



Pratibha Spandan

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Emerging Trends in Contemporary Research

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*Dedicated to
all knowledge seekers*

PREFACE

Emerging Trends in Contemporary Research is an effort to bring together diverse ideas of scholars on a single platform, where the readers can get a view of what the recent trends in the modern research. The book is divided into three sections. First Section of the book has a collection of articles by eminent academicians and scholars on the recent advances in the modern research especially focusing on blue brain technology, cyber bullying, gender stereotypes in animation, psychological wellbeing of employee's mental health, trends in advertising, plagiarism and research, gender stratification and stigmatized third gender.

Second Section has collection of papers on Environmental Issues. The contributors have presented their views on Environmental Impact Assessment of hydro-electric projects, Ethnobotanical usage of forage plant species, economics of commercial cultivation of *Fritillaria Roylei*, medicinal plants of sacred groves and issues linked with eco-tourism.

Third section has a collection of varied ideas on diverse themes, like Carbon TiO₂ composite and its application; characterization of magnetohydrodynamic triply diffusive convection in a sparsely distributed porous medium and blind searching techniques of AI.

An important attribute of this book is that it doesn't have a typical structure, where the chapters have to be read in a sequence. Therefore, a reader can start the journey from any paper, based on the interest and preference.

We hope that the book is of interest for the general readers and we would like them to share their view and ideas on this compilation.

Editors

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Part 1

EMERGING TRENDS IN CONTEMPORARY RESEARCH

INCLUSIVE STUDY ON BLUEBRAIN TECHNOLOGY

SANDHYA VATS

INTRODUCTION

Brain is the most complex structure by the nature. Nobody can understand its structure and complexity. It was a big question at the time when computer hadn't been invented. But technology makes it possible now. In actual, blue brain is the reverse engineering of brain and regenerates same brain into the computer simulation which is an artificial brain but acts like a real brain. The project was founded in May 2005 by Henry Markram at the EPFL in Lausanne, Switzerland. Goals of the project to gain a complete understanding of the brain and to enable better and faster development of brain diseases treatments. In research, slices of living brain tissue are studied using patch clamp electrodes and microscope. Data is collected using different types of neuron. In the cerebral cortex data is used to build network of neurons and biologically neurons realistic models.

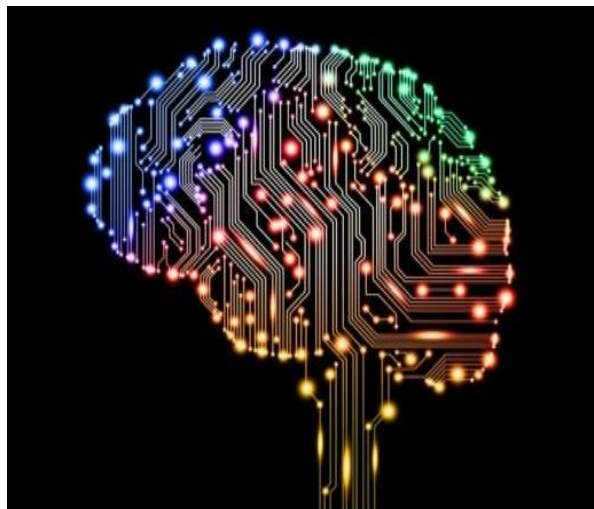


Figure 1: Blue Brain

BLUE BRAIN: AN OVERVIEW

An artificial brain i.e. virtual brain is known as Blue brain. Blue brain which is not real but can act like human brain. The IBM is doing research on virtual brain, which would be the world's first virtual brain. Within 30 years, we will be able to scan ourselves into the computers. It can take decisions based on the past experience, it can think like brain, and respond answer like normal brain. With the help of supercomputer, it will be possible to large amount of storage capacity, power of fast processing and interface between the artificial brain and human brain. Through interface, data can be loaded into computer that's stored in the natural brain after the death of person, their knowledge; intelligence can be kept and used forever.¹

MAJOR FUNCTIONING OF HUMAN BRAIN

The nervous system is a complex part. The human ability to feel, interpret and even see is controlled, by the nervous system. The nervous system is quite like magic because we can't see it, but its working through electric impulses throughout the body. One of the world's

most “Intricately organized” electron mechanisms is the nervous system. Not even engineers have come close for making circuit boards and computers as delicate and precise as the nervous system. There are three main functions that it puts into action: sensory input, integration, motor output.[2]

Sensory Input: Sensory input is the stimuli that are perceived by our senses like smell, sight, touch, taste, and hearing. Anything that you perceive using your senses can be called sensory input. Neurons called sensory cells at the time send a message straight to the brain. A sensory input is getting different type of information that’s happened surrounding environment

Integration: Integration is also said to be interpretation and it differs man to man according to one’s own understanding and beliefs. It depends upon one’s experience and experiment carried out keeping in your own understanding.

Motor Output: The central nervous system includes the spinal cord and the brain. The brain is the body’s main control center. The main function of the CNS is the integration and processing of sensory information. It synthesizes sensory input to compute an appropriate motor response, or output.

NEED OF VIRTUAL BRAIN

Intelligence is god gifted that cannot be created. Some persons are intelligent than others, human society needs intelligent peoples. After the death of person intelligence is lost along with the body. Virtual brain is solution it keeps the intelligence and brain even after the person is dead, but his brain will work into the machine-like real brain. We always face many difficulties like, remember large numbers, people names their birthday date, words spelling, grammar, important dates and other historical past things etc. Everybody wants to be live relaxed. The better solution of this problem is virtual brain, with the help of virtual brain we upload our brain into machine and we live forever in machine in form of program.

UPLOADING HUMAN BRAIN INTO COMPUTER SYSTEM

Nanobots are small objects which can pass through our entire circulatory constituent. With the help of Small robots known as the Nanobots uploading is possible. These robots are too small which can easily travel all over our circulatory system. By traveling into the brain and spine, they will be able to monitor the structure and activity of our central nervous system. They will provide a interface between our brain and computer there Nanobots scan the structure of our brain and provide a complete information. When this information entered into a computer it works different functions like human brain, whole data stored which is stored into the brain will be upload into the computer.



Figure 2: Nanobote

COMPARISON BETWEEN NATURAL BRAIN AND SIMULATED BRAIN

NATURAL BRAIN

Input: In our body in nervous system the neurons are responsible for the message passing. By the sensory cells body receive the input. Electronic impulse which produces through sensory cells is received by the neurons. The neurons transfer this electronic impulse in the form of message to the brain.

Interpretation: The electronic impulses are interpreted in the brain that is received by the brain from the neurons. The interpretation in the brain is accomplished by means of certain states of many neurons.

Output: The electronic impulse showing the responses depending on the state of neuron the brain sends electronic impulses which are further caught by cells of body to respond which part of body is going to receive that depends upon the current position of neuron.

Memory: In our brain there are certain state permanently that represents by neurons. We can remember past things when required, these state is interrupted by our brain.

Processing: When we make decision, think about logical and arithmetic calculations, imagine about somethings are done in our neural circuitry that time current input received and past experience stored are used and to give the response the state of certain neurons are changed.

SIMULATED BRAIN

Input: Artificial nervous system can be created in a similar way. The scientist has already created an artificial neurons silicon chip. These neurons can receive the input from sensory cells it has also been tested. So, the electronic impulses from the sensory cells can be received through these artificial neurons and send to super computer for the interpretation.

INTERPRETATION

Output: The output signal received from the sensory cell which can give to the artificial neurons in the body based on the states of the various register.

Memory: By using the secondary memory it is not possible to store data permanently. In the similar way the required states of the registers can be stored permanently and when need the information can be retrieved and used.

Processing: Computer perform different task like logical and arithmetic calculations it is possible due to some stored states and received input. So there is no any question how virtual brain will work like human brain.

ADVANTAGE OF BLUE BRAIN

- We can understand and remember things without any effort.
- Without the presence of person decision can be made.
- After the demise of person their intelligence can be used.
- Even the brains of animals also can be processed in this category too.

DISADVANTAGE OF BLUE BRAIN

- We will be dependent upon the computer.
- Human being totally mechanized in this system.

- Others may use technical knowledge against us.

CONCLUSION

With the advent of blue brain technology, man will be able to conquer death partially. The preservation of brain will give benefits in various fields like science & technology, medicine etc. This area is yet to be developed and lots of research needs to be done in this field but if fully incorporated, it will prove to be a boon for society.

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CYBER BULLYING AND SUICIDE

VIJAY KUMAR THAKUR

INTRODUCTION

Today, we cannot imagine life without technology as it offers fantastic opportunities, but at the same time it can be misused easily. Today such misuse of technology is popularly known as Cyber bullying. The definition given in Encyclopedia Britannica (2018) says that bullying is an “intentional harassment or harm-doing that is directed toward defenseless targets and typically repeated”. Sharma (2010) and his team from Delhi University, says, ‘cyber bullying can be as simple as continuing to send electronic messages to someone who don’t want to remain in contact with the sender, it may also include threats, sexual remarks, derogatory statement or uniting together to make victims a subject of laughter by posting false statements as fact with the aim to humiliate victims’.

GLOBALIZATION AND TECHNOLOGY

Today, we are living in an era of communication revolution and globalization. Technology is continuously changing and growing at a rapid speed and the world is witnessing a new culture. The internet has put the world at the fingertips of its user as anybody can easily access any information at any time. Technology experienced rapid development in every field such as communication, entertainment, business, education, etc. It has made communication much easier, but, at the same time it is becoming more and more difficult to keep up with the problems arising out of it.

CYBER BULLYING AS DARK SIDE OF TECHNOLOGY

Although technology offers a number of benefits to adolescents, it additionally has a ‘darkish characteristic too’, because it may be used to harm others. As technology evolves, cyber bullying also flourish. It is growing very fast and experts believe that it can be more harmful than typical traditional bullying. Victims can be reached anytime, anywhere through the internet, mobile phones and digital technologies. Technology causes people to suffer from mental and emotional disturbances. In addition, in cyber bullying millions of people can view, support and share an incident of cyber bullying, to maximize its impact. Furthermore, written terminologies seem more ‘real’ than spoken words. There is the power of the written word as they can be read by anyone over and over again.

The most evil thing about cyber bullying is that it can occur 24 X7 as there is no escape from it. Victims consequentially develop higher depression, anxiety and mental illness which sometime can develop into suicidal ideations. Supreme Court advocate and cyber law expert Pawan Duggal (2013), say, ‘cyber bullying is also taking serious roots in India. Currently there are no laws in India pertain to cyber bullying. It is indeed correct that there have been reports of some suicide being committed by individuals due to cyber bullying.

CONSEQUENCES OF CYBER BULLYING

The consequences of cyber bullying may not be noticeable at first, but over time, cyber bullying causes long-term harmful effects. Sometime the consequences of cyber bullying can be as adverse as self-harm or committing suicide. Studies have revealed that cyber bullying causes significant emotional and psychological distress to both bully and victim. Cyber

bullying victims are seen experiencing depression, loneliness, anxiety, anger, unhappiness, low self-esteem, and poor sleep. Studies have revealed that those who are victimized by cyber bullying often feel afraid or embarrassed to go to school, keep a distance from friends and disappear from social events. They are also seen with some change in personality like always remaining depressed, using alcohol or drugs, having low self-esteem, crying without reason or unpredictable emotional over-reaction. They may commit suicide; as a result of the bullying at any point of life. In 2007, cyber bullying researcher Hinduja and Patchin from United States, tried to find out the relation between cyber bullying, and suicide by demonstrating some high-profile cases of Cyber bullying. They took a random sample of 1,963 middle-school students from the United States and completed a survey of Internet use and experiences. The results reveal that Cyber bullying makes young people twice as likely to attempt suicide or self-harm. Youth who experienced cyber bullying, were more likely to attempt suicide. The findings provide further evidence that, victims prefer suicidal thoughts more than to defend themselves from bullying.

The most damaging psychological effect of Cyber bullying that can occur is an adolescent becoming suicidal (Breguet, 2007). One of the devastating effects of becoming a victim of adolescent cyber-bullying is extreme isolation, so these victims begin to feel hopeless and even suicidal about their situations (Hazler & Denham, 2002). Shireen *et al.* (2014) studied the connection between suicide and bullying behavior among teenagers and adolescents in school. This study also tried to find out strategies to prevent acts of bullying. It was seen that the threat of suicide attempts was higher amongst girls in comparison to boys, who've been concerned with bullying in the past, either as victim or bully. ChideLine has experienced in 47,000 counseling sessions that the number of cyber bullying victims has sharply increased and further 33% victims can face suicidal ideation. The CEO of the organization, Peter Wanless, said that a stranger danger of hopelessness, self-harm, cyber bullying and even suicide attempts are escalating exponentially". Even 12 years old are mentioning self-harm by 50%. He considered it as an alarming state for cyber bullying. Hay and Meldrum (2010) observed that both types of bullying (traditional bullying and cyber bullying) were directly linked to self-harm and suicidal ideation. Parent's supervision and high self-control can reduce the harmful effects of bullying victimization and suicidal ideation.

CASE STUDIES

A study published in The Telegraph on 21st April 2018 says that the Internet has become a medium of great value for students and youngsters. We cannot imagine a future without internet, but it can be deadly too. Researchers at the Universities of Birmingham, Oxford, and Swansea evaluated previous studies on cyber bullying conducted on more than 150,000 respondents throughout 30 countries over the duration of twenty-one years. They discovered that cyber bullying raises the risk of self-harm or suicidal conduct 2.3 times.

THE STORY OF OOSHMAL ULLAS

Ambika Raj published an article in The New Indian Express on 17th November 2017. In this story a bright MBBS student, Ooshmal Ullas, who committed suicide, had written a post on the college confession page directed at senior boys. The post mentioned how her seniors misbehaved with junior girls and how the students were often treated in the college. In this story Ooshmal Ullas, a vibrant MBBS student, who committed suicide, had written a post at

the university confession web page. The post referred to how her seniors misbehaved with junior girls and the way the students have been often treated inside the college campus. Due to this post, instantly, she started receiving threats and warnings on various social media platforms. Her father said that in her latest Facebook post, she uploaded screenshots of the nasty comments written to her at her initial post on the confessions page of the college on 13th November. She requested the commentators to 'end pinning' matters on her and to reconsider their moves. Her parents and relatives found out that she turned into a sufferer of cyber bullying, which might have compelled her to take a selection of suicide. Her friend said that she was very upset with the threats and vulgar comments she was receiving on social platforms.

THE STORY OF V KALAIYARASAN

A recent study of cyber bullying, published in Mirror Now on 19th October, 2018 sprang into the attention when V Kalaiyarasan from Chennai committed suicide after being continuously cyber bullied over his clothes and referred to wear ladies' clothes in his music movies. He jumped in front of a train to escape from bullying. According to the report, police in the investigation found that, He turned into in deep pressure after being teased by way of his fans for releasing the video in girls' costumes. Many of them ridiculed him as a transgender. He took the extreme step after his fans bullied him, although his close friends and circle of relatives was aware about it, but they couldn't lend a hand of help to him.

THE STORY OF TWO STUDENTS FROM KERALA

Pooja Nair, from Deccan Chronicle published her article on 8th November, 2018 in which she writes about the similar incident from Calicut, Kerala, which took place after one year of the deadly 'Blue Whale' game. In this case, two students (name not revealed) committed suicide after being influenced by a social media page. This page mostly posted images and messages related to death and suicide. Sanjay Kumar Gurudin, an IPS officer who has done huge research on cyber crimes and their effect on kids said that during such cases someone becomes a member of a suicide group. The participants of the group enter into an agreement and decide to commit suicide at the identical day or using the same strategies. In addition to this some outside force also blackmails or cyber bully the sufferers. After a close observation of many cases of suicide Mr. Gurudin said that the society hardly notices the impact of the cyber world of teenagers, but it always exists.

THE STORY ON BLUE WHALE & MOMO CHALLENGE

The Blue Whale Challenge is called as one of the most important instances of cyber bullying. This suicidal game cost the lives of more than 1000 children, the world over and in India, too. In accordance with this, Sunidhi Chugh published her story in CNBC TV 18, in which she says that the risks of suicidal games have risen-up again, as the 'Momo challenge', as suicidal games strikes again. The 'Momo challenge' has reportedly cost two deaths in Jalpaiguri, West Bengal. The police additionally mentioned to get hold of a grievance that a girl who was invited to play the 'Momo Challenge' while she expressed her interest in committing suicide. The Momo task turned into just like the Blue Whale game. The youngsters are given a set of demanding situations, and if not complied, they are threatened with violent pictures. According to reports, Children have been contacted via unknown numbers which are believed to be maintained from countries like Japan, Mexico and Columbia.

THE STORY OF BENGALI WOMAN

Mala Bhargava, who writes for The Hindu Business Line, on 12th September 2018, is more worried about the live streaming of suicides. She believes that Technology has brought a new twist to suicide. Now High-tech suicide is taking the root in our society in which taking off one's own lives on camera, and showing to the world is a new fashion. Recently, a young Bengali killed herself and streamed the incident live on Facebook. She turned on the camera and threw herself under a train, as seems to have been angry with her boyfriend. They both were in different places so live streaming of suicide was done by the lady just to show to her boyfriend. This is unfortunate and inescapable fact that technology has brought a regrettable new dimension to suicide. Blue Whale challenge and Momo challenge are also doing the same thing. Young people are influenced to go through a series of tasks ending in death. It isn't just a game, but outright cyber bullying that can also result in suicides.

THE STORY OF RAUNAK BANERJEE

In Another case in Bengaluru, Raunak Banerjee, of IX class, returned from school and went straight to the terrace of his apartment and jumped to his death from the terrace of 10th floor. Raunak's mother Rumi Banerjee found the house locked when she returned home. Her neighbor informed her on the phone about the incident. She rushed there, but it was too late. Investigations into the suicide discovered that he had been bullied via a schoolmate who travelled with him in his school-van. Police said that it was written in his notebook. In this case the bully is also a minor, so, much cannot be done. Her mother said that he was a bright student and good by nature. He was not having any bad habit. He was a victim of bullying only. Cyber bullying is a fast-growing trend that Indian parents and educators can't afford to ignore. This story was published in The Indian Express.

THE STORY OF AMANDA

The New Yorker wrote about Amanda Todd's story, who was a 15-year old teenager student from British Columbia. She committed suicide and left behind a YouTube video in which she told her entire story. According to her, she met a man online and started chatting with him. He continuously pleased her and requested her to send nude pictures. When she flashed him a few, he started blackmailing her for more. He followed Amanda on the Internet continuously and asked her to do the same thing again and again. When she refused, he shared the photo with her classmates on social media. In order to deal with the tension and anxiety, she started taking drugs and alcohols along with multiple sexual encounters. Slowly, after severe depression, and attempted suicide multiple times she finally committed suicide.

THE STORY OF CARL WALKER-HOOVER

Another example of adolescent suicide due to being bullied is an 11-year-old Carl Walker-Hoover. In April of 2009 in his home, Carl Walker-Hoover committed suicide by hanging himself just a week near to his 12th birthday. A report says that he was continually being bullied at school, including daily taunts of acting feminine and being gay. He was continuously under pressure, but helpless. His tragic story also illustrates the frequency with which adolescent suicides occur as a result of bullying.

THE STORY OF TYLER CLEMENTI

A story about Tyler Clementi, appeared in The Guardian an 18-year-old freshman at Rutgers University, in New Jersey died after jumping off the George Washington Bridge in September, 2010. Tyler took his own life after finding out that his roommate secretly filmed him kissing another man in his dorm room (Bennett, 2010). His Roommate Dharun Ravi posted about the webcam incident on his Twitter account and Tyler eventually found out about the tweets made by Ravi. Earlier, Ravi has also tweeted that he found out that his roommate is gay. Ravi invited all his friends on Twitter to watch the entire incident. Humiliated Tyler left the room and jumped off the George Washington Bridge. He left a suicide note, along with other documents on his computer which were never released in the public domain. He committed suicide because of the fear of bullying. Tyler Clementi posted goodbye messages on his Facebook pages before taking his life.

THE STORY OF TYSEN BENZ

News18 carried a story of Tysen Benz on 8th April, 2017. He saw a social media posts about the suicide of his 13-year-old girlfriend. He was at home when he saw this post. The posts were actually a prank by his girlfriend and school friends. Without confirming this post he apparently believed it and decided to commit suicide. Soon his mother saw his body hanging by the neck in his room. His mother, Goss, said that her son as appearing fine, just 40 minutes before when she was with him. He brought a mobile phone without the knowledge of his mother where he got the faked suicide news of his girlfriend and decided to end his life too. It is very easy for the internet to follow the innocent mind that can easily believe the rumours or got duped in the prank. Goss said of School bullying that it should be exposed and not be ignored anymore.

THE STORY OF GABRIELLA GREEN

CNN broadcasted a story of 12-year-old Gabriella Green, who was found unconscious in her home on January 10, 2018. She was taken to the nearest hospital where she was declared dead. Police stated that in the investigation, family and friends alerted police that Gabriella have been a victim of cyber bullying. Police said they checked out cellophanes and social media, led them to interview two of her friends. The 12 year old accused informed police that they supposed to motive troubles between Gabriella and one of her close friends. So they decided to spread rumors and made derogatory remarks verbally and electronically. They deliberately unfold rumors like victim having sexually transmitted diseases. They started calling her with vulgar name and threats to 'divulge' non-public and touchy details of the sufferer's existence on social media. The suspect also deleted all messages upon learning of the death. During a video chat with a boy, Gabriella said that she was having a bad bullying experience and mental distress and attempted to hang herself. Boy informed the police that she also had marks on her neck.

CONCLUSION

There is no doubt that cyber bullying is a real issue in today's society, from school to college. Children as young as the age of 11 have committed suicide within the last few years because of the effects of being bullied. These sufferers were taunted, excluded and demoralized for being different.

Children are using more technology now than they have ever used in the past. It also results in lack of social bonds, technology addiction and many physical and mental health problems. Victims of cyber bullying, lack much needed social skills and ultimately isolate themselves from all human contact. Studies have shown that people, who socially isolate themselves, remain in depression and live shorter lives. The increase in cyber-bullying is directly related to the increase in teen suicides all over the world.

Cyber bullying amongst teenagers is one of the darkest and most troubling aspects of the growing accessibility of new media technologies. Adolescence always shows a tendency to misuse the cyberspace either intentionally, or unintentionally. Cyber bullying is the unacceptable face of new technology as it tends to have an injurious impact on one's physical, mental, emotional and social health and it has far reaching negative impact on one's overall well-being and even suicidal ideation.

Cyber bullying is one of the offenses which can take an ugly shape in the future and needs to be addressed soon. Teachers, parents, and students themselves need to take measures to prevent such offense. There can be advertisements on the effects of cyber bullying and its concept. School authorities should teach cyber ethics to the students to make them understand the concept of cyber bullying, its consequences and effects. Parents should keep a check on the internet usage and activities of their child and should encourage the child to tell them if they are being bullied. Unfortunately, such an important issue has been totally overlooked by the legislators in India. Research Assistant in the International Cyber Bullying Research Project, Debarati Halder (2007), says that in India, there is no school manual, guidelines or uniform regulations to prevent bullying or cyber bullying and unfortunately neither the IT Act, 2000, nor the Juvenile Justice Act deals with such subjects of cyber bullying.

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SELECTED YOGIC PRACTICES AND BMI VARIABLES AMONG RESIDENTIAL FEMALES IN SHIMLA DISTRICT, HIMACHAL PRADESH

BHUPENDER

INTRODUCTION

The word *Yoga* has been derived from Sanskrit grammar the verb root *yuj* in a Sanskrit grammar. In Sanskrit literature on *Yoga* seems to use the word in all the three senses. *Yuj Samādhau* – Integration, *Yuj Saṁyamane* – Control *Yujir Yoge* – Joining. So far, the first two meanings are concerned; all the literatures and schools of *Yogic Sādhnā-s* have unanimously accepted these meanings. *Patañjali*, the first systematizer of the Yogic discipline – seem to accept the meaning of *Yoga* as integration—since the first commentator of *Pātañjalayogasūtram* on *Vyāsa* in his commentary writes: *Yogaḥ Samādhiḥ* i.e. *Yoga* is *Samādhi*. *Patañjali* does not subscribe to the other meaning of *Yuj* i.e. *Yujir Yoge* ‘joining’. This is mainly because *Patañjali-s* philosophy is based on Sāṁkhyan metaphysics and Sāṁkhyan believes in separation of *Puruṣa* from that of *Prakṛti*. – With which *Puruṣa* has wrongly got itself identified. Similarly *Patañjali* considers *Draṣṭā* Seer Principle to be separated from *Dṛśya* (Seen Principle) with which it has got identified. Thus separation of these two principles is supposed to be *Yoga*. We also find meaning of *Yoga* as separation in *Śrīmadbhagavadgītā*.

The word *Yoga* is derived from the Sanskrit root ‘*yuj*’. The meaning of word *Yoga* is *Yuj Samādhau* – Integration, *Yuj Saṁyamane* – Control *Yujir Yoge* – Joining. So far, which means total integration of the Physical, Mental, Intellectual and Spiritual aspects of the Human personality. It is an art and science for healthy living. *Yoga* helps in the co-ordination and control of the subtle forces within the Body. *Yoga* brings in perfection, peace and everlasting happiness; one can even have increased energy, vigor, vitality, longevity, resistance, calmness, and good sleep at times by the *Yogic Abhyāsa* (Practice). The *Yoga Abhyāsa* will help people to control the emotions and passions and resistance power increases and removes the disturbing elements from Mind. The aim of *Yogic Sādhnā-s* (Practices) is to overcome all kinds of sufferings that lead to a sense of freedom in every walk of life with holistic health, happiness and harmony.

Yogic Sādhnā-s is practiced with a therapeutic intention in the form of *Yogic Therapy*, it can help prevent and aid recovery from physical and mental ailments. The continuous practices of *Yoga Abhyāsa* (practices) have much effect on the Human Body and Mind such as: All round health fitness, Weight loss, Stress relief, Inner peace, improved immunity, living with greater awareness, Better relationships, increased energy, Better flexibility and posture, Better intuition etc. The benefits accrued by being a regular practitioner are numerous. Some very discernible ones are – improvement in health, Protection from stress, improvement in Physical strength, protection from injury and detoxify the Body. *Yogic Therapy* is gaining among mainstream medical practitioners. As more clinicians use these techniques either for themselves or for their patients and as more *Gurū-s* (Masters) design more specific applications of *Yoga Sādhnā*, the spectrum of *Yogic Therapy* grows exponentially.

BMI is an approximate measure of your total Body fat. Being underweight or overweight can cause health problems, especially if you are also inactive. Your waist circumference is a better predictor of Health risk than BMI. Body Mass Index (BMI) is one method used to estimate your total amount of Body fat. It is calculated by dividing your weight in kilograms by your height in meters squared (m^2). If you are overweight (with a BMI over 25) and physically inactive, you may develop: Cardiovascular (Heart and Blood circulation) disease, Gallbladder disease, High Blood pressure (hypertension), Type 2 Diabetes, Osteoarthritis, Certain types of Cancer, such as colon and Breast Cancer, Depression and other Mental Health disorders. Risks of being underweight are: Compromised immune function, Respiratory disease, Digestive diseases, Cancer, Osteoporosis etc.

