be permanent. It changes as per need, place, time, society and the nation. It changes as per its importance and acceptability 'like clouds' (Dewey).

'Values are attributes that spring from the sublimity of soul. They are emotional like love, that involve mind, feeling and will, which are strong, deep and enduring which are bonded by educational resources and wisdom. In fact a 'value is a relationship between a person and an environmental situation which evokes an appreciative response in the individual'. 'Moral value is inseparably related to the values in general' (Venkataiah 2005).

Values are intrinsic and extrinsic or objective and subjective. Intrinsic value deals with the inner most feeling and commitment to achieve salvation, devotion to human causes, feeling for sufferers and deprived lots. Extrinsic values are formed in the backdrop of materialistic living. The objective values relate to spiritualism, truthfulness, goodness, beauty and faith in natural stint. Subjective values are transforming and not permanent.

Values:

- **Coming from within**
- **Being practiced**

Values Coming From Within:

- Love
- Kindness
- Compassion
- Mercy
- Sympathy
- Empathy

Values Being Practiced:

- Punctuality
- Discipline
- Obedience
- Behaviour
- Conduct
- Character

Value Education:

'Value education' is 'the aggregate of all the processes by means of which a person develops the abilities, attitudes and other forms of behaviours of positive values in the society in which he lives' (Charles, 2007). 'Life is education and education

is life'. Education defines the efficacy, importance, usefulness and utilitarian values accomplishing the target peacefully. It is education that shapes, refines and modifies the characteristics and quality of values to be implanted. Education can develop the contents and process of values. Education can be used as a vehicle or means to teach values, that may help the learners to reason and lead a value based life.

Much hope is pinned on education to work towards developing and inculcating right values related to attitude, aptitude, interest and commitment to the purpose. Education is a process as well as means. It is a tri-polar process. Teacher, students and parents stand on three vertices of education triangle (Aneja,2014). Values can be taught through educational processes and the means. Curriculum could be developed for different level of students for teaching values based on the objectives affixed.

Value education helps in developing:

- Character
- Good conduct
- Moral integrity
- Self discipline
- Compassion
- Love for all living beings
- Responsibility

Value education makes students feel better about themselves. 'Value of education' is the key word used in practicing life course such as; politics, socio-economic status, culture; ethics, moral, spiritual and religions. The values influence the life patterns of the highly enthusiastic and motivated youths intermittently who act as per their varying needs, aspiration and the missions of life. The institutions and the family can inculcate the useful values in youths where they are groomed physically, emotionally, and intelligently (Singh & Nath 2005). The new set of minds has to be conceptually enriched and prepared to understand the very basics and relevance of values education.

Values can be developed, cultivated, imitated and borrowed. They can be taught and learnt too. Students have to be prepared to practice the human, eternal and spiritual values established by the community and the parents. The responsibility and accountability lie with the parents also to instill the family and community values in their wards. For the purpose, the parents have to create cohesive environment in the family free from tension to enable the new generation imitate manners, habit, and feeling pity for the poor and marginalized groups.

Several types of values can be practiced, developed, and taught like individual, social, national, and productive. The learners are the valued human resources and thus need to be promoted for them and the nation. The role of a teacher in imparting value education is very crucial. Under the Rashtriya Uchchattar Shiksha Abhiyan (RUSA) emphasis must be given to the importance of Value based higher education. The authority have to decide as what type of value education with what contents and curriculum should be taught; separately or with regular courses.

The teachers are required to evolve suitable method, strategy and skills to cultivate the values. The teachers in the schools and colleges should teach the value education to the students with the designed contents and curriculum. They should not prove as hurdles in teaching and learning value education. They forget that it is their secret duty to share the responsibility of value education when the children are spending more time with them. However, the teachers and the parents should be involved in the construction of value education curriculum. The role thus of the trio-students; teachers and the parents must be charted out seeing the demands of the time and needs. The educational values require realistic objectives and contents to be taught, imparted, developed and inculcated in the students by using flexible method and strategy so as they could lead a quality and value based life.

Role of Teachers in Imparting Value Education:

Ordinary Teachers can bring about extraordinary transformation in the society. A teacher should practice what he preaches. Teachers are a role-model for the students. Their actions convey more than their words. Students learn values from what the teachers are rather than from what they say. Teacher makes a maximum impact on the personality of a student in the formative years. Students imbibe virtues and vices knowingly and unknowingly from theses role models (Aneja,2014). Teachers demonstrate the appropriate behavior of their students by their actions. Teachers must have healthy attitude and should possess rich values.

Teaching is all about attitude-positive/ negative towards their job of imparting quality education. Teacher should act as a friend, philosopher and guide. A teacher is not only a source of information but is also a mentor and guardian. For this teacher must respect the teaching profession, love her subjects and students, Students will seek inspiration from teachers who have high self-esteem (Raghavan, 2001). A decade back or so the role of a teacher was limited to being a source of information. But today this place is shared by books, coaching classes, multimedia technology etc. So the role of a teacher is marginalized. In modern times we are experiencing transition. A teacher can maintain values and nurture

them. Teacher can impart values in students by giving them instructions through discussion, experimentation and lectures and by the following mentioned ways:

- By organizing cultural and sports events values like team spirit, sharing, spirit of cooperation, patience, courtesy etc can be imparted.
- National and religious festivals must be celebrated to foster a feeling of homogeneity.
- Teachers should give importance to cooperative learning.
- Skits, role plays propagating moral values can be performed by students under the guidance of teacher.
- Teacher must tell the students to go to the libraries- the treasure house of knowledge. Classics available in the library are morally rich and inspiring.
- Teacher must explain the students the importance of meditation & yoga practices for realization or the attainment of oneness with God.
- Every day a Teacher must spent at least 5 minutes on moral lecturing.
- Organize games, excursions, visits to places of historical importance. Club activities like nature club, literary club, wildlife prevention club, social service camps, blood donation etc.
- Suicidal tendencies in students should be curbed. They must be prepared by the teacher to face the challenges of life fearlessly and with courage.

The most important agent for building the character of the student is a teacher. Swami Vivekananda says that “character is nothing but a bundle of habits formed through repeated acts. It comes through “Sanskaras” or past impressions. Character building can change the nation. As strong foundation is required for a strong building, strong character is required for nation-building. Dr. A. P. J. Abdul Kalam, our honorable president in his book “India2020: A Vision of the New Millennium’ has rightly remarked that “If you are a teacher in whatever capacity, you have a very special role to play because more than anybody else it is you who are shaping the future generation.” A teacher has a higher responsibility as compared to other professionals as students look upon the teacher as an embodiment of perfection. A teacher can maintain values and nurture them. A teacher has an immense potential of bringing about a sea change in the society by demonstrating essential values of head and heart.

CONCLUSION:

Education is considered as an instrumental factor to the development of human resource of a country. The present status of higher education in India has

witnessed tremendous expansion. Education is such a process to develop skills and inculcating values. The objective of ongoing education is to literate people. Present misdirected education system has adversely affected the education scenario in India as it deals with external world around us and not to the inner self of an individual. Instead of developing a person as a humane human being it is only directed towards superficial, surface level achievements. It is mainly designed for money making and not for man making and only promotes negative qualities like rivalry, hatred and jealousy instead of virtues like love, kindness and honesty. It should be transformed to the needs of the time and changing scenario of the world.

Participation of students in demonstrations, strikes, processions, mass meetings, walk outs, damaging laboratories and university properties, indulging in ragging like activities on campus are the nationwide issues which emerged out of students' unrest. The younger generation's dissatisfaction and revolt is the outcome of a decaying system of values. Emphasis should be laid on such education through which moral values can be developed among the students so that they can conduct their life morally. They can decide what is right or wrong; what is good or evil; what is justice or injustice.

Education has become a business today. There is supposedly more 'education' now, but there is also more Corruption, more Greed, more Selfishness, more Poverty and lack of sincerity and integrity. This has changed the outlook of the students as well as the parents and it has further resulted in deterioration of respect for teachers and all those who are a part and parcel of education system.

In modern times we are experiencing transition. The tragedy is that Indian psychic always understands education as a panacea to all social and moral shortcomings, which cannot. Only theoretical values of education can be explained in the institutions through a set of curriculum contents but it is home and society where these values could be tested and verified with its veracity. The parents are required to share the responsibility to develop right kind of values in their wards in home itself.

However, students' preparation to adopt or borrow the valuable learning is necessary first. Teachers must acquire the natural affinity to the parents' vis-à-vis the society. The activities in the families and society have educative value and thus readymade values should be received forth with. Value of education and its importance depend on the close networking of the teachers, students and the parents. The trio can only complete the process of learning. Education has to function for wholesome development of valuable skills, sense of dignity of labor, Endeavour, and compassion in the students to live perfectly. Learning is desired to bring changes in the total behavior, mannerism and performance satisfactorily.

The role of teacher, students and the parents is thus interrelated in imparting and receiving the value education. Lastly, Under the Rashtriya Uchch Shiksha Abhiyan (RUSA) emphasis must be given to the importance of Value based higher education. The authority have to decide as what type of value education with what contents and curriculum should be taught; separately or with regular courses.

Works Cited:

- Aneja, Neena : “The Importance of Value Education in Present education System and Role of Teacher” *International Journal of Social Science and Humanities Research* (online) Vol. 2(3), 2014: pp: (230-233), Available at:< www.researchpublish.com>
- Avhad, Suhas: *Emerging Issues and Challenges in Higher Education*, ABHINAV, Vol.ii.(2013) pp. 53-56. available at: <www.abhinavjournal.com>
- Chahal, Mukesh: *higher Education in India: Emerging Issues, challenges and Suggestions*, *International Journal of Business Quantitative Economics and applied Management Research*, Vol. 1(11) (2015) pp.67-74.
- Chakraborty, Riki: *Lack Of Value Added Education Causes Student Unrest: A Review With Swamiji*, *International Journal of Multidisciplinary Educational Research*, Vol.1(4) Sept.2012. pp.52-54.
- Charles, Eelaina Aun (2007): *The Teachers Inspirational Handbook*, Insight Book, Paulina Sisters, Bombay society, 143-Waterfield Road, Bandra.
- Mishra, Sharda (2006): *UGC and Higher Education System in India*, Book Enclave, Jaipur.
- Pandey, M.M. (2006): *Education for Emerging Indian Society*. Pdf. Available at:< www.researchpublish.com>
- Singh, Y.K. & Nath, R. (2005) *Value Education*, APH Publishing Corporation, 5-Ansari Road, Dariyaganj, N. Delhi-2
- Veera Raghvan, J (2001): *Education in Indian Cultural Values; Experiences in School Education*, 5-Ansari Road, Dariyaganj, N. Delhi-2
- Venkataiah, N (2005): *Value Education*, APH Publishing Corporation, 5-Ansari Road, Dariyaganj, N. Delhi-2

Depiction of Cultural Heritage of Kuluta through Art and Sculpture

Savita Kumari & Gopal Chauhan

Abstract

THE FOLLOWING research paper deals with representation of cultural heritage of Kuluta region through art and sculpture. Cultural heritage is defined as the legacy of physical science, artifacts and intangible attributes of a group or society that from past generations maintained in the present and bestowed for the benefit of future generations. This paper deals with one of the major comprising element of cultural heritage i.e. tangible culture which includes art in form of architecture, buildings, monuments, temples and sculptures. The following paper is based on research work and field visits to temples located in kuluta region (i.e. present day Kullu district). It includes analytical speculation and comparison of sculpture that were basically constructed in stone and some in wood that was in contrast to the geographical features and resources found there. This paper basically focus on cultural impact of art, architecture and sculpture of temples then and now. The sculptural wealth of Kullu gives a site into the stylistic and chronological sequence of Shaivism, Vaishnavism, Shakt, Buddhism and other subsidiary deities. It contains detailed description and comparison of sculptures of *Gauri-Shankar* in Gauri Shankar temple at Naggar; *Mahishasurmardini* and *Vishwarup* in Vishweshwar Mahadev temple at Bajaura. The evidence proves that similar to Himachal Kullu too has religious culture as major chunk in cultural heriage. It also consists of reference from the account of great traveller Hiuen Tsiang. Lastly it deals with the importance of conservation of cultural heritage and cultural tourism in which one realizes the role of cultural tourism in maintaining a connection between past, present and future. Therefore, the paper reveals that Kuluta has continuous cultural threat woven by different cultural groups of south and north. Herein, found the greatest example of religious tolerance and co-existence.

Keywords: cultural heritage, artifacts, tangible culture, sculptures, Kuluta region, Shaivism, Vaishnavism, Shakt, Buddhism, cultural tourism.

Depiction of Cultural Heritage of Kuluta through Art and Sculpture

The legacy of physical science, artifacts and intangible attributes of group or society which are inherited from past generations, maintained in the present and

bestowed for the benefit of future generations is cultural heritage. There are three types of cultural heritage: tangible culture such as books, buildings, landscapes, monuments, works of art and artifacts; intangible culture such as folklore and traditions; and natural heritage including culturally significant landscapes and biodiversity.¹ Cultural heritage represents a bridge between contemporary society and the past populations and a strong collaboration archaeologists, art historians and analysts that lead to the decryption of the information hidden in an ancient object.

Quantitative elemental compositional data play a key role in solving questions concerning dating, provenance, technology, use and the relationship of ancient cultures with the environment². Nevertheless, the scientific investigation of an artifact should be carried out complying with some important constraints; above all the analyses should be as little destructive as possible and performed directly on the object to preserve its integrity.

One major comprising element of cultural heritage is tangible culture that includes art in form of architecture, buildings, monuments, temples and sculptures. Form of sculptures basically depict the ideology, tradition and social distribution of that time and represent a connecting link between some of the rituals which we inherited from our ancestors. The following paper is based on research work and field visits to temples located in Kuluta region i.e. present day Kullu District of Himachal Pradesh includes analytical speculation and comparison of sculptures which were basically constructed in stone and wood during 600-1250CE. This paper basically focus on cultural impact of art and architecture and sculpture of temples then now.

Kuluta Region: Art, Sculpture And Culture

Kulutas is considered to be one of the earliest *janapadas* of the Western Himalayan region, the other being Audumbaras, Kunindas and the Trigartas. It is bounded by Lahaul- Spiti on the North-East, by Kangra and Mandi on the North-West and South-West, by Shimla on the South and South-East, and by Kinnaur on the South-East.

The evidence of history of Kuluta region can be verified from the artefacts and twelve coins collected from various regions. The coins bear the names of four rulers. The sculptural wealth of the former principality of Kuluta gives a sight into the stylistic and chronological sequence of Shaiv, Vaishnav, Shakta sects, Buddhism and other subsidiary deities. The different sculptures present in Manali, Jagatsukh, Dashed, Gajan, Naggar, Thawa, Khokhan, Bajaura, Ani, Dalash, Behna and Nirmand provide descriptive details of icons involving their composition, iconography, code gestures, ornaments and other decorative elements.

The sculptures found in the area under consideration show culture in the Kuluta region is distinct unique in the sense that it is continuous cultural thread woven by four cultural groups of the south and north. One of the greatest example of religious tolerance and co-existence is found here. The following five sub-categories : Shiav, Vaishnav, Shakta, Buddhism and subsidiary deities, depict the religious culture being followed from past to present generations. It is of great interest to know that the stone sculptures have some similarities with art forms of South India, Kashmir and Central India whereas wooden sculptures are entirely different in reference to the postures, expressions and facial features.

a) Sculpture depicting Gauri-Shankar(see fig.1) present in Gauri-Shankar temple at Naggar: In the sculpture Lord Shiva is seen sitting on the back of Nandi which is depicted to be in motion. Shiva is sitting in a posture with one leg folded and the other one hanging down. Parvati is sitting on the left knee of Shiva. Both of them carry their normal facial expressions, ornaments, clothing and weapons with exception of their eyes being closed. Both of them maintain a smile on their faces. Till date several sculptures of Shiva and Parvati have been recovered and preserved but the above mentioned replica is a unique masterpiece of its kind. The statue of deities sitting on Nandi at Shiva temple in Halebidu³ is different in having Parvati being sat on the left thigh of Shiva and wearing a halo like headgear and Shiva is wearing a pointed crown. In another statue protected at RISD Museum, USA depicts Shiva- Parvati romancing each other. A remarkable difference in the statue is that right foot of Shiva is bended inwards.

The common difference between the statues in British museum, RISD museum and Shiva Temple Halebidu and in all the statue in Kuluta is that leaving statue of the Kuluta region aside all the statue Shiva and Parvati are facing each other.

b) Sculpture of Mahishasur-mardini (see fig.2) in the Vishweshwar Mahadev at Bajaura: Mahishasur-mardini is basically the most powerful, graceful form depicting a woman as a warrior and savior against every evil. The above mentioned sculpture is in the niche of the northern outer wall of the temple. In the sculpture a beautifully carved goddess is shown with proper curves and eight arms, each holding specific weapons. She is shown wearing half *dhoti* and glorified with all the ornaments such as necklace, waist-string, anklets, armlets, bangles, etc. The demon Mahishasur is lying under her foot in the human form and body of buffalo is beneath this demon. Halo is encarved behind her head. The sculptures of Mahishasurmardini at Brihadeshwara temple as well as⁴ in The British Museum⁵ has some similarities and dissimilarities with the above mentioned sculpture. The similarities are all sculptures have lean body, and have eight arms. The demon Mahishasur in case of sculptures at kuluta and in the British Museum is in full human form and the back of buffalo is beneath the

demon. The sculpture found in Brihadeshwara temple has certain dissimilarities as compared to the sculpture located in the Vishveshwara Mahadev temple at Bajaura such as in the former Durga's right foot is on the back of the demon and the forefeet of the lion are on the buttocks of the demon. Secondly in the statue in British Museum goddess is attacking the demon with a trident on the face of demon whereas at Bajaura goddess is piercing demon's chest.

c) Sculpture of Vishvarupa (see fig.3) in Vishveshwara Mahadev temple at Bajaura: The statue is in standing position with four arms. He is shown wearing Vajrantimala, dhoti, yajnopavita, two necklaces, armlets and anklets. He has three visible heads. The front one depicting human like form and others on each side depicting Narsimha (right side) and Varaha (left side) avatars. On the head there is head of Hayagriva. The sculpture of Vishvarupa⁶ found at Kannauj has similar crown cut out and the sculpture of Vishvarupa at Deogarh in U.P. is in similar straight standing posture as the one found at Bajaura. The difference in two references taken above and at Bajaura lies in their background, weapons and ornaments.



(fig. 1)



(fig.2)



(fig.3)

Essential Characteristics about the Culture Outlined by Sculptures

The art and sculptures provide a clear indication that in this region settlements came into existence by a series of migrations that continued for centuries. The settlers came from all the surrounding, but principally from Indian plain as we see clear impression of art of central Indian in the sculpture found in Kuluta⁷.

The sculptures and temples found in Kuluta show that different sects along with Buddhism had equal cultural dominance⁸ over the area during that the period 600-1250CE.

The art proves that the people have inherited a firm and almost a blind belief in village deities; whether the deity is a god, a hero, a rishi or otherwise called a

devata. People believe that their gods are generally well disposed towards the worshippers, and confer their blessings on them. For example- Kahika festival in Kuluta region.

As the earliest sculptures found and conserved in the region reveal that earliest inhabitants probably cherished some early forms of Shaivism. In the region there are remotely situated caves containing Shivalings which symbolize the creative power of the God. For reference several temples devoted to Shiva in Nirmand, Bajaura and Naggar were the main centres of Shiva cult in Kuluta. Closely connected with the worship of Shiva; and far more widely spread, are the Shakti cult and Vaishnavism. From the evidence provided we come across a fact that the temples dedicated to Shiva have walls decorated with Shiva, Parvati, Ganesh, various avatars of Vishnu and Mahishasurmardini sculptures.

Buddhism also have roots in the Kuluta region. Regarding this a record is provided by the accounts of Hiuen Tsiang⁹. According to the accounts the main town of Kuluta was about 14 or 15li (4km) round. There were fifteen Deva temples, different sects occupied them without distinction. It has been recorded in the accounts that in the middle of the country is a stupa built by Ashok, the Mauryan king and tathagata came to this region with his followers to preach the law and to save mankind. In addition, some sculptures dedicated to Lord Buddha have been found in Parshuram Temple at Nirmand, Murlidhar Temple at Thawa, Triyugi Narayan temple at Diyar, etc.

Although the sculptural age reveals that Vaishnavism came to the region after Shaivism and flourished most during 8th to 15th centuries. Rajput princes are credited for the propagation of Vishnu cult¹⁰. They appointed Brahmins as their priests and appointed them to spread Vaishnavism in the hills. Under various circumstances the Rajputs migrated to Shiwalik hills. As they moved towards the region, settled and made their capitals, they constructed magnificent temples dedicated to Vishnu, Rama and Krishna; but this cult remained confined to main centres of the region and a dominance of local deities remained in the outskirts or interiors of the region. The important evidence in form of sculptures of Vishnu cult came from Laxmi Narayan Temple, Thakurdwara at Nirmand in the form of Vaikunth Vishnu in Parshuram Temple at Nirmand in the form of Narayan in Triyugi Narayan temple at Diyar, sculpture of Vishvarupa found at Vishweshwar temple at Bajaura.

Besides Shiva and Vishnu, there were many other minor Hindu Gods and Goddesses in Kuluta who left an impression in cultural history in form of art, sculpture in temples. Other important

shrines in the region that we even see today dedicated to Brahma at Khokhan; sculptures dedicated to Ganesha and Kartikeya.

It is clearly evident that sculptural art of Kuluta is in great contrast to the geographical features and resources found there. As most of the sculptures are carved out of stone and not of wood.

The creative power of the artisans of Kuluta is brilliantly expressed in their art and architecture. The artifacts that are found in temples or conserved in museums testify the past achievements a proof of their extraordinary skill; it even reveals powerful and many sided reality reflected in the hill people's struggle for existence for centuries in the valleys.