METHODOLOGY

The present study was conducted to assess the Effect of Selected Yogic Practices on BMI Variables among Residential Females in Shimla District, Himachal Pradesh: A Study of the Age Group of 30 to 60 Years. The present study involved 38 subjects. All the subjects were comparatively new to Yogic practices. The study was conducted in Aura Wellness Studio ladies at Shimla Himachal Pradesh. The research protocol was approved by Dr. Satayprakesh Pathak, Assistant Professor (Yoga), Department of Yoga Studies Himachal Pradesh University, Shimla. All the subjects were subjected to Yoga Abhyāsa (practices) for two month. The Yoga Abhyāsa (practice) was performed six days per week between 8 am to 9:30 am under the direct supervision of a trained Yoga expert. This practical session utilized a standard sequence of selected Pre Practice: Sukhāsana and Prayer, Pre-requisite Practices: Śodhankriyā-s, selected Yogic Sūkṣmavyāyāma and Sūryanamskāra, Main Practices: Āsana-s, Prāṇāyāma-s, Relaxing Practices and Dietary Advice.

The various Pre Practice included in the present study are Sukhāsana, Omkāra Uccāraṇa and selected Mantra. The Pre-requisite Practices were Śodhankriyā-s: Kuñjala/Gajakarṇī, Agnisāraṅkriyā and Kapālabhāti, Sūkṣmavyāyāma: Udara-Śakti-Vikāsaka-1to10, Kati-Śakti-Vikāsaka-1to5, Vakṣa-Sthala- Śakti-Vikāsaka-1or2 and Sūryanamskāra. Main Practices Āsana-s was: Virbhadarāsana, Trikonāsana, Naukāśana, (Prone Position) Śalbhāsana, Cakrāsan, Karṇpiḍāsana, Śaśāṅkāśana and Paścimottānāsana. The different Prāṇāyāma-s were Nāḍīśodhana Prāṇāyāma, Bhastrikā-kumbhaka-Prāṇāyāma and Suryabhedana-Kumbhaka-Prāṇāyāma Relaxing Practices were Śavāsana, Dhyāna Omkāra Uccāraṇa and Śāntipāth Dietary advice are to take a Santulita, Sātvik Āhāra or modern diet according to hath yoga text only. The Body Mass Index (BMI) was estimated in all the participants before and after the experimental procedure using the formula, $BMI = \text{Weight in kg} / \text{Height}^2 \text{ in meter}$. The data obtained was analyzed for the statistical significance using a paired “t” test. $p < 0.01$ was considered the level of significance.

RESULTS

The present study involved the assessment of Effect of Selected Yogic Practices on BMI Variables among Residential Females in Shimla District, Himachal Pradesh: A Study of the Age Group of 30 to 60 Years. The present study showed that the BMI Variables subjects reduced their Body Weight and improves the BMI level in Body. The significant reduction in Body Weight ($p=0.000$, Fig-1), and BMI ($p=0.000$, Fig-2), after Yoga when compared to that before the Yoga therapy. This decline was the clear evidence that two month Yogatherapy

improved the BMI level in human Body, which further indicates that two month *Yogatherapy* improves the BMI level in the Human Body.

The present study confirmed the positive effects of *Yoga* therapy on BMI variables subjects. The significant reduction in the Body Weight and BMI as recorded in the present study.

According to *Yoga* therapy, increased Body mass is the indication of imbalance in the *Triguna* and *Tridosha*. The root causes of the abnormalities are *adhi* or mental stress. To overcome the stress the person habituates overeating leading to the deposition of fat in the Body. To manage Overweight or Obesity, one has to reduce the Mental Stress and has to provide the sufficient Physical activities. The practice of *Yoga* can regulate all the Body functions in a balanced manner and helpful in providing sustainable Health. Analysis of our results clearly indicated that the complications of BMI can be reduced by *Yoga* therapy. The reduction in the Body Weight might be due to reduction in the deposited fat on adipose tissue.

Table 1: Comparison of Height between Pre Test and Post Test of Residential Females in Shimla, Himachal Pradesh in respect of Mean and 't' Value

Height	N	Mean	S.D	R	S.E.M	DF	't' value
Pre Test	38	1.5890	.09538	.00000	.01547	37	.000
Post Test	38	1.5890	.09538				

INTERPRETATION:

Table1. Shows that the value of "t" = .000 is not significant at any level of confidence. Hence it may be inferred that there is a not any significant difference in the two means. On the perusal of means, it is clear that post test mean (1.5890) is equal to the pre test mean (1.5890). Hence it may be concluded that *Yogic* practices do not affect Height significantly. The fact related to mean values of height of Residential Females in Shimla District; Himachal Pradesh; the Age Group of 30 to 60 Years is further supported by the graphic depiction in figure 1. The height of histogram drawn in same of pre test and post test.

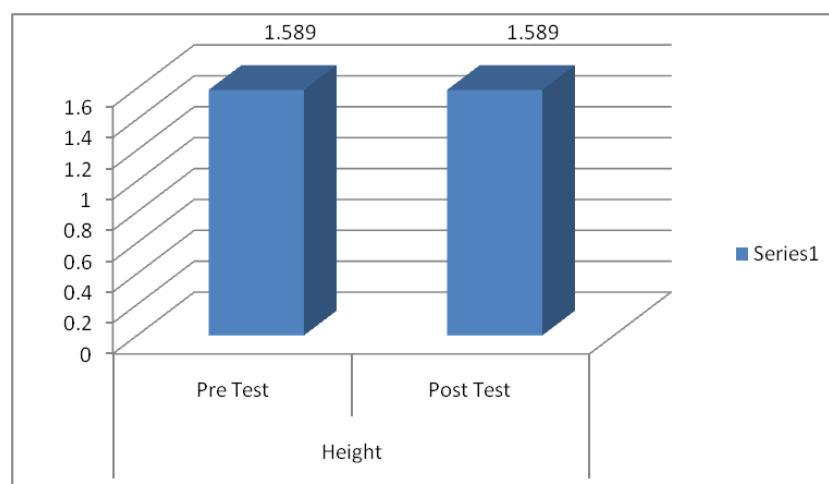


Fig. 1: Comparison of Mean Values of Height among Pre Test and Post Test of Residential Females in Shimla District, Himachal Pradesh; the Age Group of 30 to 60 Years.

Table 2: Comparison of Weight between Pre Test and Post Test of Residential Females in Shimla District, Himachal Pradesh; the Age Group of 30 to 60 Years in respect of Mean and 't' Value

Weight	N	Mean	S.D	S.E.M	r	df	't' value
Pre Test	38	68.4395	9.66391	1.56769	.984	37	13.647
Post Test	38	64.4184	8.93142	1.44887			

INTERPRETATION

Table 2 shows that the value of "t"=13.647 is more than the Table value of "t" which is 2.704 for DF = 37 at 0.01 level of confidence. Thus this value of "t" is highly significant at 0.01 level of confidence. Hence it may be inferred that there is a significant difference in the two means. On the perusal of means, it is clear that post test mean (68.4395) is less than the pretest mean (64.4184). Hence it may be concluded that *Yogic* practices do affect weight significantly.

The fact related to mean values of weight of pre test and post test is further supported by the graphic depiction in figure 2. The height of histogram drawn in favour of pre test is higher than post test. The fact related to mean values of height of Residential Females in Shimla District; Himachal Pradesh; the Age Group of 30 to 60 Years is further supported by the graphic depiction in figure 4.1. The Height of histogram drawn in same of pre test and post test.

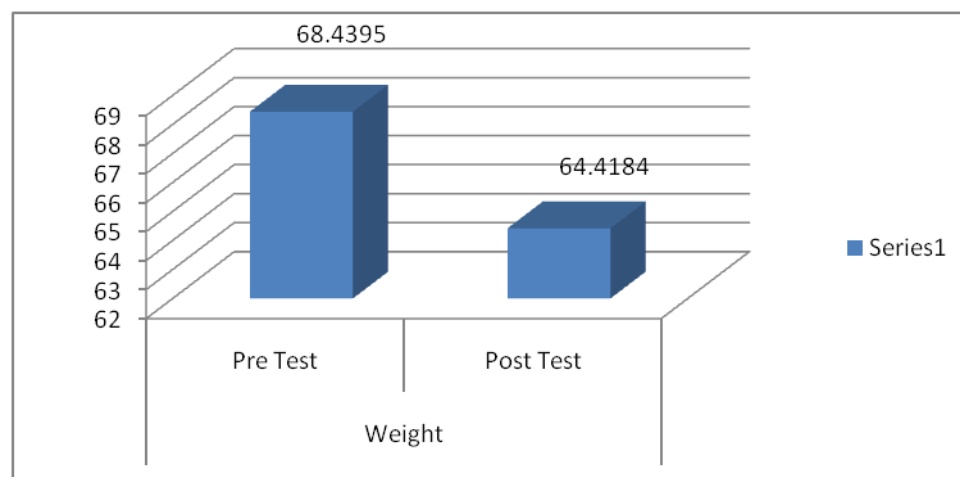


Fig. 2: Comparison of Mean Values of Weight among Pre Test and Post Test of Residential Females in Shimla District, Himachal Pradesh; the Age Group of 30 to 60 Years.

Table 3: Comparison of BMI between pre test and post test of Residential Females in Shimla District, Himachal Pradesh; the Age Group of 30 to 60 Years in respect of mean and 't' value

BMI	N	Mean	S.D	S.E.M	R	Df	't' value
Pre Test	38	27.2316	4.01282	.65097	.984	37	13.389
Post Test	38	25.6421	3.78315	.61371			

INTERPRETATION

Table 3 shows that the value of “t” = 13.389 is more than the Table value of “t” which is 2.704 for DF = 37 at 0.01 level of confidence. Thus this value of “t” is highly significant at 0.01 level of confidence. Hence it may be inferred that there is a significant difference in the two means. On the perusal of means, it is clear that post test mean (25.6421) is less than the pretest mean (27.2316). Hence it may be concluded that yogic practices do affect BMI significantly. The fact related to mean values of BMI of pre test and post test is further supported by the graphic depiction in figure 3. The height of histogram drawn in favour of pre test is higher than post test.

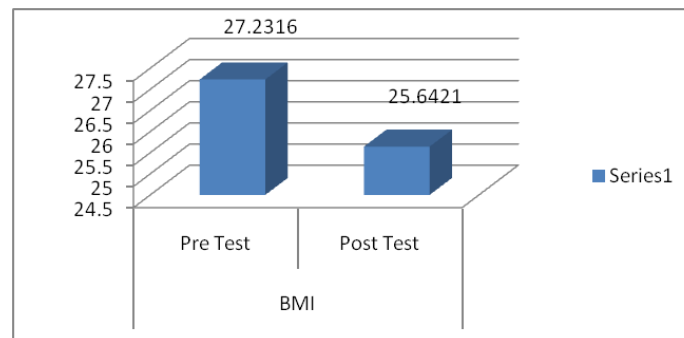


Fig. 3: Comparison of Mean Values of BMI among Pre Test and Post Test of Residential Females in Shimla District, Himachal Pradesh; the Age Group of 30 to 60 Years.

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GENDER STEREOTYPES IN ANIMATION AND EARLY SOCIAL CONDITIONING

ASHOO TOOR

INTRODUCTION

Media plays a very significant role in the dissemination of information, knowledge and entertainment. Television, especially is the most popular and effective medium in shaping our perceptions, notions, beliefs and largely, our behaviour, which in turn defines the socialisation process of an individual. Television, ‘the opiate of the masses’ has infiltrated our personal lives and changed the way we work, play and interact. A veritable feast for the senses, it is the only place where imagination becomes reality. The problem with this immense popularity of television is that children have developed an addiction for television viewing. In fact, children spend more time in front of the television than they do in the classroom. Indeed, television has opened up new worlds for kids, introducing new cultures to them and exposing them to ideas that they may never encounter in their own community. “Shows with a pro-social message can have a positive impact on children’s behaviour, while the reverse can also be true” (Levinson 1975).

While great deal of research has been done on television viewing and its effect on kids’ sleep, weight, grades, behaviour etc.; what is still a cause of concern is how animated cartoons and the stereotypical gender representation of male and female characters in popular animated cartoon programmes affects their socialisation process- of shaping and constructing ideas about male and female’s position and role in the society.

The problem is that young children often do not comprehend the difference between fantasy and reality; hence, they are particularly susceptible to the portrayal of gender types on television. Cartoons are their favourite programme which they view on a consistent basis. Children, with their impressionable minds are easily impacted by the messages conveyed by these infotainment programmes. Often, they imbibe unconsciously the gender characteristics that are displayed by their favourite animated characters.

Downs and Harrison (1985) aver “The process of socialisation begins in early childhood through regular viewing of television programmes, which shapes and moulds their perceptions and interpretations towards social values regarding gender.” The innocent display of cartoons dishes out several subtle messages related to gender representation, wherein male and female characters are depicted as belonging to their essentialist categories. Such messages are of concern as young children are unable to differentiate between internal and external experiences; and even “puppet and cartoon characters are likely to be thought of as real and alive ...” (Thompson & Zerbinos, 1995).

Gender portrayals in animated cartoons are a potent study then as children tend to imitate same-gender characters more than opposite-gender characters. Such programmes are instrumental in reinforcing gender-specific behaviour in young viewers. While realistic and varied portrayals of men and women promote healthy development; unrealistic stereotypes engender an unhealthy and negative influence. Japp (1991) suggests that “higher the television viewing, higher and stronger is the traditional role development.” Inevitably,

cartoon programming plays a pivotal role in this socialisation process among young viewers through the depiction of its characters, storyline, plot and dramatisation of different genders through different thematic concepts and their portrayals.

Gender discrimination is seen everywhere from work to family life. It begins right in our homes with the attitude of parents towards gender which is shaped according to the prejudices prevalent in the society. Right from the selection of clothes and toys- pink for girls and blue for boys; dolls and kitchen sets for girls but guns and cars for boys; it goes on to treating girls delicately and boys loutishly. Due to such a treatment, boys and girls begin to learn the differences between the two genders within the first two years of their lives. By the time they are ready to start pre-school, gender identity is largely constructed; and children as young as two, begin to divide the world between men and women.

What is particularly discerning is that a lot of hue and cry is raised over gender equality among men and women. Fierce social, political and literary movements have ensued, aiming to end the battle of sexes. Women have begun to assert themselves, coming from the margins to the centre, demanding to tell their stories, their histories, their tragedies. Today, their voices are heard outside the walls that once protected, also isolated them. The way in which women have been portrayed on television has received considerable attention from various quarters, ever since the feminists launched a scathing attack on patriarchy in the 1960s. Their under-representation and misrepresentation has raised considerable interest among sociologists, historians and politicians to accord them an equal status. However, such an interest has not been evinced in the media representation of gender stereotypes in animated programmes, namely, cartoons, meant for child viewing.

By and large, gender discrimination on several counts has seeped into the media representation of male and female characters too. After all, creativity draws inspiration from reality. It is disheartening to note that female characters are not even featured in cartoons in the first place, and when they are, they are portrayed as weak, subservient and vulnerable characters who paint an unrealistic picture of who they are in general. While male characters take on stronger, powerful roles, women are relegated to the secondary positions- generally powerless, who need to be rescued all the time. Unfortunately, children use such portrayals as a model for performance of their own genders. Cartoons usually tell cultural stories and inform young minds about who they are to become, how they are to perform and what language they are to use. In such a scenario where gender equality is largely lacking, the consequences can be hugely damaging to young viewers who are conditioned to an unrealistic role play.

Children tend to evaluate male cartoon characters as brave, dominant, intelligent, chivalrous and decisive; while female cartoon characters are analysed as demure, childish, easily excited, emotional, insecure and prone to cry easily. While male characters tend to play all major roles, female characters are usually in supporting roles. This is how the concept of – ‘Dad goes to office, mom stays at home’ begins to recreate in a young impressionable mind. Added to this, are the social values and the parental role that reinforce such feelings of division between the two sexes.

It has already been argued that television content plays a significant role in conveying strong messages to children. Since “Gender is a social construct” (“Queer Theory-Foucault”), it is

ingrained in social norms and as such, conditions us to belong to our essential categories, exhibit and possess typical masculine and feminine characteristics and behave accordingly. For those who do not conform, there is a stigma of being termed 'unnatural'. Alsop, Fitzsimmons & Lennon also argue that the materialist and discursive theories of social construction of gender underline the structural aspects of the social environment that are responsible for perpetuating certain gender roles ("Social Constructionism"). Again, gender, according to West and Zimmerman, is not a personal trait; it is "an emergent feature of social situations: both as an outcome of and a rationale for various social arrangements, and as a means of legitimating one of the most fundamental divisions of society" ("Gender Studies"). Moreover, gender is considered achieved and more or less stable after it is acquired in early childhood. An overview of some of the popular cartoon programmes would just depict some significant differences between genders both in terms of the importance or prominence of the characters and in terms of presentation of male and female characters. What is shocking is that the characterizations are quite consistent with traditional gender role types. *Ben 10*, a male oriented cartoon is about a ten year old boy named 'Ben Tennyson,' who has an ability to get himself to change in 10 different aliens. Brave and powerful, he always saves the universe from dangerous aliens. 'Kevin', another male character in the same cartoon is also shown as a powerful man. There is one prominent female character too, 'Gwen Tennyson', who is also shown as being powerful, attractive as well as more intelligent than Ben; but Ben is always shown in a more dominant light than her.

Tom and Jerry is a series of comedy animated cartoons which is about the rivalry relationship between a cat 'Tom' and a mouse 'Jerry'. It is also a male-oriented as well as male-dominated animated cartoon, in which the female character (the girlfriend of Tom) is shown in a very feminine role with long eye lashes and smart physique and is always revealed as an attractive item for the desires of Tom.

Pokémon, a Japanese animated cartoon is also a male-oriented animated cartoon in which 'Brock and Ash'; the main male characters are ambitious and active while 'Iris and Dawn', the female characters are shown in assisting positions to Brock. Though both the girls are confident and active, yet the general impression they give is of being emotional and who easily give in to depression.

Power Puff Girls is an American animated cartoon series which is female-oriented and based completely on the adventures of three scientifically created young girls, 'Blossom, Bubbles, and Buttercup', who always fight to save the world from a villainous character. The girls are shown to be very polite, soft and attractive. However, all these three girls always rely on the suggestions of a male character, a young scientist, for every step they take because the male scientist is shown to be more intelligent than all three females combined.

Batman & Spiderman are a series of two fictional characters, who are super heroes. Both are typically male-oriented animated cartoon characters who aim at saving the world from evil; and are always rewarded at the end with a female whom they save from danger. The female is a mere trophy for them.

Tarzan adopted by a tribe of the strongest mammals on earth, spends his formative years trying to imitate them. The entire film displays his ripped muscles and his heroic feats at vanquishing vicious foes. On the other hand, female characters have been portrayed as

weaker, more controlled by others, emotional, warmer, tentative, romantic, affectionate, sensitive, frail, passive, complaining, domestic, stereotypical, and troublesome than male characters.

Again, Cruella Deville (*101 Dalmatians*), Ursula (*The Little Mermaid*) and the wicked Queen (*Snow White and the Seven Dwarves*) are classical examples of middle-aged villains. They have been called Disney's femme fatales (powerful women defined by their sexuality). Additionally, in *Lion King*, when Simba's father (the king) is killed, he runs away and Scar takes over. The lionesses are shown to be very weak and they have to wait for Simba to return and save them. This shows that even lionesses can't do anything themselves and have to depend on the lions for their freedom, their future.

Gender roles are very prominent in Disney films. Typically, women are portrayed as a princess, a queen, or a homemaker. Be it Ariel in *The Little Mermaid*, *Sleeping Beauty*, *Cinderella*, and Jasmine in *Aladdin*, or *Mulan*, all are projected as damsels-in-distress, dependent on a Prince, who would come on a white horse, brandishing a sword, to rescue them from the evil clutches of demons.

ChotaBheem is another character, a nine year old adventurous and brave boy who protects Raja Indravarma and the entire kingdom from demons and enemies. In direct contrast to his physical prowess, Chutki, his seven year old friend, assists him in his actions; meaning to say that she plays second fiddle to Bheem. Though she is intelligent and skilled, good at chess as well as martial arts, yet she is usually shown to do household chores adeptly. She has a soft corner for Bheem and gets angry when he pays attention to any other female character in the cartoon. She is calm and composed, though shown to be greedy for gold.

In the Japanese cartoon, *Doraemon*, Nobita is an average boy with poor grades and is assisted by a robotic cat that provides him technological gadgets to defeat his enemies. In contrast, Shizuka is a quick witted, studious and caring girl. Yet, all that is shown about her is that she wishes to marry Nobita, have his kids and look after his household. At the most, she aims to be a nurse or an air-hostess.

Horrid Henry is a mischievous nine year old, a prankster, who loves to bully others. In contrast, Margaret, against whom Henry is pitted against is depicted to be smart but moody, vicious, ill-tempered, and having a violent and piercing voice. Though Margaret is equally smart as Henry, yet, she loses every time to the male character.

Ninja Hattori is another animated series wherein Shinzoh is a ninja in training, good at heart, loyal and powerful. Kenichi is another male character, poor in studies, but with a heart of gold. Yumeko is the female character, who is shown to be confused about her emotions towards the two male characters in the cartoon series. She also plays piano, depicting that she has an inclination towards the finer aspects of life.

Thus, it can be clearly gauged that male characters across all cartoons, tend to be aggressive, brave, full of action and violent; while female characters are passive, useless and subordinate to man. Cartoon females are less numerous than males, make fewer appearances, have fewer lines, play fewer 'lead roles', occupy many fewer positions of responsibility, are less noisy, and are more preponderantly juvenile than males. Mothers work only in the house; males do not participate in housework. Female characters lurk in the background as supportive or

insignificant characters, playing insipid roles of a homemaker, nurse, girlfriend, mother or teacher.

Overall, the general impression conveyed is that male cartoons are either princes or kings or powerful characters, are mainly rescuers of their feeble counterparts, who are young, virginal, and pretty, sweet natured and obedient. While male characters are brave, intelligent, dominant, positive characters; female characters are caring and emotional; but at the same time, they are physically weak, indecisive, dependent on male characters, and usually dressed in sexually attractive clothes.

Another disturbing result is that while girls watch cartoons with male heroes, the same is not true about boys. They invariably won't watch a cartoon programme with female lead characters. Again, male protagonists are skilled, able to express ideas and are wise as well as technically sound; female protagonists are busy with ordinary humdrum activities, are more compassionate, but in need of protection. Since male heroes are seen using technical gadgets and females are busy with run-of-the-mill chores (namely, housekeeping); the effect can be gauged in reality too. Jeanne and Debra (1996) argue, "While boys are usually gifted complicated toys that promote intelligence, girls are gifted dolls and kitchen sets, since it is believed that that is their forte."

It can be deduced thus that children television channels with their cartoon programmes, primarily reinforce these gender paradigms in a very subtle manner. The traditional image of male and female characters remains unchanged. While the male cartoon characters are inevitably dominating, powerful and intelligent, the female cartoon characters are projected as dainty, beautiful but usually dumb. It is a cause of concern then that not only female characters, but male characters too are projected stereotypically. Hence, not only females, but males too are victims of gender role paradigms, wherein the society expects them to conform to the established standards.

It wouldn't be wrong to mention that societal and parental attitude too impacts such an unbalanced representation. Sternglanz and Serbin (1994) state, "The early conditioning of youngsters goes a long way in shaping them according to the accepted code of behaviour and is usually manifested in their choice of profession later in life." It is often that girls are asked to talk in hushed tones, cover themselves decently and be adept at home tasks since they are expected to perform these life roles later. On the contrary, boys are reprimanded when they exhibit emotions- "Big boys don't cry." They have to be strong and independent, the bread earners of the family and responsible enough. Male characters are socialized to be more strong, active and aggressive while girls are socialized to be more beautiful and sexually attractive as well as weak and passive at all. An interesting factor that is revealed is that stereotypes represent models to the flexible minds of children and affect their expectations of what men and women should be like and should behave like in the society.

While some research has been conducted on the impact of a skewed gender portrayal in cartoon programming in the West, no such serious consideration has been given to the same in the Indian context. In a country with 39% children out of a 1.21 billion strong population, a country which has a shameful sex ratio of 944 girls as per 1000 boys as per 2011 census, (the ratio being abominably low in the case of Punjab wherein the girl child ranks 893 per 1000 boys), a country which has the world's highest gender gap in employment, where the national

estimate of employment to population ratio is 23.80% for females and 71.40% for males (Source: ILO), a country which reeks with shameful incidents of female foeticide, rapes, molestations, verbal, physical and psychological abuse and workplace harassment; it is high time that the root causes must be looked into. While there could be multiple and varied reasons behind the aforementioned issues, the role of discriminatory media representation of gender stereotypes cannot be negated.

Therefore this article argues that in the presence of other important agents, television is also one of the major agents in moulding and shaping the gender behaviours of children. There should be a balanced representation of male and female characters in the animated films or cartoons so that good social and gender sensitive relationships could be established between the male and female genders to socialize them effectively and positively in the society. Certainly, this calls for additional research among those for whom rigid gender-role stereotypes are seen as a limitation to the development of our culture and our children.

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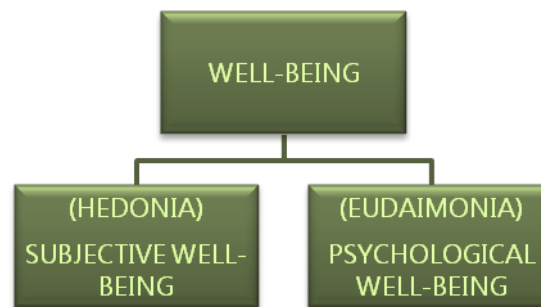
PSYCHOLOGICAL WELLBEING AND SOCIAL DESIRABILITY OF EMPLOYEES MENTAL HEALTH

MISHIKA SETHI&ARUN KUMAR

INTRODUCTION

Psychological well-being and social desirability strongly affects any employs mental-health. It affects personal as well as country's GDP rate a lot. When a person will not be high in six aspects of psychological well-being then they will not be able to work efficiently and effectively. While studying the researches on these variables, researcher found that there were no significant researches that would have taken all these three variables together. When any employee will be psychologically well and would behave in a socially desirable manner then he or she will be mentally strong, this would result in effective and efficient performance of employee.

A research titles "Impact of positive psychological capital on employee well-being over time" conducted to see the relation between psychological capital that included factors like positive psychological resources of efficacy, hope, optimism, and resilience and employee attitudinal, behavioral and performance outcome. The result indicated that PsyCap and both measures of well-being related to each other in context of employee (Palmer, 2010), another research that took psychological well-being and job satisfaction together to see their impact on job performance. Result indicated that there were no researches done with these three variables together. The finding that came out was discussed in the terms of happy productive workers (Cropanzano 2000). Social desirability was positively associated with satisfaction with social support and mental health, the association between mental healths (Duncan 2001). Research titled "Exercise and well-being: a review of mental and physical health benefits associated with physical activity" gave a continued contribution to the literature that exercising and having physical activity included in daily routine benefits mental health of any person (Penedo, 2005). In this research paper, it is said that researches have focused more on hedonic well-being instead of eudaimonic well-being. So they have tried to explore relationship between eudaimonic well-being and the current workplace environment. They developed two dimensional eudaimonic workplace well-being scales. But they combined the scale prepared by them with one of the hedonic workplace well-being scale so that they could explore the overall well-being of the employees. At the end this study suggests that the scale developed by them is a valid measure but when the scale is combined with the hedonic workplace well-being it has explored the holistic sense of well-being (Bartels, 2019). In another paper researchers are trying to endorse how employs job performance is affected by the psychological well-being. In this, 84 employees were self-assessed on psychological well-being and then their superiors evaluated them with the help of 17 information Technology Companies. The research concluded that psychological well-being and the performance of the employees are same for both projectized and non-projectized organizations (Usman, 2017).



Is there any impact of psychological well-being and social desirability on employee's mental health?

The paper is based on study carried out to investigate the impact of psychological well-being and social desirability on employee's mental health

HYPOTHESIS

- Psychological well-being will be predictor of employee's mental health.
- Social-desirability will be predictor of employee's mental health.

OPERATIONAL DEFINATIONS

- *Psychological Well-Being*: Psychological well-being refers to inter- and intra-individual levels of positive functioning that can include one's relatedness with others and self-referent attitudes that include one's sense of mastery and personal growth. Subjective well-being reflects dimensions of affect judgments of life satisfaction.
- *Social Desirability*: Indians are known as social animals they want to socialize with other people. But here comes a twist in this the people socialize in a socially accepted in manner. People like to get approval from society for every small thing.
- *Mental Health*: Mental health refers to our cognitive, behavioral, and emotional wellbeing - it is all about how we think, feel, and behave. The term 'mental health' is sometimes used to mean an absence of a mental disorder.
- *Employee*: An individual who works part-time or full-time under a contractor of employment, whether oral or written, express or implied, express or implied, and has recognized rights and duties. Also known as worker.

METHODOLOGY

For this study co-relational research design was used.

SAMPLE

A sample of 100 employees was collected from three different sectors like BPO, Semi-Government offices and Architectural Offices. The participant's age lied between 23 years to 50 years. Participants were selected by the method of quota sampling method. The language of the questionnaire was made to such a level it can be read, written and understood for 7th grade English language.

TEST

GENERAL HEALTH QUESTIONNAIRE (GHQ): The GHQ, which was originally developed by Goldberg, has been widely used in various cultures as a screening tool to determine whether an individual is at risk of developing a psychiatric disorder (Goldberg & Williams, 1988). The 12-item General Health Questionnaire (GHQ-12) is a self-report measure of psychological morbidity, intended to detect psychiatric disorders in community settings and non-psychiatric settings. It is widely used in clinical practice, epidemiological research and for research in psychology. This version of the GHQ is very quick to administer and score as it contains only 12 questions. It has comparable psychometric properties to the longer versions even though it only takes around two minutes to complete. Given its speed of administration, it is often used in research studies where it is impractical to administer a longer form.

Psychological Wellbeing (PWB) Scale: Developed by psychologist Carol D. Ryff, the 24-item psychological wellbeing scale measures six aspects of wellbeing and happiness: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Research has used a shortened 18 item PWB Scale.

The Social Desirability Scale-17 (SDS-17): Crowne and Marlowe (1960) developed a new scale for the measurement of social desirability because they were dissatisfied with the then predominant scale of Edwards (1953, 1957). The reason for this dissatisfaction was that Edwards had constructed his scale with items from the Minnesota Multiphasic Personality Inventory (MMPI). Because the MMPI mainly captures psychopathological aspects of personality, scores from Edwards' scale confounded social desirability with absence of psychopathology. For their new scale, Crowne and Marlowe (1960) therefore chose a different approach. First they selected items from personality questionnaires that described behaviors which they considered socially desirable but infrequent or socially undesirable but frequent, disregarding items with psychopathological implications.

PROCEDURE

The informed consent of the subject was taken. After the subject is given the information consent, a slight rapport with the subject was made and the instructions were given to the subjects and were asked to fill the questionnaire accordingly, with the appropriate answer suitable for their response to that particular situation. There was no time limit in filling up the questionnaire but the subjects were asked to fill it up as soon as possible. The questionnaires were taken back after it was completely filled by the subjects. The data was then collected, and subjected to statistical processing to complete the interpretation of the study.

STATISTICAL TECHNIQUE

For analyzing the data, Karl Pearson co-relation and regression was used.

RESULT AND DISSCUSSION

Table 1: Correlation among psychological well-being, social desirability and mental health

VARIABLES	M H	At	E M	P G	P R O	P L	S A	S D
Mental Health	1							
Autonomy	.026	1						
Environmental Mastery	-.078	.422**	1					

Personal Growth	.337**	.214*	.207*	1				
Positive Relations with Others	-.124	.422**	.454**	.240*	1			
Purpose in Life	.248*	.255*	-.048	.114	-.136	1		
Self-Acceptance	-.044	.416**	.578**	.240*	.134	.106	1	
Social Desirability	.021	.354**	.531**	.302**	.159	-.202*	.581**	1

**, Correlation is significant at the 0.01 level (2-tailed).

*, Correlation is significant at the 0.05 level (2-tailed).

The main objective of the research was to study the impact of psychological well-being and social desirability on mental health. For this, researchers analyzed correlation. Main Findings are given below -

- Environmental Mastery and Autonomy are significant to each other at 0.01 level.
- Personal Growth and General Health are significant to each other at 0.01 level.
- Personal Growth and Autonomy are significant to each other at 0.05 level.
- Personal Growth and Environmental Mastery are significant to each other at 0.05 level.
- Positive Relations with Others and Autonomy are significant to each other at 0.01 level.
- Positive Relations with Others and Environmental Mastery are significant to each other at 0.01 level.
- Positive Relations with Others and Personal Growth are significant to each other at 0.05 level.
- Purpose in Life and General Health are significant to each other at 0.05 level.
- Purpose in Life and Autonomy are significant to each other at 0.05 level.
- Self-Acceptance and Autonomy are significant to each other at 0.01 level.
- Self-Acceptance and Environmental Mastery are significant to each other at 0.01 level.
- Self-Acceptance and Personal Growth are significant to each other at 0.05 level.
- Social Desirability and Autonomy are significant to each other at 0.01 level.
- Social Desirability and Environmental Mastery are significant to each other at 0.01 level.
- Social Desirability and Personal Growth are significant to each other at 0.01 level.
- Social Desirability and Purpose in Life are significant to each other at 0.05 level.
- Social Desirability and Self-Acceptance are significant to each other at 0.01 level.
- Rest variables were not found to be statistically significantly co-related

To investigate the impact, stepwise regression analysis was done.

Table 2: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.337a	.113	.104	2.32407	.113	12.529	1	98	.001
2	.398b	.158	.141	2.27634	.045	5.153	1	97	.025

a. Predictors: (Constant), personal g

b. Predictors: (Constant), personal g, purpose in life

In the above table Model 1 shows that 10% variance (Adjusted R Square - .104) was explained by Personal Growth of Mental Health.

In the above table Model 2 shows that 14% variance (Adjusted R Square - .141) was explained by Purpose in Life of Mental Health.

Table 3: ANOVA Summary

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	67.671	1	67.671	12.529	.001 ^a
	Residual	529.329	98	5.401		
	Total	597.000	99			
2	Regression	94.375	2	47.187	9.107	.000 ^b
	Residual	502.625	97	5.182		
	Total	597.000	99			

a. Predictors: (Constant), personal g

b. Predictors: (Constant), personal g, purpose in life

c. Dependent Variable: mental health

Model was found to be statistically significant according to ANOVA table.

Table 4: Coefficients Summary

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.088	1.151		-1.815	.073
	personal g	.246	.069	.337	3.540	.001
2	(Constant)	-4.588	1.576		-2.912	.004
	personal g	.228	.068	.312	3.332	.001
	purpose in life	.206	.091	.213	2.270	.025

a. Dependent Variable: mental health

According to the above table the following Beta values were obtained:

Model 1- Personal Growth- .337

Model 2- Personal Growth- .312

Purpose in Life- .213

From the above result, we found that the hypothesis 1 was accepted and hypothesis 2 was rejected. It was also found that Personal Growth and Purpose in Life are the two major predictors of Mental Health of a employee. This may be due to the nature of job they are in or the nature of organization and also their age range (23-50).

The environment they are working is a competitive one where they need to have some purpose or target. It is important because the competition is very high and their job is also at

risk, if the head found someone better than the person presently working, then that person could be replaced. The salary of any person also depends upon the work performance.

- The research could help any person to understand the mental health and their predictors in the private, semi-govt. and architectural sector.
- Other responsible person in any working environment like boss, manager, HR etc. could take help from it.
- Researcher those who want to do research in this field could take help from this paper.
- Mental-Health and Well-Being of an employee could be understood from this research.

CONCLUSION

- The sample size of the research study is very small, i.e., 100, and we cannot generalize based on above findings.
- Only quantitative research method was used in present study rather a researcher for a comprehensive understanding should use quantitative as well as qualitative research method.

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RECENT TRENDS IN ADVERTISING

KAPIL CHOWDHURY

INTRODUCTION

Advertising not only captures the essential shades of the lifestyles of common people but also helps to fulfill their desires. Advertising can also be seen as a tool to trace the social history of people at a particular time. In this perspective, it can be noted that India was different before Independence and its terms of communications it was different too (Vakratsas., Ambler. 1999). The colonial effect was everywhere and in the field of print media and most of the advertisement used to publish in foreign country. In this way, the impact of colonialism can be seen on a larger scale during that time. Advertising promotes the companies or organizations and their products or brands in the market by persuading the audience or people. But it's not easy for the advertiser, people who create or designs advertisements to make successful advertising that does good business for particular companies or organizations. In the market plenty of companies and brand exist, they all want to do good business and for that everyone needs to promote their products or existence differently. Eventually, it becomes hard for the advertisers to bring something new in every advertisement for the company or brand or product to do survive in this competitive market. So due to this higher competition in the market, advertisers and advertising industry always try to convey different concepts or ideas in creative manners. As results they adapt and introduced numerous communicative technological aspects in the advertising industry. In such a way, advertising industry has emerged or changed in two broad perspectives, one is conceptual changes and other is technological changes. Here the study will only concentrate on the technological development in advertising through which it will analyze some popular trends of advertising which are currently the most common factors in this industry.

Advertisements imported in India through the source of newspapers. In the year 1780, the month of March 23rd, James Augustus Hicky founded “*Bengal Gazette*”, the first newspaper of India. Most of the prints of this newspaper showcased the Western influence in the form of its visual communication. During the period, printed option was limited; letterpress and offset printing were the major option of print media. In the print advertisements, the visual illustrations were done by the lithography or offset lithography. Usually, British artist or advertiser used to design the advertisements. In India, some political manipulations have been done through capturing the images of national heroes for its British consumers, prior to independence from British rule. The imagery of Indian National heroes for the support of the anti-British movement and some of the Indian products were promoted after using those icons.

Though the first classified advertisement appeared in the Bengal Gazette in 1780 in Calcutta (Kolkata) but development of Indian advertisement can be traced from the late 1920s and 1930s when two English companies, J. Walter Thomson (JWT) and D. J. Keymer's laid the foundations of professional advertising in India. These advertisements were not considered as the true development of advertisements in Indian context. In terms of visual presentation woman or the face of woman is the most common aspect in these advertisements. Masood stated “Looking at a few examples of print advertisements published in the 1940s, the most

distinct feature in terms of the representation of women seem to be the sharp contrast between the European and Indian facial features and lifestyles, as if different advertisements were made for the readers of different classes or identities. Since many products were actually direct imports from Britain or Europe, their print campaigns are also exact copies of what was being printed in London or elsewhere. But often, in the middle of these European looking ads, you may find a campaign for an Indian product showing a beautiful Indian woman. Some ads actually stress on different ethnic groups from India and their costumes featuring, for instance, a 'tribal' woman, or maiden bathing in a pond with lotuses blossoming. But a few ads also reflect the desire of an Indian to look or live like the British – an Indian gentleman, for instance, depicted in European suit and tie, or the European hairstyles being tried on Indian women in some ads" (Masood, Javed. "Catering of Indian and British Tastes", Tasveer Ghar, 2013).

Masood has clearly mentioned that the attributes of the woman figure highly contrasted between European and Indian facial features and lifestyles. The JWT and D. J. Keymer's came forward and run the advertisement in India. These agencies used to design advertisements for other foreign countries as well. So the agencies have different readers of different classes or identities. This may be the reason behind the exclusive imagery of women inspired by Western culture. The woman in advertising media had been particularly visualized with foreign (European) attributes. Masood said that many products directly imported from Britain or Europe, even the advertising campaigns of these imported products were exactly copied of what was being printed in London or in other countries. On the other print ad campaign of Indian products, beautiful Indian women were projected with Indian outfits but at same time in other ads the Indian gentlemen were depicted in European suit and tie with European hairstyles. This might be an approach to represent the Western lifestyle or to satisfy the urge of looking like British. Even, the Indian women were also projected in this Western style, in some advertisements whereas the women visualized in Indian attributes like sari as well as in European hairstyle. These features also signify about penetration of Western culture in India. But from the year 1905, the whole scenario of Indo-British advertisements has stopped and Indian advertising industry became self-reliance after the foundation of the new Indian advertising agency B Dattaram and Co. in Mumbai.

In the year 1907, Dattaram has designed and published first print advertisement of West and Watches. After this, Indian advertising agencies have been established and slowly foreign-owned agencies were formed in early 1920, Ogilvy and Mather and Hindustan Thompson Associated were among them. Afterward, the development of advertising continued to emerge with different perspectives. After the arrival of these foreign agencies, different changes have been brought in the advertising industry. In this way, the Indian advertising industry has grown its strong roots with the advancement of modernism. In this voyage, advertising industry got some tremendous makeover which has been proved as a major development. Indian advertising has had many changing faces. The pre-Independence advertisements were mostly based on ladies goods, men's clothes, traveling, restaurants and hotels and entertainments for the British people in India. Motor cars, house with lifts were the luxurious items of that time. Many early advertisements were made for the promotion of Hotels, Gramophone, Four-wheelers, Tea, Cotton goods, Tailoring etc. because their targeted audience was the British people in India, the royal families and the people of upper classes of

the society. It happened right after the independence of India the elimination of royal status was concluding with the British rule and middle-class lifestyles take a part in the contents of conceptual development of Indian advertising industry. That was the milestone in the emergence of advertising in India for taking one step ahead in innovative ways.

Gopakumar in his article stated that “The first full-fledged Indian advertising agency was set up in 1931. The increased competition demanded a thorough improvement in the quality of advertising work and services. To improve the art-work and copy illustration, Indian agencies used to send their employees abroad for special training. The All India Radio started telecasting various programs in 1936” (Gopakumar. KC, “History of Advertising in India” The Hindu, 2010). In this context, Gopakumar has clearly highlighted that Indian advertising has been started in 1931 in its full-fledged form. It has also improved the quality of advertising work and services to expand the competition in the advertising agency as well. Advertising is about hitting the exact point of human requirements and housed in the mind of the people after touching their hearts. When this happens, a need is generated and the brain ordered to buy the product or service or idea. This is the most successful strategy, upon these various companies; product and brands have experienced the taste of victory. Contrary to it, in the current era, print advertising in India has become more minimalistic, even television commercials are also being transformed in vivid and dynamic forms. With the help of multimedia, advertiser can create anything according to his/ her desire. Even any kind of fictitious, unrealistic visions and forms can also be projected very easily through multimedia. Animation, a very powerful element of multimedia through which advertiser can present any impossible phenomenon in a very possible manner (Mahapatra, Sarita, 2015). In Indian advertisements, numerous cartoon characters have been used such as Mickey Mouse, Donald Duck, Ban Ten, Chotha Bheem and many more as some strategical elements in the advertising. Multimedia plays a great role between children and advertisement.

Around the world, everybody knows that children are the big fan of animation and cartoons and these effects on the business world also (Shelly, *et al.*, 2000). Children have big say in family decision to purchase many products. Marketers are trying to cash on the children’s ability to nag their parents to persuade to purchase their desired goods. Pester power is a child’s ability to affect their parents to purchase decision, often through the use of nagging or pestering. The nagging or pestering finally results in adult purchasing products for kids (Seth Gaurav *et al.*, 2011). It can mold the consumer buying behavior of adults to a great extent. With the advent of various families and family planning efforts of the government the power of pestering is more relevant today. A child is pampered usually by father, mother, grandparents, uncles, aunts, etc. If, both the parents are working, the lack of quality time to spend with children is usually replaced by showering gifts and also giving in to their demands. Internet and television have loaded the children with information from marketers on what they want because of the nag factor lots of marketing and advertising activity is aimed at children. Kids are increasingly influenced by commercialization that often goes against what parents are trying to do. Silk A, J has mentioned that up to 75% of the family’s total disposal income goes on the children (Silk A.J, 2009). Young children acquire knowledge about the products primarily through advertisements. Especially, through those advertisements the advertisers only target children. Advertisers have their ability to convince children to like and desire practically any product. The brand is reinforced in the minds of the

kids if it is associated with thing or events that adored the most by children. Exclusive Kid's channels like Pogo, Cartoon Networks, and Disney Chanel, etc. have promoted their ideas for influencing the kids to be hooked into the advertisements. Celebrity endorses the same and seems to exert a considerable effect on the behavior of kids in general. Advertising is capable of producing three types of behavior among children: purchase, purchase and antisocial behavior (McNeal, 1987). Cross-selling licensed merchandising, program-length commercial, product placement and the production of advertisement as entertainment are the norms of the day. Generally, cartoon characters seem to exert a considerable effect on the behavior of kids. Advertisers take advantage of this type of kids' behavior. Though advertising is a kind of psychological game so, advertisers and companies play this mind game via children (Hopkins, 2013). So, children play a vital role in the commercial and business world. They hooked the attention of the children to create the pester power to persuade their parents to purchase their desired products (children's').

Child psychology studies show that children think and behave differently from adults. They are great observers, highly creative, very insightful, spontaneous, sensitive and unstable. They have different emotional, social and developmental needs at different stages. Children gather knowledge, attitudes, and skills as a consumer in the marketplace via a process known as Consumer Socialization (McNeal, 1987). At a particular age, children start perceiving the advertisements wherein the child can distinguish advertisements and their features and concepts. Approximately, at the stage of four to seven years of age, children start to take the advertisements as truthful, funny, exciting, interesting thing. Children show their positive attitude towards the advertisements and product too. This certain age of children is the most common targeted audiences for the advertisers. According to the child psychologist, in the stage from four to seven years, children usually do not analyze or judge the advertisements and its concepts. So keeping this fact in their mind, advertiser designs the advertisements in which they want to target the children. For making it possible and easy, advertiser takes the help of multimedia and animation. In the application of multimedia, they project variety of fantasy, supernatural, adventurous visuals in the advertisements and these elements make the children amazed. For these reasons, advertiser uses animation in a large number in advertisements to attract children. The children from four to seven years age group are very sensitive so the advertiser has to keep one major thing in his or her mind that their advertisement and concept should not create negative impact in the mind of the children. So, children imitate what they see and like what they desire. Kids are keen observers, ever experimenting, do not take anything for granted and want to learn while having fun. There is no stickiness, no brand loyalty, ultimate materialism and consumerism in sync with the latest trends and fashions. As a result it can be very vulnerable to children. The animation is a type of element in digital technology which can create any kind of visuals/ scenes/ characters in a very easy and attractive manner. Children are by instinct attracted to cartoon characters; Fictional characters like Donald Duck, Mickey Mouse, Spiderman, Superman, and Batman and they ruled the imagination of kids since immemorial time. Children not only love these characters but also live them in their childhood as well. In fact, comic book heroes have been applied to breakfast brad, jam cereals, vitamins, and other eatable products. In India cartoon characters, animated characters have been used for a very long time. In the eatable products, the use of cartoon characters may create a perception among the children that characters' strength derived from the consumption of the adorned product or brand that is promoted by

the cartoon character/superhero. It becomes difficult for the parent to deny their children regarding the products or brands endorsed by their favorite cartoon characters. In this phenomenon, multimedia is the only medium that takes all credits to create deep impact in the mind of the children (McNeal, 1987). When children see vivid fictional characters visual effects, unnatural element's very natural manners, then it automatically makes a space in the mind of the children. That space constantly pushes them to purchase that specific product. Apart from that, children become more persuasive by the advertisements when they discover their favorite cartoons character in those particular advertisements. From this perspective multimedia and animation are the most effective and profitable medium to grab their audience (children).

Apart from the use of animation and animated cartoon character, there are some other elements too which are very popular in the current trends of Indian advertising industry. These are discussed below:

QR Code: QR Code is the trademark like a matrix barcode, it is also known as Quick Responsive Code. It works much faster than barcode and stores more information than a barcode. It was first designed in 1994 for the automotive industry in Japan (www.en.wikipedia.org). QR code is a type of element which helps the printmakers or print advertisers to bridge the gap of print media. QR code is the most revolutionary element of this digital commercial world; right now it has become the most successive platform to share, store data and information within a second. In recent time, online shopping is on-trend and everyone wants to save his or her time and money as well so; online shopping has become the most convenient choice for most people. Online marketing has received a major hike with the advent of *Search Engine Optimization* (SEO) techniques that help web owners to optimize their site in an effective manner. There are numerous social sites/ networking websites that help to buy and sell the products very easily. QR Code usually embeds in the body or in the package of the products that comprise of backlinks. It is important to note that the QR Codes are advertised in an innovative way so that the people can get the information regarding the product can access a different portal; they can easily reach at the hidden Backlinks through the QR code (Macavinta, C, 2000). Now what are backlinks? A “backlink” is one of the most used words in the world of search engine optimization. Backlinks are links from outside domains that point to pages on users’ domain, essentially linking back from one domain to another domain. Generally, backlinks are considered to be “vote” of confidence for the content that is being linked on your domain from outside sources. Through backlink, QR code increases web traffic and improves rankings for the website in search engine listing. Google spider will instantly detect the presence of QR codes and will index the page over a period of time. A trader or company can also offer information about their products or company. It is an excellent mode of advertisement and to spend a large amount of money to make people aware of new services or products is not needed at all. Generally in advertisements, people have to obtain huge expenditure to reserve space in the print media and on the television channels. QR codes have provided a valuable contribution to the increase in online visibility. The codes are also capable of holding videos that can prove to be a big catalyst for promoting products and services. Online media combined with QR codes can help to increase the web traffic to certain blogs and website. QR code has various advantages towards the advertising that a company and user can enjoy by using it. QR code is

generally printed on the products that can be used for many purposes. It helps the user to know about the product by scanning the code through a QR code generator/ reader. Through QR code the storing of big data in an easy manner and fewer efforts can be done.

Through Bar code, the user/ customer/ people can get the details about the product, its manufacturing details, usability, its features, authenticity, etc. Infact, the user can customize the code accordingly as per their desire. Quick Response Code became one of the most prominent marketing tools in the global communication field and in business industry as well. Generally, it is a two-dimensional barcode which is designed to be scanned by a smartphone, in combination with a barcode decoding application. There are various applications available on the web such as QuickMark, Scanlife, Red laser, etc. which are the QR code reader, that connect the users to some specific e-portal like website, an email address, e-coupons SMS, a registration form, etc. (Handley, 2012). The term QR code was first coined by Denso Wave, a Toyota subsidiary in Japan in 1994. It was started for tracking the vehicles in the automobile industry. Besides the efficiency of QR code, in the auto industry, marketers later began to realize the functionalities of QR code that could be transferred to the marketing domain. It has the potential to connect swiftly with customers easily. Though it responds very quickly so it is an advantage for marketers to use it in proper way. Due to the trending evolvement of telecommunications industry and smartphones, QR code commercialized in 2011 on a larger scale. The QR code is the most ubiquitous trends in marketing, especially in Japan, USA, and Western Europe in recent times. Furthermore, with the growing demand of smartphones, the usages of QR codes are also rapidly gaining popularity across Asia and India in particular. The data encoded in QR code is totally informational, most of the times it is either scanned to a corporate website of the brand being promoted to a social networking site or opened through an app or QR code reader. Using QR code via smartphone has become the most popular choice of the current age. Through QR codes, advertisers are using a dynamic range of communication process of advertising (Media & Advertising, 2017). With the help of this code, advertisers transform the consumer or target audience from one portal to another portal and share various types of information.

Cinemagraph: In the recent trends of advertising, social media has become the most important part of human lives and also become a great source of daily communication in social media. In this modern era, cinemagraph has emerged as a new form of advertising. This is totally a different type of art form which is used in social media on a large scale. Basically, cinemagraph is a short animated video which consists of multiple still images with a very little animated movement. Cinemagraph is a kind of online advertisement made by taking a series of still photographs or a video recording/ using image editing software to compose the photographs in a particular sequence or in video format into a seamless loop. This sequential loop contains minor repeated movement. In constant-evolving digital technology, cinemagraph is a brand new invention and a revolutionary tool in the field of visual communication. It was invented by Louis Le Prince, who is also known as ‘Father of Cinematography’ (Peter, 2014). As discussed earlier, cinema graph is an art of creating and highlighting specific moments. In the field of marketing and advertising, cinemagraph also becomes an effective tool for promoting brands/ product/ TV series/ web series online or in social media. It is designed in such a way that minor movements which occur in the video put focus on the brand/product to convey the message clearly. It is very easy and convenient to

use it in social media owing to its auto-looping and auto-playing features. Its existence can be seen in almost all kinds of social media like Facebook, Instagram, Tweeter, and Snapchat and so on. Numerous prestigious companies, multi-national companies use cinemograph for digital advertisements and social media posts. Cinemagraphs have also been used by companies like Netflix, Disney, Parada, Coca Cola, etc.

Video has emerged as a great option and tool for the agencies, marketers, and creators to break through the oversaturation of motionless/ still photo content and digital advertisements to capture the limited-attention duration of online consumers (Nowak and Phelps, 1997). A new definition of storytelling has been introduced vividly which empowered the companies or brands for the successful sharing of their products in social media. In 2011, cinemograph has been revisited and embellished into a sophisticated medium which raised visual storytelling across all social media's domains. It was successful and able to attract the attention of the audience. Cinemagraphs are short videos and this is the main reason behind the incredible performance of cinemagraph in Facebook advertisements, Instagram advertisements and so on. "Framed like a photo and brought to life with subtle hint of motion, cinemagraphs are often perceived as complicated to make with extensive production process; in reality, this thumb-stopping format can be in just a few minutes" (Flixel; 2016). In the current scenario top global brands are increasingly projecting and utilizing the power of cinemagraphs in their digital advertising campaigns. According to AdAge, Ad Week, Creative Blog and more, cinemagraphs are an ideal and suitable media for the platform like Facebook era, Instagram Era of auto-loop and auto-play. The subtly disruptive nature of cinemagraphs is very beneficial for the advertising industry. KFC, Lexus, Puma, Netflix, etc. are making cinemagraphs on social media for promotion through digital advertising.