Sculptural art can be broadly divided into three groups, each distinguished by the recurring themes of Hinduism and Buddhism. These are- (1) Indigenous or Khasa art (2) Indo-Aryan art (3) Indo-Tibetan art. Thus Kuluta has been a meeting ground of varied arts and cultures.

The region faced several invasions from the plains and Tibetians. Each wave of invasion left behind deposits of race, religion, language and customs which in course of time came to be woven into the cultural life of the land. Eg: the architecture and sculpture of Baseshwar Mahadev (Vishweshwar Mahadev) at Bajaura and the motifs seen in it suggest that the workmen responsible for this work had come from the Gangetic plains or the hilly area, which was directly under the cultural influence of that region¹¹.

Importance of Conservation of Culture and Cultural Tourism

Culture can give people a connection to certain social values; beliefs; religions and customs. It allows them to identify with others of similar mindsets and backgrounds. Cultural heritage can provide an automatic sense of unity and belonging within a group and allow us to better understand previous generations and the history of where we come from. As artifacts and sculpture in Kuluta give an idea about religious belief of the people then and now.

As a community, we share the responsibility to identify and respect our heritage and pass on these to future generation so they will understand what came before them. We are not born capable of judging fairly and wisely. However, learning about various cultures help us be a good global citizen and improve our critical and analytical thinking. Every historical site has an important story to tell and these stories have inspired many people to strengthen their convictions and commitment to fight injustice and oppression.

The conservation of cultural heritage is best achieved by promoting cultural tourism. Cultural tourism helps to establish and reinforce an identity. This is an essential element in preserving and enhancing national and local pride and spirit. It can be the key instruments in developing a positive image of a country internationally. It makes it possible to fund the balance between protection and

the use of heritage.

The retention and management of heritage places or artifacts has an important role to play in protecting the environment creating vibrant communities and sustaining local economies. Utilising and revitalizing our heritage places can also assist local economies through employment opportunities and by generating additional revenue particularly through tourism; so that valuable asset of our heritage is recognised, respected and promoted.¹²

Conclusion

The above research paper undertook the concept of cultural heritage, its types and its impact on the past and present society. In process of explaining cultural heritage we used art, artifacts and sculptures of past (600-1250CE) as a parameter. From the artifacts we come across the ideology followed by past and the views that we have inherited from them.

The type of sculpture in the respective period helps us to know the creativity of the people and tends to find the school of art they represent or they are inspired from. In the last section it deals with the conservation and importance of cultural tourism in which one realizes its role in maintaining a connection between past, present and future as knowledge of past helps us to lead a balanced life making out way for a bright future.

References

- Cultural Heritage', <https://en.wikipedia.org/wiki>
<https://medievalstudies.ceu.edu>, The Concept and History of Cultural Heritage
Hoyasaleshvara Temple; (12th c.) in Hassan district, Karnataka
Brihadeshwara Temple; Thanjour, Tamil Nadu
The British Museum, London
T.S. Maxwell; Visvarupa, Oxford University Press, Delhi, 1988
Mian Goverdhan Singh, Art and Architecture of Himachal Pradesh, B.R. Publishing Corporation, Delhi, 1983
Samuel Beal, tr., SI-YU-KI : Buddhist Records of the Western World, Volume 1, Book 4, Trubner's Oriental Series, London, 1884 Ibid.
Mian Goverdhan Singh, op.cit
V.C. Ohri, Sculpture of Western Himalayas, Agam Kala Prakashan, Delhi, 1991
www.gounesco.com

Legacy of the British Rule in India

Rameshwar Singh

Abstract:

DESPITE having negative influence on all aspects of India's national life, the British also left behind few positive developments for India to consolidate and build a new nation. British came as traders and became colonial masters. Their strategy to exploit India put many negative effects on us like draining of wealth, end of indigenous industries, communalization and ultimately partition. But as is the case in any interaction between two civilizations, the British had contributed positively to India in some ways and it cannot be said with certainty whether all of them were aimed towards development of India. Scholars expressed divergent views about the legacy of the British Rule to India which was started in 19th century and is still continuing. The British scholars and the Indian scholars hold different views relating to the contribution and legacy of the English to India. The English scholars like Alfred Loyal, J.F. Stephen, and W.W. Hunter opined that the modernization of India, growth of nationalism, efficient administration, modern education, Law and order was the Legacy of the English to the Indians. Prior to the rule of the British, India was divided into a number of states and there was no unity among the rulers of different states. The rulers always fight against one another in order to establish their power. They lacked political unity which was the chief reason of their defeat against the British. This paper attempts to bring out the legacy and impact of the British Rule in India.

Keywords: Divergent, Strategy, Legacy, Political, Contribution.

Introduction

The British rule in India for about 200 years left behind it some permanent imprint in the socio-economic, political and cultural life of Indians. Whatever developments political, administrative economic, social or intellectual-India witnessed during two centuries of British rule here were not planned by the colonial rulers out of any philanthropic mission for the welfare of Indians but were merely outcomes of the imperial ruler's larger aim of keeping their hold over India and for promoting the political, economic or material interests of their

own country. Jawaharlal Nehru has rightly commented that “Changes came to India because of the impact of the west but these came almost in spite of the British in India. They succeeded in slowing down the pace of those changes.” He further said that the most obvious fact is the sterility of British rule in India and twirling of Indian life by it. Scholars expressed divergent views about the legacy of the British Rule to India which was started in 19th century and is still continuing. The British scholars and the Indian scholars hold different views relating to the contribution and legacy of the Britisher to India. The English scholars like Alfred Loyal, J.F. Stephen, and W.W. Hunter opined that the modernization of India, growth of nationalism, efficient administration, modern education, Law and order was the Legacy of the Britisher to the Indians. They even showered lavish praise on the British for converting India into a civilized nation. They evaluated the Legacy of the British from the nationalistic point of view. They also spread the feeling of communalism among the Hindus and Muslims which ultimately led to the partition of India. No doubt, India achieved her political unification under the British rule.

The credit of origin of administrative machinery also goes to the British rule. The post mutiny period witnessed the growth and development of this administrative system. The Indian Civil Service, the Indian Police Service, the Indian Audit and Account Service, the Indian Medical Service, the Indian Education Service, the Revenue and Judicial Service created an administrative machinery that not only shouldered the responsibility of the work of Government on a large scale but also dealt with the famine, plague, means of transport and communication, agricultural projects etc. Credit goes to the British Government for the establishment of popular institutions. The Legislative Council was set up in 1853 and later enlarged in 1861 to induct some nominated members. With the Morley Minto reforms the provincial legislative councils began to reflect popular opinion. The principle of direct election for democracy was introduced in the Montague Chelmsford Act. Ultimately India became a supplier of raw materials to England and the buyer of manufactured goods of England. It adversely affected the trade and commerce of the country. The condition of the peasants became miserable. The ruin of rural artisan industries proceeded more rapidly once the railways were built. Agriculture, trade, and industry of India were ruined badly and India became a poor country as it had never been.

Social Changes during the British Rule

Traditionally, India has been a country of many languages, religion, ethnicity, culture and geographical variations which is why it also is called as the multi-lingual, multi-cultural, multi-ethnic and multi-religious country. But when the British left the educated class spoke one language English which held immense

importance in the world. This is also one of the reasons which are keeping India unified even today amidst all the cultural chaos. This has led to India becoming one of the world's largest trading economies and also paved way for modern ideas in the traditional economy. This introduction of English also revolutionized the education system in the country. Now mostly all schools and universities are providing education using English as a medium of instruction instead of regional languages, thus bringing in standardisation in the education sector. However it is being argued that this has led to the decreased usage of the regional languages thus contributing to the depletion of the culture. The first girl's school was also started at this time, and they ensured that the women were entitled to university education. It changed the cultural hierarchy which was deeply rooted in the nation through the introduction of an efficient bureaucracy and army, where the selection was completely on the basis of merit and examination. It gave an equal opportunity for everyone to attain economic and political power in the society as no discrimination was done here on the basis of caste system.

Political impact of British Rule

Although British rule unified the country and brought the entire subcontinent under one political authority, when they departed from India left it in two – India and Pakistan. And India is experiencing conflicts of resource sharing with its this neighbour even today. By one single action, the departing Britishers left a very deep impact on the Indian economy. But it also taught India how to organise administration like into different decentralised units, as the structure of governance that we see in the nation today is deeply influenced by it. Also the constitution of India which is the backbone of the nation has found inspiration from the British Constitution. India's foreign relations were also highly affected due to this period of colonialism. India became a member of Commonwealth nations and got easy access to trading with various countries. Also during their rule they encouraged workers to shift to its various other colonies which generated goodwill amongst these countries which is intact even today. However racial discrimination was highly prevalent then and is prevalent even now. India has tried to take this issue up in various international forums, time and again.

Economic Legacies of British Rule

The British were not against 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. So in many areas India has grown positively due to the rule. A tremendous number of things associated modern state such as railways, posts and telegraphs, automobiles, mills and factories manufacturing on a mass scale a wide of goods, use of machinery and

mechanical equipments, aviation, broadcasting, a trained army, an impartial civil this apparatus are the legacies which independent India inherited and maintained, and are the foundations upon which India is building its new and sophisticated infrastructure. But except these developments India has been extensively exploited by its colonial masters. India was made reduced to the position of just raw material exporter and an importer of produced goods. The thriving handloom industry was shut down because of the cheap machine made goods being imported from Britain. India was typically an agrarian economy but agriculture stagnated in most parts of the country and even deteriorated over the years during the rule. Their interest was mainly revenue collection from agriculture at any expense. They also forced Indigo cultivation which has deteriorated the very fertile soil of this nation and even today after Green revolution, the soil quality cannot be restored. Industrialisation also came in very late in India.

Legal Impact of British Rule on India

The British rule introduced the common civil and criminal laws and a uniform legal system throughout the length and breadth of the country. Also the British feminists found a lot of interest in the status of women in this country and worked extensively to improve the condition of women. However the British man who had all the power did not really want to take any step that could go against them and the crowd would find a reason to unite and mobilize against the British administration. However if not complete changes, they started the revolution in the system whose impacts can be seen even today as some of the laws remain unchanged till date.

Examples of such legal changes are:

- 1) The Age of Consent Act, 1891 which raised the age of consent for sexual intercourse for all girls, married or otherwise from ten to twelve years. Although the change wasn't much but this was the first time that the consent of girl was being talked about, which made a lot of difference in the society.
- 2) Hindu Widow's remarriage Act was introduced in 1856 in a society where a woman was expected to jump and die in the fire after her husband's death.
- 3) Sati was abolished completely in 1829
- 4) The Child Marriage Restraint Act of 1929
- 5) The Hindu Women Right to Property Act of 1937
- 6) Female infanticide was prohibited in Acts of 1795, 1804 and 1870.

Regional Legacies of British Rule

Before the British came to India was divided into various different regions and

there were different rulers in each region. The Vedas describe that the country was divided into “Janapadas” & “Mahajanapadas” on the basis of race, language, culture and identity. However they were unified under the rule of Chandragupta Mourya only to be divided by the Mughals into “Subas” on the basis of the socio-cultural togetherness among the people of that region. However even the Mughals were not able to bring the entire India into its control. Then came the British who forcibly united India within its colonial empire and then internally divided and separated it so deeply and skilfully that no other force in the history of subcontinent could. They did not consider the feelings of people and adopted various policies to disintegrate the caste system. They started to create army based on caste instead of race. This created tension among the people. They mainly adopted the policy of divide and rule and started to separate the Hindus and Muslims into two distinct strong groups. As colonial rulers, they wanted to exploit India to increase their national wealth for their own growth and development. But for this they just developed the main trade areas which led to the unequal development of regions. This led to the deprivation of the large sections of the society, leading to widespread dissatisfaction among people.

Legacies that were left behind by the System of British Rule in India

Legacy of Leadership

In the Indian context the first important legacy that India got was that of the leadership. During freedom struggle there were two major political organisations which always drew the admiration of their own admirers and had large following; namely, the Indian National Congress and the Muslim League. The policies and programmes of the League with the passage of time became communal. Leadership in the organisation openly declared that it wanted to have a separate homeland for the Muslims. It also declared that the Hindus and the Muslims are two separate nations and both have separate cultures, customs and traditions. Both cannot live together because the Hindu majority will always try to dominate and control the Muslim minority. The League's communal character was not at all hidden one and there was nothing secret in that. When India was divided and some Muslim population from India migrated to Pakistan with that the influence and impact of communal policies in India was expected to considerably come down. Therefore, when Constituent Assembly started its work and took upon itself the responsibility of giving a Constitution to the people of India, this legacy played a very big role. The Assembly had to think in terms of secularism alone. It was on account of this legacy that it was provided in the Constitution that all citizen of India are equal in all respect. The Hindus who formed about 90% of the total Indian population

were given no special rights, in spite of the fact that they had to undergo untold sufferings during national struggle for freedom. It was provided that all positions and jobs in the country will be filled on the basis of ability of the person concerned, without caring for caste, creed and religion. Similarly it was this legacy which became responsible for making India a secular State in which it was provided that the State will have no religion of its own.

Centre-State Relations

Then another legacy which old system left was in the field of Centre-State relations. India had passed through very difficult times of communal hatred and disharmony. It was a period of turmoil for India. During the course of all negotiations with British government and the Muslim League, the thinking all along had been that India should be a federal State. In this state the provinces should be strong whereas there should be a weak Centre. In fact, in the scheme of things only few important subjects like the External Affairs, Defence, Finance and Transport and Communication systems were to be retained by the Centre; whereas all other subjects, including residuary subjects were also to be left with the provinces. It was policy of appeasement and concessions to communal politics so as to avoid partition of the country. But this policy did not prove a success. India was ultimately divided. But a legacy was left behind. The leadership in India now was faced with the problem of centre-state relationship i.e., whether in free India centre should be weak or strong. Similarly, it was felt that the partition of the country had left many social, economic and political problems which needed a strong centre to deal with. Leadership on the one hand and founding fathers of the Constitution on the other felt it unavoidable to have a strong centre and weak states in the new set up.

Blending of Religious, Social and Political Systems

Then another legacy of the system is blending of social and political systems. In fact, such a blending is found even in the so-called advanced societies of the world as well. History is a witness that in England in the past there was a bitter struggle for some time between the church and the sovereign and ultimately it was found that both could not be separated from each other. No Sovereign in England could rule peacefully and comfortably by antagonising the church. The sovereign must have an unquestionable faith in the church of England. In the whole Muslim world there is very close blending of religion and the state. The state must enforce the principles enunciated and expounded in holy religious books. In a Muslim state, the head of the state must be a Muslim and it is both his religious and political duty to champion the cause of Islam. Muslim states of the world are knit together in a system of brotherhood, ready to help and defend each other at the time of need and necessity. In India there has been blending of

religion with politics since times immemorial. Hindu religious books make it amply clear that in the past rajas used to have gurus who were religious heads and had attained perfection in the religious field. Commands of religious leaders could not be disobeyed.

Steel Frame Work of Bureaucracy

Steel frame work of bureaucracy is another legacy of past to the present system of administration. Britishers came to India as traders. Gradually they became the masters of India and immediate problem for them was how to govern the vast empire which laid exposed to them. It was a difficult situation because, on the one hand, the Company was to administer territories, on the other, it was to make conquests and wage wars against Indian rulers and still another task was to exploit the people. The number of Britishers who could stay in India was much less than what Indian administration needed. The situation did not much improve in this respect after the transfer of power from the company to the crown. The basic structure remained the same. All senior posts were manned by the Britishers who began to be drawn from Indian Civil Service. But in fact these personnel were neither Indian, nor civil nor servants. They were masters of the country. Each head of the office was assisted by his subordinate officers. Lower posts were manned by Indians.

A Federal System:

India is a vast country. Since times past the country is considered a sub-continent and a cradle of different clusters. In a federation usually there are small scattered units, which have their own problems and powers but are quite independent of each other. These are geographically nearer to each other and politically these have more or less similar views. Not only this, but the units are sovereign and have a desire to come nearer and closer to each other but do not wish to end their individual identity. They wish to combine so as to economically rise and be strong enough to preserve their individuality. But in the case of India situation was altogether different. There was nothing which could be called a pre-requisite of a federation. But still due to historical reasons it was felt that unitary form of government was not suited to Indian conditions because of the vastness of the country. A federal system in India was envisaged both under the Acts of 1909 and 1919. Nehru Report presented in 1929 also envisaged that India should be a federation. Subsequently when three Round-Table Conferences were convened in London it was proposed that India should be a federation. A communal politics got momentum it was believed by British masters that only way out of the difficult constitutional problem was a federal polity with a weak Centre.

Politics of Poverty

Then another legacy of the old system to the present generation is the politics of

poverty. GaribiHatao slogan or preference for programme of ending unemployment within ten years or work to at least one member of a family under Nehru Rozgar Scheme or promise of right to work have become very popular slogans. In fact, electorates are very much allured and attracted by these slogans. But again this is the legacy of the past India has always lived in poverty and living standard of the people has always remained very low. But our freedom fighters always gave hopes to the people that in free India there would be no poverty. Thus, in India there was no time when poverty was not mixed with politics. Both have all along gone with each other. This is thus another legacy of the past and this legacy is continuing today. British government in India always tried to tell the world that it was staying in India only to raise living standard of the people and to industrialise the country so that its poverty came to an end, though in practice it just did the reverse. But the politics of poverty has always remained on the fore front. Our national leaders always tried to attract masses towards themselves on the plea that the British government was deliberately trying to drain out India's wealth and keeping the masses poor so that they had no time to participate in freedom struggle.

Departmentalisation

Then another legacy of the past is that of departmentalisation. Under the British government whole governmental activity was divided into different departments. Each department was created according to its need and necessity. Some such departments were Foreign Affairs, Political Affairs, Home, Defence, Education and Health, etc. Each department was under the control of an executive counsellor of Viceroy's executive council. He was to see that his department worked well. For all failures and acts of omissions and commissions he was to explain his position to the Governor-General and through him to the Secretary of State. He was the key man and policy-maker of his department and every activity of the department revolved around him. This legacy have been passed on to the present political system as well. Today whole governmental activity is divided into departments. Some such departments are External Affairs, Defence, Home, Railways, Finance, Education, Labour, etc. For all his acts of omission and commission he is responsible to the Prime Minister, his cabinet colleagues and then to the Parliament.

Casteism and Regionalism

Casteism and regionalism is another inheritance of the British rule to modern India. The Britishers in their best interest and to suit their requirements decided to follow the policy of divide and rule. British bureaucracy followed this at every level. At the communal level they divided India into different communities and introduced in body politic the system of separate electorate instead of joint

electorate system. They, thus, never allowed any religious community to come nearer and closer to the other. As if this was not enough they encouraged the policy of regionalism and casteism, so that the people of one region quarrelled with the other. Not only this, but they also gave encouragement to casteism, so that the people of different castes within the same religion quarrelled with each other and India was never one united nation. Many British political leaders quite often said that India was not one country, but a geographical entity like Europe, Asia and Africa, etc. Today India thinks not only in terms of castes and classes but also in terms of creamy and non-creamy castes and also on the lines of advanced and backward classes. The forces of regionalism are becoming very strong as is clear from the emergence of regional political and religious party which enjoy good popularity. Thus, infant independent India inherited much from the Britishers at the time of partition of the country.

System of Reservation

The British government in its own interest introduced the system of reservation of seats. Its only aim then was to keep Indians divided. The reservation of seats in elected bodies and services in the first instance was on communal basis but subsequently seats began to be reserved for landlords, zamindars, commerce and industry, etc. When India became free a nation the country decided to dispense with all these reservations but to have reservation of seats for only scheduled castes and scheduled tribe people and that too for a limited period of 15 years. But the seeds of reservation of seats which were sown at that time have come to us a legacy. Today not only reservation of seats in elected bodies and services for scheduled castes and scheduled tribes has become a permanent affairs, but seats have been reserved in elected bodies at panchayat level for women. There is reservation of seats for other backward classes as recommended by Mandal Commission, even in educational institutions. Some religious communities have again started demanding reservation of seats for themselves and this unhealthy trend is increasing day-by-day

Conclusion

We conclude that British rule contributed a lot for the progress of the Indians. The impact of western civilization was quite clear in Indian life, thought, dress, food and education etc., it is clear that British rule is responsible for the modernisation of the Indian civilization. Major changes have come in the Indian economy due to this British Raj. These changes are both positive and negative. But these changes even after 73 years of Independence cannot be wiped off and have now become the part and parcel of the Indian economy. India has to endure these changes and take it in the right stride. It has to take the positive impacts on the next level and

ensure that the negative legacies do not become road blocks to the growth and development of the nation. The British rule in India proved both beneficial and harmful in different spheres. In-fact whatever harm the British had done to India was only to safeguard their own interest and whatever advantage the Indians received from the British rule was the outcome of the efforts made by the leaders of national movement.