VR Vision: In this competitive advertising world, thousands of brands and products are being launched in the market. So advertisers are trying really hard to create a good, different and creative advertisement that can grab the audience not only with message but also through the technology. In this competitive marketing world, to being creative and different, advertisers are trying almost everything to communicate effectively and to make something really new for the audience. So, advertisers have started taking the help of technology like multimedia and animation. By the help of digital technology, the advertising world has achieved a dynamic form in front of global arena. A television commercial is typically broadcast before or in the middle of any program. The scenario of advertisements is totally different, particularly in social media. Because in social media, advertisements often break the concentration and interest to the video that audience or viewers were watching (Singh & Sandhu, 2011). Sometimes, advertisements pop-ups in mobile screens, banner on websites or Facebook to recommend something that the user or audience ever won't these. Many people use numerous software and applications in their devices to block the advertisement which often appear in the screens. People often skip the advertisements in the online portal so now advertisements with the duration of 6 to 7 seconds have started appearing in the social media like Facebook, Instagram, Tweeter and etc. Aaron Burch has stated in his article that online advertisings in Facebook are not going up to the mark of expectation and that is why Virtual reality is going to be the next big thing in the advertising industry, but only if it's done in right way (Burch, Aron. 2016). It is also known as VR Vision, an interactive computer-generated experience taking place within a virtual environment through a particular device. It

mainly works on auditory and visual feedback, but can also allow other types of sensory feedback of some activities on the surface. Through the headset, the audience or user experience is being entertained through some supernatural ambiance with interactive manners. It is the most distinctive characteristics of VR Vision that after putting the headset the audience or user perceives an immersive experience way (Burch, Aron. 2016). This type of media provides a unique opportunity for the advertisers because when an individual uses a virtual reality headset, they are not going to take it off. Facebook and YouTube are the two big names in the current era which support 360° (degree) video. This feature has experimented with 360° advertisements. Another interesting feature of VR Vision is that it is being utilized on the desktop version, smartphones and in the app as well. It can easily engage the audience in the video, apart from that interactivity is the main key through which audience never take off the headset until the end of the video. It was started with Facebook advertisement. James Wan a filmmaker from Hollywood created a 360° trailer of his horror movie 'Conjuring 2' and published it in the YouTube channel of Warner Brothers Picture. It was totally a different kind of trailer and got hike of appreciations. Through this Virtual Reality, technology-loving people are not only watching the trailer but also getting involved in the 360° virtual ambiance of this horror movie. After the success of this trailer on YouTube, James Wan created more trailer and VR based interaction of his other movies.

In 2015 Indian film director S.S Rajamauli has also opted the technique of virtual reality in the promotion of the sequel of his movie known as "*Bahubali 2: The Conclusion*". For this, he used the 360° video of the set of the movie, which was only based on the method of recording and making this movie. The purpose of the video is to create the curiosity within the audience towards the movies and to show them the gigantic set of the movie as well. This is the first time when Indian audience have perceived this type of interactive video of any upcoming movie. This 360° VR video has got millions of views on Facebook and YouTube. This showcases how smartphones have become a great path for marketing and advertisements. In the same way this latest technology VR vision with the tool VR headset also becomes the most popular and demanding tool in the field of communication and advertising. In June 2018; Nestlé launched a short advertisement of Kit Kat with the duration of 1:41 minutes. The theme of the videos was *my travel break* where the scenic beauty of Munar has shown. This is the first commercial in the Indian advertising industry with 360° VR vision technology. This will be a landmark setter in the Indian advertising industry if the uses of VR Vision will be reached on its zenith. If the advertising industry will provide the interactive session to the audience regarding the launching, demonstration of the quality of the product, that will also be beneficial. VR vision technology will be one of the most powerful media if it will be used properly. Through VR vision advertisers, companies can promote their products, brand in various, creative and innovative manner.

CONCLUSION

Advertising is become the most important source for marketing and promoting the brands/products /ideas/ service etc. The Indian advertising industry has been evolved tremendously over the last 70 years. This reflects the changes in economic status and social emergence of the country. Earlier, advertising used to be done through Radio, Television, Newspaper, and Magazine. These mediums have been used to convey the information and to promote the brands/product among the consumer. From a certain time period, the scenario of Indian

advertising entirely changed; now the brands or companies prefer to launch their advertisements in digital media or through social media to receive the views and like as much as possible. The creative industry demands update according to the current global scenario whether it is regarding Visual Arts or regrading Advertising. In the new age of advancement, the rush is on internet and social media. From the teenager to senior citizen, approximately each and every majority of the people is using internet and smartphones in India. In this way, online advertising is the best option for the advertising agency and for companies to reach to the consumer and audience quickly. In Indian scenario, the charisma of multimedia became a magical element for the entire Indian advertising fraternity. Form the last two decades, this industry has emerged incredibly, but due to the competitive market now this industry is moving towards the technological advancement of itself. So in this process the anticipation of companies, advertising agencies, consumer and the audiences have reached on a higher level. In this era of internet and online media the aforesaid media like QR Code, Cinemagraph and VR Vision have given another dimension to the audience or customers to perceive the new level of communication, where people not only obtain the information effectively but also get it as per their own convenience. Moreover, the transformation of the ambiance or surrounding can bring many new dimensions in advertising where the advertiser or artists will achieve the ability to represent different kind of information with more unique concepts. Thus, these types of new technological aspects will open many doors for the future of visual arts, communication, and other domains.

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PLAGIARISM AND RESEARCH

MONIKA SOOD & KANCHAN BALA

INTRODUCTION

Research is valuable in any discipline while Plagiarism is an offense. Hence it is essential to know the difference between research and plagiarism clearly.

Research is an art of scientific investigation of any subject. It is an organized and systematic effort to gain new knowledge. Research is systematic effort because there are definite steps in research process to get precise results.

Plagiarism is derived from Latin word “plagiare” which means kidnap or abduct. This word was first used in 1600’s in English literature (Times of India). With the increase of internet tools, it is easy to Plagiarise. To curb plagiarism, it is essential to develop anti- plagiarism software. Plagiarism is presenting someones ideas, texts in one’s own research paper without crediting the source from where one has collected the information which is unethical. It is an offence to steal someone’s ideas and present these as ones own ideas. Plagiarism is indeed an academic dishonesty. It is essential to collect the information from different sources to write any topic in this universe. It is not necessary that all the information should be first hand. We need to gather information from different sources. To beware of plagiarism, it is essential to mention sources from where information was taken. The plagiarism is dishonesty while doing research. It is of different types.

- **Direct plagiarism-** It is word to word copy of any text without mentioning the original original source of that text or phrase.
- **Mosaic plagiarism-** It is a process in which a research scholar borrows phrases from original sources and replace the word of original texts to show the works his/ her own.
- **Self plagiarism-** Self plagiarism is reuse of one’s own work without proper citation of his or her own work. It occurs when a researcher submit his previous work without giving the reference or without proper citation. It is also an offense but it is not intellectual plagiarism.
- **Accidental plagiarism-** Accidental plagiarism occur when we do not have knowledge how to properly paraphrase a research paper, article, any book, quote and how to cite research paper. It is a situation when we plagiarize unintentionally. Students must learn how to cite their sources and to take careful and accurate notes when doing research.

HOW TO AVOID PLAGIARISM?

Plagiarism is to steal some others work and publish it as copyright. It is an offense to plagiaries. There are some ideas to avoid plagiarism.

- First of all read the text carefully, to understand it properly. And then write the text in your own way. Do not copy and paste the material from reference paper.
- Use the quotes to show that the text has been taken from another paper. The quotes should be same as they present in the original paper.

- Any ideas taken from others paper is need to cited. Cite your own paper if you want to take content from your previous paper. If you don't cite your own publication that is known as self plagiarism.
- Keep the records of your citation. You could use online citation software to maintain records eg. Mendeley, Zotero, Endnote etc.
- You must use online plagiarism checkers software such turnitin, viper, urkund, CFP, and maalik etc.

ACCORDING TO THE MERRIAM-WEBSTER DICTIONARY

The word plagiarize means

- To steal and pass off (the ideas or words of another) as one's own.
- Use (another's production) without crediting the source.
- To commit literary theft.
- Present as new and original ideas or product derived from an existing source.

According to T. Fisherman

Plagiarism occurs when someone:

- Uses words, ideas, or work products
- Attributable to another identifiable person or source
- Without attributing the work to the source from which it has obtained
- In a situation in which there is legitimate expectation of original authorship
- In order to obtain some benefit, credit, or gain this need not be monetary.

DIGITALISATION AND PLAGIARISM

Digitalisation plays a very important role in every sector in India. Digitalisation brings paradigm shift in every sector of education because after digitalisation every information or knowledge becomes easily accessible to masses in few seconds. Digitalisation makes our learning effective. Digitisation is very much helpful in research in any sector. Digitalisation reduces the cost of learning resources and it maximises the learning outcomes.

Digitisation provides learning resources easily to students and scholars. Due to these resources, learning becomes too fast. It connects peoples internationally because all the knowledge is shared online. But there is one disadvantage of digitisation of research papers, that of it offers plagiarism all around the world. Plagiarism become a serious threat to research because some researcher steals other's work and produces it as his/her own. They take benefit of others work. This is not ethical. There are so many anti-plagiarism softwares available online, to detect plagiarism. Few of them discussed below.

TURNITIN

Turnitin is the best plagiarism checker software. It is developed in America by iParadigm for commercial purpose in 1997. Turnitin is proprietary software. It checks submitted documents against its database and content of other websites with the aim of identifying plagiarism. In

turnitin text length limit is 400 pages. Turnitin support .pdf, .html, .doc, .txt, .ps, .rtf, .wpd document file. Turnitin support only English language. Its result can identify similarity with existing sources and also provide feedback for students to avoid plagiarism and improve their writing skills. Green label of similarity is tolerable. Yellow orange and red label are considered as punishable plagiarism. Its scale is listed in table below.

VIPER

Viper is plagiarism checker software. Viper is alternate to turnitin software. It is designed specially to help students. Viper checks plagiarism against electronic material such as research paper, journal, books, and research articles etc. Viper was developed in 2007 and launched in 2008 in England. It is free plagiarism checker software and in November 2017 viper premium has been launched. Viper premium allows users to pay for better scan quality, speed, and more features. Now viper software becomes freemium (free+premium). It checks plagiarism in 56 languages. Some of these are Hindi, English and other Indian regional languages. Viper used percentage scale for plagiarism. It support document file such as .hwp, .rtf, .txt, .doc, .docx, .odt, .ps, .pdf and .html etc. Text length limit in viper software is 30 mb.

URKUND

Urkund antiplagiarism software is developed in 2000 in Sweden. Urkund support only English language. It does not support other Indian regional language. Urkund is fully automatic software. The text length limit is not less than 100 MB. Once document is submitted, urkund checks that document automatically and it supports only of single file at a time. It is propriatery software. It support document files such as .doc, .docx, .xls, .xlsx, .sxw, .ppt, .pptx, .pdf, .txt, .rtf, .html, .htm, .wps, .odt etc.

Indian Universities get free access to urkund software from 2nd August 2019 and subscription of Urkund starts from 1st September 2019.

CFP

CFP stands for Check- For- Plagiarism. It is developed by India. It is first software developed through “Make in India (2014)” initiative. CFP software developed to curb the plagiarism. Its text’s length limit is unlimited. It is propriatery. CFP software support Hindi, English and other Indian regional languages. It supports document files such as .pdf, .txt, .doc, .docx etc. Its scale for plagiarism is percentage.

MAULIK

Maulik is anti-plagiarism software develop by India to check plagiarism in Hindi language and improve writing skill of people. It is develop by Punjabi University Patiala in 2016. It is propriatery software. It supports only Hindi language. Its scale for plagiarism is percentage.

A brief comparison of anti-plagiarism softwares

Software Property	Turnitin	Viper	Urkund	CFP	Maulik
Founded	1997	2007	2000	----	2016
Website	https://www.turnitin.com	https://www.scanmyessay.com	https://www.urkund.com	https://www.checkforplag.com	https://maulikcreatives.com
Country of origin	America	England	Sweden	India	India
Licence	Proprietary	Freemium	Proprietary	Proprietary	Proprietary

Text length limit	400 pages	30 mb	<=100MB More than 430 characters	Unlimited words	-----
Submission (single/multiple files)	Single	Single	Single	-----	Single
Document support	.pdf, .html, .doc, .txt, .ps, .rtf, .wpd	.hwp, .rtf, .txt, .doc, .docx, .odt, .ps, .pdf, .html	.doc, .docx, .xls, .xlsx, .sxw, .ppt, .pptx, .pdf, .txt, .rtf, .html, .htm, .wps, .odt	.pdf, .txt, .doc, .docx	
Language support	English	56 languages English, Bangla, Gujrati, Hindi, Kannada, Malayalam, Marathi, Punjabi, Tamil, Telugu, Urdu, Chinese, Spanish etc.	English	Hindi, English (other Indian regional languages)	Hindi
Scale for Plagiarism	Percentage and Colour Blue (0% similarity)	Percentage	Not defined	Percentage	Percentage
	Green (1-24% similarity)				
	Yellow (25-49% similarity)				
	Orange (50-74% similarity)				
	Red (75-100% similarity)				

CONCLUSION

Plagiarism is presenting someone's ideas, texts, images, intellectual thoughts and passing them as their own. It is theft of another's work. World has develop so many anti-plagiarism software tool to discourage plagiarism and to improve writing s kill of people .There is need to aware researcher regarding anti-plagiarism softwares. Checking of plagiarism must compulsory and provided by all the institutions free of cost so that researcher can improve the quality of their research work. Also there is need to develop softwares in regional languages of India. So that quality of research can be improved in India.

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INTERDISCIPLINARY RESEARCH AND PROCESS OF PRODUCT PROMOTION IN INDIA

NIMESH SHAH

INTRODUCTION

India is known for its “Unity in Diversity” India is a diverse country where people of many religions live together, Diversity in terms of language, food tradition, rituals, festivals, etc. The national language of India is Hindi however there are almost 22 official languages and almost 400 other languages that are spoken daily in India in its various states and territories. India’s Visual Culture is very diverse through different approaches, believes, iconographies, social, political, religious, folk/artistry, market signs, and traditional landscapes. There are a number of national and International brands available in the Indian market. The basic purpose of product promotion is to influence/ Educate customers to buy or to create a brand image of the company/ service provider. It is quite difficult to reach the prospective customers in the market without proper research and effective planning. Product promotion also presents unique benefits to customers. It takes lots of efforts in interdisciplinary research and development of campaigns. Interdisciplinary research plays a major role in educating the costumers in various perspectives. Promotional activity is the link between manufacturers/ service providers and consumers. Interdisciplinary research plays a major role in product promotion which is information, Specific data, techniques, tools, different perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge put together, with the objective to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research. Product Promotion covers different areas like Promotional material, Promotional Schedule, Consumer behavior and buying motives.

INTERDISCIPLINARY RESEARCH FOR PRODUCT PROMOTION

Product Promotion is the voice of a company which helps to promote your brand’s message in a loud and clear way to the customer. Different media platforms used to promote your company and brand. Product promotion communicates a message with different Media like television, radio, shopping outlets, billboards, magazines, and social media. Various promotional strategies can be used to promote and market your business depending on the goals, objectives, and priorities of the company. Product promotion is done to increase brand awareness; provide appropriate information, Increase Customer Traffic, Build sales and profits. “Without data, you’re just another person with an opinion,” it was rightfully pointed out by W. Edwards Deming.” Market research is a consistent process of gathering, studying and inferring information in order to empower a company with considerable statistics about the market for a particular product or service category. To understand the market trend, leading companies focus on market research. “The National Academies definition is broadly similar: Interdisciplinary research (IDR) is a mode of research by teams or individuals that integrates information, data, techniques, tools, perspectives, concepts, and/or theories from two or more disciplines or bodies of specialized knowledge to advance fundamental understanding or to solve problems whose solutions are beyond the scope of a single discipline or area of research practice. Interdisciplinary research focuses on particular

problems or a question that is too complex to be answered by anyone area of research. Specialized research is performed by communities of scholars who share a set of guiding questions, concepts, theories, and methods.”

CASE STUDY 01: INDIA DEGA AASHIRVAD- INDIA GATE

There are different types of products available in Indian market like Cold Drink, Instant cooking products, Home appliances that we are using in our day to day life. Manufactures introduce the products in market with their unique features that highlights how the product is different from the other brands and promotional activity helps to convey message effectively. India Gate Rice Company comes with the new Initiative which not only about selling rice but rice for the hungry. “Showering rice as a gesture of blessing is a revered tradition that no wedding ritual is complete without. However, at India Gate, we believe that every grain of rice can serve a greater purpose. One that tackles an issue that millions suffer from every single day is hunger. The India Dega Aashirvad initiative offers special rice packs that your wedding guests can choose to simply touch as a gesture of blessing, instead of showering the rice. In return for these packs, we request you to give us whatever rice you have, which, along with every pack left unopened, will be donated to those who need it most. Feeding India is a not-for-profit social organization which aims to solve the problem of hunger, malnutrition and food waste in the country. They channelize extra nutritious food from individuals, weddings, restaurants, corporate offices to the people who really need it and have no means or access food. They also serve freshly cooked food or raw grains to our partnered shelter homes and beneficiaries.”

CASE STUDY 02: JAAGO RE CAMPAIGN - TATA TEA

There are several types of Tea available in Indian Market, The tea brand ranges from local level to International brands. “Tata Tea brand is back again with its iconic Jaago Re campaign – Jaago Re Version 2.0. The new campaign ‘Alarm Bajne se Pehle Jaago Re’ (Wake up before the alarm rings) is urging people to stop reacting after tragedies hit and instead start ‘Pre-acting’, and prevent these issues from happening. Tata Tea is encouraging ‘Preactivism’, a behavior of timely activism which happens before, to prevent unfortunate things. The Jaago Re 2.0 ad film highlights how we, as a country, need to change our behavior towards social issues. We are living in a time where people gather in huge numbers on-ground and online when outraged by an incident. However, to push our consciousness further, we need to create a new behavior within activism. We need to ignite the spirit of prevention so that our society can evolve into a new reality; where it takes measures to intercept warning signs and prevent disasters. We need to wake up before the ring of the alarm – Alarm Bajne Se Pehle Jaago Re! Commenting on the new Jaago Re campaign, Sushant Dash, Regional President - India, Tata Global Beverages, said, “Jaago Re has been a path breaker in many ways. It set the way for brands embracing social change as part of their DNA. However, over the years, as with any innovation or new thinking, the space has become crowded. Hence, we needed to break the mould again and showcase our thought leadership. So we went back to the consumer, to the youth. We realised Jaago Re has helped move the needle. From complete apathy, as a nation we have become reactive. However, the need now was to move from being reactive to instilling a sense of ‘Preactivism’ in people. We wanted to create a new paradigm shift that would be relevant to people of all age groups and demographics, to continue this journey of social change in India. ‘Preactivism’ is a new

dimension – not reflecting on culture but creating one. This is hopefully the start to another new wave of social uprising that India will see.”

CONCLUSION

Product promotion and Design based on facts, not assumptions, for designing the product and its promotion campaign requires research regarding the product, competitors, price, promotion media, consumers and about the customers. India Gate – Rice brand came with a new idea. They are not only informing about the rice but also combining it with the malnourished condition in many areas of India and a solution for it through design. Tata tea connects tea to the consumers in India through social awareness. It focuses on their tagline “Jaago Re” the, Tata tea raises the current issue related to our day to life and our habits in the digital age. Interdisciplinary research is not only/giving the data but gives a new perspective for the advertisers. Interdisciplinary research has helped advertisers to catch points or topics which attract the audience attention and get their active response/ participation (like issues of social awareness, self awareness apart from USPs of products rather than simple branding). It is also contributing towards creating a more responsible and thoughtful society.

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GENDER STRATIFICATION

AISHWARYA KUMARI

INTRODUCTION

Why is that women are still not treated equal as although so many women are educated and have entered the work force in huge numbers? One needs to find out the significant forces that create hurdle for gender parity. Gender is a socially structured term and it gives the idea of hierarchal arrangement of people in the society. One should understand that term sex and gender has two different meaning, where one is related with biological growth other means the discrimination of two opposite sex. Gender stratification talks about the living style of men and women and their circumstances on others. When one talks about inequality, one needs to understand the dimension of inequality basically the levels at which inequalities are generated. These levels could be wealth, power, privilege, economic growth, etc. The concept of gender stratification took rise from feminist perspective in social sciences mainly in sociology around 1970s. Gender roles vary significantly across cultures and it continues to take place from family life to work place.

Aristotle, believes in the perfection of nature, and continued to acknowledge women as an inferior, partial version of man, and was presented as the ideal approval of nature's objective. However, the documents of suppressed women exceeded the literature on liberation. Historically, the male dominance could be observed since nineteenth century. Thus, there are numerous examples of challenges to the ruling gender divisions that disempowered women. Through the idea of writing one could explore the harshness carried by women but it was also a space to imagine a different kind of society in which women lives might be improved, and men's dominant role(s) opposed. Clearly, women writing gave an opportunity to deal with their problems. Women writing have questioned the existing viewpoints which are essentially patriarchal.

In the patriarchal societies, be it India or Africa, women are subjected to male subjugation and suppression. Female oppression is deeply rooted in the structure of the different societies. Moreover, Indian Cinema too reflects the social issue and harshness carried out by women. The paper does not aim to discern the quality of content Indian cinema produces rather it is used as a medium to show the glimpses of women in Indian society respectively. This paper aims to show the levels of gender discrimination through the Bollywood movie as mentioned above 'Kabir Singh' (2019) by comparing it with the real stories of women and the women portrayed in literary work.

'Kabir Singh' is an official remake of the Telugu blockbuster 'Arjun Reddy' and it portrays the journey of a short tempered doctor Kabir Singh (Shahid Kapoor), whose obsession for his girlfriend leads him on the path to self-destruction. It is a world that he created himself. Shahid's performance pulled the attention of audience with a lot of voices like womanizing, drug addiction, alcoholism and brash male toxicity. His character is strongly prejudiced against women, abusive, reeks of misplaced sense of male entitlement - exactly the kind of man that our society reeling under patriarchy and sexist stereotypes can be called out. His psyche and behaviour are dominated by his irrepressible anger and desperate need to be in charge of the women he is obsessively in love with. While sharing the screen space, it has

been visualize that no one dares to come closer to the leading man. For most part, film's leading lady Kiara remains reserved and is left to use silence as her only tool for performance. With such limited scope, she never really gets a chance to shine. Shahid's trusted friend Shiva (Soham Majumdar), on the other hand, gets ample opportunity to show solid support even when his friend is way out of line. Kabir's madness and dark side of his love leads him to silence a woman Preeti in the movie. Also, the title of the movie itself justifies the lead role and patriarchal dominance in the society. Throughout the movie it has been observed that there is a male dominance over women for e.g. If men slaps a women they call it love but will it be accepted if women does the same? The answer would be a big No; men finds it mere insult and just because he was good at studies or being the topper of the college does not give him the right to do such things.

Such abusive relationship can definitely lead to a dangerous path. The female lead is mostly to describe with surface-level qualities like beauty, marriage, attractive, etc. Whereas men are to show masculinity, strong, power, etc. Nonetheless one cannot deny about the performance of Kabir Singh in the movie but all revolves to the centre of dominance over women. The piece of art directed by Sandeep R.Vnaga has triggered a tsunami of negative impact over several women. There are many lot examples to show the gender discrimination that still exist in our society. From the fictional world to the reality women have been suffering and facing the suppression till date.

Sunday Times had a talk to the sufferer and abuse survivors questioning them how they gather courage to walk away and restart a new life. This is an attempt to show the real suffering of women by interviewing them through the Times of India. Sunday Times basically talk about surviving kabir Singh in their lives. The first woman he spoke to was Rashmi Anand, 52 years old. She discussed about her unbearable suffering and pain showered by her husband. She was smashed against the wall, she was pushed on the stairs, her arms were fractured and ribs got damaged but she still made an effort to stay in marriage bond for ten years until her son stop speaking. It was also affecting her child as he was in trauma to see such harsh step taken by his father against his mother.

This however stunt him and blown him away. When the level of abusiveness was reaching its point, Rashmi spoke to her parents but they did nothing just sympathized and sent her back. This gave a chance to her husband to threaten her more and more. However, Rashmi decided to escape not because of her own pain but because of her son's muteness. She is now running the women of element Trust that gives free legal aid to women who could not earn five thousand a month. She also gives talks to corporate and educational institution on gender violence, sexual harassment on workplace.

The Sunday Times spoke to another victim name Indu Gopal of thirty two years old. She was too smashed, hit, and humiliated throughout the marriage. He used to leave a huge bite mark to keep her silent. Out of societal fear she could not think of divorce and accepted all harassment forced by her husband. The word divorce itself is a big eye catchy word for Indian people especially when one starts to think Mrs. Sharma '*kya bolengi*'. The major issue with Indian people is to think of others first before accepting yourself. Indu says she would have continued to live this life if her husband would have not left him. This very well shows the power of women in present date. Women are still in dilemma whether to raise voice for

the continuous oppression or not. Indu is working in Hyderabad but still suffers from post-traumatic stress disorder; thought of going back to Chennai shakes her in fear. She has started a support group for divorced and depressed women called project kintsugi. She is now capable to voice many unvoiced women. She did not raise her voice in early phase because she thought she would be blame for her bad choice.

Likewise, there are still women who are neither acknowledged nor given opportunity to raise their voice. The reason behind this suppression is nothing but women themselves. Yes, why is it that women who wants to succeed in particular field being it music, art, dance, literature, sports, etc are doing extra ordinary because they do not look for someone to become backbone. They just fight for their passion, work-hard and snatch it. The very recent example is of PV Sindhu who became the first Indian to win the Badminton World Champions over Japanese opponent and won a gold medal and made her country proud. The passion to follow your goals becomes secondary over 'Log kya sochnge'.

From fictional to reality we have come across gender parity and same can be seen in literary field. Adam and Eve; the figure taken from bible's mythic history, had stolen the apple from the Garden of Eden; and later it was found that God punished Eve by increasing her pain in child bearing and declaring Adam to rule over her. However, Adam was also punished having to work hard to earn a living. This clearly states that man was granted a power to rule over the woman and was also engaged with human civilization. On the other hand, woman was excluded from any activity and was treated more like an average animal than a divine human being. Jumping to Victorian period, Marry Anne Evans a leading writer of Victorian period used her pen name George Eliot to avoid stereotype of women's writing. She was a poet, novelist, journalist, etc. She wrote many novels out of which one is 'Mill on the Floss' published in 1860.

The Mill on the Floss opens up with unnamed narrator talking about dorlcote mill where Mr. Tulliver head of the family talks about his son Tom to send him away for his studies so that he can be something more than a farmer. On the other hand Maggie Tulliver, Tom's sister being a very bright girl, intelligent and with good intention to always please her brother never got a chance to explore or express. She was always mocked upon either for her look or for her intense knowledge and the books she chose to read. Maggie was always in dilemma in choosing her desire and in her acceptance of society. She was strongly opposed by the society and family to choose her own happiness. Being a woman she was not the priority for getting higher education, to be treated equally or to be accepted for her extreme knowledge.