References

- Chopra, P.N., A Comprehensive History of Modern India, New Delhi Sterling Publishers Private Limited, 2003.
- Kumar, Deepak, Science and the Raj: A study of British India, Oxford University Press, 2006.
- Majumdar, R.C. (ed.) History and Culture of Indian People, Vol.9, British Paramountcy and Indian Renaissance, Bombay, 1963.
- Mehra, Parshotam, A Dictionary of Modern Indian History, 1707-1947, Delhi, New York: Oxford University Press, 1985.
- Viswanathan, Gauri, Masks of Conquest: Literary Study and British Rule in India. Oxford University Press, 1998.
- Wolpert, Stanley A., A New History of India. Oxford University Press, 2004.
- https://en.wikipedia.org/wiki/History_of_the_British_Raj
- <http://www.yourarticlelibrary.com/society/indian-society/impactof-british-on-indian-society-and-culture/47607>
- <https://exampariksha.com/economic-impact-of-british-rule-inindia-history-study-material-notes/>
- <http://nptel.ac.in/courses/109103024/pdf/module5/SM%20Lec%2025.pdf>
- <http://www.historydiscussion.net/british-india/social-andeconomic-impact-of-british-rule-in-india/1595>
- <https://www.scribd.com/doc/144830095/The-Impact-of-Englishon-Indian-Culture>
- <https://prezi.com/nmibixwvg0b3/the-impact-of-british-rule-onindias-education-sy>

Armed Forces Special Powers Act : An Introspection

Shriya Mokta

ABSTRACT

MORE THAN 62 years of de facto military rule through the Armed Forces (Special Powers) Act (AFSPA) 1958 in India's northeast has engendered neither stability nor peace. Problems regarding the impunity of violence and crime, official corruption and the virtual collapse of the rule of law continue, but the Act remains in operation. This article attempts to reframe the debates on the AFSPA in terms of its necessity and also tries to analyse different aspects relating to AFSPA.

ARMED FORCES SPECIAL POWERS ACT : AN INTROSPECTION

AFSPA has been called a 'draconian' law by human rights activists. AFSPA gained international attention after Manipur activist Irom Sharmila decided to fast to protest against the Act, which lasted for 16 years. In 2016, the Supreme Court has said that the Army is not immune to any prosecution by criminal court if found committing any offence. Armed forces special power Acts of the Parliament of India grants special power to the Indian armed forces in "disturbed areas" In post-independence era, the Indian State has witnessed many secessionist movements and has long suffered from extremist attacks. The very notion of secessionism disturbs the territorial integrity and unity of a country. India is one such country. In order to curb the secessionist activities of the militants, the Armed Forces Special Powers Act (AFSPA) was implemented by Indian government in 1958. AFSPA is active in the disturbed areas of North East India and Jammu and Kashmir.

The Act was passed in the context of separatist movements and the violence caused by them. It has received mixed reactions from across the country and has always been a debatable issue. Overwhelming presence of insurgents causes grave insecurity to the common people. It creates a situation where people have to live under constant fear and anxiety. Frequent declaration of bandh, forcible extortion and shelter by militants are sources of insecurity to the people. On the

other hand, widespread protest by people against the Act clearly shows their discontent towards it.

Introduction

The Armed Forces (Special Powers) Act, 1985 (AFSPA) was preceded by the Armed Forces (Assam and Manipur) Special Powers Ordinance 1958. The Ordinance gave the armed forces certain special powers in the 'disturbed areas' of Manipur and Assam. It was replaced by AFSPA on September 11, 1958. Currently, AFSPA is applicable to the seven states of the North-East, i.e. Assam, Manipur, Mizoram, Arunachal Pradesh, Meghalaya, Nagaland and Tripura. AFSPA empowers the Governor of the State, or the Central government to declare any part of the State as a 'disturbed area', if in its opinion there exists a dangerous situation in the said area which makes it necessary to deploy armed forces in the region. In the backdrop of the growing insurgency in Jammu and Kashmir, the Central government issued a similar enactment known as The Armed Forces (Jammu and Kashmir) Special Powers Act, 1990. It empowers the Governor or the Central government to declare any part of the State as a 'disturbed area' if in its opinion special powers are required to prevent.

- a) Terrorist acts aimed at overthrowing the government striking terror in the people, or affecting the harmony of different sections of society or
- b) Activities which disrupt the sovereignty of India, or cause insult to the National Flag, Anthem or India's Constitution.

Special Powers given to Army Officials

Under Section 4 of the AFSPA, an authorized officer in a disturbed area enjoys certain powers. The authorized officer has the power to open fire at any individual, even if it results in death, if the individual violates laws which prohibit (a) the assembly of five or more persons; or (b) carrying of weapons. However, the officer has to give a warning before opening fire. The authorized officer has also been given the power to (a) arrest without a warrant; and (b) seize and search without any warrant any premise in order to make an arrest or recovery of hostages, arms and ammunitions. Individuals who have been taken into custody have to be handed over to the nearest police station as soon as possible. Prosecution of an authorized officer requires prior permission of the Central government.

Important Provisions

Sec. 4-Special powers of the armed forces- Any commissioned officer, warrant officer non commissioned officer or any other person of equivalent rank in the armed forces may in a disturbed area:-

- a) If he is of opinion that it is necessary so to do for the maintenance of

public order, after giving such due warning as he may consider necessary, fire upon or otherwise use force; even to the causing of death, against any person who is acting in contravention of any law or order for the time being in force in the disturbed area prohibiting the assembly of five or more persons or the carrying of weapons or of things capable of being used as weapons or of fire-arms, ammunition or explosive substance;

- b) If he is of opinion that it is necessary so to do, destroy any arms dump, prepared or fortified position or shelter from which armed attacks are made or are likely to be made or are attempted to be made or any structure used as a training camp for armed volunteers or utilized as a hideout by armed gangs or absconders wanted for any offence;
- c) Arrest without warrant, any person who has committed a cognizable offence or against whom a reasonable suspicion exists that he has committed or is about to commit a cognizable offence any may use such force as may be necessary to effect the arrest
- d) Enter and search without warrant any premises to make any such arrest as aforesaid or to recover any person believed to be wrongfully restrained and confined or any property reasonably suspected to be stolen property or any arms, ammunition or explosive substances believed to be unlawfully kept in such premises, and may for that purpose use such force as may be necessary

Sec.5-Arrested persons to be made over to the police- any person arrested and taken into custody under this Act shall be made over to the officer in charge of the nearest police station with the least possible delay, together with a report of the circumstances occasioning the arrest.

Sec.6-Protection to person acting under Act- no prosecution, suit or other legal proceeding shall be instituted, except with the previous sanction of the Central Government, against any person in respect of anything done or purported to be done in exercise of the powers conferred by this act.

Disturbed Areas (u/s 3 of AFSPA Act)- If, in relation to any State or Union Territory to which this Act extends, the Governor of that State or the Administrator of that Union Territory of the Central Government in either case, is of the opinion that the whole or any part of such State or Union Territory, as the case may be, is in such a disturbed or dangerous condition that the use of armed forces in aid of the civil power is necessary, the Governor of that State or the Administrator of that Union Territory or the Central Government, as the case may be may, by notification in the Official Gazette, declare the whole or such

part of such State of Union Territory to be a disturbed area.

Protest against AFSPA

1. **Irom Sharmila:** Irom Chanu Sharmila is arguably waging the longest-running hunger strike in history. This year will mark the fifteenth year of her protest – launched on November 5, 2000 – demanding that the government repeal the draconian law that grants absolute power to armed forces in troubled areas. The Malom massacre of November 2, 2000, in which 10 civilians in the Imphal Valley of Manipur were killed allegedly by the Assam Rifles, traumatized her like no other incident. More recently she has been charged with Section 309 (attempt to commit suicide) of IPC for fasting at Jantar Mantar in Delhi during her fast until death on October 5, 2006.

For the latest she has broken her fast and has decided to contest election from Manipur as she has reached this view that a democratic 'ill' can only be rectified by getting into the democratic arena i.e. elections.

Till date, the government has not agreed to this demand. Recently, the Jammu and Kashmir government has asked for some parts of the State to be removed from the list of 'disturbed areas'. However, the army has opposed this and according to news-reports, a compromise formula is being framed to be discussed at the meeting of the unified command (the highest decision making body on the security affairs of the State).

Causes of Discontentment with AFSPA

Although the Government and many military experts are of the opinion that the Armed Forces Special Powers Act is necessary to maintain law and order in the region, but the main causes of the discontent should be looked into. A brief introduction to the main causes of discontent as of now is as follows-

- a) **Human Rights Violations** The use of the powers provided under the Armed Forces Special Powers Act for human rights violations is a prime reason for the opposition to the Act. A detailed analysis into the legal perspectives as well as the present situation
- b) **Hindrance to Peace Talks** With the Central Government in the process of peace talks with many of the insurgent organisations of the region, the need for the Act further diminishes. Contrary, to the main purpose of the Act to protect the law and order, it might act as an inflammatory fuel, as continuing operations under the Act may force the insurgent organisations to take an aggressive stand or move away from the negotiations. Such—a step would be a huge loss in the aim of long term peace and harmony in the region.

c) Existence of the Act in peaceful areas The Act as of now is in force in many relatively peaceful areas of the region. Although, there are sporadic incidents of violence in these regions but those can be very well counteracted with the existing provisions of the Indian Laws. The widespread use of the Act and putting the whole State under its blanket only increases the probability of misuse of the Act while mainly defeating the purpose of the Act to use it in 'disturbed areas' only.

d) Determination with Central Government The amendments to the act brought in 1972 also allowed the Central Government to declare any area as a disturbed area. This took away the powers from the Governor and the State Government who had better knowledge of the prevailing situation or circumstances.

AFSPA Violations in India

- 1. Operation Blue Bird (Oinam, Bishunpur District, Manipur):** Operation Blue Bird was launched in 11th July 1987 at Oinam of Manipur, where more than 30 Naga villages were covered and human rights violations including torture and even extrajudicial killings were done in addition to sexual harassment, theft and loot by security personals.
- 2. Kunan Poshpora (Kupwara District, J&K):** On 23rd February 1991, a search operation was conducted by Indian army in Kunan Poshpora village of Kupwara District. During this search operation, around 100 women including pregnant women were allegedly raped by army persons in front of villagers.
- 3. Malom (Imphal District, Manipur):** It was 2nd November 2000, when at Malom, a place near Imphal, Assam Rifles fired upon 10 persons at a bus stand and they got killed. In these persons, even a 60 year old lady and 18 year old bravery award winner also got killed. This case sparked the anger in Manipur. Protest was organized. Irom Sharmila started her fast with demand to repeal the act AFSPA. However, still nothing happened.
- 4. Pathribal (Anantnag district, J&K):** On 25th March 2000, at Pathribal in J&K, 5 civilians were picked up by Rashtriya Rifles and allegedly made as 'foreign militants' as the main accused persons who were responsible for Chhatisinghpura case. Initially, no case was lodged as defined with the impunity granted under AFSPA but later when protest erupted, CBI was asked to investigate the case. These encounters were

told as 'cold-blooded murders'. Supreme Court of India, with findings of CBI, ordered Indian army in the year 2011 for court martial, however after two years army closed the case with no actions on accused personnel.

5. **Manorama Killing (Imphal District, Manipur):** It was the night of 10th July 2004, when Assam Rifles went to house of Manorama at Imphal, Manipur at night, tortured her at her house before her brother and mother, then picked her up. In the morning, dead body was found at Ngariyan Yairipok road with bullets injuries in her private parts.
6. **Mass Graves in J&K:** in the year 2008-09, mass graves of approximate 3000 unmarked persons were found in Bandipora, Baramulla, Kupwara and other Districts. It was believed that most of these graves may belong to people who has been killed and buried by security personals without any accountability under security personals without any accountability under AFSPA. It was also believed that there may be persons who were reported as 'disappeared', as thousands of cases of disappearances are recorded.
7. **Machil Encounter (Kupwara district, J&K):** On 30th April 2010, three civilians of Baramulla (J&K) were shot by Indian army at Machil sector in Kupwara District of J&K and were framed as 'foreign militants'. However, later with the protest and inquiry, it was established that these persons were civilians and were called by army to provide them jobs of porters and later were killed in a staged encounter.²

Challenges before Armed forces special power Act

1. Law is a State Subject

Opponents of AFSPA-The submission is that the use of the armed forces in aid of the Civil power contemplates the use of armed forces under the control, continuous supervision and direction of the executive power of the State and that Parliament can only provide that whenever the executive authorities of a State desire, the use of armed forces in aid of the civil power would be permissible but the supervision and control over the use of armed forces has to be with the civil authorities of the State concerned.

Proponents of AFSPA: The power conferred under clause (a) of Section 4 can be exercised only when any person is found acting in contravention of any law or order for the time being in force in the

disturbed area prohibiting the assembly of five or more persons or the carrying of weapons or of things capable of being used as weapons or of fire arms, ammunition or explosive substances. In other words, the said power is conditional upon the existence of a prohibitory order issued under a law, e.g. Cr. P.C. or the Arms Act, 1959.

2. Power to Governor not Valid

Opponents of AFSPA: The conferment of power to issue a declaration under Section 3 of the Central Act on the Governor of the State is invalid since it amount to delegation of power of the central Government and that for the purpose of issuing a declaration the application of mind must be that of the Central Government with respect to the circumstances in which such deployment of armed forces is to take place and that conferment of the power to make a declaration on the Governor of the State cannot be held to be valid.

Proponents of AFSPA: the conferment of power to issue a declaration under Section 3 on the Central Government on the ground that the words "in aid of the civil power" postulates that the State alone should consider whether the public order requires armed forces of the Union to be called in aid of civil power and that the conferment of such a power on the Central Government is destructive of the federal scheme which is a part of the basic structure of the Constitution.

3. Declaration of Disturbed area

Opponents of AFSPA: Under Section 3, as amended by Act 7 of 1972, the Governor has empowered to declare an area to be a disturbed area. It has been outlined that the Central Act had foreseen a situation similar to armed rebellion in order to consider and declare an area to be disturbed.

Proponents of AFSPA: There is no requirement under the said act that Central Government shall consult the State Government before making the declaration of disturbed area. The conferment of the said power on the Central Government regarding declaration of areas to be disturbed areas does no, however, result in taking over of the State administration by the Army or by other armed forces of the Union because after such declaration by the central Government the powers under Section 4 of the Central Act can be exercised by the personnel of the armed forces only with the cooperation of the authorities of the State Government concerned.

4. Provisions under Cr.P.C.

Opponents of AFSPA: Adequate provisions are contained in Section

130 and 131 of the Cr. P.C. to deal with a situation requiring the use of armed forces in aid of civil power and that there is no justification for having a special law, as the Central Act, unless it can be shown that the said provisions in section 130 and 131 Cr. P.C. are not adequate to meet the situation.

Proponents of AFSPA: Section 130 makes provisions for the armed forces being asked by the Executive magistrate to disperse an unlawful assembly which cannot be otherwise dispersed and such dispersal is necessary for the public security. The said provision has a very limited application in as much as it enables the Executive magistrate to deal with a particular incident involving breach of public security arising on account of an unlawful assembly and the use of the armed forces for dispersing such unlawful assembly.

5. Powers to Junior Officers of Armed Forces

Opponents of AFSPA: The powers under section 4 can also be exercised by a non-commissioned officer who is much inferior in rank and that as a result of the conferment of these powers on a junior officer, there is likelihood of the powers being misused and abused.

Proponents of AFSPA: An infantry battalion in the area is required to cover large areas wherein it is deployed on grid pattern with special reference to sensitivity of certain areas and important installations/vital points. The deployment is either in sections or platoons. However, during an operation the group is required to be further sub divided into teams which are commanded by Non-Commissioned Officers. A Non-Commissioned Officer exercising powers under Section 4 is a mature person with adequate experience and is reasonably well versed with the legal provisions.

6. Training and Orientation of Armed Forces

The primary task of the armed forces of the Union is to defend the country in the event of war or when it faces external aggression. Their training and orientation defeat the hostile forces. A situation of internal disturbance involving the local population requires a different approach.

Various viewpoints regarding AFSPA

United Nations View: When India presented its second periodic report to the United Nations Human Right Committee in 1991, members of the UNHRC asked numerous question about the validity of the AFSPA. They questioned the constitutionality of the AFSPA under Indian law and asked how it could be

justified in light of Article 4 of the International Covenant on Civil and Political Rights, ICCPR. On 23 March 2009, UN Commissioner for Human Rights Navanethem Pillay asked India to repeal the AFSPA. She termed the law as "outdated and colonial-era law that breach contemporary international Human rights standards." On 31 March 2012, the UN asked India to revoke AFSPA saying it had no place in Indian democracy. Christof Heyns, UN's Special Rapporteur on extra-judicial, summary or arbitrary executions said "During my visit to Kashmir, AFSPA was described to me as 'hated' and 'draconian'. It clearly violates International Law. A number of UN treaty bodies have pronounced it to be in violation of international Law as well."

Non-Governmental Organizations' Analysis: A report by the Institute for Defense Studies and Analysis points to multiple occurrences of violence by security forces against civilians in Manipur since the passage of the Act. The report states that residents believe that the provision for immunity of security forces urge them to act more brutally. The article, however, goes on to say that repeal or withering away of the act will encourage insurgency. Many human rights organizations such as Amnesty International and the Human Rights Watch (HRW) have condemned human rights abuse in Kashmir by police such as "extra-judicial executions", "disappearances", and the "Armed Forces Special Powers Act", which "provides impunity for human rights abuses and fuels cycles of violence. Activists who are working in J&K for peace and human rights include names of Madhu Kishwar, Ashima Kaul, Ram Jethmalani, Faisal Khan, Ravi Nitesh, Swami Agnivesh, Dr. Sandeep Pandey and many others. They all accept that people to people communication and development of new avenues are the only way for peace, however laws like AFSPA are continuously violating human rights issues there.

Wikileaks Diplomatic Cables: the Wikileaks diplomatic cables have recently disclosed that Indian government employees agree to acts of human rights violations on part of the Indian armed forces and various paramilitary forces deployed in the North-Eastern parts of India especially Manipur. The violations have been carried out under the cover of this very act, Governor S.S. Sidhu admitted to the American Consul General in Kolkata, Henry Jardine, that the Assam Rifles in particular are perpetrators of violations in Manipur which the very same cables described as a State that appeared more of a colony and less of an Indian State. Earlier leaks had also stated that international Committee of the Red Cross (ICRC) had reported to the United States diplomats in Delhi about the grave human rights situation in Kashmir which included the use of electrocution, beatings and sexual humiliation against hundreds of detainees. This act is in

force in Kashmir since 1990.

Judiciary and Armed Forces special power Act

There were questions about the constitutionality of AFSPA, given that law and order is a State Subject. The Supreme Court has upheld the constitutionality of AFSPA in a 1998 judgement, the Supreme Court arrived at certain conclusions including.

Committees and Commissions

A. Justice BP Jeevan Reddy Committee

The Committee submitted its report in 2005, which included the following recommendations:

- (a) AFSPA should be repealed and appropriate provisions should be inserted in the Unlawful Activities (Prevention) Act, 1967;
- (b) The Unlawful Activities Act should be modified to clearly specify the powers of the armed forces and paramilitary forces and
- (c) Grievance cells should be set up in each district where the armed forces are deployed

B. Second Administrative Reforms Commission

The 5th report of the Second Administrative Reforms Commission on public order has also recommended

1. Repeal of the AFSPA
2. To provide for an enabling legislation for deployment of armed forces of the Union in the NE States, the Unlawful Activities (Prevention) Act, 1967, should be amended by inserting a new chapter

C. Santosh Hedge Judicial Commission

The Commission was headed by former judge Santosh Hegde with former Chief Election Commission J.M. Lyngdoh and retired IPS officer A.K. Singh as its members. It was constituted by the Supreme Court to investigate alleged cases of extra-judicial killings in Manipur. The findings of the commission are:-

- a. There was gross abuse of the Act and encounters being carried out in the North-eastern State were not genuine.
- b. Proposed repeal of AFSPA in Manipur

D. Justice JS Verma Committee

The committee was of the view that

- a. The armed Forces Special Powers Act (AFSPA) a controversial law that give sweeping powers to and often confers immunity on security forces- must be reviewed.
 - b. Security forces must be brought under the purview of ordinary criminal law rather than under army law.
 - c. The Act's provision of seeking sanction from the Central government before initiating any legal action against an armed forces personnel should be done away with in case of sexual crimes.
 - d. Appointment of Special Commissioners for safety of women in conflict areas
 - e. Reorientation of training of armed forces to includes laws and issues related to women's safety.
1. A suo-motto declaration can be made by the Central government, however, it is desirable that the State government should be consulted by the Central government before making the declaration;
 2. AFSPA does not confer arbitrary powers to declare an area as a 'disturbed area';
 3. The declaration has to be for a limited duration and there should be a periodic review of the declaration after 6 months have expired
 4. While exercising the powers conferred upon him by AFSPA, the authorized officer should use minimal force necessary for effective action, and
 5. The authorized officer should strictly follow the Dos and Don'ts issued by the army.

Conclusion

The Armed Forces Act was partially removed from three of nine Districts of Arunachal Pradesh. The deployment of military takes place when the situation becomes worse and can no longer be handled by the government, police or CRPF. When the laws and rules that function in the normal situation become ineffective, military is called-in. Now, such circumstances demand the tackling of events in a unique and independent manner. Such manner further requires some express provisions for the military to work independently. AFSPA is the manifestation of requirement of these express provisions. That being the case, repealing of AFSPA will handicap the army. Security forces certainly need some powers to tackle the insurgency. At the same time continuation of AFSPA at the cost of mistrust cannot lay foundation of real Democracy. Striking the balance

between power and trust is the biggest challenge before Governance.

References

<https://journals.sagepub.com/doi/abs/10.1177/0262728015606259>

<http://en.m.wikipedia.org>

Chronicle Special, "Census Note-Board", Vol. XXVIII No. 6 December 2016, pp. 80-82

Chronicle Special, "AFSPA", Vol. XXVIII No. 6 December 2016, pp. 86-91

Bhaskara Rao Digumarti, Facts files of Human Rights, Discovery Publishing House, 2011

Suresh Kumar Soni, "Human Rights: Genesis and Development" in Suresh Kumar Soni ed., *Human Rights: Concept, Issues, Emerging Problems* (New Delhi: Regal Publications, 2007), p. 14.

G.S. Bajwa, *Human Rights in India: Implementations and Violations* (New Delhi: Anmol Publications, 1995), p. 26.