GENDER EQUALITY: WOMEN EMPOWERMENT

Gender equality is basically a human right which aims to focus on every individual irrespective of their gender parity to enjoy personal space and freedom. Gender equality also sometimes become prejudiced for all round development. Empowered women can make indispensable contribution for the improvement of productivity, education and health which in turn will be useful for the next generation. Gender equality and women empowerment is now widely considered as a key stone for achieving goals. This paper has made an attempt to show the key determinants of inequalities that still exist in our country to get an idea to what extend women are empowered. Gender equality can be achieved when men and women enjoy same power, obligations, and rights by all means. This paper finds education the major

lacking factor for women's empowerment which apparently affects economic growth. However, cultural and social influence could be another reason for women's autonomy and empowerment.

ON MAGGIE'S FEMINIST THOUGHT IN THE MILL ON THE FLOSS

George Eliot is one of the most highly praised novelists in the literary culture because of her unique position in English literature. Her perspective towards feminism has been discussed among feminist critics in different countries. The Mill on the Floss is regarded as Eliot's autobiographical novel. In the novel, the female protagonist Maggie was somehow influenced and shattered because of male dominance in patriarchal society during the Victorian period. This paper aims to discuss Maggie's feminist thought and influence upon women in her times. In Victorian times women were allowed to write under their own name but were limited to write particularly about carefree romances to which Eliot wanted to escape such stereotype of women in her writing therefore she used male pen name so that her work is acknowledged.

The paper dwells into Maggie's struggle with her brother and her society. Maggie is shown as warrior woman who does not lose hope in spite of being humiliated for so many times. She fights for her equal economic and social status in a numerous way in a patriarchal society. Women were deprived of education rights under the influence of traditional rights. Maggie's attitude towards feminism was influenced due to prevailing gender assumptions. George Eliot has shown the importance of education and social cause to cultivate higher sensibilities of women that would provide moral purpose of their lives.

METHODOLOGY

For the purpose of the present study data has been collected by observation method and from secondary sources. It is collected from Journals, Magazines, and literary books and by browsing internet.

CONCLUSION

This paper 'Social and Gender Stratification' attempts to explore the major roots of gender parity that still exist in the society. From the time of Victorian period till present, gender inequality is a major issue for the development of society. This decline in growth leads to lack of moral values, however it's not just male community solely responsible but women are too equally responsible for their growth and development. Every individual has their rights but the matter lies in who enjoys those rights? As it is said charity begins at home similarly the gap can be filled at home. In order to achieve Gender equality, it's not important to organize awareness programmes or talk show with famous personalities as these ideas does not remain for longer term. Before moving into the zone of education, a child is brought up by their parents and merely their mother.

Thus, a child can develop a sense of equality since the beginning of their step in the world. Thus it becomes very important for the family to develop a sense of gender equality from the existing examples in the family and society as when a child is born they are like blank slate and thus easily imitate what they are taught or visualise. This paper will help the reader to understand the levels of gender inequality and how women are made silence over their dreams, knowledge and social cause by citing issues from various genres.

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STIGMATIZED THIRD GENDER

VARTIKA LAL & SHIVA NAMAN

INTRODUCTION

Since the present study is concerned with those persons who claim that they suffer from a condition in which there is some deficiency of sexual development, it is, therefore, desirable to look into whether their claim is factual or not. Being sexually deformed, they are not capable of reproducing. Inability to reproduce, in view of the cultural traditions of Indian society is socially disapproved. Any such individual is singled out in the society. It is on account of sexual deformity that the third gender people (hijras) become stigmatized. In any human society, there is always likelihood that people, in general, would practice discrimination against any stigmatized individual. The sense of stigma practiced as Ervin Goffman puts, it is the gap between what a people ought to be “virtual social identity” and what a person actually is “actual social identity”. Anyone who has a gap between these two identities is stigmatizing.

The topic on third gender (hijras) was chosen, not because of any personal relationships with anyone from the community, nor because of any special interest in gender issues. My choice arose from simple curiosity. I was curious to find out who these anomalies were, how they lived their lives and how they tackle the problems of their life. In 2009, the hijra term was announced that the term was now legal. The hijras would have passports. And in 2015 the government's social welfare department announced that they had planned to hire 14 Hijras in low-level positions in the country's first quota scheme. After 12 of those who were selected for the jobs were classified as "full-grown males," and failed to meet the standard medical test requirement. Thus the personal interest developed and I wanted to understand what factors influenced a hijras identity – An identity that seemed to be personal, public and political all at once.

The purpose of this research paper was to detect the various focal points that consist in the building of the hijra identity. The paper required a study of the different spaces in a Hijra's life. The paper discusses the concept of stigma and the related problems in the life of the third gender

people, finally focusing on how sexuality becomes so important in the life of an individual or for the society that due to sexual ambiguity individuals have to leave their native homes, their parents and this paper also focuses on the rights of the third gender and what place they got by laws made by Supreme Court and also focusses on the functional aspect of the stigma and how the third gender people are accepted, during certain festive occasions, in the society.

METHODOLOGY

The methodology followed in this study is descriptive and analytical as well as empirical in nature. The study is a collection of interview of an individual who belongs to the third gender, which was taken in the view to know their stance in the society and to collect all their socio-cultural aspects in India. The research explores their struggle as the matter of social exclusion and their few successes in the fight for inclusion. The present status of transgender and some of the contemporary landmark initiatives taken by the Indian

government are also dealt. The findings suggest a definite correlation between a traumatic childhood and the individuals joining the community, rather than the participants willfully chosen lifestyle choice.

STIGMA

Stigma is a Greek word that in its origins referred to a type of marking that was cut or burned into the skin of criminals, slaves, or traitors in order to visibly identify them as flawed or morally polluted persons. These individuals were to be avoided particularly in public places. French sociologist Emile Durkheim was the first to explore stigma as a social phenomenon in 1895. Erving Goffman was one of the most influential sociologists of the twentieth century.

Ervin Goffman describes stigma in his book *Stigma: Notes on the Management of Spoiled Identity* (1963) and argues that stigma is a relationship of devaluation in which one individual is disqualified from full social acceptance. In Goffman's theory of social stigma, a stigma is an attribute, behavior, or reputation which is socially discredit in a particular way: it causes an individual to be mentally classified by others in an undesirable, rejected stereotype rather than in an accepted, normal one. Goffman, a noted sociologist, defined stigma as a special kind of gap between virtual social identity and actual social identity. The virtual social identity is assumed demands and the character we impute to the individual and the category and attributes in fact, be proved to possess will be called his actual social identity.

Goffman divides the individual's relation to a stigma into three categories:

- the stigmatized are those who bear the stigma;
- the normal's are those who do not bear the stigma; and
- The wise are those among the normals who are accepted by the stigmatized as "wise" to their condition (borrowing the term from the homosexual community).

Goffman emphasizes that the stigma relationship is one between an individual and a social setting with a given set of expectations, thus everyone at different times will play both roles of stigmatized and stigmatizer. Social stigma basically is a disapproval of a person or an individual on the grounds of their unique characteristics which distinguish them from others in society.

THIRD-GENDER (HIJRAS)

The term transgender is derived from the Latin word "trans" and the English word "gender". The Latin word "trans" means "across, though, beyond". Transgender persons are born with either male or female anatomies but they feel different from their body structure. A transgender person is a person whose self-identified gender does not correspond to the gender assigned to them at birth. Their gender identity may not act in accordance with predictable notions of male and female, but they may relate themselves as a third gender. Hence they always experience an inconsistency between their gender identity, gender expression and their assigned sex. These individuals signify the uncompromising and single-minded nature of the dual gender constitution.

In India, transgender community includes *Hijras*, *Eunuchs*, *Shiv-Shakthis*, *Kinnars*, *kothis*, *Jogappas* etc. The Vedic and Puranic literatures mention "*tritiyaprakriti*" meaning the third gender and *napunsaka* meaning someone with the loss of procreative ability. The word hijra used in the Indian language appears to be derived from the Persian word that is someone

who is effeminate or ineffective. Another commonly used word is *kinnar*, whereas *chhakka* is used in an insulting context.

The LGBTQ group is referred to as the “lesbian, gay, bisexual, transgender, and queer community” which includes those who have different sexual orientations. In order to completely understand the nature of transgender, it is necessary to understand the difference between Gender Identity and Sexual Orientation. Gender identity signifies a person's deeply felt internal and individual experience of gender, which may or may not correspond with the sex assigned at birth. Whereas, sexual orientation signifies the individual's enduring physical, romantic and/or emotional attraction to another person.

HISTORICAL BACKGROUND

The transgender or the Hijra community has vastly been affected by the various cultural, religious and social developments throughout history.

MUGHALERA

Hijras played a famous role in the royal courts of the Islamic world, particularly in the Mughal rule in the Medieval India. During the Mughal Era, ‘hijras’ they were known as ‘eunuchs’. The customary roles of the eunuchs were to guard the ladies of the harem and the children. Thus, ‘Hijras’ in the Mughal Period were given a position which provided them with respect, power and a position. They were rendered the positions as political advisors, administrators, generals as well as guardians of the harems. Hijras were consider clever, intelligent, reliable and intensely loyal and had free access to all spaces and sections of population, thereby playing a crucial role in the politics of empire building in the Mughal era. As the person of trust the Hijras also occupied high positions as the guardian of the queen or to take care of her, and also received large amount of money to have been closest to kings and queens. Thus hijra often state the role of their status in that period.

THE BRITISH PERIOD

In the beginning of the British period in the Indian sub-continent ‘Hijras’ were protected and received benefits by some Indian states through entry into the ‘Hijra’ community. The benefits comprised of provision of land, rights of food and smaller amount of money from agricultural households in particular areas which were ultimately removed through British legislation as because the land was not inherited through blood relations.

CRIMINALIZATION UNDER THE COLONIAL RULE

In the beginning of colonial rule from the 18th century onwards, the situation changed drastically. Early European travelers showed that they were shocked by the sight of Hijras and could not understand why they were given so much respect in the royal courts and other institutions. In the second half of the 19th century, the British colonial administration vigorously wanted to criminalize the hijra community and to deny them the civil rights. Hijras were considered to be separate caste or tribe indifferent parts of India by the colonial administration. The Criminal Tribes Act, 1871, this included all hijra who were concerned in kidnapping and castrating children and dressed like women to dance in public places. The punishment for such actions was up to two years imprisonment and a fine or both. This pre-partition history influences the helpless circumstances of hijra in this modern world.

CONTEMPORARY PERIOD

The transgender in India is probably the most well-known and popular third type of sex in the contemporary world. The Supreme Court stated transgender as third gender. The third genders in India have emerged as a strong group in the LGBT rights. In the contemporary time the Government of India introduced so many welfare policy and schemes such as, census, documentation, issuing of the citizenship ID Cards, issuing passports, social-economic development and constitutional safeguards for the transgender people. The Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is a major initiative of the 11th Five Year Plan period which brought employment opportunities for transgender people. The Ministry of Housing and Urban Poverty Alleviation is the National Urban Livelihood Mission and Healthcare facilities. The social, economic, political transformation, housing, legal measures, police reforms and constitutional safeguards prevent human rights violations.

SOCIAL EXCLUSION OF THIRD-GENDER

Discrimination are faced by third gender in our society at various levels; beginning from their homes to outside world as a whole. Their entire life is a complete struggle only because they are born with a particular sexual orientation which is completely different from others. In fact it is also proved by various scientific or psychological studies that such behaviors are perfectly natural.

Transgender or third gender communities have been excluded from participating in social and cultural life, economy and politics and decision-making processes. Most families do not accept if their male child starts behaving in ways that are considered feminine or inappropriate to the expected gender role. Consequently, family members may threaten, scold or even assault their son from behaving or dressing-up like a girl or woman. Some parents may disown their own child for crossing the set gender norms of the society and for not fulfilling the roles expected from a male child. Parents may provide numerous reasons for doing so, bringing humiliation and shame to the family, diminished chances of their child getting married to a woman in the future and thus end of their generation (if they have only one male child) and professed inability on the part of their child to take care of the family. Thus, later transgender women may find it difficult even to claim their share of the property or inherit what would be lawfully theirs. Sometimes, the child or teenager may decide to run away from the family not able to tolerate the discrimination or not wanting to bring disgrace to one's family. Some of them may sooner or later find their way to Hijra communities. This means many Hijras are not educated and as a result find it difficult to get jobs. Moreover, it is hard to find people who employ Hijras or Third gender people. Some members of the society laugh at gender-variant people for being 'different' and they may even be hostile. Even from police they have fear of physical, mental and verbal abuse, forced sex, extortion of money and materials and arrests on false allegations. Absence of protection from police means they find Hijras or Transgender people as easy targets for extorting money and as sexual objects.

Hijras or Third-Gender communities face a variety of social security issues. Most Hijras run away or expelled from home, they do not expect support from their biological family in the long run. Afterward, they face a lot of challenges especially when they are not in a

position to earn or have decreased earning capacity due to health concerns, lack of employment opportunities, or old age.

THE NEW VISIBILITY OF HIJRA AS RIGHTS BEARING CITIZENS

Transgenders or third genders are not treated as normal individual in the society. The person born with any sexual abnormality should be recognized as such with the entire available constitutional, legal and civil rights including the right to work. Legally the Constitution of India protects certain rights of citizens and persons. Every person has a right to life and personal liberty. Every person means male, female and any person amongst the sexual minorities. It does not mean that only male or female have such rights. They were legally granted voting rights as a third sex in 1994. Due to legal ambiguity of the procedure, Indian transgender individuals do not have right of safe medical facilities. On 15 April 2014, Supreme Court of India stated transgender people as a socially and economically backward class permitted to reservations in Education and Job.

Discourse of disability and recognition

National Legal Services Authority v. Union of India, 2004 is a landmark decision by the Supreme Court of India, which declared transgender people to be a 'third gender', that the fundamental rights granted under the Constitution of India will be equally applicable to transgender people, and gave them the right to self-identification of their gender as male, female or third-gender.

This judgment is a most important step towards gender equality in India. Moreover, the court also held that they will be granted reservations in admissions to educational institutions and jobs. The Court has directed Centre and State Governments to grant legal recognition of gender identity whether it be male, female or third-gender be granted reservations in admissions to educational institutions and jobs. In recognizing the third gender category, the Court recognizes that fundamental rights are available to the third gender in the same manner as they are to males and females. Further, non-recognition of third gender in both criminal and civil statutes such as those relating to marriage, adoption, divorce, etc. is discriminatory to the transgender. Centre and State Governments have been intended for to take proper measures to provide medical care to Transgender people in the hospitals and also provide those separate public toilets and other facilities. Centre and State Governments have been asked to provide the community various social welfare schemes and to treat the community as socially and economically backward classes. They have also been asked to extend reservation in educational institutions and for public appointments. Centre and State Governments are asked to take steps to create public awareness so that Transgender people will feel that they are also part and parcel of the social life and not be treated as untouchables; take measures to recover their respect and place in society; and seriously address the problems such as fear, shame, gender dysphoria, social pressure, depression, suicidal tendencies and social stigma.

The Union Cabinet cleared the Transgender Persons (Protection of Rights) Bill, 2016 which will cover the way for the community to be declared as the third gender with an option to identify themselves as male, female or transgender. However, the bill cleared by the cabinet does not clearly talk about giving reservation to such transgender who by birth do not belong to Scheduled Castes or Scheduled Tribes. The rights guaranteed under the Bill are

mostly substantive rights such as the right to equality and non-discrimination, life and personal liberty, free speech, to live in a community, integrity, along with protection from torture or cruelty and abuse, violence and exploitation. There is a separate clause for transgender children. Education, employment and social security and health are also covered under the Bill. The bill envisages at constituting committees. There is penalty by way of imprisonment for up to a year for hate speech against transgender people.

Navtej Singh Johar v. Union of India, 2018 is a landmark decision of the Supreme Court of India in 2018 that legalized all consensual sex among adults in private, including homosexual sex. On 6 September 2018, the court delivered its unanimous verdict, declaring portions of the law relating to consensual sexual acts between adults unconstitutional. The court found that the criminalization of sexual acts between consenting adults violated the right to equality guaranteed by the Constitution of India. The court ruled that LGBT people in India are entitled to all constitutional rights, including the liberties protected by the Constitution of India. It held that "the choice of whom to partner, the ability to find fulfillment in sexual intimacies and the right not to be subjected to discriminatory behavior are intrinsic to the constitutional protection of sexual orientation". The judgment also made note that LGBT community is entitled to equal citizenship and protection under law, without discrimination.

PROHIBITION OF DISCRIMINATION

Discrimination of transgender persons with respect to basic amenities and services have been prohibited under this Bill. This bill prevents the unfair treatment, or discontinuation, or denial of service for transgender in the following ministration:

- Education
- Employment
- Healthcare
- Access to, or enjoyment of public goods, facilities and opportunities
- Right to reside, rent, own or otherwise occupy property
- Opportunity to hold public or private office and
- Access to a government or private establishment in whose care or custody a transgender person is.

RECOGNITION OF GENDER IDENTITY

Every Transgender person has a right to be recognized as a Transgender person to others and need not represent themselves as a man or woman or hide their gender identity.

CERTIFICATE OF IDENTITY

In order to ensure the benefits under this Bill reach the intended persons it prescribes Certificate of Identity to Transgender people. This certificate confers rights and serves as a proof of recognition of his identity as a transgender person.

CENSUS REPORT: 2011

According to 2011 census total population of transgender in India was 4.99 lakhs, state-wise population of transgender. The highest proportion of the third gender population: 28% was

identified in Uttar Pradesh followed by 9% in Andhra Pradesh, 8% each in Maharashtra and Bihar and over 6% in both Madhya Pradesh and West Bengal.

According to 2011 census total population of transgender in India was 4.99 lakhs, state-wise population of transgender. According to 2011 census total population of transgender in India was 4.99 lakhs, state-wise population of transgender.

Population of Third Gender (State-wise) Census of India 2011

State	No. of the Third Gender (Thousand)
Uttar Pradesh	137
Andhra Pradesh	44
Maharashtra	41
Bihar	41
West Bengal	30
Madhya Pradesh	30
Tamil Nadu	22
Orissa	20
Karnataka	20
Rajasthan	17
Others	97
Total	499

INTERVIEW OF RESPONDENT

Name - Aisha (Real name – Nilesh)

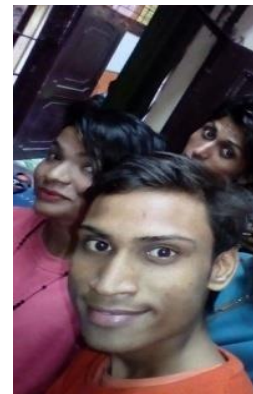
Gender – Transgender

Age – 19 years

Place of Domicile – Kanpur

Qualification – 10th

- When did you first realize that you were different? At that time what such qualities you possessed that you wanted to discard and what qualities you wanted to carry forward?
- How hard was it for you to figure out who you were? What exactly was the feeling like?
- How did you negotiate such sexuality urge?
- Do you strive to move ahead in life and career notwithstanding the inner self contradictions?



RESPONSES

When my age was 17 years, I realised that I'm different. Earlier at my home I was treated as boy, but when i came to know that I possesses the qualities of a girl then, decided to discard all the qualities that symbolise me as a boy and gave more emphasis on the qualities of a girl.

It was not hard for me, as my mother helped me a lot. Sometimes it appears to be very different and awkward but as my family is supportive, it was never a difficult task for me.

It was very much different for me to suddenly get an identity which upto yesterday was not even imagined by me.

I simply convinced myself, by saying that I belong to a different category of people. The negotiation was very much tough but at that time I showed courage in myself and thus succeeded at that point of time. Yes, I strive to move ahead as I have to show my family that I can do something for the sake of upliftment of their social status.

SOCIETY

- Are your parents aware about your transition? When did you start to tell the people around you about this transition? How do you find the society accepting you?
- Only my mother knows about my transition. I did not disclose to anybody about my transition, will tell everybody proudly when I will do something good in my life.
- Did your mother call for a gender specialist or Therapist? What was your family member's attitude in beginning compared to other siblings and change of attitude and behaviour after discovering that you are different?
- Nobody was called, not any doctor or therapist. Nothing is known to my family members except my mother.
- It is much easier to change the body than to brainwash the mind. How challenging was it for you to accept a soul of a woman and the body of a man.
- It often cried over my identity, the girl inside me always crave me and forces me to go towards boy, but the boy which everybody see me as, never wanted to go near girls as I am attracted towards boys and not girls.
- What if after realizing that you are a transgender, your parents had given you the liberty to choose your gender?
- Even if they allowed me to choose my gender, then also I will never reveal it to anybody, as my sisters are not married yet and my identity can harm their life in some way or the other.

COMMUNITY

- According to you who are Trans-genders?Are there any particular rituals that are followed in this community?
- Trans-genders are people who never discriminates on the basis of one's gender rather they treat everybody equally and also they never think of anybody's wrong.
- Are there any particular rituals that are followed in this community?

- Our Friday get together is a part of ritual that means because of this togetherness we can always stand for each other in unity.
- What religion do you follow?
- Hindu
- Which God do you worship?
- Krishna
- What is the language used within this community?
- Parsi.
- What is the dressing style? (Cross Dressing Style) Please Elaborate
- I prefer clothes of boys at my home.
- But when I am outside and with my type of friends I prefer to wear dress full of appeal and that is good girlish attire.
- Do you think a representative of your community should and is necessary to be elected from your community? Yes/ No and why?
- Yes, because we are treated differently and if anybody from our community gets elected then it would be very much easy for us to get the very basic rights.
- There are fake trans-genders roaming about the streets just with the desire to earn money... How is your community affected by this?
- Due to fake trans-genders sometimes the real trans-genders are also termed as (kaccha) which is very much embarrassing and also it lowers our reputation.
- What more can be done to bring about progress amongst the people in your community?
- If we people easily gets job such as of mehendi at ceremonies and at fashion designing then it would be very helpful for us to get proper income and good livelihood.

SCHOOLING

- In which city did you complete your schooling? Did you share this transition in you you're your schoolmates/ teachers? If yes, how did your school mates/ teachers react? And if no, what was the major reason behind not revealing?
- Currently I am studying in a school of Delhi.
- I did not revealed anything to them as one of the students who did i.e. revealed his identity was often mocked by others and thus he left the school.
- How many friends have you got? Do they behave normally with you as they behave with the rest of them or are there any differences in the way they treat you?
- I have limited friend circle.
- Yes, they behave normally most of the times but sometime boys mock me.

- Have you got any friends who are trans-genders? If yes, do you share the same background story or is there any significant difference in your stories?
- Yes, I have many friends like me.
- Everybody has different story. Mine one is very simple some of my friends have very harsh story.



FRIDAY GET TOGETHER PARTY

WORK LIFE

- What all jobs do you think is most suited for you?
- Make up and painting.

PERSONAL LIFE

- Are you married and are you able to satisfy your spouse? Do you expect to find a soul mate? What type of a soul mate do you desire?
- Yes, I expect to find a soul mate. The one who would treat me good and love me more than everybody and also he must be true to me all the time. If he encounters any problem with me or within our relation then he must first ask me about the same and discuss that with me.
- What are/were some of the struggles you have/had to go through being transgender?
- One of the worst things that I have encountered till date is the mocking by others who differentiate us. And name us anything which they want.
- According to you what are the benefits of being a trans- gender and what are the drawbacks?
- Till date I know of the benefit is nothing.
- Drawback is that if the same thing goes on forever as like we are treated at present , mocked often, teased often and encounter with filthy words also then this drawback will drag us to that situation from where we can never be a part of this so called normal society.
- Before transition, how different was life back then to the life you're living now?
- Everything has changed now.

- From friends to attire, everything has changed.
- Now after so many years how do you feel living a life of a trans- gender? Are you now comfortable with your body, physical (sexual) and emotional needs? Are you at peace with yourself?
- I am good with my present life.
- And also ok with my all type of needs
- How do you satisfy your sexual needs?
- I have boyfriend.
- It is much easier to change the body than to brainwash the mind. How challenging was it for you to accept a soul of a woman and the body of a man.
- It often cried over my identity, the girl inside me always crave me and forces me to go towards boy, but the boy which everybody see me as, never wanted to go near girls as I am attracted towards boys and not girls.

SITUATIONAL RESPONSE

- Have you ever confronted a situation wherein you are at a shopping mall / some public place and you urgently need to use the loo then do you face a dilemma as in whether to go to a male / female washroom?
- No, as whenever I visit such places I always have girlish attire, so no chance of dilemma.
- What if during your work in the hotspot area you confront any of your family members? (a) How do you think they would react? ; (b) How would you tend to respond to their reaction?
- They would be very angry and also they will never talk to me.
- I would not be able to respond to them, I will be in dilemma at that very point of time.

GARFINKEL ON AGNES (CASE STUDY)

The case history gives us some background for understanding Agnes' complicated gender claims, as well for understanding Garfinkel's theory of passing.

Agnes was a 19-year old girl with an accidental penis appendage. Studied by anthropologist Harold Garfinkel and written about in a 1967 report titled *Studies in Ethno methodology*, Agnes became recognized by her researchers as an example of "passing". After undergoing a sex transition operation at UCLA in 1959 removed her existing penis and transformed it into a "manmade" vagina. Garfinkel's research presents Agnes construction of her own personal history of femininity, draws attention to the secrets she refuses to disclose to anyone, and paints a portrait of a woman raised as a boy and fighting to fit into a society of "normal" gendered people.

At 17, Agnes was identified by society and by her family as a male, left home to live with her grandmother for a month—leaving one day with all of her belongings, changing into "female" attire, and creating a new life for herself as a woman. Because she was living in a society that

prohibits willful or random movements from one sex status to the other, Agnes consciously learned the accepted and expected mannerisms that accompany being a woman. She gained a boyfriend and avoided for as long as possible the day when she would have to tell him about her “vestigial penis.”

In interviews about her experiences both before and after the UCLA castration, Agnes identifies as a natural woman living in an environment that does not recognize her penis as accidental. She is the victim of a mistake made by nature and corrected by man. After operation, Agnes still fights to hide her past. Her sex transition was easily accepted by her parents and her boyfriend, and easily constructs a plotline that gives an impression of her as she wants to be seen.

Garfinkel struggles with separating the truth of Agnes story from its reality. Reading through the conflicted and often confusing accounts of Agnes. Despite her own personal ambiguous “sex,” she is dismissive of homosexuals and transsexuals. She is really uncomfortable when these categories are seen as similar to her life, and she repeatedly refers to them as “abnormal.” She does not want to be classified with “them.” As Garfinkel explains, avoiding any examinations or inquiries that could reveal the presence of her penis, prior to castration became a game for her. Agnes learned the script of society’s stereotypes and its rules. This was the act of “passing.”

Now this practice of passing is important for understanding the performativity of gender. The term “passing” refers to the “work of achieving and making secure their rights to live in the elected sex status while providing for the possibility of detection and ruin carried out within the socially structured conditions in which this work occurred” The term “ruin” is stipulated as status degradation, psychological trauma, and loss of material advantages.

The Respondent Neelesh (Aisha) is also hiding his girlish feelings from society, friends and even from his own family. Because the “unusual” growth of a feminine boy is not tolerated in schools and in work place and even not in his own family. They often experienced loneliness and abusive treatment. Feminine attitudes were matters of jokes & humiliation. Most of the male who have feminine character failed to find a safe space and unable to get hostile environment.

In the present study, researcher finds that the respondents could not reveal his identity being a Third Gender. Because of the fear that he was teased, abused and ridiculed not only by the batchmates, but even by the teachers. The respondent also hid his sexual identity because he was afraid that his sexual deformity could create a hindrance in the marriage of his brothers and sisters.

Generally, the third gender people hid the information regarding their biological deformities, because they were afraid that this would create problems for their family as well. Though, social stigma was attached with the community because of their sexual deformity, but on the other hand there was social stigma in terms of marriage of their brothers and sisters also.

CONCLUSION

The researcher found that third gender people (hijras) are stigmatized in the society. The third gender people have a physical deformity which places them at a terrible disadvantage in the

society. Following Goffman, one can say that the third gender people are something that is “not quite human”. The society has developed a belief system which explains their inferiority, and accounts for the dangers presented by a stigmatized person. But, the similarity seems to end here Goffman postulates, the Third Gender people (hijras) do not think of themselves as superior to normal human beings. They have the same self-image as the one that the society has of them. Intersexuality primarily is an issue of stigma and emotional trauma. In our culture, sexual variations which construct the line between male and female are stigmatized. Thus, the birth of an intersex child is emotional traumatizing. Parents are traumatized because the birth of child with sexual ambiguity violates a deeply held world-view, and because it elicits parental feeling of shame and guilt. Intersex child are traumatized because they are made to feel utterly unique, alone, and unacceptable. Intersex individuals are still raised as either male or female in most societies. However, these individuals are challenging medical thinking that they should be surgically or hormonally assigned to one sexual category or the other, particular during infancy or childhood before they have consolidated their gender identity. In most societies, intersex individual do end up living in one gender role or the other and have either a male or female gender identity.

Third Gender people who performed religious ceremonies at weddings and at the birth of male babies, involving music, singing, and dancing are intended to bring good luck and fertility. Although third gender people are most often uninvited, the host usually pays the third gender person a fee. Many fears the hijras curse if they are not appeased; will bring bad luck or infertility. Third Gender also argued that sometimes they are rejected for what they are and the way they live. Still, they were called at special ceremonies such as births and weddings where they get cash for performing dances and blessings.

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HISTORICAL BACKGROUND OF SOCIO-POLITICAL ORGANIZATION IN HIMACHAL PRADESH

LALIT KUMAR SHARMA & VIJAY KUMAR SHARMA

Himachal Pradesh came into being as a Chief Commissioner's Province in the year 1948. The province consists of hill districts around Shimla and southern hill regions of the earlier Punjab region. On 1st November 1956, Himachal became a Union Territory. On 18th December 1970 the State of Himachal Pradesh Act was passed by the Parliament and the new state emerged on 25th January 1971 as the eighteenth state of the Indian Union. The history of Himachal is as old as the human civilization and the region has not only acted as the cradle of human civilization but acted as the barrier against many foreign invasions. The state is a home for diverse ethnic and rural communities, who have shaped its cultural heritage but the socio-political systems. This paper traces the evolution of socio-political systems in Himachal Pradesh.

The history of Himachal Pradesh, dating back to the beginning of human civilization, has seen many ups and downs. Owing to the presence of several mountain passes, the state has been a trade route for many traders and travellers. In 10th century, the northern part of the state was under Tibet, which is revealed in the socio-cultural and religious belief systems of Lahaul-Spiti and Kinnaur. The southern region was under the control of Ranas, Thakurs and other clans. Earlier the state was divided into smaller regions each under different rulers. In early 19th century, the state was captured by Sikhs and later a treaty was signed with the British rulers. The archeological excavations brought into limelight the signs of primitive men in the foothills of the state, who have believed to inhabited Bangana Valley, Markanda Valley and Sirsa Valley. The remains of Indus valley civilization and Aryan civilization, which flourished in the region, are still evident. There is a mention of Kinnars, Nagas, Yakshas, Dasas, Dasyus and Nishadas in Sanskrit and Vedic literature. The Kols are believed to be the original immigrants of the hills, while the migrants of Mongoloid origin also came. Later, the Aryans who left Central Asia came and settled here (Balokhra, 2008).

According to the Epic Mahabharat, the region which forms the present day Himachal was made up of small republics known as Janpadas. There were *Audumbras*, the most prominent ancient tribe of Himachal, who inhabited the lower hills between Pathankot and Jwalamukhi; Trigarta, an independent republic, in the foothills of three rivers, i.e. Ravi, Beas and Sutlej; Kuluta, the kingdom of Kilita in the upper Beas valley; and Kulindas kingdom in the area between the Beas, Sutlej and Yamuna rivers. During the Gupta period, Chandragupta slowly conquered most of the republics of Himachal. Ashok, the grandson of Chandragupta extended the boundaries of his kingdom to the Himalayan region and introduced Buddhism in the region. After the collapse of Gupta Empire and before the rise of Harsha, the area was ruled by minor chiefs known as Thakurs and Ranas. With the rise of Harsha, in the early 7th century, most of small states recognized his power though local powers were retained by the petty chiefs. A few years after the death of Harsha many Rajput states grew in Rajasthan and Indus plains who fought amongst themselves and the defeated moved to the hills with their followers and established small states or territories, i.e., Kangra, Nurpur, Suket, Mandi,

Kutlehar, Baghal, Bilaspur, Nalagarh, Keonthal, Dharni, Kunihar, Bushahar, Sirmour (Lyal, 1874).

The small hill territory cherished a high degree of freedom till the Muslim invasions, which ruined the foothills of the state. Mahmud Ghaznavi conquered Kangra in the beginning of the 10th century, while Timur and Sikander Lodi trooped through the lower hills and seized several forts.

Later with the breaking of Mughal dynasty, the rulers of the hill states took full advantage. Katoch rulers of Kangra grabbed the benefit of this opportunity and Kangra regained independent status under Maharaja Sansar Chand who ruled for almost half a century. He was one of the competent administrators of the region and expanded his territory. Chamba, Suket, Mandi, Bilaspur, Guler, Jaswan, Siwan and Datarpur were under the control of Sansar Chand. Chamba remains a storehouse of arts, crafts and ancient monuments. Chamba was founded by King Maru in the middle of the sixth century. He entered the Upper Ravi Valley and after winning the territory held by Ranas, founded the town of Brahmapura (Bharmour), which became his capital. It was Raja Sahil Varman, the 20th successor of Maru, who moved the capital from Brahmapura to Chamba. According to folktale:

“Chamba town was founded on the request of King Sahil Varman’s daughter Champavati. She was captivated by the beauty of the place. Later, the king built which is named after her. The people of Chamba still worship Champavati as a goddess.

According to another legend, Chamba was named after *champaka* flowers, which grew in abundance. Rulers of Chamba went for spatial planning with regards to hierarchical socio-cultural spaces, well-connected designs of street, and courtyard houses. The Chowgan is a large open space around which the township has come up and is known to be the social heart of the town. For the inhabitants of the town, the saying *Chamba-Achamba* (Chamba the unique) is of little implication as the district is one of most backward regions of the state. When it was a princely state, the Chowgan was used for organizing sports events and court. Now, the famous *Minjar* fair is held in the Chowgan, which marks the appearance of the shoots of paddy and maize near the end of July and is a jubilant appeal for good harvest. Placed amongst the sky-soaring mountains, the erstwhile Chamba state underwent the tempestuous days of the Sikh rule and sustained until the merger of states after Independence. The area’s topographical remoteness safeguarded it until Emperor Akbar brought it under Mughal control after 1860. Later with the rise of Sikh power, it was subject to Lahore Durbar and later, with the Punjab, remained under British paramountcy (Anonymous 1910).

In the year 1768, the Gorkhas tribe came into power in Nepal and united their military to expand the territory. They seized Sirmour and Shimla hill states and later Kangra. They overthrew Sansar Chand, but they could not capture Kangra fort which came under Maharaja Ranjeet Singh. After this defeat they started expanding towards south, which resulted in the Anglo-Gorkha war. They came into direct conflict with the English after which they ousted them from the hill states and British slowly emerged as the supreme power in this region.

After the Anglo-Gorkha war the common boundary of British domain and Punjab became very sensitive. The Sikh and English were not willing for a direct war, but after the death of Ranjeet Singh, the Khalsa army fought numerous wars with the British. In 1845, the Sikhs invaded the British territory by crossing the Sutlej River and rulers of many hill states were

with British. After the first Anglo-Sikh war, the British did not reinstate the hill territory evacuated by Sikhs to its original holders (Singh, 1988).

The first Indian war of independence was resultant of the building-up of political, socio-economic, religious and military protests against the British. General public of the hill states was not politically active as the people in other parts of the country. They remained more or less secluded except Bushahr. Some of them, for instance, the rulers of Chamba, Bilaspur, Bhagal and Dhami even helped the Britishers during the revolt. The British regions in the hills came under British crown after Queen Victoria's declaration of 1858. The states of Chamba, Mandi and Bilaspur made good progress during the British rule. During the First World War, almost all rulers of the hill states remained loyal and contributed to the British war efforts.

Later, the people participated in the freedom struggle. Praja Mandal launched agitations against the British in the areas under British control. In other princely states agitations were started for socio-political reforms. But, these were directed more against the princes than against the British. The Mandi conspiracy was carried out in 1914-15. Meetings were held in Mandi and Suket states in December 1914 and January 1915 and a conspiracy was planned to murder the Superintendent and Wazir of Mandi and Suket, to rob the treasury and blow to up the bridge over River Beas. But, the conspirators were held and imprisoned. The Pajhota protest in which the people of Sirmaur state repelled is considered as an extension of the Quit India Movement of 1942. Important freedom fighters of this state included Dr. Y. S. Parmar, Padam Dev, Shivanand Ramaul, Purnanand, Satya Dev, Sada Ram Chandel, Daulat Ram, Thakur Hazara Singh and Pahari Gandhi Baba Kanshi Ram. The Congress party was active during the freedom movement mainly in Kangra. However, the princely states of early and late Himachal had their own historical backdrop.

Bilaspur, earlier known as Kahlur, was an erstwhile princely state of British India. On 12th October 1948, Bilaspur was made an Indian state with a chief commissioner. The state of Bilaspur was merged with Himachal Pradesh on 1st July 1954, and recognized as district Bilaspur. Bilaspur was the capital of a state established in the 7th century, and known as Kahlur (Chandel, 2007). The ruling dynasties were Chandela Rajputs, who are known to be the descendants of the rulers of Chanderi in the present-day Madhya Pradesh. The Bilaspur town was established in 1663. The state later became a princely state of British India, and was under the control of British province of Punjab. On 13th May 1665, Guru Tegh Bahadur went to Bilaspur to attend the mourning for Raja Deep Chand of Bilaspur. The Rani Champa of Bilaspur offered the Guru a piece of land in her state. The Guru accepted the site on payment of Five Hundred Rupees. The land consisted of the villages of Lodhipur, Mianpur and Sahota. On the mound of Makhawal, Guru Tegh Bahadur raised a new habitation. Baba Gurditta Randhawa broke the ground on 19th June 1665. The new village was called after the name of Guru's mother, Nanaki. Chakk Nanaki later became famous as Anandpur Sahib (Mamgain, 1975). In 1932, state was made part of the newly made Punjab States Agency, and in 1936, the Punjab Hill States Agency was detached from the Punjab States Agency. India became independent in 1947, and on 12th October 1948, the ruler, Raja Sir Anand Chand, acceded to the Government of India. Bilaspur became a separate state of India under a chief commissioner, and on 1st July 1954, Bilaspur state was made a district of Himachal Pradesh state by an act of the Indian Parliament. Later in 1954, the historic town of Bilaspur was

submerged when Sutlej River was dammed to create the Govind Sagar, and a new township was established (Chandel, 2007).

There is mention of Kingdom of *Trigarta*, the present day Kangra in Panani literature written between the 7th and 4th centuries BC. The mention of Kangra or Nagarkot is found in the works of Ferishta and Heun Tsang. The riches of the Nagarkot temple attracted the attention of Mahmud Ghazni, who defeated Hindu princes and seized Kangra fort. In 1556, Akbar occupied the fort of Kangra. Once, Mughal emperor Jahangir also planned to construct a residence in the valley. Kangra is known for having the ancient dynasty of the world, the Katoch. In 1758, Raja Ghamand Chand was selected as *nazim* of Jullundur Doab under the Afghans. He was a courageous ruler who restored the prestige of Kangra. He built a fort at Tira Sujanpur on the left bank of the Beas River. After his death in 1774, he was succeeded by his son, Tegh Chand. In 1810, Kangra was captured by Maharaja Ranjeet Singh's Sikh Empire. In 1846, Kangra became a district of British India when it was surrendered to British India at the end of the First Anglo-Sikh war. The British district included the present-day districts of Kangra, Hamirpur, Kullu, and Lahaul-Spiti. Kangra was a part of the British province of Punjab. The administrative headquarters of the district were initially at Kangra, but later shifted to Dharamshala in 1855.

Princely state of Mandi was established by Bahu Sen in 1200 AD; however, it was Ajbar Sen who set up the ancient city of Mandi in 1526 AD. The Chiefs of Mandi State are believed to be the progenies of Chandervanshi lineage of Sen Dynasty of Bengal who claim to be the descendants of Pandav brothers of Mahabharat period. The present day Mandi was shaped after the unification of two princely states, viz. Mandi and Suket on 15th April 1948. Maharaja Ranjeet Singh captured Mandi in 1839 but he died on 27th June 1839, which resulted in collapse of Sikh rule in hills and British emerged as the subsequent power. In 1849, princely states of Mandi, Suket and Chamba were under the control of superintendent. Lala Lajpat Rai visited Mandi in 1906 and a revolt led by Shobha Ram arose in Mandi State in 1909 against the brutal, dishonest and arrogant Raja Bhawani Sen and his wazir. Hardev Ram of Mandi joined the revolutionary group of patriots and went to Shanghai, America and Japan and met Lala Hardayal and Dr. Mathura Singh. Bhai Hirda Ram of Mandi also took part in revolutionary activities. In 1915, the viceroy converted death sentence of Hirda Ram into life imprisonment. Later, Nagchala dacoit took place in Mandi and Sidhu Kharara, a revolutionary of Mandi was sentenced for seven years. In 1933, Mandi Legislative Council was constituted and Swami Purna Nand was elected as the president of Himalayan Hill states regional Council with Pt. Padam Dev as its general secretary. Finally, on 15th April 1948, Mandi came into existence. The Chiefs of Mandi State are believed to be the descendants of the Chandervanshi lineage of Sen Dynasty of Bengal. According to one version, Bahu Sen founded a sovereign territory and was known as a Rana or local Chief. Raja Ajber Sen, the nineteenth descendent from Bahu Sen, was a capable and kind ruler, who instituted the present Mandi city around the 'Bhootnath Temple' in early 16th century. He was replaced by Chhattar Sen who constructed a fort in Kalar. The succeeding rulers of Mandi were Shyam Sen, Gaur Sen, Sidh Sen, Shamsheer Sen, Surma Sen, Ishwari Sen, Jalam Sen, Balbir Sen and Vijay Sen. Numerous public amenities were created by Raja Vijay Sen during his time. He also constructed palaces and houses. Raja Vijay Sen was issueless and left no legatee. Hence in 1897, Bhawani Sen was accepted as his successor. During his reign the city was

extensively smashed in the earthquake of 1905. In April 1914, he was triumphed by Joginder Sen and during his reign, Mandi remained under a British Officer. Mandi being one of the ancient cities adores urban status since 1901. Mandi district was created by union of the erstwhile princely states of Mandi and Suket on 15th April 1948 and since then, it is the district headquarters of the district.

There is mention about Kullu valley in ancient literary works of Ramayan, Mahabharat and Puranas. During Vedic period, several small states known as *Janapads* were present which were later occupied by the Nanda Empire, Mauryan Empire, Gupta Empire, Pala Dynasty and Karkota Empire. After a brief period of reign by King Harshavardhana, the region was divided into several local powers controlled by the chiefs, comprising of some Rajput territories. These princedoms were later occupied by Maratha and Sikh Empire. Kullu derives its name from the word '*KulantPeeth*', denoting the 'end of the habitable world'. According to a legend:

During the great flood, king Manu stayed in this valley, but was unable to cross the Rohtang pass. He found the last community, named as Kulant Peeth, and decided to settle and meditate in Manali town. The name was further changed to '*Kulut*', before finally known by the name Kullu. The Buddhist pilgrim monk Xuanzang visited Kullu Valley around 635 CE and described it as a fertile region entirely bordered by the mountains. It had a Stupa built by Mauryan Emperor Ashok, which was later taken away by a Mughal ruler. There are numerous Buddhist monasteries and Hindu temples in the valley. After long periods of isolation the area retains a charisma.

Kinnaur came into being as an independent district on 1st May, 1960. Earlier, Kinnaur was a part of the erstwhile Bushahar State with headquarters at Rampur. Very little is known about the history of Kinnaur. The initial reference of *Kinnauras* and their land is found in the folklore and mythological accounts. In the beginning of the 14th century, Kinnaur was divided into seven parts. According to Punjab State Gazetteer, from 1803 to 1815, the former states of Bushahar faced the threat of *Gurkha* attacks. The king and his mother, who could not resist the attack, escaped leaving behind their belongings in Sarahan. The *Gurkhas* robbed the assets and completely destroyed the state records. With the break of paramountcy, the Kinnaur named as Chini tehsil was united to form a part of Mahasu district. By 1960, political, ethnic and cultural deliberations created the present day Kinnaur. Even today, the culture of Kinnaur is ethnic. However, the development of horticulture has changed the lifestyle of people.

The history of Spiti is not very clear and by 10th Century, it came under the sway of the expanding Guge state. The Gazetteer of Kangra district (Mamgain, 1971) states:

"Spiti is properly a Tibetan country and had originally no connection with India, but was included in the empire of Ladak of Great Tibet. On the break-up of this empire in the 10th century many of the outlying districts were formed as independent kingdoms and in this way a chief of the name of Palgyi Gon formed the kingdom of Ladak, of which Lahaul and Spiti were the southernmost provinces."

For centuries, Spiti remained subject to raids by the neighboring states. The Nono of Spiti, based in Kewling village near Kaza represented the paramount power. Spiti's overall political status changed drastically in the 19th Century. In 1841, the Dogras of Jammu province took over Spiti. The Sikhs raided the valley but the Dogras regained Spiti following the Anglo-Sikh war of 1846. In the same year, the British exchanged Lahaul-Spiti for other territory with Dogras and later these regions became the part of British India. During the British rule,

Lahaul-Spiti were part of Kangra district of Punjab and in 1960, the two regions were conferred with the status of a separate district with headquarters at Keylong in Lahaul. In 1966, the hill regions of Punjab, including Lahaul-Spiti became a part of Himachal Pradesh (Mattoo, 1978).

Established by Raja Rasaloo of Jaisalmer, Sirmaur remained an independent state. Later, it became the princely state in British India and was named as Nahan. It was mainly ruled by Rajput dynasty. The territory of Solan district consists of princely states of Baghal, Baghat, Kunihar, Kuthar, Mangal, Beja, Mahlog, Nalagarh and parts of Keonthal and Koti and some areas of Punjab State later joined with Himachal in 1966. The district came into being in 1972 and was carved out by integrating Solan and Arki tehsils of Mahasu district and Kandaghat and Nalagarh tehsils of erstwhile Pepsu (Parmar, 1970).

The present day Shimla district comprised of nineteen erstwhile Shimla Hill States which were merged with Himachal in 1948 and founded a portion of Mahasu district. Besides these states, the hilly areas of Patiala State and areas of Kotkhai, Kotgarh, Shimla town and Jutogh Cantonment of the provincial government were merged with the district after independence. All princely states of Shimla district suffered Gorkha invasions in the beginning of the 19th Century. In the year 1815 when the Gorkha were overpowered by the Britishers they were sent to Nepal. Subsequently, their states were returned to them. Being smaller in size, these states were under the direct control of the then Superintendent of Punjab Hills States. Shimla got its name from Shimla town which was once a very small village occupied by the Charcoal manufactures. The panoramic view of Shimla fascinated the Britishers who resolved to setup their capital and in 1864 it became the official seat of the summer capital (Mamgain, 1975). Lord Lawrence came here along with the members of Supreme Council and public offices. The Punjab Government first went to Shimla in 1871 but from 1876 onwards Shimla was the summer capital till 1947 and after the partition of Punjab, it was the headquarter of Punjab government. On 1st November, 1966, Shimla became the part of Himachal after the re-organising Punjab state. At that time, it had three sub-divisions, i.e., Shimla, Kandaghat and Nalagarh. Shimla district came into being on 1st September, 1972. After the re-organisation, Kasumpti tehsil and Shimla sub-tehsil were merged to form Shimla tehsil while Kandaghat and Nalagarh were merged with Solan district. The whole Mahasu district excluding Solan and Arki tehsils were merged with newly founded Shimla district. On re-organisation of Punjab in 1966, part of Nalagarh tehsil of Ambala district were merged with district Shimla (Anonymous 1995).

During the post-independence period, the Chief Commissioner's province of H.P. came into being on 15th April, 1948. On 26th January, 1950, Himachal became a part C state with the execution of the Constitution of India. On 1st July, 1954, Bilaspur was merged with Himachal Pradesh. On 1st November, 1956, Himachal Pradesh became Union Territory. Kangra and most of the other hill areas of Punjab were merged with Himachal on 1st November, 1966 though its status remained that of a Union Territory.

Thus, on 18th December, 1970 the State of Himachal Pradesh Act was passed and the new state came into being on 25th January, 1971 and Himachal emerged as the eighteenth state of the Indian Union. Since then, it has come a long way.

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Part 2

ENVIRONMENTAL ISSUES

DISTRIBUTION, NATIVITY AND TRADITIONAL USES OF *TARAXACUM OFFICINALE*, ITS MEDICINAL, NUTRITIONAL AND ECONOMIC POTENTIAL FOR SOCIOECONOMIC DEVELOPMENT OF WATERSHED RISSA-KHAD OF MANDI, HIMACHAL PRADESH

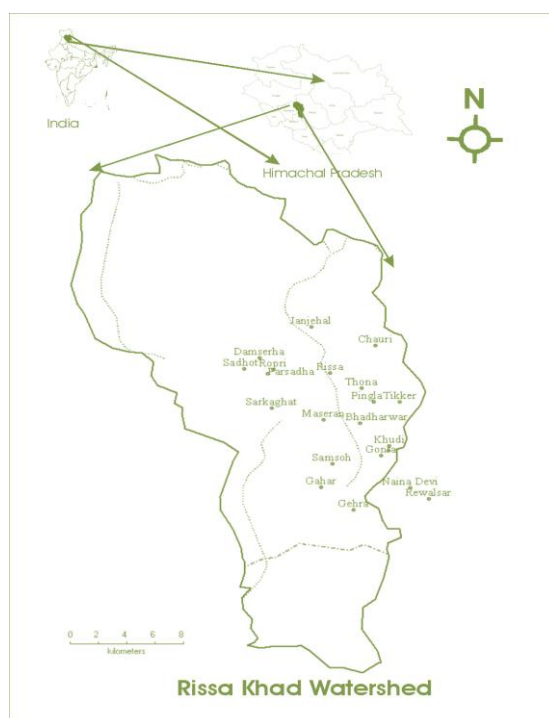
TARA DEVI & BHAVNA DEVI

INTRODUCTION

India is bestowed with enormous biodiversity useful plants. Himalayan forests are the most important source of medicinal plants and with useful species for the local people¹. The important advantages against the therapeutic use of medicinal plants in various ailments and disorders are their safety besides being economical, effective and easily available². Traditional knowledge of using such plant is decreasing day by day and is at the verge of extinction among young generation. As a result, many useful plants like *Taraxacum officinale* are ignored in spite of having immense medicinal and edible potential. *Taraxacum officinale*, commonly called Dandelion, is an herbaceous perennial belonging to family Asteraceae (Compositae) with synonyms *Leontodon taraxacum*, *L. taraxacum dens-leonis*³. Dandelion is a scapigerous, milky herb commonly seen growing along roadsides, grassy meadows, lawns, shady and damp corners of gardens, banks of water ways and other areas with moist soils. All the parts of the plant root, leaves and flowers are useful for local people and rich source of food and medicine. Dandelion is a rich source of vitamins, minerals and is particularly high in vitamins A and C and iron, carrying more iron and calcium than spinach⁴. But it is not much consumed by inhabitants of watershed Rissa-khad, so awareness is required among inhabitants for its optimum sustainable utilization as a food also. Main aims of this study are:

- To assess distribution and nativity of *Taraxacum officinale*
- To know the indigenous uses of plant in Water-shed Rissa -Khad.
- To know the nutritional, medicinal and economic potential of *Taraxacum officinale* for inhabitants of water-shed Rissa -Khad.
- To evaluate the gap between documented and actual uses of plant with respect to its medicinal uses.

The present study has been conducted in Rissa Khad Watershed (31° 37' 38" N latitudes and 76° 48' 20" E longitudes) of Mandi district; Himachal Pradesh from 2017 to 2018. Watershed covers approximately 123.07 Km² areas and represents 20 panchyats and 132 villages. The altitude of the watershed ranges from 700-2150m. It supports diverse habitats, species, communities and Ecosystems. The vegetation mainly comprises of sub-tropical and temperate types and mostly dominated by broad leaved deciduous and evergreen species and coniferous species. The watershed is inhabited by a large number of villages with 11,258 households and 33,458 human populations. The total livestock population is 11,214. (Statistical Department H.P.)



METHODS

Rapid samplings of the Dandelion were conducted throughout the watershed in different seasons of the year. Species were identified with the help of local flora^{5,6,7}. The knowledgeable persons were interviewed through questionnaire. Information on the local names, plant part(s) used, and use values including indigenous knowledge and practices was gathered. The information on the indigenous uses of the Dandelion gathered through primary as well as secondary data was analysed. The nativity of the species has been identified following Anonymous (1883-1970)⁸ and Samant *et al.*, 1998⁹.

RESULTS AND DISCUSSION

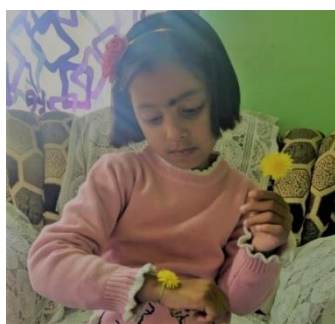
Morphology: Plant is an acaulescent perennial herb 5–70 cm tall; rhizomatous unbranched taproot root stock. Latex milky; Scapes 5–35 cm long hollow ribbed; 1–10, glabrous, hairy, tinted purplish. Flowering scapes lack bracts having single flower head. Leaves basal, radical sessile; 5–45 cm long, 1–10 cm wide, oblanceolate, oblong, or obovate, narrowing to the base. Margins shallowly lobed to deeply lobed. Lacerate or toothed. Heads ligulate, 1–2 in. diam., glabrous, solitary hollow; leafless stalk 2–3 in. long; florets, 40–100 per head, ligulate and bisexual. Pappus copious, white not leathery, soft; corollas yellow or orange-yellow. Calyculi, 12 to 18 segmented; Involucre, 14–25 mm wide, green to dark green or brownish-green, tips dark grey or purplish. Fruits, cypselae, olive-green or olive-brown to straw-coloured to greyish, 2–3 mm long. 4 to 12 ribs, silky pappus white to silver-white. 6–8 mm long.