Historiography of Translation in Punjabi

Ravinder Singh,

TRANSLATION has an undeniable importance in the History of Human knowledge-systems and culture. It has brought about and facilitated the interaction between diverse communities, religions, ideologies, nations and linguistic groups. World today is aware of the knowledge and wisdom of ancient sages, philosophers and literary personalities through translation only. So the transference of Idea and knowledge of one linguistically different group of mankind to other is possible only with the help of translation, thus the very idea of translation, in any form, is very old.

The history of translation traces its origin back to the rendering of the old testament of the Holy Bible. There have been many translated versions of the Bible and subsequently translations were primarily taken up with the reference to the Holy texts like the Vedas and Puranas in the Indian context. The translation has of course been atleast indirectly adopted as a technique of imparting instruction in the Gurukula system. (Aspects of Translation, K.V.V.L. Narasimha Rao, CIIL, Mysore)

But the Translation in its present form is not very old a practice as it was prevalent in India in some other forms. Present day translation work is mostly dependent on and related to the printed form of text. Translation practices were very much prevalent in Indian subcontinent in various other forms with the same idea of providing knowledge and wisdom available in one language to the other. There are up to ten examples of telling earlier renderings afresh in a new Idiom or in simple and more commonly understandable language to transfer knowledge and idea with same focal point as that of the original text. So the translation is like an art which could be used to recreate and refresh the knowledge available in one

language to other. Translations help understanding all aspects concerning humanity and society with the idea of commonness.

India is a land of linguistic diversities as well as with greater linkages among them. Ancient scriptures and literary knowledge texts available orally were preserved as Mantras and later those ideas were retold in commonly spoken language to transfer that knowledge and in the process the focal point of original renderings were taken care of to be kept intact while practicing retelling. This process itself was an earlier form of translation in India. Even during the medieval period or *Bhakti* period, same tradition was followed to translate our own ancient texts and scripture to make them available in more easily understandable language. In this process we still have the knowledge available with us that was once created in, now considered as, classical language. This is the prime spirit and idea of translation. In fact translation practiced in India has been an inclusive kind of transference of ideas for instance *bhashya*, *tika*, *anvaya*, *varṭika* are some of the important forms of rendering textual ideas of one language to other in which transference of idea was more important than linguistic transference.

When we are making an effort to create a data-base of translation activities in Indian languages and further to have an analysis of theoretical approach of translation practices prevalent in present times, it is very important to have a look at the chronology of translation work available. To begin the research work it is also necessary to categorize texts that have been translated in Punjabi from other languages and vice-versa. Modern day translation work in Punjabi begins with the advent of printing and publishing of textual work. The time and environment in which translation practices started indeed has an impact on translation styles and in shaping the educational environment of that period.

Firstly we can take stock of the translation done in Punjabi from other Indian and foreign languages. In this context the first translated piece of text published in Punjabi from English as per the information available is John Bunyan's text of *Pilgrim's Progress*. This English novel was translated by a priest and was published in 1888 as 'Maseehi Musafir di Yatra'. But before this English to Punjabi translation several other Sanskrit and Greek texts were translated. Most of the translated works available from 1849 to 1900 are related to Indian religion and medicinal sciences that are translation work of Sanskrit and Greek texts. As the colonial power of British Empire got hold of Punjab and started implementing its education policy, more and more English literary texts were made available in English as well as in Punjabi in translated form.

Most of the translation work available in Punjabi from other languages is a kind of linguistic transference with focus on the main idea of the text. It serves the

purpose particularly in the field of literary translation from other Indian languages whereas in the case of foreign languages, the work is first translated into English and then into Punjabi. It means that Punjabi translation from the languages other than English mostly takes place from the secondary translated work. In such cases the methodology adopted to translate those texts uses the same tools to translate as of English translation. Translated Punjabi books do not contain any details about the methodology or the tools adopted for translation. Prefaces, Introductions, Forewords, Foot-Notes, Glossaries, or Postscripts written by translators, editors, authors or anthologists rarely go into the details of translation practices. But in the background of translation process the main idea that transpires is same as *K. V.V.L. Narasimha Rao argued in the Introduction of his book stating as--*

Translation is a process of transferring the theme/subject from one language (SL) to another language (TL). In other words, it can be stated that through translation, the idea/thought expressed in one language is represented without deviation and distortion in another language. Ensuring that deviation and distortion need to be minimized to the least, if not completely avoided, is very essential for a good translation. In absence of this phenomenon, the process does not remain translation.

In fact translation from other languages to Punjabi does not face any major problem as the Punjabi to English or other foreign language translation face. Major problems arise when a text of an ancient or medieval era is translated and that too from the field of philosophy and religion. This is an important area where translation practices need to be carried out with more care so as not to deviate the reproduced translated work from the original text with its core idea of concern. In this regard, for instance, the translation of *Adi Granth* (*Sri Guru Granth Sahib*) and other related religious text faced serious problems that need to be addressed. In this context scriptural translation requires serious approach with in-depth knowledge of those scriptures and the religion and philosophy related to them. In the past and medieval times human experience with the quest of world and its origin, questions about self and existence were all related to philosophy and religion thus theological explanations were conceptualized over the centuries. Those life experiences are in the background of our scriptures and religious texts. Translation work on these monumental writings involves great deal of knowledge and expertise. In such cases generative as well as normative translation practices are required to uphold the true meaning and idea of those particular knowledge texts. Many socio-culturally complex linguistic idioms simply cannot be translated into other linguistic expression having completely different theological experiences. It is pertinent to use the same word, term, idiom and

expression with elaboration at the end as short notes. For example there are several translations of Sri Guru Granth Sahib available in English but most of them have similar kind of transference hurdles while attempting to translate core religio-philosophical terms of Indian roots. I would like to focus more on this aspect with some examples from English translation of rich Punjabi medieval literary work.

Before going into the details of translated medieval literature, I wish to put some facts about translation practices in Punjab of that era. According to available evidence the history of translation in Punjabi can be traced to the last decades of 17th Century. During this period several classical Sanskrit texts of Indic *dharma* tradition, were rendered in Bhakha or Sadhu Bhasha (a lingua franca of Northern India in medieval times) by Guru Gobind Singh, the 10th Sikh Guru and his court-poets. These texts were written in Gurmukhi, a script patronized by the Sikh Gurus. Originally, these texts were composed in the form of booklets or *pothis* during the Guru's life. After the demise of Guru Gobind Singh in 1708, these writings were included in a single volume in present form (known as Dasam Granth or Dasven Pateshah ka Granth) by Bhai Mani Singh. This was done by him on the instructions of Mata Sundri, the wife of the Guru.

The following compositions included in Dasam Granth are based on Sanskrit texts:

1. Chandi Charitar Ukati Bilas: As per internal textual references, it is based on 'Devi Mahatamya' section in Markandeya Puran. It depicts divine attributes and narrative accounts relating to Chandi.
2. Chandi Charitar 2: Thematically similar composition relating to Chandi.
3. Var Sri Bhagauti Ji Ki (Chandi di Var): It is also based on the above Devi Mahatamya episode in Markandeya Puran. It is a poetic narrative employing a popular Punjabi folk literary genre (Var). It is a narrative account of the battles between Chandi and Asuras (Mahishasur, Sumbh, Nisumbh and others). These battles were fought by Chandi on Indra's request to recapture the lost kingdom of *devas* from Asuras. But whereas 'Chandi Charitar Ukati Bilas' and 'Chandi Charitar 2' are written in a hybrid language (containing elements of Braji, Awadhi and Punjabi), 'Chandi di Var' is composed in Punjabi.
4. Another important category of compositions included in Dasam Granth relates to the narrative accounts of various Hindu Avatars. These compositions are part of a larger section of the Granth entitled as Chaubis Avatar. Under this section we find accounts of incarnations of Vishnu. In these narratives prominent space is given to Krishnavatar and

Ramavatar.

At the end of Krishnavatar we come across following verse, which indicates its purpose:

The tenth tale of Bhagwat has been composed in Bhakha

I have no other desire but to engage in righteous war.

These compositions provide an abridged version of the original elaborate narratives. There is an important ideological difference between presentation of Avatars in 'Chaubis Avatar' and Pauranic literature. The author of Chaubis Avatar believes in One Supreme Being which is beyond birth and death and treats all Avatars as persons who worked as his agents. The aim here is not to worship any of incarnations but to enlighten the people about these incarnations. These Avatars cannot be accepted as the Supreme Being.

As a matter of fact these compositions are instances of re-rendering or reworking of the primary texts. These compositions largely follow the original narrative structure of the source texts and preserve their overall thematic concerns. But at certain places they also attempt at renewed interpretations of the narrative events and situations in the light of contemporary concerns. In our view these compositions are instances of a pioneering activity in translation. In the proper sense of the term, they are reworking or trans-creations of the earlier texts.

It is true that the idea of translation basically emerges from the need to share religio-philosophical ideas across the religion and faiths.

The history of translation as dealt with elsewhere in the present volume traces back of the translation of Bible from Hebrew to Greek. In fact, the emergence of the art of translation emanated from the efforts to translate the Christian holy text into different languages. (AoT, Rao, 62)

An important aspect of the historiography of Punjabi translation relates to English translation of Sikh scripture (*Guru Granth Sahib*). We can mention here Dr Ernest Trumpp's translation of the portions of *Guru Granth Sahib* which was published in 1877 under the title *The Adi Granth* as the earliest attempt in this direction. Dr Trumpp (1828-85) was an eminent linguist sponsored by the Ecclesiastical Mission Society. He was commissioned by India Office in 1869 to translate *Guru Granth Sahib* into English. Being a Christian missionary his approach towards the Sikh scripture was biased which offended the Sikh sensibilities. McAuliffe was another European scholar who attempted translation of some of the writings of the Sikh Scripture into English in his monumental work "The Sikh Religion". He endeavored to make some reparation to the Sikhs. But these scholars introduced, consciously or unconsciously, the Christian theological terms in their translation of conceptual terminology of Indic *dharma*

traditions employed in *Guru Granth Sahib*. For instance the very first word 'Ek-Omkar' in the opening section of the *Granth* is rendered as 'one God':

There is but one God whose name is true, the Creator, devoid of fear and enmity, immortal, unborn, self-existent by the favor of the Guru. Repeat his name. God was true in the beginning; he was true in the primal age. He is true now also, Nanak, and He also will be true.

The first complete translation of the *Guru Granth Sahib* into English was provided by Dr. Gopal Singh in 1960. It was published in a four-volume set. The International Edition of the same was published by the World Sikh University Press in 1978. Dr. Gopal Singh traces the common threads of Indian religious thought which provides one a deeper appreciation of Sikh Dharma. He included footnotes explaining Hindu mythology and folk idioms. After Dr. Gopal Singh several other Sikh scholars -Man Mohan Singh, Gurbachan Singh Talib, Pritam Singh Chahil, Dr. Sant Singh Khalsa and others – have attempted English translations of *Guru Granth Sahib*. Given below is the comparison of their translation of the Mool Mantra:

Dr. Gopal Singh:

By the Grace of the One Supreme Being, The Eternal, The All-pervading Purusha, The Creator, Without Fear, Without Hate, the Being Beyond Time, Non-incarnated, Self-existent, The Enlightener.

Man Mohan Singh:

There is but one God. True is His Name, creative His personality and immortal His form. He is without fear, sans enmity, unborn and self-illuminated. By the Guru's grace He is obtained.

Gurbachan Singh Talib:

He is the Sole Supreme Being; of eternal manifestation; Creator, immanent Reality; Without Fear; Without Rancour; Timeless Form; Unincarnated; Self-Existent; Realized by grace of the holy Preceptor.

Pritam Singh Chahil:

The Creator of all is One, the only One. Truth is his name. He is the doer of everything. He is without fear and without enmity. His form is immortal. He is unborn and self-illuminated. He is realized by Guru's grace.

Dr. Sant Singh Khalsa:

One Universal Creator God. The Name is Truth. Creative Being Personified. No Fear. No Hatred. Image Of The Undying, Beyond Birth, Self-Existent, By Guru's Grace.

Translation of *Guru Granth* is now available on website and as pdf also. The

translator of one of the translated version Dr. Kulwant Singh Khokhar, Virginia, USA comments about his work in 'ABOUT THE BOOK'-

With this philosophy, only God remains for worship and nothing else. The ancient, religious Hindu Holy Books are rich with the heritage of historical events, mythical stories, and other episodes. The Sikh Gurus have liberally drawn on them to make their own views easily understandable by the masses oriented to these. In this book, the attributes of God have been given with capital letters. This is my choice. Most of the bridging-elements, meanings, explanations etc. have been put up within parentheses (round brackets) to distinguish the self-added material, and as an effort to keep it running smooth in the script. This work is more of an easy transliteration. Special care has been taken to use the simple words. The spellings of a few non English words both in roman and English, may have some variation in their spellings. These should be ignored. Mainly, the roman is by Dr. K.S. Thind. Another version is by the author, and in this the punctuation marks have been attached to the characters to modify their phonation.

Medieval Punjabi literature has its roots in the ancient theological tradition of Indic civilization and has further progressed, delivered and developed the core Idea of our traditional knowledge and wisdom with linguistically simpler and transference Idiom. Literary texts of those theological concerns have used common man's language and idiom to explain our rich knowledge traditions and made them more relevant in contemporary society. So the role of translation has always been there and remained important till date.

In Punjabi, the translation work progressed through several institutes and agencies since the inception of organized efforts in this field. In the pre-independence period some institutes were involved in translation work such as-

- Ludhiana Bible Society, Ludhiana
- Khalsa Tract Society, Amritsar
- Punjab Text Book Committee, Lahore
- Punjab Translating Publishing House, Amritsar
- Swadeshi Bhasha Publishing Agency, Amritsar

In the post-independence India systematic efforts have been made to facilitate translation work from Punjabi to other languages and vice-versa. Amongst the prominent institutes are-

- Bhasha Vibhag, Punjab
- Punjabi University, Patiala

- National Book Trust, Delhi
- Sahitya Akedamy, Delhi
- Punjabi Academy, Delhi

And several more private agencies and sole authors who are interested in translation work of their choice may be for the purpose of business or with the mind of contributing something to the society. The choice of text to be translated varied from institute to institute as per their policies. Some institutes/agencies choose literary texts only and others may choose from history, philosophy, religion or other disciplines. So the list of literary texts is longer as compared to the texts of other disciplines.

During the course of time Punjabi translators have tried to evolve and conceptualize some theoretical approach for standardizing this practice. Some Punjabi translators have tried to formulate and explain their own experience of translation. Here are some comments from the Prefaces, Author's note etc to ascertain how and what they think about translation and their own translation practice. Translator of *Anndata* (the hands that feed) a novel by Sahit Akademy awardee Baldev Singh and translated by Narinder Jit Kaur, Publication Bureau, Punjabi University, Patiala in its Translator's note says:

Translation is an art in itself, equally challenging as creative writing. The translator is required to mould him/herself into the mood of the writer. Each language has its own set of idioms and connotations, and it's likely to leave some blank spaces between the original text and the translation. The translator has a dual responsibility, sincerity towards the original text as well as to prove his/her own creativity and skill, without tempering with the meaning, mood and tenor of the original work, and for this he/she has to be well equipped with a thorough knowledge of both the languages.

Departmental note in the book by Amarjeet Kaur, Head, Department of development of Punjabi language, Punjabi University, Patiala states about the project of translation under department as-

The University has formulated a policy for translating important works. There are two major types of translation activities in which this department is active. On one side department is making efforts to translate the world famous literature of the Nobel Laureates in to Punjabi thus enlightening the Punjabi reader about the world view on different cultures, their life styles, socio-political situation and personal relationship. On the other side translation activity of the department is to

translate the classics of Punjabi into English so that they could get first hand in formation of the cultural milieu of the Punjabi society and culture.

According to recent trends in translation works of literary texts it is more or less clear that the institutes and agencies chose to get popular literary texts of other languages into Punjabi. They also focus on getting classic Punjabi literary texts into English and other languages.

While reading translated work of Punjabi in English we can notice short comings in translation of culturally imbibed vocabulary and philosophical terms related to Indic theological concepts. Even the texts related to medieval texts and folkloristic piece of poetic narrative. Translation work involves many elements to take care of. Equivalence of words that are contextualize in particular time and space. It's a careful task to recreate that delicate process of production of meaning keeping the same idea in focus.

References:

1. Rao, K. V. V. L. Narsimha, Aspects of Translation, CIIL, Mysore 2005
2. Kaur, Narinder Kaur, Anndatta (The hand that feeds), PB, PUP 2010
3. Sethi, Sudeshan Kaur, Maangven Moti, PB, PUP 2008

Cultural and Ethnic Disintegration of Gikuyu Society: A Study of Ngugi wa Thiong'O's *Weep Not, Child*

Sanjeev Kumar

THE PROPOSED research project will undertake a study of Ngugi wa Thiong'O's *Weep Not, Child* with regard to the socio-cultural, and ethnic disintegration of Gikuyu (Kenyan) society by domineering Western imperialistic forces. The present study also aims at providing aesthetics and various cultural dynamics employed by Ngugi to delineate the need for identity and individuality for the Gikuyu society at large and dissolution of their identity and individuality by the subversive colonial ideology and politics. Gikuyu is a language and a race of people in Kenya which forms a common platform for sharing emotion and sentiment of people. East Africa shares with rest of the Africa a common history of pre-colonial migration and settlement, colonial exploitation, strengthening resistance to foreign intrusion, then disillusionment during post-independence decolonization. Africans in Kenya, elsewhere, resisted foreign incursions into their territories with varying degrees of success. A few introductory remarks about the writer are in order before making a statement of intent for this study.

Ngugi wa Thiong'O is a celebrated essayist, novelist and Lotus Prize laureate. Likewise, the Ghanaian novelist Armah, Ngugi's novels are a projection of the contemporary post-independent socio-cultural scenario of Kenya and explore the failure of African ruling to cope up with the new situation in the post-independence era. Ngugi is a true embodiment of the African culture and identity and how the pre-colonial socio-cultural cohesiveness is disrupted by the imperialistic politics forms the basis of this study. His novel *Weep Not, Child* (1964) exposes the dissolution of Gikuyu's social and cultural life which is marked by the manifestation of various domineering colonial ideology.

The colonization of Kenya was escalated in 1895 with the establishment of East Africa Protectorate and till 1920 it was known as Kenya colony. Having witnessed the tragic and brutal experience of seven years emergency lasted from

1952-1959; eventually the independent Republic of Kenya was formed in 1964. In Kenya, Africans lost ground against an increasingly competitive European settler community intent of securing priority for their own class and race on matters of land in the colony. The present study examines that Kenya's particular mode of resistance to foreign intrusion to imposed colonial jurisdiction, to land alienation, to the privileging of an alien culture over a devalued indigenous one, and to a subsequent erosion of human rights has determined Ngugi's portrayal of the changing traditional socio-cultural and religious scenario in postcolonial Kenya.

Indeed, the two primary concerns of African art and literature, as with the entire gamut of post-colonial literature, has been to seek cultural self-definition and political self-determination which was denied to the third world countries and their inhabitants as a strategic measure to enslave their minds and lives. An integral part of this political strategy was to destroy history, literature and culture which form the root identity of their existence.

In this context, the myths of Africans being uncivilized and barbaric are propagated by travelers and missionaries. The Africans being primitive and uncivilized are accepted blindly by most of the Europeans who entered the continent either for trade or colonization. In fact, the colonial masters have made this myth of primitivism of the African arguing that Africa has no history, no culture, and no past. The Europeans have used this myth of primitivism as a political reason entering into the Africa to civilize the savages and later systematically exploited its people for the economic and political benefit. On the global platform, these white men have taken upon themselves the responsibility of civilizing the savage Africans.

In response to this Eurocentric version of Africa various literary activity have been organized by modern African writers, leaders and novelist who after the World War IInd emigrated to Europe and under the inspirations of thinkers like Amie Caesar, Frantz Fanon and George Padmore open a second front and step up their cultural activities to assist the freedom struggle in their respective countries back home.

In the second half of the twentieth century various colonized regions of Africa receive independence but political emancipation do not sound the complete liberation for the colonized. Frantz Fanon study of the psychology of colonialism says the almost irreparable damage done to the psyche of the people by the colonial process. Displacement, alienation of the self, negative of one's own history, tradition and culture are some of the negative impact left by colonialism. The people are granted political independence but the minds of the people, cultural and religious spheres of life have still to be liberated from imperialist

hegemony. Soon there is a sense of growing realization among the newly independent people that the independence they have achieved through bloodshed and martyrdom is completely nominal.

Education and religion have remained the dominant tools of European's suppression to exercise their control over Africans. Introduction to Christianity and the formation of various missionary schools have ultimately culminated in breaking the cultural and traditional fabrics of African. In *Petals of Blood* Eustace Palmer has rightly pointed out, "Christianity, which in earlier novels was shown to exercise a firm hold over the lives of the people, is presented here as oppressive, unsympathetic, and hypocritical" (165)². At the beginning of colonialism education (meant to be Christian) is supposed to be the certificate for entry into the middle class.

African literature in English, especially fiction from 1950 can be broadly segregated into three broad categories. The first category is the novels that talk of the distant past, of society and people in pre-colonial Africa. Chinua Achebe's *Things Fall Apart* (1958), Ngugi wa Thiong'O's *The River Between* (1965), *Weep Not, Child* (1964), Ayi Kwei Armah's *Two Thousand Seasons* (1973), *The Healers* (1978) are some instances that belong to this category. The second category deals with the novels which primarily focus on life under colonialism, and the subsequent struggle for independence. Ngugi's *A Grain of Wheat* (1967) is a classic example. In this category the individual histories and regional variations of the different parts of Africa guide the historical reconstruction. In the third category writers' attention is specifically on independent Africa and neo-colonialism. The historical consciousness of the present becomes exceptionally important for the African writers. Writers like Achebe, Soyinka and Ngugi examine the present with intense introspection where the inept political systems, economic inequalities, corruption and degeneration of moral values are seen not as a result of colonialism but as an internal crisis.

Ngugi wa Thiong'O is an eminent African writer who hails from Kenya is amongst those writers of time who gives expressions to his thoughts on culture, politics, and history. Born in Kamirithu village in 1938 Ngugi is known as James Ngugi until his symbolic decision in 1970 to reject his Christian name (James Ngugi) and adopt his Gikuyu name Ngugi son of Thiong'O. Ngugi was twenty five years old when Kenya becomes independent in 1963. Ngugi's father is a peasant farmer who is forced to become a squatter on his own land under the British Imperial Act of 1915. Ngugi has attained his education both mission run and independent Gikuyu school. Ngugi has been the student of the prestigious Alliance school which forms the parallel to the Siriana Mission School of his novels. Probably all of Ngugi's protagonist Waiyaki (*The River Between* 1965),

Njoroge (*Weep Not, Child* 1964), and Karega and Munira (*Petals of Blood* 1977) are all created out of his own experience of education in a Christian Mission school.

Development of the inherent resources of a people like dance, song, speech comprises the aesthetics context of Ngugi's novel. In this respect, his cultural association with Kamiriithu theatre community and reconstruction and celebration of Gikuyu life and culture through the incorporation of traditional actor, dance, folk, literature and music form as a code of aesthetic and cultural expression for undertaking a study of Ngugi's novel.

Ngugi's writing is mainly concerned with the narrative which comprises a network of metaphor and images. The picture of oral- tradition which is deeply rooted in the land of Gikuyu and Mumbi to which he is associated is remarkably shown by him. The narrative of myths, songs, proverbs, the figure of speech, folktales, fables, ceremonies, language and imagery of the traditional and indigenous Kenyan society have been significantly explored by Ngugi. For the justification, I have taken the reference of Ngugi wa Thingo'O's *Weep Not, Child*.

The novel *Weep Not, Child* presents the incidents which are very close to the life and family of Ngugi himself. In this novel he has raised the issues of alienation of land and Mau-Mau rebellion which marks the beginning of the freedom movement in East Africa. It has been considered as the, "first East African novel in English, and the first to deal with the Mau-Mau guerrilla war of the 1950s from an African point of view" (Harry Blonk's *Twentieth Century Literature in English* 198)³. In this novel the changing use and ownership of land in Kenya, dictated by the principles of capitalism and influenced by colonial and foreign office policy that colonies be self-sufficient as quickly as possible greatly altered cultural dynamics of community, effectively dispossessing a large percentage of Gikuyu tenant farmers from tribal land. Newly introduced farming methods requiring large consolidated tracts of land rendered the smaller, individually farmed shambas (field used for growing crops) obsolete and therefore militated against the strongly held Gikuyu tradition that every individual has a right to land. Kabonyi (*The River Between*) and Jacobo (*Weep Not, Child*) are presented as opportunists whose allegiance and contact with Europeans enables them to exploit the rest of the African community.

The corrosive division among Africans as treated in *The River Between* is focused again in *Weep Not, Child*, this time against the background of the increasing conflict between Africans and European settlers over land and political representation, the problems of post-war assimilation for returned African soldiers and the disruptive events of the Emergency. The widening rifts in African communities are reflected in microcosm in the tragic and brutal death

of the dispossessed Ngorho and the subsequent disintegration of his family. Ngorho's implicit faith in Gikuyu prophecy proves to be misplaced while Boro's experience outside Kenya in World War IInd ensures his lack of faith in the generation that in his view failed dismally to resist the plundering intrusion of outsiders on tribal land. Njoroge's youth and his exposure to Western education and Christian values leaves him unsure of how he should respond to a conflict between African nationalism and British colonialism that has prematurely ended his schooling, damaged community relationships and destroyed his family.

The narrative gives us a detailed account of a crucial phase in the life of Gikuyu people who are trying to repossess their alienated land and seeking political emancipation. The incidents have been built up through the life of young boy named Njoroge who has been transformed from an innocent school boy to a victim of the Mau-Mau. The Mau-Mau Uprising (1952-1959) which is also known as the Kenya Emergency or the Mau-Mau Revolt was a war in the British Kenya Colony (1920-1963) between the Kenya land and Freedom Army and the British Colonists. In this novel Ngugi inspires the Kenyan youth to identify the positive elements in their heritage and appeals them to come out of despair and take charge of the freedom struggle.

The novel is divided into two parts. Part one belongs to Njoroge and his endeavor to achieve education and second part deals with the revolutionary and anti-colonial upheaval in Kenya. Connecting part one and two is called the 'interlude' which goes beyond two pages; the interlude begins two and half years later. In part two as the novel proceeds towards a conclusion, the various issues and questions which are raised earlier work out. Second part begins with a white govt. official stands on a hill overlooking Nairobi, got disillusioned and amazed to see the changes. He becomes surprised after having seen the city, and the people are no longer deaf and dumb. The colonized have regained their speech and strengthen their anger for action. Their actions are to be seen as reactions to colonization, the systematic violence of an oppressive structure that sought to keep the subjugated. Finally, Jomo Kenyatta and other leaders are arrested, and emergency is announced.

Continuous physical and psychological exploitation leading thousands of young men moves into forest and in 1952 formation of Kenya land and freedom Army is taken place. Their goal is specifically the liberation of the land and to achieve this at any cost. They are quite aware of the fact that they cannot fight the British armed forces. Therefore they prefer guerilla tactics against them. White settlers, government officials and blacks who have betrayed their own people are now on their targets. The colonial authorities have launched a counter-attack, and many of the fighters are captured and shot dead. In 1952, Jomo Kenyatta and twenty-

five other leaders are arrested and charged of supporting Mau-Mau. As a result of this, all political organizations and demonstrations are banned, and state of emergency is declared which has lasted for seven years from 1952-1959

The increasing violence, the threats to the school, involvement of their family members force the children and people to accept Mau-Mau as a political reality and not as an adventurous romantic tale. Ngotho, who belongs to the old generation and staunch adherent to non-violent ethics, refuses to accept the reality and necessity of the Mau-Mau. Boro tries to persuade his father to determine not to take the oath and join the Mau-Mau. It is towards the end of this novel that Ngotho becomes partially aware and accepts the cause of Mau-Mau and its political philosophy. He tries to help his son by taking on himself the blame of Jacobo's murder.

The manifestation of ethnic and traditional order has been replaced and for some extent is disrupted by alien culture in this novel. In *The River Between* it was father Chege who suggests his son Waiyaki to restore and maintain traditional solidarity employing education but in *Weep Not, Child* Boro tries to persuade his father to join Mau-Mau for community benefit. The narrative suggests that the youth will no longer be non-violent and subdued as many of their father generations were. They have attained some measure of historical consciousness which urges them to articulate their protest against colonialism. In this context, many young men like Boro have taken the oath and are now committed Mau-Mau's. In the forest, Boro addresses his comrades.

The lost land will come back to us may be. But I have lost too many of them whom I loved for land to mean much to me'... Boro had always told himself that the real reason for his flight to the forest was a desire to fight for freedom. But this fervor had soon worn off. His mission became a mission for revenge. (102)

The land has been a source of rancor since the turn of the century when the amicable trade-relationship that existed between the Gikuyu and the British prior to white settlement deteriorated dramatically with both groups competing for the same land. Both seem irrevocably competing for the same. European penetration helped to destroy what group cohesiveness existed among Gikuyu, as we have already seen in the class division manifested in *Weep Not, Child*, which is set some fifteen years later than *The River Between*. The resentment felt by those who had no land of their own was directed not only at European landowners but also at those African whose allegiance to the colonizers culminated in permission to own European style plantations and employ African peasant labor themselves. Therefore, the spirit of traditional cohesiveness existed among the Gikuyu has been systematically dismantled by

the European penetration. This has been conspicuously manifested in *Weep Not, Child*.

The dilemma caused by changed circumstances, thus, highlights the disruption to traditional forms of hierarchy that in turn led to the dramatic divisions between generations depicted in *Weep Not, Child*. The unevenness of Kenyan political awareness, even within the one family, is also immediately apparent. In the rural areas, the younger, less patient, more militant members of fundamentally conservative communities tended to eclipse their more conservative elders. Alienated from the rural community that still nurtured most of his family, Boro clearly represents those African who returned from the war to find themselves disinherited, relegated to being laborers rather than land-owners:

But the Kenyan Africans who had been active in the same warsee part of the landless and jobless majority in the cities and rural areas. The white soldiers had the votes: the Kenyan African did not... The African soldiers rejected their destinies as hewers of wood and joined the Mau Mau guerrilla army. (Ngugi, *Moving the Centre* 138)⁴.

In *Weep Not, Child* Ngugi has significantly pointed out the cultural alienation and generation gap best exemplified through the characters of Ngotho and Boro. In the post-war reintegration the problem of land for freedom fighter has been intense which the government and communities have not addressed well. Disenchanted with their lot, awakened to political consciousness by the experience of war, they became nationalist, subversive of continued colonial rule, and with nothing to lose, ready to risk all in a fight for freedom and land restoration. Boro's conflict with his father is rendered in terms of the urbanized African in conflict with the traditional peasant. While Ngotho feels that to order a father to take an oath reverses "the custom and tradition for which he and his generation stood" (84).

Cultural alienation has been the significant part of this novel which occurs on account of the penetration of the European forces into African territory. Boro's cultural alienation from the traditional community makes him impatient with his father's generation, whose refusal to act, he believes, has robbed the present generation of its rightful heritage. We witness him distancing himself from the compliant behavior of the previous generation by referring to them as "these people": "How could these people have let the white man occupy the land without acting? And what was all this superstitious belief in a prophecy?" (30).

Jacobo is the portrayal of that type of African, who wants to become a part of the elite class. The distinction of economic class, absent in the time of *The River*

Between have now become an important issue. Jacobo is a rich and powerful person who has snatched the land from Ngotho and the majority of poor, landless Africans.

In this novel *Weep Not, Child* Boro's counterpart in the violence and degeneration is Howland. If read them parallel it is quite evident that the intensity of Boro is a consequence of Howland's violence. Nonetheless, there is an implication that it diminishes them both to the same level. C.B. Robson has rightly commented in this respect; "the picture of the two men (Boro and Howlands) conditioned by interesting forces which in the end dehumanize them, enables us to see a complicated chain of cause and effect" (Clifford B Robson, *Ngugi waThiong'O* 41)⁵.

Amidst all this Njoroge is still living his life on the line that education would uplift him socially and economically. Unlike Waiyaki in *The River Between* who was an idealist, Njoroge is an escapist. Education for him is the means of escaping from the present scenario and his intense desire to go to England for higher education. Therefore, his immense desire of pursuing education further reveals his inability to accept any responsibility. He only thinks of tomorrow, today is too chaotic for him to deal with. This is quite reflected in his conversation with Mwihaki.

Sunshine always follows a dark night. We sleep knowing and trusting that the sun will rise tomorrow. He liked this piece of reasoning. But he was rather annoyed when she laughingly said 'Tomorrow, Tomorrow never comes. I would rather think of today.' (95)

Weep Not, Child portrays a society which has been largely disempowered by colonialism, characterization, historical context and cultural issues all compete for the foreground, while the lack of a strong narrative point of view sometimes produces narrative unevenness. *The River Between*, which takes specific cultural issues as the basis for character construction, strikes a firm balance between context and motivation. Both novels reveal that changes to the Gikuyu social structure, including the traditional line of authority, have left the older generation without a role to play in resisting any further disenfranchisement. Therefore, the lack of unity between new generation or Western educated leaders and traditional communities, explored at length in *The River Between* is still discernible in *Weep Not, Child*.

In the final analysis, although this novel remains apprentice work, yet forms a significant part portraying the way in which colonialism and the African response to it eroded the traditionally close relationship between the individual

and the community and disrupted the traditional social and cultural fabrics on which the entire society had based.

Clearly, Ngugi wa Thiong'O is one of the most eminent writer Africa has so far produced: recognized at home and abroad as exceptional, he remains, even in exile, a powerful spokesperson for the re-assertion of African cultural identity. Courageously critical of current African rulers and their government, his analyses of various aspects of postcolonial Africa, and in particular the role of the intellectual in relation to rural peasants, the urban proletariat and political change have been both challenging and enlightening. Despite enormous personal difficulties placed in his way by a government opposed to his views and his freedom to express them, Ngugi has continued to argue for an end to all repressive regimes.

Works Cited and Consulted

- Ngugi wa Thiong'O. *Weep Not, Child*. London: Heinemann, 1964. Print.
- Palmer, Eustace. "Ngugi's *Petals of Blood*." *African Literature Today* No.10 (1979):153-166. Rpt. in *Critical Perspectives on Ngugi wa Thiong'O*. Ed. G.D. Killam. Washington, DC: Three Continents, 1984. 271-284. Print.
- Blaires, Harry. Ed. *A Guide to Twentieth Century Literature in English*. (London and New York): Methuen, 1983. Print.
- Ngugi wa Thiong'O. "Biggles, Mau Mau and I". *Moving the Centre: The Struggle for Cultural Freedom*. Studies in African Literature, New Series. London: James Currey, 1993. Print.
- Robson, Clifford B. *Ngugi wa Thiong'O*. Macmillan Commonwealth Writers Series. London: Macmillan, 1979. Print.

हिमाचल प्रदेश में प्रचलित लोक कलाओं की शब्दावली

श्रीराम शर्मा एवं प्रेम प्रकाश

कला का सामान्य अर्थ --- निपुणता, कोमलता, कुशलता से है। जब कोई कलाकार मन की भावनाओं को कुशलता के साथ प्रस्तुत करता है, तब उसे कला कहा जाता है। कला के माध्यम से ही मानव के विचारों और भावनाओं की अभिव्यक्ति होती है। इसी के माध्यम से हम अपने परिवेश, जन्म-भूमि, संस्कृति एवं परम्पराओं को पहचानने तथा उन्हें चिरंजीवी बनाने में समर्थ होते हैं।

कला संस्कृति का अभिन्न अंग मानी जाती है। अतः कला के अध्ययन के बिना सांस्कृतिक विकास का ज्ञान अधूरा है। किसी भी क्षेत्र के लोक जीवन में उसकी लोक कलाओं का विशिष्ट स्थान होता है। लोक कला क्षेत्र विषय की सांस्कृतिक समृद्धि की द्योतक होती है। सभ्यता के विकास के साथ-साथ कला भी विकसित होती रहती है। मुननशी राम शर्मा ने कलाकार की कार्यकुशलता पर अपने विचार प्रकट करते हुए कहा है, “जैसे सूर्य की किरणें अनेक प्रकार के पुष्पों को विकसित करती हैं, भूमि को हरित दूर्वा के कोमल मखमली गद्दी को सुसज्जित कर देती हैं, खेती की स्वर्ण-शालियों में मण्डित कर देती हैं, वैसे ही कलाकार अपने हाथों की कला द्वारा असुन्दर को सुन्दर तथा कुरूप को सुरूप बना देते हैं।” अतः कला में एक विषय शक्ति होती है, जिससे कि वस्तुओं का स्वरूप बदल जाता है। कला में एक ऐसी शक्ति रहती है, जो मानव मन की अन्तरंग भूख को शांत कर देती है।

कला और जीवन का चोली-दामन का साथ रहा है और एक के बिना दूसरे के अस्तित्व की कल्पना नहीं की जा सकती। वस्तुतः श्रम-साध्य हिमाचली लोक-जीवन के भावात्मक पक्ष का यहां की लोक-कलाएं आधारभूत सम्बल हैं। आदिम आग्रहों, धार्मिक-मान्यताओं और सामाजिक अपेक्षाओं से उत्प्रेरित यहां की लोक-कलाएं जीवन के साथ, उसी का अभिन्न अंग बनकर, निरन्तर गतिशील सामाजिक-परिवेश में अपनी प्रासंगिकता को प्रमाणित करती आ रही है। यहां के पर्यावरण ने जहां साधन जुटाए हैं, वहां श्रम-साध्य भौतिक जीवन की विषमताओं से उद्भूत कुण्ठाओं से निवारण के लिए अमूर्त सत्ताओं के पूजा-प्रसादन का प्रचलन भी यहां हुआ है और उसी उद्देश्य से भावनाओं की अभिव्यक्ति के लिए लोक-कलाओं के बहु-विध उपकरण सुलभ कराए हैं।

हिमाचल प्रदेश जैसे क्षेत्र में लोक-कलाओं की बहुविधा और समृद्ध परम्परा रही है। यहां की मनोहारी नैसर्गिक घटाएं, कलात्मक मन्दिर, सुरुचिपूर्ण घर-आंगन, आनन्दोल्लास से परिपूर्ण मेले और त्योहार, कला-पूर्ण हस्त-शिल्प और बहु-रंगीय लोक-कलाएं कुछ इस प्रकार के अत्यन्त सम्मोहक आकर्षण हैं, जिनके सामने शरीरिक बाधाएं गौण हो जाती हैं। लोक-कलाओं को लोक संगीत, नृत्य कला, चित्रकला, मूर्तिकला और हस्त-शिल्प व वास्तु कला आदि के रूपों में विभाजित किया जा सकता है तथा इससे सम्बन्धित शब्दावली का विवरण निम्न प्रकार प्रस्तुत है :----

टिरकू. मिटी से बनाया गया एक छोटे से घड़े के आकार का बर्तन, जिसका प्रयोग सामान्यतः घरों में लस्सी दूधछाछन बनाने तथा रखने के लिए किया जाता है। कुछ क्षेत्रों में इसे दोदड़ू तथा कोखी भी कहा जाता है।

दीऊट. तम्बाकू पीने के लिए मिटी से बनायी गयी एक छोटी व पतली चिलम। कुछ क्षेत्रों में इसे धौतूरी भी कहा जाता है।

शैरी. एक पतली खोखली लकड़ी से बनी वस्तु, जिसका प्रयोग चिलम में तम्बाकू पीने के लिए किया जाता है।

दीवा. मिटी का बना एक छोटा कटोरीनुमा बर्तन, जिसका प्रयोग घरों में जोत जलाने के लिए किया जाता है। इसे डयूठी, दीऊड़ी, दीऊवा और संजीआ भी कहा जाता है।

मल्ली. मिटी से बने सभी घड़ानुमा बर्तनों को ढकने के लिए मिटी से बनी ढकनी।

कुज्जु. मिटी से बनाया गया एक बहुत ही लघु घड़ा आकारीय बर्तन, जिसका प्रयोग विविधा संस्कारों द्वाजैसे विवाह में लगन वेदीकृत पर किया जाता है। इन छोटे कलशों में पानी भरा जाता है।

औली. मिटी से बनाया गया एक लघु घड़ा आकारीय बर्तन, इसके बगल में ही मिटी की ही बनी नली रहती है, जिसमें से पानी निकलता है। इसका प्रयोग शदी-विवाह तथा अन्य अवसरों पर पानी तथा चाय पिलाने के लिए किया जाता है।

हाण्डकू. मिटी का बना एक बर्तन, जिसका प्रयोग घरों में दाल पकाने के लिए किया जाता है।

घौड़े. मिटी का बना कम चौड़े मुंह वाला घड़ानुमा बर्तन, जिसका प्रयोग, दहीं से लस्सी बनाने के लिए किया जाता है।

दोदड़ू. मिटी का बना एक छोटा घड़ानुमा बर्तन, जिसका प्रयोग घरों में दूधा से दही जमाने के लिए किया जाता है।

भड्डू. मिटी का बना एक बड़े आकार का बर्तन, जिसका प्रयोग घरों में पानी रखने के लिए किया जाता है।

डौकी. लकड़ी की बनी एक कड़छीनुमा वस्तु, जिससे घड़े से पानी निकाला जाता है।

घिटा. बांस या नगाल की पतली टहनियों को शंकु के आकार में बुनकर तैयार किया गया किल्टानुमा सामान, जिसका प्रयोग घास लाने तथा खेतों में गोबर डालने आदि के लिए किया जाता है। इसे कुछ क्षेत्रों में कोटि, किरण्डू या घिड्डा नाम से भी जाना जाता है।

छाबड़ा. बांस या नगाल की पतली टहनियों से बुनकर तैयार की गयी टोकरीनुमा वस्तु, जिसका प्रयोग घरों में सामान रखने के लिए किया जाता है। इसे कुछ क्षेत्रों में छाटो नाम से भी जाना जाता है।

कण्डा. बांस या नगाल की टहनियों से बुनकर तैयार किया गया टोकरा, जिसका प्रयोग घरों में रोटी रखने के लिए किया जाता है।

आड़ी. लकड़ी से बनायी गई हथ्थी, जिसका प्रयोग हल चलाते समय उसको नियन्त्रित करने के लिए किया जाता है।

कड़ेइया. लकड़ी से बना एक बड़े आकार का उपकरण, जिसके द्वारा बकरी के बालों को काटा जाता है।

श्लौंटा. पत्थर से बनाया गया एक विशेष प्रकार का आयाताकार समतल उपकरण, जिस पर नमक, मसाले, दाल तथा दूसरी खाद्य वस्तुओं को पीसा जाता है। इसे शिल, सिल, सील-बटा भी कहा जाता है।

हमाम-दस्ता. लोहे तथा किसी अन्य धातु का बना एक उपकरण, जिसमें एक लोहे का छोटा डण्डा तथा ओखलीनुमा बर्तन होता है। इसमें नमक, मसाले, दाल तथा दूसरी खाद्य वस्तुओं को पीसा या कूटा जाता है।

रूखल. पत्थर या लकड़ी को काट-काट कर, उसे ओखली का आकार दिया जाता है। इसका प्रयोग धान तथा चावल कूटने के लिए किया जाता है। कुछ क्षेत्रों में इसे कार्नि नाम से भी जाना जाता है।