Dandelion in different developing stages

Distribution and Nativity: Plant shows luxuriant growth in well-drained humus-rich neutral to alkaline soils in full sun or light shade and look like an ornamental plant. Plant commonly found in temperate regions of Western Himalayas from 300 m to 5500 m, in watershed plant is seen from 700 m to 2150 m. It is native of Europe and Asia, but naturalized in North America and now grows widely as a weed in nearly all the temperate climates.

Indigenous Uses: Dandelion is used as a food, medicine and ornamental plant by locals; it is very famous among children and known for its silky pappus which forms the parachutes for seed dispersal. This silky white pappus is flown by children during their play in air and is a great source of fun and entertainment for them, it appears as a snow ball after flowering period so the plant is also known as **snowball** locally. Children also divide unbranched stem bearing flower into two parts upto apex and bear it like wrist watch therefore Dandelion is famous among kids with the name **ghadiphool**. Old women used to wear a gold nose pin called as Dandelion in their nose which resemble with *laung* flower so the plant is given the local name Dandelion in many parts of Himachal Pradesh. Local name of Dandelion varies from place to place and many other names are also given to the plant like, *dudhii*, *kaadavisunaehari* and *sihanparni*. People mix its tender leaves with other available greens and cook as a vegetable. Flowers are used to prepare a traditional dish *KACHARU*, *SOSRU*, *BHALE* or *MASORU*. For this they make paste of spices, flowers and *besan*, then cook like a *chilla*, but this practice of consuming plant is not very popular as very few knowledgeable people used to use Dandelion for edible purposes.

A child bearing Dandelion flower as wrist Watch, so plant is known as *GhadiPhool*

Dandelion silky white pappus giving appearance of snowball

A woman bearing gold nose pin *laung* in her nose which shows resemblance with Dandelion flower so plant known as *Laung* plant

Edible uses and nutritional potential: Leaves, stems and flowers of dandelion are consumed in their natural state and can be eaten cooked or raw. Its tender and young leaves can be eaten

raw as a salad or can be used in other dishes requiring greens. Leaves can be cooked as spinach. The root can be roasted and used in teas or consumed whole as a great beverage. The stem leaves, and seeds can be used to prepare coffee which is caffeine free. The flowers can be eaten raw, cooked or even made into wine.



Harvested Dandelion Flowers for cooking



Harvested Dandelion leaves for cooking

Dandelion is not much known for its edible uses in watershed *Rissa khadof* Himachal Pradesh and considered as a weed to be removed from lawn, gardens or cultivated field. Although people use plant as an herbal remedy to treat many disease. Very few people know that from root to flower all the parts of Dandelion are highly nutritious. Plant is loaded with vitamins, minerals and fibre which can provide edible leaves and roots all year round and flowers during spring season. Leaves are cooked like spinach with potato or as a *saag*. Flowers with *besan* (Gram flour) and spices are cooked as *chilla* (*Kachru*).

For preparing a *kachru*, ingredients required are 250 g *besan* (black gram powder) or *corn flour*. 1/2 kg Dandelion fresh flowers. 1 cup amount fresh coriander leaves, 1/2 table spoon *ajwain*, 3-5 green chillies, 1/2 table spoon turmeric powder, 2-3 chopped onions and salt according to taste. Make a paste of flower petals, *besan* or *corn flour* and spices. Heat some oil on a flat heating pan. Put this paste over a pan and cook for 15 to 20 minutes then *kachru* will be ready.

Plant is bitter in taste so it's better to mix leaves of this plant with leaves of other available pot herbs like *Medicago polymorpha*, *Rumex hastatus*, *Chenopodium album*, *Vicia sativa*, *Vicia hirsute*. *Amaranthus viridis* and *Commelinacommunis* are usually mixed.

RECIPE PREPARED FROM LEAVES AND FLOWERS OF DANDELION

Dandelion Root Tea: Roots are dried and used to prepare tea for a different flavour and for its medicinal uses.

Food Value: 100g of the raw fresh leaves contain about 2.7g. Protein; 9.2g, carbohydrate, 187mg Calcium; 66mg, phosphorus; 3.1mg, iron; 76mg, sodium; 397mg, potassium; 36mg, magnesium; Thiamine, 0.19mg; Riboflavin, 0.26mg; Niacin, 0.81 mg; vitamin B1, 0.26 mg; vitamin B2, 35mg, vitamin C; Vitamin E, 3.44 mg; Vitamin K, 778.4 µg; 14000 µg vitamin⁷

Dandelion vegetable is considered tonic, blood purifier, laxative with strong antioxidant capabilities that can prevent aging and certain diseases, help to reduce weight and boost immune system.

Medicinal Potential: Roots and leaves used to treat liver problems, Kidney disease, swelling, skin problems, heartburn, and upset stomach. Plant extract treat stomach problems, appendicitis, and breast problems, such as inflammation or lack of milk flow. Plant is

remedies for fever, boils, eye problems, diabetes, cancer and diarrhoea. The plant has slight insulin content and is used as bitter for loss of appetite and stomach upsets it is useful in vitiated conditions of kapha and vata¹⁰.

Powdered leaves (1-2g) recommended for stomach ailments twice a day for three days¹¹.

Chemical constitution: Active constituents of rhizome and roots and fruits are bitter crystalline principle, taraxacin and a crystalline substance, taraxacerine: the phytosterols-taraxasterol and homotaraxasterol beside saponin. The milky sap contains acerylalcohol, lactuce-roltaraxacin and choline. The root yield insulin, tannin and some ethereal oil; the leaves contain vitamin C and the flower xanthophylls. Also contain potassium and vitamin A^{12,13,14}.

Aesthetic Value: Dandelion is known for its tremendous aesthetic beauty in watershed. Yellow flowers during flowering period in spring season and silky white pappus after flowering fetch everyone attention. This silky white pappus appears as a snow ball after flowering period and is flown by children during their play in air. They also divide unbranched stem bearing flower into two parts upto apex and bear it like wrist watch. Plant can be planted for ornamental purpose in garden.

Economic Potential: Dandelion root extract is sold in many parts of India as a dietary supplement. Whole plant is also available in various supplemental forms, such as capsules, extracts and tinctures. So Dandelion can be a good source of earning for the inhabitants of watershed Rissa-Khad where it is generally considered as a weed due to its vigorous growth. The flowers are also dried and mixed with powdered mixture of several other herbs that can be added to a compost heap in order to speed up bacterial activity and thus shorten the time needed to make the compost¹⁵. A liquid plant feed can be made from the root and leaves¹⁶. Low-quality latex can be obtained from the roots of this plant which can be used for making rubber. A magenta-brown dye is also obtained from the root of this plant¹⁷.

Table1. Pharmaceutical products of *Taraxacum officinale* and their biological roles

Name of Market Product	Biological Activity	Products
Solaray Dietary Supplement	(Provide vitamins, minerals) Supports the liver and the gall bladder to promote digestion. Supports the liver and the detoxification process. Used by some as a liver or kidney tonic, as a diuretic and for minor digestive problems.	
Health Aid-Dandelion herbal liquid	Dandelion herbal liquid is derived from top quality herbs, those are cultivated without the use of chemicals, preservatives, herbicides, pesticides, fumigicides or irradiation to maintain purity.	
Dandelion fresh herb tincture	Dandelion is a well-known digestive herb, and a few drops can be taken before meals to prevent gas and after meals for heartburn. It's also known as a cleansing herb, that supports healthy liver and kidney function. The same cleansing action is used as a blood purifier, that can help reduce blood cholesterol.	

Dandelion Liver Tone Herb	Dandelion has been shown to improve liver function by removing toxins and reestablishing hydration and electrolyte balance.	
Dandelion root capsules	Dandelion Root has a number of beneficial properties. Specifically, it is known for its antioxidant and anti-inflammatory properties. This can lessen swelling and pain. It's also beneficial as a diuretic that stimulates urination, and as a laxative to promote bowel function	

Dandelion is a good source of ethylene gas, which stunts the growth of nearby plants and causes premature ripening of fruits¹⁸. Distilled water made from the ligules is used to clear the skin and is particularly effective in fading freckles cosmetically¹⁹. Dandelion is harvested as a fodder in watershed and is considered good for milch cattle and supposed to enhance milk yield.

CONCLUSION

Dandelion with its multifarious uses is a multipurpose plant for the inhabitants of watershed *Rissa-khad*, but it is not yet utilized optimally by locals. Documented medicinal uses of this plant are enormous but practised very less in actual. Plant has a vast potential of treating many serious diseases and is also used in many pharmaceutical medicines. People can commercially use dried plant parts of Dandelion to enhance their income. Awareness regarding its medicinal and nutritional uses is required among masses. So, they can be benefited by its enormous potential to treat diseases, fulfil malnutrition and increase earning of people.

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EIA OF HYDRO-ELECTRIC PROJECTS IN DISTRICT KINNAUR, HIMACHAL PRADESH

HARISH SINGH & SUNIL KUMAR GUPTA

INTRODUCTION

Hydropower generation has shown increased development from the beginning of the 21st century. Trends for upcoming decades forecast a great increase of hydropower mainly in developing countries and growing economies. Electricity is essential for human life, welfare and sustainable development. In the last decade, hydroelectric, wind energy and solar energy have been developed strongly. The most vital source of energy is the power of water.³ Hydropower is a major developmental activity in most of the parts of the world. The state of Himachal Pradesh is situated in the heart of Western Himalaya and covers 5550890.60 hectare land. Himachal Pradesh is rich in natural resources. Himalayan regions are rich sources of natural water flowing through its continuous rivers⁶. Himalayan region is now under continuous threat. Kinnaur district is not untouched with these developmental activities. These developmental activities have disturbed natural resources in Kinnaur. Hydropower projects have majorly disturbed the nature of Kinnaur. The Kinnaur has very high hydel potential. Large number of hydroelectric project has been constructed in the area. The people in Kinnaur are facing lots of difficulty due to construction of hydroelectric projects.

Natarajan 2000, in their paper author has examined the role of energy for national development. The main objective of the paper has been to examine the significance of renewable energy sources in the energy mix. It has been studied that energy along with other dimension such as environment, ecology, economics and equity. The study highlights the many issues, concepts and paradigms which are required for policy maker to make sustainable policy.

Sinclair and Diduck (2000) studied the changes of Environmental Protection Act. They highlight many issues i.e. inaccessibility of information, lack of familiarity with EIA, lack of institutional capacity and hinder serious public involvement. The authors have focused on safety issues new road construction and jobs with little thought of environmental impact.

Jai-kon li (2012) author has studied the importance of the primary development of hydroelectric energy. The study had related to the climate changes concern the development of energy. Authors suggest that to encourage the sustainable development of the economy and society. It is necessary to invent the proper model of hydropower exploitation and environmental protection should also be given more attention.

Ganguly *et al.* (2014) In that paper has been evaluated the Environmental impact assessment of hydropower projects in Himachal Pradesh. They have analyzed that the impacts of hydropower project on environment during both construction and operational phases of the projects. They have analyzed National and International procedures on EIA of hydropower projects. They Authors have suggested that develop hydropower projects more environmental friendly.

Sharma *et al.* (2014) highlighted the social and environmental impacts that arisen from hydroelectric power projects. Author has point out the Some negative impacts of hydroelectric projects include loss of vegetations, topographical disturbances, changes in rivers flow patterns, involuntary resettlement, health problems, loss of cultural values and marginalization of local people. They have suggested that the nongovernmental organizations should come forward with full time participation to protect the environment and taking appropriate strategies and make the local people aware about their rights.

Ahlers 2015, examined the new development of hydropower in the Eastern Himalayas of Nepal and India. Author has emphasized that ways also mitigate the effects of climate change. He has reviewed the construction and operation existing hydro geological processes and ecosystems as well as its impacts on the livelihoods of diverse groups of people that depended on the project. The study concludes that hydropower development in the region has inherent contentions and uncertainties and refuting the idea that dams constitute development projects whose impacts can be simply predicted, controlled and mitigated. Authors have suggested outline the characteristics of the Himalayan region and discuss the scale of planned hydropower development.

Krishnan 2015 paper evaluates Central Government policy and development related to hydropower sector. Author explained India was able to use all the exploitative hydroelectric power in the region including the Himalayas in co-operation with its neighboring countries. Author was suggested that there should been renewable energy projects to meet the future demand of power in the country by which the object of power to all can be achieved.

Chhabra, 2017 examined the socio-economic and environmental effect by the construction of hydro-electric projects in Uttarakhand. Impact evaluation is determined through the domestic survey in three villages. Analysis shows mixed effects. Author has analysed that income in fertility of soil, deforestation, noise pollution and deficiency. Also hydroelectric project development, generate employment and infrastructure through road construction and better drinking water facilities.

Viviane *et al.* 2018 conducted a study on “An Overview of Hydropower Reservoirs in Brazil: Current Situation, Future Perspectives and Impacts of Climate Change”. They investigated the potential impacts of climate change on hydropower generation and possible mitigation adjustments. The assessment of climate change impacts projections anticipates possible future scenarios and can assist in strategic planning together with the dentition of adaptive operational policies. They have suggested the studies to develop reliable scenarios for the future availability of water resources for hydroelectric power generation.

Akova *et al.* 2018 identified the environmental impact of small hydropower project plant in spisske Bystr Slovakia. The main objective of paper was to analyses and evaluated the environment impact of small hydropower project. The matrix has been used for the environmental impact assessment. Environmental requirements for construction the negative impact on the environment is minimized in the preparatory phase of the project. They have assessed the impact of the construction on the environment. Finally they find out that avoiding an increase in costs due to unforeseen impacts during the construction phase. The paper is based on the study carried out to study the impact of hydropower project on Environment in kinnour district.

ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment (EIA) it is environmental law. That is use an important instrument for environmental protection. EIA study provides information based on sufficient information and scientific study. Such information is to be placed in the public domain and is issue to critical review by people. As a scientific analysis of the environmental constraints, the EIA constitutes an important part of pre-project study which helps in improving project standard. EIA study is aimed at protecting the environment by integrating the environmental issues in the planning process. Assessment of the impact on the environment by hydroelectric project is considered as a instrument that minimizes the implementation of actions which could in any way negatively interfere with the environment. The same time allows choosing the optimal solution from the proposed alternatives of the project implementation the alternative with the minimum negative impact of a proposed activity on the environment.

IMPACT ON ENVIRONMENT IN KINNOUR DISTRICT

The Hydropower projects have impacts on the environment in district kinnour. Impacts perceived by the respondents. There are some ecological problems related with impact on environment. Some of the impacts and problems faced are mention under table 1.

Table 1: Classification of the following physical environment and bio diversity factors are being affected by the hydropower project.

SN	Statement	Agree	Disagree	Can't Say	Total	Mean	S.D.	Chi Squire	P. Value
1.	Soil erosion.	380 (79.2)	32 (6.7)	68 (14.2)	480 (100)	1.35	0.715	457.800	0.000
2.	Affected to drinking water supplies.	330 (68.8)	64 (13.3)	86 (17.9)	480 (100)	1.49	0.781	272.450	0.000
3.	Shortage of water irrigation.	246 (51.3)	139 (29.0)	95 (19.8)	480 (100)	1.69	0.783	75.388	0.000
4.	Noise Pollution/ Air Pollution.	377 (78.5)	44 (9.2)	59 (12.3)	480 (100)	1.34	0.686	442.163	0.000
5.	Deprivation of the Right on Natural Resources (herbs, timber, fodder etc.)	301 (62.7)	88 (18.3)	91 (19.0)	480 (100)	1.56	0.792	186.413	0.000
6.	Problems Arising out of Cash Compensation (Apple, Pulses and Pine nut or chilgoza etc.)	402 (83.8)	28 (5.8)	50 (10.4)	480 (100)	1.27	0.636	550.550	0.000
7.	Depletion of forest resources.	375 (78.1)	48 (10.0)	57 (11.9)	480 (100)	1.34	0.680	433.612	0.000
8.	Land slide/ Rock fall.	389 (81.0)	52 (10.8)	39 (8.1)	480 (100)	1.27	0.601	492.163	0.000

Source: Field Survey, 2019.

Note- Figure in parenthesis depicts percentages

d.f. 0.6 P value 0.000

ANALYSIS AND INTERPRETATION

Soil erosion after projects: It is observed from the table 79.2 percent agree that soil erosion due to the project. However, 6.7 percent of the total respondents were disagreed and 14.2 percent are no opinion with the statement. The table exhibits that that majority (79.2 percent) of the respondents was agree with the opinion that soil has been erosion after the project.

Thus, it can be concluded that respondents were strongly agreed that during construction phase, soil erosion level in area has been increased. In case of soil erosion after project the mean value has been found 1.35, which shows soil erosion after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is soil erosion due to hydro power projects.

Affected drinking water supplies after projects: It is observed from the table 68.8 percent agree that affected to drinking water supplies due to the projects. However, 13.3 percent of the total respondents were disagreed and 17.9 percent are no opinion with the statement. The table exhibits that that majority (68.8 percent) of the respondents was agree with the opinion that drinking water supplies has been affected after the projects in study area. Thus, it can be concluded that respondents were strongly agreed that during construction phase, affected to drinking water supplies. In case of affected to drinking water supplies after project the mean value has been found 1.49, which shows affected to drinking water supplies after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is environmental pollution due to hydro power projects.

Shortage of water irrigation after project: It is observed from the table 51.3 percent agree that shortage of water irrigation due to the project. However, 29.0 percent of the total respondents were disagreed and 19.8 percent are no opinion with the statement. The table exhibits that that majority (51.3 percent) of the respondents was agree with the opinion that water irrigation has been shortage after the projects. Thus, it can be concluded that respondents were strongly agreed that during construction phase, shortage of water irrigation has been increased. In case of Environment pollution after project the mean value has been found out 1.69, which shows shortage of water irrigation after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is shortage of water irrigation due to hydro power projects.

Noise Pollution/ Air Pollution after projects: It is observed from the table 78.5 percent that noise Pollution/ air Pollution due to the project. However, 9.2 percent of the total respondents were disagreed and 12.3 percent are no opinion with the statement. The table exhibits that that majority (78.5 percent) of the respondents was agree with the opinion that noise/air has also been polluted after the projects. Thus, it can be concluded that respondents were strongly agreed that during construction phase, pollution level in air has been increased. In case of noise Pollution/ air Pollution after project the mean value has been found out 1.34, which shows noise Pollution/ air Pollution after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is noise Pollution/ air Pollution due to hydro power projects.

Deprivation of the Right on Natural Resources after projects: It is observed from the table 62.7 percent agree that deprivation of the Right on natural resources (herbs, timber, fodder etc.) due to hydropower projects. However, 18.3 percent of the total respondents were disagreed and 19.0 percent are no opinion with the statement. The table exhibits that that

majority (62.7 percent) of the respondents was agree with the opinion that the right on nature resources has also been deprivation after the project in kinnour district. Thus, it can be concluded that respondents were strongly agreed that during construction phase, deprivation of the right on natural resources has been increased. In case of deprivation of the right on natural resources after project the mean value has been found out 1.56, which shows Environment pollution after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is Deprivation of the Right on Natural Resources due to hydro power projects.

Problems Arising out of Cash Compensation after projects: It is observed from the table 83.8 percent agree that problems arising out of cash compensation (Apple, Pulses and Pine nut or chilgoza etc.) due to hydropower projects. However, 5.8 percent of the total respondents were disagreed and 10.4 percent are no opinion with the statement. The table exhibits that that majority (74 percent) of the respondents was agree with the opinion that Environment has also been polluted problems arising out of cash compensation after the project. Thus, it can be concluded that respondents were strongly agreed that during construction phase, problems arising out of cash compensation has been increased. In case of problems arising out of cash compensation after project the mean value has been found out 1.27, which shows problems arising out of cash compensation after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is problems arising out of cash compensation due to hydro power projects.

Depletion of forest resources after project: It is observed from the table 78.8 percent agree that depletion of forest resources due to the project. However, 10.0 percent of the total respondents were disagreed and 11.9 percent are no opinion with the statement. The table exhibits that that majority (74 percent) of the respondents was agree with the opinion that forest resources have been depletion after the project in study area. Thus, it can be concluded that respondents were strongly agreed that during construction phase, depletion of forest resources has been increased. In case of depletion of forest resources after project the mean value has been found out 1.34, which shows depletion of forest resources after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is depletion of forest resources due to hydro power projects.

Land slide/ Rock fall after project: It is observed from the table 81.0 percent agree that land slide/ rock fall due to the project. However, 10.8 percent of the total respondents were disagreed and 8.1 percent are no opinion with the statement. The table exhibits that that majority (81.0 percent) of the respondents was agree with the opinion that land slide/ rock fall has been increased after the projects. Thus, it can be concluded that respondents were strongly agreed that during construction phase, land slide/ rock fall has been increased. In case of land slide/ rock fall after project the mean value has been found out 1.27, which shows land slide/ rock fall after project by the respondents. On applying χ^2 test, its P value has been found significant at 5 percent level of significance, which shows null hypothesis is rejected. That the table shows there is land slide/ rock fall due to hydro power projects.

CONCLUSION

Like all energy and water management works, hydropower projects have negative and positive environmental and social impacts. Hydroelectric may have significant environmental impacts at local area and regional level. The present study is an attempt to describe some of the above mentioned issues in reference to a hydroelectric project in the district kinnour of Himachal Pradesh. The Hydropower projects have both positive as well as negative impacts on the environment. There are various ecological problems which negatively impact on environment. The selection of a specific power project also helps to highlight these issues from the point of view of the affected inhabitants of the site and its catchment area. The Study shows that the impacts of hydropower projects activities in kinnour district indicate need for sustainable development to the environment.

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GOVERNMENT & PRIVATE ECO-TOURISM SITES IN DISTRICT SHIMLA: A COMPARATIVE STUDY

KANIKA CHAUHAN & PANKAJ GUPTA

“When one tugs at a single thing in nature, he finds it attached to the rest of the world.”

INTRODUCTION

Eco-tourism is the most uprising sub-sector of tourism industry. To overcome the detrimental effects of anthropogenic degradation of the environment, which include overcrowding, traffic congestion, privacy invasion and environmental pollution, eco-tourism has developed as a holistic approach for a sustainable environment. In 1987 Ceballos-Lascurain first coined the definition of ecotourism stating that *‘we may define ecological tourism that involves travelling to relatively undisturbed or uncontaminated natural areas with the specific objective of studying, admiring and enjoying the scenery, wild plants and animals’*. He also made reference to *‘any existing cultural manifestations (both past and present) found in these areas’* as an essential component of the eco-tourism resource (Ceballos-Lascurain, 1987). Buckley (1994) studied the eco-tourism framework as it is the fastest growing subsector of tourism. He discussed the four main links between tourism and environment which include components of the natural environment as the basis for a marketable tourism attraction or product; management of tourism operations to minimize or reduce their environmental impacts; economic or material contribution of tourism to conservation, either directly or indirectly; and attitude of tourists towards the environment and environmental education of clients by tourist operators. Thampi (2005) evaluated the eco-tourism project at the Periyar Tiger Reserve, Thekkady, Kerala which was initiated through the “India-Eco-Development” programme in seven states to promote the local community participation. The Periyar Tiger Trail Project involved members who were earlier involved in illegal trade of forest produce. Their indigenous knowledge and survival instincts were put to best use in eco-tourism practices. Vinodan and Manalel (2011) discussed Parambikulam Tiger Reserve in Kerala as a case study for examining the economic development of local communities or tribal communities residing in the forest areas through the concept of eco-tourism. The study explored the socioeconomic benefits enjoyed by the local dwellers and revealed that the ecotourism programmes made the local communities less reliant on forest produce for their livelihood needs. Agarwal *et al.* (2013) prepared a list of best practices and recommendations for sustainable development in eco-tourism especially for the state of Himachal Pradesh. Various potential eco-tourism sites have been analysed based on the interviews with various government officials, local people and tourists while studying the best practices. The main findings revealed that people still lacked the understanding of eco-tourism due to the presence of untrained staff and were willing to promote sustainable practices if government helped in the promotion of the same.

Himachal Pradesh is blessed with valuable natural heritage, which exists in form of mountains, rivers, coniferous forests, enriched wild flora and fauna. HP ECOSOC-Himachal Pradesh Eco-tourism Society explains that Community Based Eco-tourism (CBET) is a key element of eco-tourism in Himachal Pradesh. Direct involvement of local communities would improve the socio-economic conditions of the people and make the community directly

answerable for protection of cultural heritage and environment. The study tries to analyze and compares the eco-tourism sites developed by public and private organisations with the help of case studies. A set of recommendations have been proposed which will help in upholding the environment and society at large.

RESEARCH METHODOLOGY

Research methodology is a way of systematically solving the research problem. The Primary data was collected using a pre-designed semi-structured questionnaire which consisted of both close and open-ended questions for the locals and visitors. A total of 120 respondents were selected. An exhaustive field study of the four ecotourism sites- Nature Park, Carignano, Mashobra; Aamod Eco-unit, Shoghi; Mashobra Greens, Village Seepur, Mashobra and Tannu Jubbar Lake-Eco-Park, Kotgarh was carried out and photographic documentation was done for elucidating the data. Secondary information included research papers; detailed project reports of concerned departments; books and web sources; national, international journals and newspaper articles.

RESULTS AND FINDINGS

The International Eco-tourism Society (IETS) has defined eco-tourism as *“responsible travel to natural areas that conserves the environment and improves the well-being of local people.”* Himachal Pradesh is a potential eco-tourism site and thus the HP Forest Department formulated the Ecotourism Policy in 2001 which was subsequently revised in the year 2005 and then in the year 2017. The central theme has been to decongest and disperse the over flowing city tourists closer to nature and ensure adequate economic return to the state and livelihood opportunities to the local communities. The policy aims to provide a preferred destination for visitors and opportunities to promote Community Based Eco-tourism (CBET) particularly using latest approaches of Participatory Forestry Management, for sustainable development of the forests, thereby generating revenue for the state.

ANALYSIS OF GOVERNMENT AND PRIVATE ECO-TOURISM SITES IN SHIMLA DISTRICT OF HIMACHAL PRADESH

The analysis of the three governments and a private ecotourism site presented the actual implementation process of the ecotourism policy.

The main findings revealed that despite various drawbacks in the implementation of the eco-tourism policy at the sites, the visitors or tourists found the eco-tourism sites eco-friendly and worth visiting. 57.5% of the visitors were likely to visit the sites again and 81.25% belonged to states other than Himachal Pradesh.

The private sites were observed to work more towards achieving the goals of eco-tourism policy than the government sites. Absence of well-built roads, nature guides, unfit drinking water, and lack of signages for promotion of eco-tourism, unhygienic washrooms and occasional littering were observed at most sites. The money allocated for the development of various attractions by the government had not been invested much and wisely. Local people found insignificant change in the livelihood opportunities which has been one of the fundamental aspects of the policy. Lack of interaction between the locals and visitors was observed; whereas the underlying concept focuses on the active participation of local communities. Though local excursions were being organized, the significance of traditional

and religious values and customs of the native places were not made to be understood among the visitors. Some sites also reported cases of mishaps. Lack of adequate number of training workshops for local people has also caused unemployment and disinterest in the visitors about learning the culture and biodiversity of the sites.