पारछी. घरों में सामान रखने के लिए लकड़ी के तख्ते को आकर्षक बनाकर ऊंचाई पर लगाया जाता है, इसे पारछी कहते हैं।

ढोलके. शीशम की लकड़ी को खोखला करके उसे गोलाकार रूप देकर, इसके दोनों सिरों पर बकरे की खाल मढ़कर बनाया गया, यह वाद्य-यन्त्र ढोलके नाम से जाना जाता है।

डौण्डी. लकड़ी से विशेष रूप से बनायी गई पतली छड़ी, जिससे ढोलक बजाया जाता है।

खैरचा. बकरे के बालों को कातकर बनाया जाने वाला एक विशेष प्रकार का बिछौना, जिसे बैठने या सोने के लिए प्रयुक्त किया जाता है।

झालर. लकड़ी की तख्ती पर तूल-पत्तों की चित्रकारी व विभिन्न प्रकार की कला-कृतियाँ बनाकर, इसे घर की छत के साथ चारों ओर लगाया जाता है।

घाण्डी. लकड़ी के छोटे-छोटे गोल टुकड़ों पर विभिन्न प्रकार की बनाई गई कलाकृतियाँ, जिन्हें मन्दिर के चारों ओर छत से लटकाया जाता है।

मुहरा. चान्दी या किसी अन्य धातु अथवा अष्ट धातु से बनाई गई देव मूर्ति, जिसे पालकी के अन्दर रखा जाता है।

पलगे. शीशम या शहतूत की लकड़ी से तैयार की गई पालकी, जिसके बाहर मखमली कपड़ा या कई बार सोने या चान्दी की पतली पर्त मढ़ दी जाती है।

जमाणी. देवता की पालकी को उठाने के लिए जिन दो लम्बी लकड़ियों का प्रयोग किया जाता है।

झारी. लकड़ी तथा याक की पूँछ के बालों को एक खोखले डण्डे या बांस की लकड़ी में नसाकर बनाया जाने वाला यन्त्र, इस यन्त्र में लगी लकड़ी को चान्दी से आच्छादित किया जाता है। देवता की पालकी के साथ इसका प्रयोग झाड़न के रूप में किया जाता है।

गलावचे. लकड़ी से बनी गहरी आयाताकार, जिसका प्रयोग पशुओं को चारा देने के लिए किया जाता है।

तकलू. लकड़ी से बना लम्बे व पतले आकार का औजार, जिसका प्रयोग ऊन कातने के लिए किया जाता है।

ठालू. लकड़ी का बना थोड़ा लम्बा एवं गोल सा हथौड़ानुमा औजार, इसमें छेद करके बांस के डण्डे की हथ्थी लगाई जाती है, इसका प्रयोग हल चलाने के पश्चात् मिट्टी के ढेलों को तोड़ने तथा मिट्टी को समतल करने के लिए किया जाता है। कई स्थानों पर इसे भड़ौट्टा, बरौटा या भरौटा भी कहते हैं।

दाथरा. हिन्दी के प्रश्नवाचक चिह्न ? के आकार का हथियार या औजार, इसका प्रयोग नसल ढ़गेहूँ, मक्की, जौ, घास, लकड़ी आदि के पौधोत्त आदि के काटने के लिए किया जाता है। कुछ स्थानों पर इसे दराटी, दात, दाच, डाट, दराट, छऊ, दाथटी, हसिया भी कहा जाता है।

थबेड़ा. नगाल या बांस से बनाया गया कटोरीनुमा उपकरण ढ़छिकड़ा जिसको हल चलाते समय बैलों के मुँह पर बांधा जाता है। कुछ क्षेत्रों में इसे नाटि तथा छिकड़े भी कहते हैं।

श्माई. विशेष टिकाऊ लकड़ी का बना उपकरण, जिसे बैलों की गर्दन पर रखा जाता है तथा जिसके द्वारा हल खींचा जाता है। इसे कुछ क्षेत्रों में शकौल, जुंगड़ा, जुआ भी कहा जाता है।

मोई. हल चलाने के पश्चात् ऊबड़-खाबड़ मिट्टी को समतल करने के लिए लकड़ी के एक छोटे-छोटे से बना उपकरण।

नशिण. ढ़मधाणी ढ़ लकड़ी से बना एक गोल एवं घुमावदार औजार, जिसके द्वारा दही को मथ कर लस्सी बनाई जाती है।

रश्टा. बीहूल या भांग के पौधों के रेशों से बनायी गयी रस्सी, जिसे शेल या सेल भी कहा जाता है। इसका प्रयोग पशुओं को बांधने के साथ-साथ घास तथा नसलों को बांधने के लिए भी किया जाता है।

शूपा. नगाल या बांस से बनाया गया लम्बा-चौड़ा-अर्ध गोलाकार बर्तन जिसके द्वारा अनाज को घास-तूस से अलग किया जाता है तथा अनाज को बोरियों में भी भरा जाता है। कुछ क्षेत्रों में इसे छाजा, छज्ज, सूपा, सूप, सूपली नाम से भी

जाना जाता है।

पोगा. रिऊंग नामक लकड़ी की छाल से बनाया गया गोलाकार वाद्ययन्त्र जिसे सेतूक मारकर बजाया जाता है।

बांशले. ढ्वांसुरीक बांस की टहनी से बना वाद्ययन्त्र जिसमें मुख रूध्र के अतिरिक्त सात रूध्र और होते हैं, इसे मुंह से तूक मार कर आड़ा रखकर बजाया जाता है। कुछ क्षेत्रों में इसे भाष के नाम से भी पुकारा जाता है।

ढाँस. अखरोट या शीशम की लकड़ी से बना ढोलक के आकार का बड़ा वाद्ययन्त्र जिसे बैणी की सहायता से बजाया जाता है।

शींगी. भैंस या भैंसे के सींग से बना वाद्ययन्त्र जो गम्भीर गर्जना उत्पन्न करता है, इसका प्रयोग कई बार तो जंगली जानवरों तथा पक्षियों से शूलों की रक्षा करने हेतु भी किया जाता है।

चंग. लोहे की पत्तियों को मोड़कर बनाया गया वाद्ययन्त्र जिसे मुंह से तूक मार कर बजाया जाता है।

रौणसिंगा. अंग्रेजी के एस अक्षर के आकार का धातु से बना वाद्ययन्त्र जिसे मुंह से तूक मार कर बजाया जाता है।

पुड़े. बकरे की खाल से बना एक उपकरण जिसे ढोलक के दोनों किनारों पर लगा दिया जाता है। इसे कसने के लिए डोरी या पेंच का इस्तेमाल किया जाता है।

खुल. बकरी या भेड़ की खाल को मुलायम बनाकर उसे थैलीनुमा आकार में सिलाकर अनाज आदि का भण्डारण कर या अनाज को एक स्थान से दूसरे स्थान तक ले जाने हेतु इसका उपयोग किया जाता है। कुछ क्षेत्रों में इसे खल, खलड़ी, खालड़ा या खल्हड़ो नाम से भी जाना जाता है।

लामठ. कांसा या पीतल धातु से बना एक बड़ा अर्धगोलाकार बर्तन, इसके दोनों ओर पकड़ने के लिए हथ्थे लगे रहते हैं। शरी में उपहार स्वरूप देना या दान के रूप में इसे देना शुभ माना जाता है।

टोको. लकड़ी के पुराने घरों में दरवाजे को अन्दर से बन्द करने के लिए दीवार में लगाई गई एक विशेष प्रकार की कुण्डी।

कासगुनांग. कांसा धातु से बना एक विशेष प्रकार का थालीनुमा बर्तन, इसका प्रयोग देव पूजन के लिए किया जाता है।

कोरछी. लकड़ी से बनी एक विशेष प्रकार की कड़छी, इसका प्रयोग साग घोटने के लिए किया जाता है।

थम्बू. लकड़ी से बना एक विशेष प्रकार का कटोरीनुमा बर्तन, इसका प्रयोग बड़े पतिले से चाय निकालने के लिए किया जाता है।

कासचान. मिट्टी से बनाया गया एक विशेष प्रकार का कपनुमा बर्तन, इसका प्रयोग नमकीन चाय पीने के लिए किया जाता है।

बटलोई. ताम्बे या पीतल से बना बड़ा सा घड़ानुमा बर्तन जिसका प्रयोग पानी भण्डारण तथा सामूहिक भोज में चावल तथा सब्जी-दाल बनाने के लिए किया जाता है।

कुहलू. ताम्बे या पीतल से बना छोटा सा घड़ानुमा बर्तन जिसका प्रयोग पानी गर्म करने के लिए किया जाता है। यह बर्तन हमेशा चूल्हे पर ही रहता है।

ठेली. लकड़ी के चौड़े टुकड़ों से बैठने के लिए बना चौका, जिसका प्रयोग रसोई घर में किया जाता है।

चामजुराब. ऊन को कातकर विशेष रीति से बनाया गया पांव में पहनने वाला मोजा।

पानठर. लकड़ी तथा मिट्टी से बना कमरा, जो रंग-बिरंगे भित्ति चित्रों, कलाकृतियों तथा परंपरागत सजावटी वस्तुओं से सजाया जाता है।

थांगा. घर के अन्दर लकड़ी का बना गोलाकार स्तम्भ, जिस पर सुन्दर चित्रकारी बनी रहती है।

ऊर्च. अन्न भण्डारण के लिए लकड़ी से बनाया गया एक कमरा।

छोतक. घर की सबसे ऊपरी मंजिल पर बनाया गया लकड़ी का नक्काशीदार बौ) पूजा स्थल।

नोगदौरी. भेड़ की ऊन से बनाया गया एक विशेष प्रकार का कम्बल, इसका प्रयोग ठण्ड से बचने के लिए किया जाता है।

दोबो. नमकीन चाय जिसमें दूधा, मक्खन, नमक तथा पीसे हुए अखरोट को मिलाया जाता है, को बनाने के लिए लकड़ी का बना पतिलानुमा बर्तन।

रोमबश. बकरी के बालों से कातकर तथा काते हुए धागों को आपस में गूँथकर तैयार की गई लम्बी डोरी। इसका प्रयोग घास, लकड़ी तथा बोझा ढोने के लिए किया जाता है।

बोंडू. कांसा धातु का बना घड़ानुमा या सुराहीनुमा बर्तन, इसका उपयोग पानी गर्म करने के लिए किया जाता है।

सिथरंग. लोहे से बना हिन्दी के प्रश्न चिह्न ? का आकारनुमा एक औजार, जिसके द्वारा घास तथा पेड़ों की पत्तियों को काटा जाता है।

गोलि. खेतों की खुदाई करने के लिए लोहे से बना कुदाल।

खोरी. मिट्टी का बना दीपक, जिसका प्रयोग पूजा के अवसर पर होता है।

पाँठ. ऊन कातने के लिए लकड़ी की बनी चक्रीनुमा गोल लकड़ी, जिसके मध्य में छिद्र होता है तथा इस छिद्र में एक पतली लकड़ी लगी रहती है।

कोरो. लकड़ी का बना एक औजार, जिसका प्रयोग तकली पर काती गई ऊन के धागों को मजबूती देने के लिए आपस में लपेटा जाता है।

तदरंग. धागों को बुनकर कपड़ा या पटी इस उपकरण द्वारा तैयार की जाती है। इस उपकरण को खाड़ी भी कहा जाता है।

तुसना. हिन्दी के प्रश्न चिह्न ? के आकारनुमा एक उपकरण जिसका प्रयोग पुरी द्रूपकवान विशेष ऋ बनाने के लिए किया जाता है।

गौरा. मिट्टी का बना घड़ानुमा बर्तन, इसका प्रयोग मधाणी द्वारा दही से लस्सी बनाने के लिए किया जाता है। इस मिट्टी के घड़े के नीचे मोटे कपड़े को लपेटकर रखा जाता है। कुछ क्षेत्रों में इसे भड्डू, मांघ, चाटी, जमैणु तथा घड़ी भी कहा जाता है।

जौम. लकड़ी का बना चौकोर बर्तन जिसका प्रयोग पानी लाने के लिए किया जाता है। इस बर्तन में लगभग दो ईंच व्यास का छिद्र पानी निकालने के लिए किया जाता है।

जौबा. लकड़ी का बना बर्तन जिसका प्रयोग गाय से दूधा निकालने के लिए किया जाता है।

गुथु. लकड़ी का बना बड़ा बर्तन, जिसका प्रयोग ऊन के भारी-भरकम कपड़ों को धोने के लिए किया जाता है।

खोलो. लकड़ी का बना भारी-भरकम बर्तन, जिसका प्रयोग पानी इक्टा करने के लिए किया जाता है।

चार. ऊन के धागों को कातकर खड्डी में तैयार की गई ऊनी चादर।

घूबा. ऊन के धागों को कातकर बनाया गया घुटनों तक पहना जाने वाला लम्बा कोट।

खुलुपौश. भेड़ या बकरी की खाल को मुलायम बनाकर बैठने के लिए बनायी गई चटाई। कुछ क्षेत्रों में इसे बखराली भी कहा जाता है।

खैर. बकरी के बालों को कातकर तैयार किया गया बिछौना, इसका प्रयोग सर्दियों के दिनों में सोने के लिए किया जाता है।

कुटिच. खेतों में ंसल से खरपतवार निकालने के लिए लोहे से बना छोटा सा कुदाल।

गाछ. स्त्रियों तथा पुरुषों द्वारा कमर पर बांधो जाने वाला ऊन का पांच-छः ईंच चौड़ा पटा, जिसकी लम्बाई लगभग दो मीटर रहती है।

ठेप. एक विशेष प्रकार की ऊन से बनी गोल टोपी, जिस पर हरी पटी लगी रहती है तथा कुछ रंग-बिरंगे धागों में वृक्षों के फेद पत्ते भी लगाए जाते हैं। इस टोपी को स्त्री एवं पुरुष दोनों सिर पर पहनते हैं।

चमुसुतन. ऊन की पटी से बना वस्त्र-धूपायजामात्र इस स्त्री तथा पुरुष दोनों पहनते हैं।

डेलंग. घर में प्रवेश द्वार द्वंदहलीजत्र पर लकड़ी का बना तख्ता, जिस पर नक्काशी भी की जाती है।

छाम्ब. घर की छत पर चढ़ने के लिए अखरे की मोटी लकड़ी से बनी सीढ़ी, जिस पर थोड़ी-थोड़ी दूरी पर छेद किए जाते हैं।

बूम्बा. चांदी से बना विशेष पूजा पात्र-द्वर्तनत्र, जिसमें गंगाजल आदि भी रखा जाता है।

तसराट. विशेष प्रकार की लकड़ी से बना एक लम्बा डण्डा, जिसमें ऊन के धागों को पिरोया जाता है।

डोंगजिंग. धातु का बना एक कटोरीनुमा वाद्ययन्त्र, जिसके खाली सिरे को शेर की खाल से मढ़ा जाता है। इसको बौ) मन्दिरों में लटकाया जाता है। पूजा के समय प्रत्येक मन्त्र के साथ इस पर डण्डे से चोट की जाती है।

दबानो. धातु के बने दो छोटे-छोटे आकार के नगाड़े, जिनको एक साथ दोनों हाथों से बैणी दलम्बी बांस की डण्डियाँत्र से बजाया जाता है। इन वाद्ययन्त्रों को बकरे की खाल से मढ़ा जाता है।

औली. मिटी का बना एक छोटा घड़ानुमा बर्तन, जिससे सामूहिक भोज आदि में लोगों को पानी पिलाया जाता है। इस बर्तन में एक किनारे में पानी निकालने के लिए छिद्र बना रहता है।

कट्टैटी. मिटी की बनी एक कढ़ाहीनुमा बर्तन, जिसका उपयोग सब्जी आदि बनाने के लिए किया जाता है।

मटनाली. मिटी का बना एक बड़ा सा बर्तन, जिसमें गीली उड़द की दाल के छिलकों को अलग किया जाता है। इस उड़द की दाल से बड़े दूध एक विशेष पकवानत्र बनाए जाते हैं।

महन. आटा रखने हेतु मिटी से बना एक बड़ा सा बर्तन।

माणी. अनाज उधार लेने तथा देने तथा मापने के लिए प्रयोग किया जाने वाला लकड़ी का बना टोकरीनुमा बर्तन।

कांगा. भेड़-बकरी के बालों अर्थात् ऊन को संवारने या पिंजने के लिए लकड़ी तथा लोहे की बारीक तारों से बना औजार।

कटैड़ा. घरों में बरामदे के जंगले दूधेरात्र में लगने वाली गोलदार नक्काशी।

कुनाल. लकड़ी का बना छोटे टब दूधपरात्र के आकार का बर्तन, जिसका उपयोग आटा गूँथने के लिए किया जाता है।

टोबकी. लकड़ी का बना छोटा टोकरीनुमा बर्तन, जिसका उपयोग अनाज रखने के लिए किया जाता है।

तूण. लकड़ी का बना विशलकाय सन्दूकनुमा बर्तन जिसमें अनाज का भण्डारण किया जाता है। कुछ क्षेत्रों में इसे कंजाल भी कहा जाता है।

पेडू. बांस या नगाल की लकड़ी व मिटी का बना विशल गोलाकार एवं ऊंचा बर्तन, जिसमें गेहूँ व मक्की का भण्डारण किया जाता है। कुछ क्षेत्रों में इसे पेड़ी भी कहा जाता है।

सलाई. तकली को हाथ से घुमाने के लिए उस पर लगी पतली सी लकड़ी।

टीहलू. लोहे से बना एक पतला-लम्बा उपकरण जिसका प्रयोग चूल्हे से भुने-भुट्टे को निकालने के लिए किया जाता है।

पौए. पलंग या चारपाई में लकड़ी के बने नक्काशीदार चार पांव।

तलाहड़. पानी गर्म करने के लिए मिटी से बनाया गया घड़ानुमा बर्तन।

हण्डू. मिटी से बनाया गया छोटा लेकिन खुले मुंह वाला घड़ानुमा बर्तन, जिसका प्रयोग दाल-सब्जी पकाने के लिए किया जाता है।

कौरा. घी रखने के लिए तंग मुंह वाला तथा कम चौड़ा मिटी से बनाया गया छोटा-घड़ानुमा बर्तन।

दुधोनु. मिटी से बनाया गया छोटा-घड़ानुमा बर्तन, जिसका प्रयोग घरों में दूधा गर्म करने तथा रखने के लिए किया जाता है।

मंहगी. मिटी से बनाया गया छोटा-घड़ानुमा बर्तन, जिसका प्रयोग घरों में घी रखने के लिए किया जाता है।

कोई. लकड़ी का बना चौड़ा तथा कुछ लम्बा उपकरण, जिसका प्रयोग बकरी और भेड़ की खाल को नरम करने के लिए किया जाता है।

धूपैर. मिटी से बना छोटा दीयानुमा बर्तन, जिसका प्रयोग धूप जलाने के लिए किया जाता है। इसे धूणधा भी कहा जाता है।

अत्रे. मिटी के बर्तन बनाने हेतु प्रयोग में किया जाने वाला मिटी का ही बना चपटा बर्तन।

कनेरू. मिटी के बर्तन बनाते समय अन्दर से सहारा देने के लिए प्रयोग में किया जाने वाला औजार, जो पतली लकड़ी या मिटी का बना होता है।

तूलटू. लोहे का बना छड़ीनुमा औजार द्धतराजूरू जिसका एक सिरा मोटा रहता है तथा दूसरे पतले सिरों में छेद करके धागों से एक लोहे की पतली चादर का छोटा सा गोल टुकड़ा लगाया जाता है। इस का प्रयोग प्रायः भेड़-बकरी की ऊन तोलने-मापने के लिए किया जाता है।

दिला. नक्काशीयुक्त द्धडिजाइनदाररू लकड़ी का बना छोटा नट्टा जिसका प्रयोग लकड़ी से बने घर के दरवाजों, लकड़ी की अलमारी तथा खिड़की के दरवाजों में किया जाता है।

मीरू. लकड़ी से बने घरों में बरामदों को आगे से दो टुट तक की ऊंचाई तक लगाई गई नक्काशीदार द्धडिजाइनदाररू लकड़ी।

धानेरो. लोहे से बनाया गया बर्तन द्धपूजा करने के लिएरू इसमें दो कटोरीनुमा बर्तन रहते हैं। एक छोटा तथा दूसरा उससे बड़ा रहता है, इनमें एक हत्थी भी रहती है, इसका प्रयोग देव-पूजा में किया जाता है। बड़ी कटोरी में आग के अंगारे तथा छोटी में घी रखा जाता है।

थोबी. बकरे के बालों से बना दरीनुमा बिछौना।

मकोल. घरों की दीवारों पर चिचकारी करने से पूर्व एक विशेष स्फेद मिट्टी का किया जाने वाला लेप।

प्राखण. लकड़ी पर की गई विशेष प्रकार की चिचकारी। इन चित्रों में सूर्य, चन्द्र, पशु-पक्षी, नूल-पत्तियां तथा देवताओं के रहते हैं।

पूला. खाए नामक घास या ऊन से बना जुराबनुमा जूता, जिसका प्रयोग प्रायः सर्दियों में किया जाता है। कुछ क्षेत्रों में इसे मोछडू तथा अला नाम से भी जाना जाता है।

चोब. टमक द्धएक विशेष प्रकार का बड़ा सा ढोलरू बजाने के लिए प्रयुक्त विशेष प्रकार की लम्बी लकड़ी की छड़ी।

डग्गा. ढोलक बजाने के लिए प्रयुक्त विशेष प्रकार की लम्बी लकड़ी की छड़ी।

दोहड़. ऊन से बना एक विशेष प्रकार का चादरनुमा भूरे रंग का वस्त्र।

मधुड. मिटी से बना एक घड़ानुमा बर्तन, जिसमें प्रायः स्वयं बनाई गई स्थानीय शराब को रखा जाता है।

लूँढा. लोहे का बना थालीनुमा बर्तन।

कुनाल. लकड़ी का बना परातनुमा बड़ा डोंगा या टब के आकार का बर्तन।

डोई. लकड़ी का बना हुआ कड़छीनुमा बर्तन, जिसका प्रयोग घड़े से पानी निकालने के लिए किया जाता है।

टण्डू. जंगली बांस या नगाल से बना छोटा सन्दूक, जिसका प्रयोग खाद्य वस्तुओं के संग्रहण हेतु किया जाता है।

खान्दा. लकड़ी के चौड़े-चौड़े टुकड़ों से बना बड़ा सा सन्दूक, जिसका प्रयोग अनाज भण्डारण हेतु किया जाता है।

चोला. ऊन का बना तथा ऊन के ही धागों से सिला लम्बा कोटनुमा वस्त्र, जिसका प्रयोग प्रायः सर्दियों में किया जाता है। इसे प्रायः पुरुष पहनते हैं। कुछ क्षेत्रों में इसे लोइया भी कहते हैं।

झुड़की. ऊन के धागों से बना पट्टी का कोट, जो घुटनों तक लम्बा होता है, इसे केवल महिलाएं ही पहनती हैं।

चादरू. ऊन के धागों से बना गया शॉल, चादर या पट्टू। इसे केवल महिलाएं ही पहनती हैं।

गात्रि. ऊनी चोले को बांधने के लिए ऊन से ही बनी हुई 50 से 50 गज लम्बी रस्सीनुमा डोरी, जिसको कमर पर बांधा जाता है। इसे डोरी या डोरा भी कहा जाता है।

मुत्थण. काली या स्फेद ऊन से स्वयं तैयार किया जाने वाला लम्बा चूड़ीदार पायजामा। कुछ क्षेत्रों में इसे इसे घेचा भी कहा जाता है।

जुड़की. महिलाओं द्वारा ठण्ड से बचने के लिए पहना जाने वाला ऊन से बना लम्बा घुमावदार वस्त्र चोगाक़्क़ संगली. ऊनी वस्त्रों पर पीठ व गले पर रंगीन ऊनी धागों से की गई कढ़ाई।

छट्टा. औरतों द्वारा कमर पर बांधा जाने वाला एक प्रकार का शीश, जिसे चमड़े पर मढ़ा जाता है, इसमें माला के बारीक मणके लगे रहते हैं। यह एक विशेष प्रकार की कढ़ाई होती है।

लखोट्टी. ऊन के रंग-बिरंगे धागों से बुनकर तैयार 4-5 ईंच चौड़ी पट्टीनुमा वस्त्र या कमरबन्धा, इसे केवल महिलाएं अपनी कमर पर बांधाती हैं।

गाची. ऊनी धागों से बना पटका, डोर, रस्सी या कमरबन्धा। इसे कमर में बांधा जाता है।

पोछिऊड़ा. ऊन की चौड़ी पट्टी को दोहरा करके इस चादरनुमा वस्त्र को गाची वस्त्र के साथ कमर पर इसे बांधा जाता है। इसका प्रयोग बैठने तथा इसे ओढ़कर वर्षा से भी बचा जा सकता है।

रेजी. ऊनी धागों से बनी पट्टीनुमा डोरी या कमरबन्धा, जिसका प्रयोग जुड़की वस्त्र को बांधने के लिए किया जाता है।

बगलु. भेड़ की खाल से बनी छोटी थैली, जो रंग-बिरंगे मणकों से सजी रहती है। बगलु केवल पुरुषों द्वारा बगल में बांधा जाता है। इसमें तम्बाकू, चकमक पत्थर और भुजलू घास रखा जाता है।

गलबन्द. ऊन की 9 से 10 ईंच चौड़ी पट्टी से बना फलरनुमा वस्त्र, इसका प्रयोग प्रायः पुरुष सर्दियों में अपना सिर एवं कान ढकने के लिए करते हैं। इसे गुलबन्द तथा फलर नामों से भी जाना जाता है।

खडबूज. नगाल से बना टोकरीनुमा वस्त्र, जिसको सिर पर टोपी की तरह पहना जाता है।

दप्पा. महल अथवा बड़े-बड़े घरों मुख्य प्रवेश द्वार का दरवाजा एक ही लकड़ी के मोटे तख्ते से बना होता था, इसमें छोटे-छोटे छेद रखे जाते हैं, ताकि बाहर से आने वालों पर नजर रहे। इन छेदों से बाहर की ओर तीर भी छोड़े जा सकते हैं।

कात. लोहे की बनी एक विशेष प्रकार की कैची, जो लोहे की दो मोटी पल्लियों से बनाई जाती है। इसका प्रयोग भेड़-बकरी की ऊन कातने के लिए किया जाता है।

गोंठा. गोबर से बना गेंदनुमा उपल्ला। इसे सुखाकर सर्दियों में ठण्ड से बचने के लिए जलाया जाता है।

टोकरू. बांस, शहतूत तथा नगाल की टहनियों से बना टोकरा, जिसका प्रयोग बर्तन-वस्तु रखने, रोटी आदि रखने तथा घास, अनाज आदि को सिर पर ढोने के लिए भी किया जाता है। इसे डल, डाला, टोकरा, टोकरी, रेंकड़ो, रेंकड़ी आदि नामों से भी जाना जाता है।

चंगेर. बांस तथा नगाल की टहनियों से बना बड़ा गोलाकार लेकिन ऊंचाई में छोटा टोकरा, जिसका प्रयोग अनाज आदि वस्तुओं को सुखाने या धोने के लिए किया जाता है।

छड़ोहलू. बांस के बारीक रेशों से टोकरीनुमा बना बर्तन, जिसका प्रयोग शदी आदि अवसरों पर कच्चे चावलों तथा दालों आदि को धोने तथा पके चावलों को बांटने में इसका प्रयोग किया जाता है।

छाबी. बांस की टहनियों से बना टोकरीनुमा बर्तन, जिसका प्रयोग घरों में रोटी आदि रखने के लिए किया जाता है। इसे छक्कू भी कहते हैं।

ओडली. लकड़ी का बना बड़ा एवं ऊंचा टोकरीनुमा बर्तन, जिसका प्रयोग घराट में आटा पीसते समय अनाज डालने के लिए किया जाता है। इसे ओडी या ओडलू भी कहा जाता है।

खारा. बांस की टहनियों से बना बहुत बड़ा टोकरानुमा बर्तन, जिसका प्रयोग सिर पर भूसा ढोने तथा अनाज आदि के भण्डारण हेतु भी किया जाता है।

धाड़ोडा. बांस, नागल या टाकू की टहनियों से बना टोकरीनुमा बर्तन, जिसका प्रयोग गोबर ढोने के लिए किया जाता है। नदाणी. एक विशेष प्रकार की लोहे की बनी कुदाली, जिसका प्रयोग खेतों में खुदाई तथा गुड़ाई के लिए किया जाता है। कई क्षेत्रों में खुट, खुटी, किलणी, किटी, कस्सी, किल्णु तथा कुदालू नाम से भी जाना जाता है।

तणी. कपड़े से बनी एक विशेष प्रकार की रस्सीनुमा डोरी, जिसका प्रयोग कमीज या कोट आदि में बटन की जगह किया जाता है।

लवांचंडी. सूत से बना स्त्रियों द्वारा पहने जाने वाला लम्बा कुर्ता।

मांज. बांस या लकड़ी के लम्बे-चौड़े टुकड़ों से बनी सीढ़ी, जिसका प्रयोग घर की एक मंजिल से दूसरी मंजिल तक चढ़ने के लिए किया जाता है।

शिरठू. मोटी लकड़ी से बनी एक टांग वाली सीढ़ी, जिसमें पांव रखने के लिए जगह उसी मोटे डण्डे के भीतर खोदकर बनाई जाती है, इसका प्रयोग घर की एक मंजिल से दूसरी मंजिल तक चढ़ने के लिए किया जाता है।

पारू. लकड़ी का बना कटोरीनुमा बर्तन, जिसका प्रयोग घी रखने के लिए किया जाता है।

घेहर. लकड़ी से बना कटोरीनुमा बर्तन, जिसमें देव-मन्दिर में पूजा के लिए घी रखा जाता है।

नौण. पत्थर की शिलाओं पर बने सूर्य, नदियों, नवग्रह, पशु-पक्षियों आदि के चित्र।

डुंडसू. पतली लकड़ी का बना एक लम्बा सा डण्डा, जिसके एक सिरे पर गोलाकार करके कपड़ा बंधा रहता है। इसका प्रयोग गन्दम या मक्की के दानों को कढ़ाई में धुनते समय, दानों को हिलाने के लिए किया जाता है।

दोमो. लकड़ी का बना एक छोटा कटोरीनुमा बर्तन, जिसका प्रयोग चाय पीने के लिए किया जाता है।

डोई. पतली तथा लम्बी लकड़ी से बना कड़छीनुमा बर्तन, जिसका प्रयोग सब्जी बनाने तथा खाना परोसने के लिए किया जाता है।

जोवा. लकड़ी का बना एक लघु घड़ा आकारीय बर्तन जिसका प्रयोग दूधा तथा दही रखने के लिए किया जाता है।

खिन्दड़ा. नट्टे-पुराने कपड़ों को फिर से सिलकर ओढ़ने या बिछाने के लिए बनाया गया, बिछौना या गद्दा। कुछ क्षेत्रों में इसे खिन्द, खन्दोलु, खन्दोला आदि नामों से भी जाना जाता है।

मांजरी. मक्की तथा धान के पौधे द्वपरालम्ह से बैठने या सोने के लिए बनाया गया बिछौना या तलाई।

बनैन. सूत के धागों को सलाइयों से बुनकर तैयार किया हुआ स्वेटरनुमा वस्त्र, जिसे सर्दियों में पहना जाता है।

शंगुल. लोहे के तार को छोटे-छोटे टुकड़ों में काटकर फिर उनको जोड़कर बनाई गई चैननुमा शंकल जिसका प्रयोग दरवाजों को बन्द रखने के लिए किया जाता है। यदि यही चैन अधिका लम्बी बना दी जाए, तो इसको पशुओं को बान्धाने

के लिए भी प्रयुक्त कर लिया जाता है। इसे संगल, सांगल, संगली आदि नामों से भी जाना जाता है।

आगल. रिऊंर, बान या अन्य विशेष लकड़ी से चपटे आकार में बुना कुण्डानुमा उपकरण, इसका प्रयोग दरवाजे को अन्दर से बन्द करने के लिए किया जाता है।

किलणी. घर की किसी दीवार पर कोई भी वस्तु टांगने के लिए लकड़ी या लोहे की बनी मजबूत कुण्डानुमा कील। इसे खूण्टी भी कहा जाता है।

चालनो. लोहे की थालीनुमा बना बर्तन ढ़छाननीऋ, जिसका प्रयोग आटा छानने के लिए किया जाता है।

न्हूडी. घराट से आटा खींचने के लिए बांस की लम्बी लकड़ी से हथी लगा उपकरण।

काकर. घराट में ऊंचाई से तेज पानी गिराकर, जब लकड़ी के बने पंखेनुमा उपकरण पर गिरता है, तब वह घूमता है और घराट चलना शुरू होता है।

घरटौल. घराट में आटा पीसने के लिए प्रयुक्त चक्रनुमा दो बड़े-बड़े पत्थर।

पनैल. लकड़ी का बना एक नालीदार उपकरण, जिसके माध्यम से पानी तेज गति से गिराया जाता है।

चूल. लकड़ी और लाल मिट्टी के मिश्रण से बना एक विशेष प्रकार का चूल्हा, इसमें धुएँ को बाहर निकालने के लिए अलग से जगह छोड़ी जाती है।

ऐरनोटी. चादर बुनने से पहले सूत को उचित स्थान पर बिठाने के लिए लकड़ी का बना एक उपकरण।

तारनैटी. चादर बुनने के समय सूत को खोखले नाल में डालने से पहले सूत को उचित स्थान पर बिठाने के लिए प्रयुक्त लकड़ी की बनी छड़ी।

ब्रूआं. खड्डी में चादर बुनने का लकड़ी का बना एक उपकरण विशेष।

घेरनु. ऊन की पिंजाई के लिए प्रयुक्त गोल पहियानुमा उपकरण। इसे वनणी भी कहते हैं।

द्वारसाख. दरवाजे तथा खिड़की के लिए बना लकड़ी का नक्काशीयुक्त चौखट।

थापी. लकड़ी का बना आगे से चौड़ा तथा नरम उपकरण, जिसका प्रयोग कपड़े धोने के लिए किया जाता है।

पुल्टा. घास को काटने के बाद एक सुनियोजित रूप से बांधा कर रखना। कुछ स्थलों पर इसे पुल्ला भी कहते हैं।

परैंठ. बांस की बनी एक लम्बी छड़ी, जिसका प्रयोग हल जोतते समय बैल हांकने के लिए किया जाता है। इसे परवैंठ भी कहते हैं।

तसला. लकड़ी या धातु का बना एक बर्तन जिसमें पशुओं को चारा, चोकर या नमक दिया जाता है। कुछ स्थलों पर इसे परात भी कहते हैं।

कान्धा. लकड़ी का बना एक लम्बा-चौड़ा तख्ता, जिसको दीवार के साथ लगाकर, बर्तन तथा दूसरी आम प्रयोग में लाने वाली वस्तुओं को रखा जाता है।

पाथा. लकड़ी या लोहे का बना एक टोकरीनुमा बर्तन, जिसका प्रयोग चावल, गेहूँ तथा धान आदि मापने के लिए किया जाता है।

टोपरा. बांस की लकड़ी से बना एक लघु घड़ा आकारीय बर्तन, जिसको अन्दर से मिट्टी से लीपा जाता है और इस का उपयोग घी रखने के लिए किया जाता है।

कुन्दड़ा. मिट्टी से बना घड़ानुमा बर्तन, जिसका प्रयोग तेल आदि तरल पदार्थों को रखने के लिए किया जाता है।

कोठडू. देवदार की लकड़ी से बना सन्दूकनुमा सामान, जिसका प्रयोग ऊन के वस्त्र रखने के लिए किया जाता है।

ढाढ. मेखल की लकड़ी का बना हुआ लगभग दोगुट का देव-वाद्य यन्त्र ढ़ढोलऋ इसे केवल देव प्रतिनिधि व्यक्ति ही बजा सकता है।

शणारे. लोहे की लम्बी पत्तियों से बना चिमटानुमा उपकरण जिसका प्रयोग रोटी सेंकने तथा आग के अंगारे या कोयले उठाने के लिए किया जाता है।

धुऊंटू. लोहे या बांस से बानुट भर लम्बा तथा अन्दर से खोखला औजार, जिसका प्रयोग चूल्हे में आग जलाने में तूंक मारने के लिए किया जाता है। इसे भैम्पलू भी कहा जाता है।

शड़ैना. कपड़े को आयताकार बनाकर तकियानुमा वस्त्र, जिसके अन्दर ऊन तथा कपड़े के छोटे-छोटे टुकड़ों को भरा जाता है।

चरखी. रऊंश या जामुन की लकड़ी से बना चक्रीनुमा उपकरण, जिसका प्रयोग दही से लस्सी बनाने के लिए किया जाता है।

माट. मिट्टी से बना दीर्घ आकारीय घड़ानुमा बर्तन, जिसका प्रयोग जल भण्डारण के लिए किया जाता है। कुछ स्थानों में इसे मट या मटका भी कहा जाता है।

कछाली. मिट्टी से बना मटकानुमा बर्तन जिसका प्रयोग लस्सी बनाने के लिए किया जाता है। इसे मटका भी कहा जाता है।

झाम्बा. लाल मिट्टी से बना खुरदरा आगे से कुछ गोल व चौड़ा उपकरण, जिसका प्रयोग पांव की एड़ियों को सफ करने के लिए किया जाता है।

डोली. लकड़ी को जोड़कर बनायी गयी सुन्दर-आकर्षक पालकी, जिसमें बिठाकर दुल्हन को ससुराल भेजा जाता है। कुछ क्षेत्रों में इसे डोला या पालनी भी कहा जाता है।

खडाऊ. मन्दिर एवं पूजा-स्थलों पर पहने जाने वाले जूते या चप्पलें जो लकड़ी तथा कपड़े से बनाई जाती हैं। कुछ स्थानों में इसे खड़ावां भी कहा जाता है।

लम्बारी. घरों के अन्दर दीवारों में लकड़ी की बनी अलमारी, जिसमें दैनिक प्रयोग में लाने वाली वस्तुओं को रखा जाता है।

पन्द. खजूर के पत्तों से बैठने के लिए बनी चटाई।

करण्डी. बांस की टहनियों से बना टोकरीनुमा बर्तन, जिसमें गूंगार-प्रसाधानों को रखा जाता है।

मंजा. बांस की लकड़ी तथा नवार से बनाई गई चारपाई, जिसका प्रयोग सोने व बैठने के लिए किया जाता है। इसे मंजोलू, मंजोली भी कहा जाता है।

टपरी. पत्थर, मिट्टी तथा लकड़ी से रहने के लिए बनाया गया छोटा कमरा। इसे टपरू भी कहा जाता है।

गौड़. पत्थर, मिट्टी तथा लकड़ी से पशुओं को रहने के लिए बनाया गया कमरा। इसे गोएड, ग्वायेण या गरुशला भी कहा जाता है।

छुक्क. बांस तथा नगाल लकड़ी से बना बर्तन, जिसका प्रयोग अनाज डालने के लिए किया जाता है।

चक्का. घर तथा मन्दिर की छतों पर काटकर लगाया जाने वाला बड़ा सपाट पत्थर।

लकोला. घर की दीवारों में खाली रखी गई या खुदाई करके बनाई गई या निकाली गई छोटी सी जगह, जिसमें किसी भी आवश्यक या छोटी वस्तु को रखा जाता है। इसे लकोला, लकोलू, लकोली आदि भी कहा जाता है।

देउठा. लकड़ी व पत्थर से बना पालकीनुमा कमरा, जिसमें देवताओं को स्थापित किया जाता है।

नकेल. रस्सी से बनाई गई लम्बी डोरी, जिसे पशुओं के नाक को बंधाकर डाला जाता है। खतरनाक पशु इससे नियंत्रित किए जाते हैं।

नाल. बांस की लकड़ी से बना कलमनुमा उपकरण, जिससे पशुओं को दवाई, दूधा, घी तथा तेल आदि पिलाया जाता है।

बेलू लकड़ी से बना एक उपकरण, जिसमें दो गोल डण्डियां तथा एक हथी लगी रहती है। इससे रूई और कपास को अलग किया जाता है।

घेरनी. बांस की लकड़ी से बनी अंगूठी के आकार की चोंचनुमा नली, जिससे बच्चों को दूधा तथा दवाई पिलाई जाती है।

ओटला. घर में चूल्हे के चारों तरु आग से बचने के लिए काट कर लगाया गया पत्थर।

दांव. एक विशेष प्रकार की रस्सी, जिसका प्रयोग बाण या मूँज से बुनी चारपाई को पांव की ओर से कसने के लिए तथा पशुओं को बांधने के लिए भी किया जाता है।

टोली. सूखी कटी घास को र्क तथा पानी से बचाने के लिए त्रिंकु आकार में जब रखा जाता है। कुछ क्षेत्रों में इसे खहली भी कहते हैं।

शूटे. घास विशेष की मोटी टहनियों को मुट्ठी के आकार में एक सिरे से बांधा जाता है, इसका प्रयोग सफाई करने के लिए किया जाता है।

रघोड़. एक विशेष प्रकार के खुरदरे पत्थर को कंगन आकार में गोल काट कर इसका प्रयोग लकड़ी के र्श को सफा किया जाता है।

दंदालटी. विशेष लकड़ी से बना उपकरण, जिसमें छोटे-छोटे नुकीले डण्डे लगे रहते हैं, हल की तरह इसे बैलों में जोतकर, इसके द्वारा नसलों से खरपतवार निकाला जाता है।

मैड़ा. हल चलाने के उपरान्त मिट्टी को समतल करने के लिए प्रयुक्त होने वाला वह उपकरण, जो लकड़ी के चौड़े तख्ते से बना होता है।

चंयासी. पत्थर से बना एक उपकरण, जिसमें छोटे-छोटे कई गहड़े बनाए जाते हैं, इसमें दीवाली के अवसर पर एक पकवान विशेष द्वाएहकलियांर बनाया जाता है। इसके लिए कुछ स्थानों पर च्वांसी भी कहा जाता है।

सांचड़ू. लकड़ी विशेष का बना सांचा, जिसके द्वारा एक पकवान विशेष द्वाबबबरु बनाया जाता है। इसके लिए कुछ स्थानों पर संचा, सैंची भी कहा जाता है।

सनसी. किसी गर्म बर्तन को चूल्हे पर से उठाने के लिए प्रयुक्त लोहे की दो मजबूत तारों से बना उपकरण। इसे समसी भी कहा जाता है।

तैंथु. लोहे की मोटी छड़ से बना उपकरण, जिसका एक सिरा कूट-कूट कर चपटा तथा दूसरा गोल रहता है। इसका प्रयोग चूल्हे पर रोटी बनाते समय रोटी को बदलने के लिए किया जाता है।

घरोड़ू. मिट्टी का बना लघु घड़ानुमा बर्तन, जिसमें दूधा की मलाई को घरोड़ू द्दनिकालकरर कर रखा जाता है।

सेल-रस्सा. भांग तथा ब्यूहल की टहनियों की छाल को भिगो तथा सुखाकर गण्गु या न्गु द्दलकड़ी का बना विशेष उपकरणर पर बनाया गया रस्सा या रस्सी। इसका प्रयोग सामान बांधने, नसलों के कई कार्यों तथा पशुओं आदि को बांधने के लिए भी किया जाता है।

तरिड़ा. रिऊंश या बांस की गीली लकड़ियों से बड़ी चूड़ी के आकार का बना उपकरण, जिसका प्रयोग गोल बर्तनों को लुढ़कने से बचाने के लिए किया जाता है।

उखल. घर के आंगन में गद्दी और पत्थर की बनी गोल कुण्डी या ओखली, जिसमें धान, चावल, दाल आदि कूटे जाते हैं।

मोहल. मजबूत लकड़ी के बने जिस लम्बे-गोलाकार उपकरण से ओखली में धानादि कूटे जाते हैं। इसे कुछ स्थानों पर मूला, मोल, मुहल भी कहा जाता है।

सिंगी. भेड़ या भैंसे के सींग से बना हाथी की सूँडनुमा वाद्य-यन्त्र मुंह से तूंक मारने पर इससे घोर गर्जना होती है।

नागनी. सांप के आकार का धातु से बना तुरही अथवा नागणी वाद्ययन्त्र।

थुनछैन. कांसे की धातु से बना लगभग छः-दुःट लम्बा वाद्ययन्त्र(बौ)-विहारों में सुबह-और शम पूजा के समय इसे बजाया जाता है।

तालिंग. स्त्री की जांघ की हड्डी से बना वाद्ययन्त्र। इसके निचले भाग में वायु निर्गमन के लिए दो छोटे-छोटे छेद होते हैं। इसका मुख-रून्ध्र रत्न-जड़ित या चान्दी की पट्टी से शृंगारित रहता है। कुछ स्थानों पर इसे कलि भी कहा जाता है।

पोगड़ी. चौड़े तथा लम्बे नरम पत्ते को गोलाकार बनाकर वाद्ययन्त्र का रूप देकर मुंह से तूंक मारकर बजाया जाता है। इसकी रहनाई के समान ध्वनि निकलती है।

चंग. इस वाद्ययन्त्र में लोहे की पत्ती को रूपये का आकार देकर अर्ध-गोलाकार बनाकर दोनों सिरों पर लम्बे तथा बीच में लोहे की पत्ती द्वाजिवलीकृत बनाकर मोड़ा जाता है तथा इसके एक सिरों को दान्तों से दबाकर तूंक मारकर बजाया जाता है।

मन्दलू. इस वाद्ययन्त्र में घड़े के मुख पर चमड़ा लगाया जाता है, इससे ध्वनि में गाम्भीर्य उत्पन्न होता है।

हुड़कू. अखरोट तथा शीशम की लकड़ी से बना डमरूनुमा वाद्ययन्त्र, इसे एक ओर से बैणी की झलकड़ी की छड़ीकृत सहायता से बजाया जाता है।

धानतू. एक तारा वाद्ययन्त्र के समरूप धानुषनुमा गज से बनाया जाता है।

ग्यालिंग. रहनाई वाद्ययन्त्र के समरूप लकड़ी से बने इसका प्रयोग बौ (विहारों में आनुष्ठिक अवसरों पर किया जाता है।

स्वैगुन. बाघ की टांग की हड्डी से शंख-ध्वनि समान उत्पादक वाद्ययन्त्र का प्रयोग बौ (गोम्पाओं द्वारा किया जाता है।

गुज्जू. शीशम की लकड़ी से बना डमरूनुमा वाद्ययन्त्र, जिसके दोनों ओर बकरे की खाल को मढ़ा जाता है तथा लकड़ी की बैणी या भायटे से बजाया जाता है।

चाम्बी ढोल. यह वाद्ययन्त्र ढोल वाद्य की अपेक्षा लम्बा कम तथा गोलाई में अधिका होता है। इस वाद्य-यन्त्र में लकड़ी, ताम्बा, पीतल तथा चान्दी आदि धातुओं का प्रयोग किया जाता है। इसे गले में डालकर बैणी से बजाया जाता है।

टौगक. नगाडानुमा लोहे की धातु से बना कटोरीनुमा वाद्ययन्त्र, जिसके मुख पर भैंसे की खाल मढ़ी होती है, इसे बड़े-बड़े डण्डों से बजाया जाता है।

नार्शु. डमरूनुमा वाद्ययन्त्र, इसका घेरा डमरू से बड़ा होता है। इसे डमरू की तरह ही बजाया जाता है। इसे डाखू भी कहा जाता है।

ढाकुली. डमरूनुमा वाद्ययन्त्र, इसके बाएं पुड़े पर बिरोजा लगाया जाता है। बैणी से बजाए जाने वाले इस वाद्ययन्त्र की ध्वनि को घीह कहते हैं।

पौहल. डमरूनुमा ताम्बे तथा पीतल से बना वाद्ययन्त्र, जिसको बकरे की खाल से मढ़ा जाता है। इसका प्रयोग देवपूजन तथा लोक-नृत्यों में किया जाता है।

तिरड़ी. मिट्टी से बना घड़ानुमा वाद्ययन्त्र, जिसके मुख को भेड़ की खाल से मढ़ा जाता है।

कौली-घण्टे. चान्दी, पीतल, कांस्य, लोहे की मिश्रित धातुओं से बना वाद्ययन्त्र, जिसको छड़ी से बजाया जाता है।

घौड़ो. मिट्टी से बने घड़े को गोद में रखकर अंगुली में लोहे या किसी अन्य धातु के छल्ले को पहनकर बजाया जाता है।

घड़थाल. घड़े के मुख पर कांसे की थाली को उल्टाकर बजाया जाता है।

शड़ैश. चिमटानुमा इस वाद्ययन्त्र में लोहे की एक लम्बी पत्ती को मध्य भाग से मोड़कर बनाया जाता है। मोड़े गए मध्य

भाग पर धातु का कड़ा लगाया जाता है। चिमटे के बाहरी ओर कीलों की सहायता से धातु की गोलाकार पत्तियां लगा दी जाती हैं। इससे छनछनाहट की आवाज पैदा होती है।

तुम्बी. इस वाद्ययन्त्र में कद्दू के ऊपर भेड़ की खाल को मढ़ा जाता है। इसके साथ बांस की लकड़ी तथा हड्डी के टुकड़ों की जरूरत रहती है। इसमें एक पतली तार को बांस के डण्डे से कसा जाता है।

रबाना. खुमाणी या चीड़ की लकड़ी से तैयार वाद्ययन्त्र, इसमें छः तारें होती हैं, तथा इसका एक हिस्सा तुम्बे के आकार का होता है।

किंगर. हड्डियों से निर्मित यह वाद्ययन्त्र, मुंह से ठूँक देकर बजाया जाता है। इसके मुख द्वार पर चान्दी आदि धातु मढ़ दी जाती है।

सुलसुली. बांसनगाल की लकड़ी से निर्मित वाद्ययन्त्र, इसे सीधा रखकर ही बजाया जाता है, इसमें छेद नहीं होते हैं।

नाद. हिरण आदि जंगली जानवरों के सींगों से बना शंखनुमा वाद्ययन्त्र।

ब्यूसली. नगाल तथा भुजनली की लकड़ी से बना सपाट वाद्ययन्त्र। इसका मुख भाग सपाट तथा दूसरे भाग में छिद्र होते हैं, इन्हें घर कहा जाता है। इसे बांसुरी भी कहा जाता है।

नलगोजु. नगाल की लकड़ी से बना चोंचनुमा बांसुरी के आकार का वाद्ययन्त्र। इसमें मुख के पास एक छिद्र तथा थोड़ी दूर छः अन्य छिद्र होते हैं।

गलगोजा. दो नलगोजू को संयुक्त रूप से वादन प्रक्रिया अलगोजा कहलाती है।

बम्बई. नगाल लकड़ी से निर्मित वाद्ययन्त्र, जो हारमोनियम के रीढ़ के आकार का 10 से 15 से0 मी0 लम्बा तथा 1.50 से0 मी0 चौड़ा बना होता है।

शहना. शीशम अथवा चीड़ की लकड़ी से निर्मित घण्टीनुमा वाद्ययन्त्र, इसके मुख भाग पर कोमल पत्ते की विशेष प्रकार की नलिका लगाई जाती है तथा किसी धातु की चक्रनुमा गोल पत्ती भी लगाई जाती है।

बैंस. यह नगाल की खोखली लकड़ी से बनी होती है। इसमें मुख रूद्ध सहित आठ छिद्र होते हैं।

जंग. लोहे की धातु से बना अंगूठीनुमा चक्र। इसकी दो मुखी गोल पत्तियों के बीच, एक और अन्य पत्ती लगी होती है।

छंछाल. ताम्बे अथवा पीतल धातु से बना परिधिनुमा शंकु आकार में, जिसमें उठी हुई थालीनुमा दो तश्तरियां तथा मध्य में छिद्र होता है। इसमें डोरी लगाकर हाथों से पकड़कर आपस में टकराया जाता है।

घड़ियाल. कांसा धातु से गोल चक्रनुमा वाद्ययन्त्र, इसके एक भाग पर छिद्र रहता है।

बेलआ. कांस धातु से बना एक थालनुमा बर्तन, जिसको ढोलक के साथ लय एवं ताल देने के लिए बैणी से बजाया जाता है।

अहोई. व्रत एवं पूजा के समय दीवार पर बनाए गए पशु-पक्षियों, पेड़-पौधों एवं मानव की आकृतियों की चिचकारी।

शरि. बांस या नगाल की पतली बाणनुमा लकड़ी, जिसका प्रयोग नर्तक धानुष पर चढ़ाकर दूसरे व्यक्ति की टांग पर प्रहार करने के लिए करता है।

धाणु. बांस की लकड़ी को अ)गोलाकार कर सूत की डोरी से धानुषनुमा बनाकर बांधाना, इसका प्रयोग नर्तक ठोडा नृत्य में करते हैं।

तरार. लोहे की मोटी पत्ती के किनारों को पतला धारदार बनाकर, पकड़ने के लिए शीशम की लकड़ी की बनी हथथी लगी तलवार, इसका प्रयोग नृत्य में किया जाता है।

देऊथला. नर्ष पर गोबर से लीपकर, उसके ऊपर मिट्टी या आटे से की गई रंग-युक्त चिचकारी।

अल्पणा. मकान की भीतरी दीवारों पर स्केद मिट्टी अथवा वनस्पति के रंग द्वारा की गई चिचकारी।

लिखणू. किसी टोंटीदार मिट्टी के बर्तन में रंग डाल कर नर्श पर की गई चिन्कारी।

हंगाईये. नर्श को गोबर के पतले घोल से लीपकर, उस पर अंगुलियों से बनी कलाकृतियां। कुछ क्षेत्रों में हांगें या हांगां भी कहा जाता है।

छिट्टा. गोबर से नर्श की पुताई करने के उपरान्त मकोल या स्फेद मिट्टी से की गई चिन्कारी।

पीढ़िये. नर्श या दीवारों को गोबर के पतले घोल से लीपना तथा आधी दीवार को स्फेद रंग से रंगना।

कणदेऊ. विवाह के अवसर पर दीवार पर विवाह से सम्बन्धित विविधा चित्र अंकन।

कौहरा. एक प्रकार का भित्ति चित्र, जिसको दीवार, कपड़े या कपड़े पर चित्रित किया जाता है।

बंगद्वारी. किसी भी मांगलिक अवसर पर घर के मुख्य द्वार पर कलात्मक ढंग से की गई चिन्कारी। कई बार बंगद्वारी कागज या कपड़े पर बनाकर चौखट पर लटका दी जाती है।

डैहर. मांगलिक अवसर पर घर के आंगन को गोबर से लीप कर कलाकृतियां बनाना तथा उन पर मकोल मिट्टी से किया छिड़काव।

दिङ्नाग का जीवनवृत्त

डॉ. लता देवी

संक्षेपिका

सम्पूर्ण विश्वसाहित्य का अध्ययन करने पर यह ज्ञात है कि संस्कृत-साहित्य के इतिहास की एक सुदीर्घ सतत एवं प्रवाहमयी परम्परा वेदों के समय से चलती आ रही है। इसी प्रकार कुन्दमाला के रचनाकार दिङ्नाग भी हाथ में वीणा धारण किए हुए सरस्वती के उन वरद पुत्रों में से एक थे जो अपने व्यक्तिगत जीवन परिचय के विषय में मौन ही रहे। फिर भी उपलब्ध अन्तरंग एवं बहिरंग प्रमाणों के आधार पर इनके व्यक्तित्व एवं कर्तृत्व को कुछ सीमा तक व्यक्त किया जा सकता है।

सर्वप्रथम दिङ्नाग के स्थितिकाल, जन्मस्थान, जीवनवृत्त तथा कर्तृव्य के ऊपर प्रकाश डाला गया है और अन्त में निष्कर्ष को बताया गया है।

कुन्दमाला के रचनाकार दिङ्नाग भी हाथ में वीणा धारण किए हुए सरस्वती के उन वरद पुत्रों में से एक थे जो अपने जीवन परिचय के विषय में मौन ही रहे।

स्थितिकाल

स्थितिकाल के विषय में भी वे मौन ही रहे हैं। नाटककार दिङ्नाग वेद, पुराण एवं काव्यशास्त्र के प्रवीण पण्डित थे। नाटककार ने नाटक की प्रस्तावना¹ में स्वयं को अरारालपुर निवासी और अपना नाम दिङ्नाग बताया है।

कुन्दमाला भवभूति के उत्तररामचरित से अत्यधिक प्रभावित है। अतः दिङ्नाग भवभूति के पश्चात् ही हुए हैं। कुन्दमाला का प्रथम उल्लेख रामचन्द्र-गुणचन्द्र ने अपने नाट्यदर्पण में 1100 ईस्वी में किया है।² इस आधार पर दिङ्नाग का स्थितिकाल 1000 ईस्वी पश्चात् का माना जा सकता है।

जन्म स्थान

संस्कृत साहित्य में दिङ्नाग नाम के दो व्यक्ति प्राप्त होते हैं। एक दिङ्नाग का नाम कालिदास के मेघदूत में प्राप्त होता है। कवि दिङ्नाग का जन्म 'अरारालपुर नगर' में हुआ है। इस कुन्दमाला के रचयिता अराराल नगर निवासी कवि दिङ्नाग ही हैं अतः इसमें कुन्दमाला का द्वितीय श्लोक दिङ्नाग के नाम से उद्धृत किया है। परन्तु इसमें समय का कोई संकेत नहीं किया गया है।

जीवनवृत्त

नाटक के आरम्भ में गणेश एवं शिव की स्तुति से ज्ञात होता है कि नाटककार दिङ्नाग विशुद्ध पौराणिक ब्राह्मण थे तथा शैव धर्मानुयायी थे। दिङ्नाग की रचना कुन्दमाला के अध्ययन से ज्ञात होता है कि वे कर्मकाण्डी ब्राह्मण थे। नाटक में कहीं भी ऐश्वर्यमय जीवन का वर्णन नहीं है। सर्वत्र वनों, आश्रमों आदि का सुन्दर वर्णन है जिससे कवि की धार्मिक प्रवृत्ति, एकान्त, शान्त जीवनयापन का सहज अनुमान लगाया जा सकता है।³ कुन्दमाला में उपलब्ध प्रमाणों से ज्ञात होता है कि दिङ्नाग का व्याकरण⁴ ज्योतिष⁵, संगीत⁶ एवं नाट्यशास्त्र⁷ पर पूर्ण अधिकार था। अतः दिङ्नाग एक प्रतिभा सम्पन्न एवं निपुण कवि थे।

कर्तृत्व

कुन्दमाला नाटक दिङ्नाग की एकमात्र रचना है। इस नाटक में छः अंक हैं। प्रथम अंक में लक्ष्मण के द्वारा

सीता के वन में लाना तथा उसे बताना कि मैं तुझे वन में छोड़ने पर विवश हूँ ये शब्द सुनकर सीता मुर्छित हो जाती है। गंगा की लहरों के स्पर्श से आने वाली शीतल हवा सीता को होश में ला देती है। सीता लक्ष्मण को निर्दोष कहकर विदा कर देती है। महर्षि वाल्मीकि शिष्यों से परिव्यक्त स्त्री का समाचार सुनकर वहां आते हैं। सीता वाल्मीकि के साथ जाती हुई गंगा से प्रार्थना करती है कि यदि मेरे सुखपूर्वक सन्तान उत्पन्न होवेगी तो मैं प्रतिदिन कन्दपुष्पों की माला बनाकर जल में समर्पित किया करूँगी।

द्वितीय अंक में दो मुनि कन्याओं के वार्तालाप से ज्ञात होता है कि सीता ने दो बालकों को जन्म दिया है।

तृतीय अंक में राम लक्ष्मण के साथ वाल्मीकि के आश्रम में प्रवेश करने के लिए आश्रम का मार्ग खोजते हुये आ रहे हैं कि गोमती नदी के किनारे कुन्द पुष्पों की एक माला लहरों के आघात से राम के चरणों के पास आ जाती है।

चतुर्थ अंक में राम का अश्वमेध यज्ञ प्रारम्भ होने वाला है इसी मध्य राम के बचपन के मित्र कण्व वहां आते हैं और राम को वन के दृश्य दिखाते हुये राम को बावड़ के समीप पहुंचा देते हैं। वहां पर उन्हें सीता की परछाई जल में दिखाई देती है। अतः वह निश्चय ही सीता है।

पंचम अंक में रामचन्द्र पिछली घटनाओं से चिन्तामन हो रहे हैं। कुश और लव रामायण की कथा राम की सभा में सुनाने के लिये तैयार होते हैं। यह सुनकर राम दोनों बच्चों को रघुवंशी मान लेते हैं उनकी आकृति से सीता की समानता देखकर उन्हें अपनी सन्तान मानने लगते हैं।

षष्ठ अंक में रामचन्द्र अपने बन्धुओं से कुश और लव से रामायण की कथा सुनते हैं। इस प्रकार सीता को राम स्वीकार कर लेते हैं। इस प्रकार कुश राजा बन जाता है और लव को राम युवराज पद दे देते हैं। उसके बाद भरत वाक्य के साथ नाटक समाप्त हो जाता है।

निष्कर्ष

कुन्दमाला के रचनाकार दिङ्नाग जी हैं यह उनकी एकमात्र रचना है जो अपने व्यक्तिगत जीवन परिचय के विषय में प्रायः मौन ही रहे हैं। यहां पर उनकी स्थितिकाल, जीवनवृत्त, तथा जन्मस्थान और अन्त में कर्तव्य के ऊपर प्रथम अंक से लेकर षष्ठ अंक तक का वर्णन किया गया है।

सन्दर्भ सूची

1. कुन्दमाला, भूमिका, पृष्ठ, 41
2. नाट्यदर्पण, पृष्ठ, 186
3. कुन्दमाला, 2 / 2
4. वही, 1 / 2
5. वही, 6 / 15
6. वही, पृष्ठ, 6
7. वही, पृष्ठ, 7

HIMACHAL PRADESH UNIVERSITY JOURNAL (HPUJ)

(A Bi-annual Multi-disciplinary Research Journal)

ISSN: 2277-1425; e-ISSN: 2277-1433

General Information

Himachal Pradesh University Journal (ISSN: 2277-1425; e-ISSN: 2277-1433) is a biannual peer reviewed multi-disciplinary research journal published on behalf of Himachal Pradesh University covering all areas of research and studies being conducted at Himachal Pradesh University, Shimla.

Submission of manuscripts

Manuscripts for publication in HPUJ should be sent in the form of soft copy on the journal's email ID: hpuniversityjournal@gmail.com directly. On receiving the soft copy of the manuscript, the Associate Editors of respective sections will process the manuscripts for reviewing and publication. The authors will be required to confirm that the contents of the manuscripts have not been published elsewhere and any part of the manuscript is not currently being considered for publication elsewhere.

Instruction to the authors

Manuscripts should be written in English (except in subjects of languages) and be typewritten in Microsoft office Word 2007 with 1.5 spacing in Times New Roman, font 12. Authors are required to present the text as concise as possible (8 to 12 typed pages). Manuscripts should be submitted in complete and finished form.

Sections of the paper should be arranged in the following order: 1. Title page, 2. Introduction, 3. Materials and methods, 4. Results, 5. Discussion, 6. Reference (arranged alphabetically), 7. Tables, 8. Figures. The title page should comprise of title of the paper, names and addresses of authors, abstract (not exceeding 250 words) and key words.

Reference style should be followed as:

Journal article: Levan, A., Fredga, K. and Sandberg, A. 1964. Nomenclature for centromeric position on chromosome. *Hereditas*, 52: 201-220.

Book: Stebbins, G.L. 1971. Chromosome evolution in higher plants. Edward, Arnold, London.

Book chapter: Randall, J.E. 1995. Groupers, seabasses and their allies. *In*: Paxton, J.R. and Eschemeyer, W.N. (eds). *Encyclopedia of fishes*. Academic Press, pp 197-201.

Disclaimer

The information and opinion expressed in the Himachal Pradesh University Journal reflect the views of the authors only and not of the journal or its editorial board or the publisher. Publication does not constitute endorsement by the journal. Himachal Pradesh University Journal or editorial board of HPUJ does not assume any liability or responsibility for the accuracy, completeness and usefulness of any information provided in the journal.

Contact details

Harish K. Thakur

Editor

Himachal Pradesh University Journal

Deptt. of Political Science, Himachal Pradesh University,

Shimla 171 005 India

Email: hpuniversityjournal@gmail.com

Copy right: Himachal Pradesh University Journal (HPUJ) 2015

Published by:
Himachal Pradesh University, Shimla-5

Printed by:
New Era Graphics, Khalini, Shimla-6
Ph.: 0177-2628276