Despite lacking some of the major objectives of the eco-tourism policy, each site implemented some aspects of the eco-tourism policy which included the maintenance of aesthetic appeal of the sites and peaceful atmosphere by establishment of gardens, lawns and adventure activities. Preparation of local cuisine and organisation of a plantation drive at Aamod Eco-unit can be considered as a beginning step towards achieving the goals of eco-tourism policy. The construction of bamboo cottages using pre-fabricated material was observed to be less deteriorative towards the environment. One of the major positive impacts of the private eco-tourism site was the providing of employment to the local residents of the areas. Organisation of fairs near the eco-tourism sites provides an increase in the temporary livelihood opportunities of various vendors during a particular season only. Hence, it has been observed that both the government and private eco-tourism sites need to enact the procedures as mentioned in their Detailed Project Reports (DPRs) and in the Eco-tourism Policy for the successful implementation of the objectives and visions enshrined in the concept of adopting the eco-tourism approach. The Eco-tourism Policy of Himachal Pradesh is still in its infancy stage and a lot needs to be done for the overall protection and preservation of the environment.

RECOMMENDATIONS

- Development of a layout plan before the construction of sites.
- Use of pre-fabricated material for the building of infrastructure.
- Maintenance of sanitary and hygienic conditions.
- Use of pro-environment waste management practices.
- Use of energy conservation and water harvesting techniques.
- To provide ample livelihood opportunities to the local dwellers of the area.
- To develop a “silence zone” around the eco-friendly sites to reduce noise pollution and disturbance to flora and fauna.
- Proper construction of road leading to the main site.
- Direct revenue for conservation of natural and protected areas.
- Framing and execution of strict rules and penalties for prohibition of hunting.
- To involve active participation of local community for preserving the environment and protection of cultural practices.
- To minimize environmental impact by conducting small tourist groups for excursion activities.
- To maintain the sanctity of local religious places so as not to affect the sentiments of local community.
- To spread awareness regarding the various sustainable practices to promote eco-tourism.
- To organize various training workshops for the local people to make them aware regarding their responsibilities, rights and duties.

Analysis of the implementation of Eco-tourism policy vis-à-vis the objectives laid down in the DPR are presented in Table 1-4. The comparative case study revealed that Site I attracted more tourists from outside as compared to site II. The interaction of the visitors staying at site I is more with the local people which is about 70% in comparison to site II where it is a mere 35%. Site II showed visitors with more environmental awareness in comparison to visitors at site I. The visitors visiting site II were 100% affirmative on visiting the site again as it was readily approachable. As for the local residents, livelihood opportunities increased by 80% for locals at Site I than those at site II. The residents of both the sites were almost equally aware regarding eco-tourism awareness

DISCUSSION

The concept of initiating eco-tourism has been to overcome the detrimental effects of mass tourism. Hence, it has evolved as an important part of tourism sector. This is in accordance with the research of Buckley (1994) who emphasized eco-tourism as the fastest growing sub-sector of tourism. In Himachal Pradesh, its initiation and growth has been developed through an eco-tourism policy framed by the eco-tourism wing of the HP Forest Department which includes the conservation of environment, sustainable practices and educating visitors and providing employment to the local stakeholders. This is in accordance with the study of Diamantis (1999) in which the concepts and definitions of eco-tourism have been discussed which include nature, education and sustainable development as the major components of eco-tourism. Visit to Tanu Jubbar Lake revealed that the religious and spiritual beliefs of the local people have great significance for propagation of eco-tourism. The area around the lake has been developed into an eco-park keeping in view the traditional sentiments of the local communities. This finding is in accordance to the assessment made by Maharana *et al.* (2000) of Khecheopalri Lake in Sikkim where it has been suggested that proper management of the Himalayan lakes can increase the economy of the place. Adventure activities and promotion of community fairs and festivals also forms an important aspect of the eco-tourism policy for promoting community-based eco-tourism. This finding is in accordance with the findings of Singh and Mishra (2004) in which inter-relation of natural and cultural heritage is considered as an important aspect for improving the socioeconomic aspects of the area. Analysis of Mashobra Greens revealed that many local youth had been employed for conducting various adventure activities at the site. Along with this, the local women had been employed to plaster the walls of the mud houses. Since plastering of walls is a peculiar feature to that area, the women required no training and were adept to perform the task well. The findings lie in agreement to those of Thampi (2005) in which indigenous knowledge of the members of local communities were evaluated for the promoting eco-tourism practices. The participation of host communities also finds its acceptance in the research work of Bansal and Kumar (2011) which signify the need for capacity building among the host communities.

The best practices for Himachal Pradesh should include minimum negative impacts on nature and culture of the concerned site. Regional tourism covering spiritual and traditional aspect of the host community must be given impetus for procuring sociocultural and economic benefits for the stakeholders. Last, but not the least, eco-tourism promotion should not exceed the social and environmental limits.

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COMPARATIVE CASE STUDY OF A GOVERNMENT & PRIVATE ECO-TOURISM SITE

Site I: Mashobra Greens, Mashobra (Private) TOURISTS PROFILE							Site II: Aamod Eco-Unit, Shoghi (Government) LOCAL'S PROFILE						
Gender	Site I		Site II		Total		Gender	Site I		Site II		Total	
	N	%	N	%	N	%		N	%	N	%	N	%
Male	11	55	12	60	23	57.5	Male	7	70	8	80	15	75
Female	6	30	8	40	14	35	Female	3	30	2	20	5	25
Children	3	15	0	0	3	7.5	Total	10	100	10	100	20	100
Total	20	100	20	100	40	100							
Age groups	Site I		Site II		Total		Age groups	Site I		Site II		Total	
	N	%	N	%	N	%		N	%	N	%	N	%
15-25	7	32	7	35	14	35	20-30	1	10	5	50	6	30
26-35	3	15	4	20	7	17.5	31-40	2	20	5	50	7	35
36-45	8	40	4	20	12	30	41-50	2	20	0	0	2	10
46-55	2	10	5	25	7	17.5	51 above	5	50	0	0	5	25
56-65	0	0	0	0	0	0	Total	10	100	10	100	20	100
Total	20	100	20	100	40	100							

Site I: Mashobra Greens, Mashobra (Private) TOURISTS PROFILE							Site II: Aamod Eco-Unit, Shoghi (Government) LOCAL'S PROFILE						
Occupation	Site I		Site II		Total		Educational Qualifications	Site I		Site II		Total	
	N	%	N	%	N	%		N	%	N	%	N	%
Student	5	25	7	35	12	30	Uneducated	1	10	0	0	1	5
Govt. Employee	5	25	3	15	8	20	Up to class 10	4	40	2	20	6	30

Private	5	25	6	30	11	27.5		Up to class 12	4	40	3	30	7	35
Business	2	10	2	10	4	10		Graduation	1	10	2	20	3	15
Others	3	15	2	10	5	12.5		Graduate with training	0	0	3	30	3	15
Total	20	100	20	100	40	100								
Hometown	N	%	N	%	N	%		Occupation	N	%	N	%	N	%
From H.P.	-	-	3	15	3	7.5		Private	4	40	8	80	12	60
Outside H.P.	20	100	17	70	37	92.5		Govt. Employee	0	0	0	0	0	0
Total	20	100	20	100	40	100		Horticulture	3	30	0	0	3	15
Associates	N	%	N	%	N	%		Others	3	30	2	20	5	25
Family	17	85	14	70	31	77.5								
Friends	3	15	6	30	9	22.5		Income	N	%	N	%	N	%
Transportation	N	%	N	%	N	%		Below 10,000	5	50	4	40	9	45
Personal Vehicle	8	40	10	50	18	45		Above 10,000	5	50	6	60	11	55
Tourist Cab	12	60	10	50	22	55								
Site Suggestion	N	%	N	%	N	%		Type of Family	N	%	N	%	N	%
Internet	13	65	6	30	19	47.5	Joint	7	70	7	70	14	70	
Tour and travel	5	25	11	55	16	40	Nuclear	3	30	3	30	6	30	
Friends	2	10	3	15	5	12.5	No family	0	0	0	0	0	0	

CASE STUDIES: REFLECTION OF THE IMPLEMENTATION OF POLICY AT VARIOUS SITES**Table 1: ANALYSIS- NATURE PARK, CARIGNANO, MASHOBRA, SHIMLA**

Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Preservation of natural flora and fauna	Naming of prominent tree species	Implemented	No methods for conservation of natural fauna
Increase in livelihood opportunities of locals	Proposed: 6 workers	Employed: 4 workers	No impact on livelihood/ employment opportunities
Recognition of spiritual, religious and traditional beliefs of local communities	Not mentioned	Not implemented	Less involvement in ecotourism activities by the locals.
Provide peaceful and knowledgeable experience to visitors	Mentioned	Implemented	None
Efforts in controlling pollution and garbage collection	Not mentioned	Implemented	None
Presence of information boards	Mentioned	Implemented	None
Proper construction of roads/ pathways	Mentioned	Not implemented	Inconvenience to visitors especially children and elderly
Organisation of training programmes and workshops	Mentioned	Implemented	None
Involvement of students at primary level	Not mentioned	Not implemented	Lack of environmental protection at primary level
Development of training modules and materials	Not mentioned	Not implemented	Lack of detailed informative knowledge regarding the flora and fauna of the site
Employment of nature guides/adventure professionals	Not mentioned	Not implemented	Unemployment among locals and inefficiency in guiding the tourists
Collaboration with Community Based Organisations (CBOs)	Not mentioned	Not implemented	Lack of awareness and maintenance of the sites due to non-involvement of locals

Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Involvement of local institutions like Mahila Mandals, Yuvak Mandals, etc.	Not mentioned	Not implemented	Lack of interaction among locals and visitors
Establishment of linkages with other departments	Mentioned	Not implemented	Lack in efficient management of the site
Tie-ups with tour operators, travel agents and hoteliers	Not mentioned	Not implemented	Travelling and accommodation problems faced by visitors
Development of nature parks and trails/ nature walks	Mentioned	Implemented	None
Organisation of camps	Not mentioned	Not implemented	Reduced influx of visitors
Construction of only pre-fabricated/temporary structures	Mentioned	Implemented	None
Organizing adventure activities	Not mentioned	Not implemented	Lack of sight-seeing and thrill adventures
Plantation and maintenance of nurseries	Mentioned	Implemented	None
Impact assessment studies	Not mentioned	Not implemented	Lack of measures for constructive assessment
Permissible limit of carrying capacity	Not mentioned	Not implemented	Excessive pressure on the natural resources
Revenue generation	Mentioned	Implemented	None
Conducting research studies	Not mentioned	Not implemented	Lack of scope for improvement through educative research

Table 2: ANALYSIS- MASHOBRA GREENS, VILLAGE SEEPUR, MASHOBRA, SHIMLA

Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Preservation of natural flora and fauna	Naming of prominent tree species	Implemented	No methods for conservation of natural fauna
Increase in livelihood opportunities of locals	Proposed: 6 workers	Employed: 4 workers	No impact on livelihood/ employment opportunities
Recognition of spiritual, religious and traditional beliefs of local communities	Not mentioned	Not implemented	Less involvement in ecotourism activities by the locals.
Provide peaceful and knowledgeable experience to visitors	Mentioned	Implemented	None
Efforts in controlling pollution and garbage collection	Not mentioned	Implemented	None
Presence of information boards	Mentioned	Implemented	None
Proper construction of roads/ pathways	Mentioned	Not implemented	Inconvenience to visitors especially children and elderly
Organisation of training programmes and workshops	Mentioned	Implemented	None
Involvement of students at primary level	Not mentioned	Not implemented	Lack of environmental protection at primary level
Development of training modules and materials	Not mentioned	Not implemented	Lack of detailed informative knowledge regarding the flora and fauna of the site
Employment of nature guides/adventure professionals	Not mentioned	Not implemented	Unemployment among locals and inefficiency in guiding the tourists

Collaboration with Community Based Organisations (CBOs)	Not mentioned	Not implemented	Lack of awareness and maintenance of the sites due to non-involvement of locals
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Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Involvement of local institutions like Mahila Mandals, Yuvak Mandals, etc.	Not mentioned	Not implemented	Lack of interaction among locals and visitors
Establishment of linkages with other departments	Mentioned	Not implemented	Lack in efficient management of the site
Tie-ups with tour operators, travel agents and hoteliers	Not mentioned	Not implemented	Travelling and accommodation problems faced by visitors
Development of nature parks and trails/ nature walks	Mentioned	Implemented	None
Organisation of camps	Not mentioned	Not implemented	Reduced influx of visitors
Construction of only pre-fabricated/temporary structures	Mentioned	Implemented	None
Organising adventure activities	Not mentioned	Not implemented	Lack of sight-seeing and thrill adventures
Plantation and maintenance of nurseries	Mentioned	Implemented	None
Impact assessment studies	Not mentioned	Not implemented	Lack of measures for constructive assessment
Permissible limit of carrying capacity	Not mentioned	Not implemented	Excessive pressure on the natural resources
Revenue generation	Mentioned	Implemented	None
Conducting research studies	Not mentioned	Not implemented	Lack of scope for improvement through educative research

Table 3: ANALYSIS- AAMOD ECO-SITE, SHOGHI, SHIMLA

Aspect of Ecotourism Policy	Observation in DPR	Implementation	Drawbacks
Preservation of natural flora and fauna	Mentioned	Implemented	None
Increase in livelihood opportunities of locals	Mentioned	Implemented	None
Recognition of spiritual, religious and traditional beliefs of local communities	Not mentioned	Implementation not required	None
Provide peaceful and knowledgeable experience to visitors	Mentioned	Implemented	None
Efforts in controlling pollution and garbage collection	Mentioned	Implemented	None
Presence of information boards	Mentioned	Implemented	None
Proper construction of roads/ pathways	Mentioned	Not implemented	Inconvenience for visitors to reach to the site
Organisation of training programmes and workshops	Not mentioned	Not implemented	Lack of information and awareness among stakeholders for environment protection
Involvement of students at primary level	Not mentioned	Not implemented	Lack of environmental protection at the primary level
Development of training modules and materials	Not mentioned	Not implemented	Lack of detailed informative knowledge regarding flora

			and fauna of the site
Employment of nature guides/adventure professionals	Mentioned	Implemented	None
Collaboration with Community Based Organisations (CBOs)	Not mentioned	Not implemented	Lack of awareness and sites maintenance due to non-involvement of locals
Involvement of local institutions like Mahila Mandals, Yuvak Mandals, etc.	Not mentioned	Not implemented	Lack of interaction among locals and visitors
Establishment of linkages with other departments	Mentioned	Implemented	None
Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Tie-ups with tour operators, travel agents and hoteliers	Mentioned	Implemented	None
Development of nature parks and trails/ nature walks	Mentioned	Implemented	None
Organisation of camps	Not mentioned	Not implemented	No effect
Construction of only pre-fabricated/temporary structures	Mentioned	Implemented	None
Organising adventure activities	Mentioned	Implemented	None
Plantation and maintenance of nurseries	Mentioned	Implemented	None
Impact assessment studies	Not mentioned	Not implemented	Lack of measures for constructive assessment
Permissible limit of carrying capacity	Not mentioned	Not implemented	Excessive pressure on the natural resources
Revenue generation	Not mentioned	Implemented	None
Conducting research studies	Not mentioned	Not implemented	Lack of scope for improvement through educative research

Table 4: ANALYSIS- TANNU JUBBAR LAKE- ECO PARK, KOTGARH, HIMACHAL PRADESH

Aspect of Ecotourism Policy	Observation in DPR	Implementation	Drawbacks
Preservation of natural flora and fauna	Mentioned	Implemented	Lack of departmental efforts
Increase in livelihood opportunities of locals	Mentioned	Not implemented	No impact on livelihood/ employment opportunities
Recognition of spiritual, religious and traditional beliefs of local communities	Mentioned	Implemented	None
Provide peaceful and knowledgeable experience to visitors	Not mentioned	Implemented	Not much informative
Efforts in controlling pollution and garbage collection	Mentioned	Not implemented	Littering and dumping depreciating the aesthetic appeal of the site
Presence of information boards	Not mentioned	Not implemented	Lack of awareness and misguiding of tourists
Proper construction of roads/ pathways	Not mentioned	Implemented	None
Organisation of training programmes and workshops	Not mentioned	Not implemented	Lack of information and awareness among stakeholders for environment protection

Involvement of students at primary level	Not mentioned	Not implemented	Lack of environmental protection at the primary level
Development of training modules and materials	Not mentioned	Not implemented	Lack of detailed informative knowledge regarding the flora and fauna of the site
Employment of nature guides/adventure professionals	Not mentioned	Not implemented	Unemployment among the locals and inefficiency in guiding the tourists
Collaboration with Community Based Organisations (CBOs)	Not mentioned	Not implemented	Lack of awareness and maintenance of the sites due to non-involvement of locals
Involvement of local institutions like Mahila Mandals, Yuvak Mandals, etc.	Not mentioned	Not implemented	Lack of interaction among locals and visitors

Aspect of Eco-tourism Policy	Observation in DPR	Implementation	Drawbacks
Establishment of linkages with other departments	Not mentioned	Not implemented	Lack in efficient site management
Tie-ups with tour operators, travel agents and hoteliers	Not mentioned	Implemented	None
Development of nature parks and trails/ nature walks	Mentioned	Implemented	None
Organisation of camps	Not mentioned	Not implemented	Reduced influx of visitors
Construction of only pre-fabricated/temporary structures	Mentioned	Being implemented	None
Organising adventure activities	Not mentioned	Not implemented	Lack of sight-seeing and thrill adventures
Plantation and maintenance of nurseries	Not mentioned	Not implemented	Lack in improving the aesthetic appeal of the site
Impact assessment studies	Not mentioned	Not implemented	Lack of measures for constructive assessment
Permissible limit of carrying capacity	Not mentioned	Not implemented	Pressure on natural resources and threat to the natives
Revenue generation	Not mentioned	No report obtained	Distribution of revenue not known
Conducting research studies	Not mentioned	Not implemented	Lack of scope for improving through educative research

ENLISTING ETHNOBOTANICAL USAGE OF FORAGE PLANT SPECIES IN RENUKA AREA OF SIRMAUR (HIMACHAL PRADESH)

PARUL SHARMA, POONAM KUMARI & S.K. SOOD

INTRODUCTION

Ethnobotany, perhaps is the first science that originated with the evolution or existence of man in this planet. The term came into being used for the first time by Harshberger in 1895 and the subject included mere identification and cataloguing of plants used by the primitive or aboriginal people. Since then, the scope, concepts and implications of ethnobotany have been expanding at a very fast rate (Schultes, 1960; Alcorn, 1984; Jain, 1987; Wickens, 1990). According to Pushpangadan (1990), the term refers to the study of the traditional system pertaining to the multidimensional perspective of life, culture, traditions as well as interaction of traditional or less advanced human communities like tribals with their local flora or fauna.

India (lat. 8° - 04' N to 37° - 06' N and long. 68°-07' E to 97°-25' E) with its 53 million tribal population belonging to 550 native or tribal communities under 227 ethnic groups covering 5,000 villages has been rightly described as the melting point of race and tribes and boasts of a valuable heritage of accumulated indigenous/ tribal knowledge (Pushpangadan, 1994). As many as 106 different languages and 227 subsidiary dialects are spoken by tribals of India (Arora 1995, 1996).

The picturesque state of Himachal Pradesh with its awe-inspiring landscape, agrarian economy and rich folk arts and culture nestles in the lap of North-West Himalayas between lat. 30°-3' to 33°-3' N and long. 75°-3' to 79°E. With as many as 16,997 villages of different sizes covering around 55,678 km² area (10.54% of Himalayan landmass) under its 12 districts namely Bilaspur, Chamba, Hamirpur, Kangra, Kinnaur, Kullu, Lahaul-Spiti, Mandi, Shimla, Sirmour, Solan and Una having altitudinal range between 300-8,000m, and land-locked state shares its boundries with Kashmir on the north, Haryana on the south, Uttrakhand on the southeast, Punjab on the west, and Tibetan part of China in the northeast and considered a veritable emporium of medicinal and aromatic plants and diverse ethnic communities like Gaddis, Gujjars, Kinners, Jads, Lahaulis, Spitians, Panwals and Swanglas having distict differences in socio-economic and socio-cultural conditions. Since ages the indigenous people of this region follow varied traditional practices of resource utilization and conservation, and the place considered a very fertile area for ethnobotanical research for which the studies so far are almost negligible and need to be undertaken for ushering in economic prosperity to the people of the State.

METHODOLOGY

Study Area & Location: The land of Gods, Dev Bhumi, Himachal Pradesh is entirely mountainous with altitudes ranging from 460 to 6600 metre. It was carved out of former East Punjab like Haryana, Delhi and Punjab. The state of Himachal Pradesh is spread over an area 55,673 km² and is bordered by Jammu and Kashmir on the north, Punjab on the southwest, Haryana on the south, Uttarakhand on the southeast and Tibet on the east. The

state comprises 12 districts and they are Hamirpur, Kangra, Bilaspur, Mandi, Chamba, Una, Sirmaur, Lahul and Spiti, Kullu, Kinnaur, Shimla and Solan.

Sirmour, a land adorned by lofty mountains, deep gorges, treacherous ravines, lush valleys and meadows and laced by gurgling rivulets is a quixotic land of dreams. Shrouded by conjectures regarding its nomenclature Sirmaur spans from 77° 01'12" to 77°49'40" East Longitude upto 30°22'30" to 31°01'20" North Latitude.

In this District, there are five Administrative Sub-Divisions, nine tehsils Namely Paonta Sahib, Nahan, Pachhad, Rajgarh, Renuka, Kamrau, Shilai, Ronhat, Nohra and Dadahu. Sirmaur in the southeast corner of the State is divided by river Giri into two parts, the cis-Giri and the trans-Giri. The Sirmaur district has the Shivalik hills in the south and the northern parts are made up of the forests and ravines of the first and second belt of the Himalayan ranges.

The Renuka Lake is a place of interest for the pilgrims as well as the general tourists and is the most beautiful lake of Himachal. Its shape is said to be that of a sleeping woman. In November, the Renuka Fair is held in honour of the mother of Parshu Ram i.e. Renuka Devi. People mainly follow agricultural practices while some are also engaged in industrial enterprises and other allied services to earn a living.

Climate & Geography: Renuka is the most important place of religious and tourist interest in Sirmour District. It is nearly 40 km away from Nahan and is well linked with motorable metalled road. This place has a famous lake. Boating in Renuka Lake is main attraction for the tourists visiting Renuka. This sacred oval shaped lake has a circumference of 2.4 km. Close-by lies the Parshu Ram Lake which vaguely resemble a human figure. It is believed that Parshu Rama's mother consecrated into water out of which this lake was formed. Towards the end of the lake are towering palm trees which offer ideal picnic spots during day time.

Vegetation & Wildlife: The vegetation of national park is mainly composed of thick Sal forests, and other deciduous species of tropical and sub-tropical origin, providing food and shelter to animals like Goral, Sambar, Chittal, Spotted deer, Barking deer, Blue bull, Leopard, Wild boar, Pea fowl, Red jungle fowl, elephants, partridges, along with many species of the non-chordates and the chordates including fishes, amphibians, reptiles, birds and mammals.

People & Land use: Agriculture is the main occupation of the people and has an important role in the economy of the state. Most of the area is rainfed and farmers depend on rain for irrigation. Sirmaur have a wide range of agro-climatic conditions which have helped the farmers to cultivate large varieties of fruits ranging from temperate to sub-tropical. During past few decades, due to climatic range horticulture and vegetable growing is developing very expeditiously.

The park with their huge livestock and they migrate from the lowland plains in the winters to the upper hills of Himachal Pradesh during the summer season. Their economy depends mainly on agriculture. People residing in the vicinity of the study area belong to various caste, creed and religion. Major activities of locality are agricultural practices and pastoralism for which they depend on the forest resources.

Study period & Methodology: The study was carried out in Renuka Tehsil of district Sirmour. The Renuka Sanctuary is situated in Sirmour district in Himachal Pradesh. The total area of the sanctuary is about 4.028 square kilometres. The entire sanctuary is Renuka Reserve Forest and has been declared as Abhayaranya. An area of roughly about 3 square kilometres that lies outside the sanctuary has been declared as a buffer belt.

The sanctuary falls in the bio-geographical zone IV and biogeographical province IV as per the classification done by the Wildlife Institute of India (WII).

The forest bears a mixed crop of *Anogeissus*, *Lucinea*, *Terminalia*, *Khair*, *Shisham*, *Cordia* and a number of climbers. The fauna includes leopard, sambar, spotted deer, barking deer, hare, jungle cat, palm civet, porcupine, blue jay, black partridge, drongo, hill crow, scarlet minivet, bulbul, common coot, and green pigeon.

The area is fenced by inter-channeled chain fence to restrict the illegal entry of villagers to the area. At present the lion safari, zoo, aviary and sanctuary are under control of the administrative control of the Shimla Wildlife Division.

To escape the clutches of the emperor Renukaji jumped into small pond, known by the name of the Ramsarover at that time, and vanished into it. The lake is worshiped as Renuka lake.

For collecting data of interest on ethnobotanically important plants of Renuka Tehsil, district Sirmour, Himachal Pradesh, field tours were undertaken as per the procedure delineated by Schultes (1962) and Jain (1964, 1967). The duration of each visit was of 15-20 days. Interviews and group discussion were held with medicinemen, healers, family heads, old people and many local informants. The data collected were verified and cross checked by showing plant specimens to various informants and even to the same informants on different occasions. The information pertaining to botanical name, locality, altitude, part used, ethnic use, method of preparation, administration and appropriate dose were recorded in field note book. The herbarium specimens of the collected ethnobotanical plants were also prepared as per the standard techniques (Jain & Rao, 1977). Photographs of the ethnically important plants were also clicked in the natural habitat.

RESULTS & DISCUSSION

The finding shows that local inhabitants, nomadic extracted fodder from the nearby forests by cutting floor vegetation. They also left their livestock free in forest area for grazing. So far as its diversity is represented by 84 species (68 dicots, 16 monocots) belonging to 70 genera under 38 families (Fig.1; Table1) of which species richness predominantly belongs to Fabaceae (15 species having 11 genera); Poaceae (11 species, 10 genera); Rosaceae (7 species, 4 genera); Moraceae (6 species, 3 genera); Brassicaceae (4 species, 2 genera); Euphorbiaceae (3 species and 3 genera); Asteraceae, Lythraceae and Meliaceae, Rutaceae, Urticaceae (2 genera 2 species each); Rhamnaceae (1 genus and 2 species); Amaranthaceae, Apocynaceae, Asparagaceae, Berberidaceae, Bombacaceae, Cannabaceae, Casuarinaceae, Chenopodiaceae, Combretaceae, Convolvulaceae, Cucurbitaceae, Dioscoreaceae, Dipterocarpaceae, Ericaceae, Fagaceae, Flacourtiaceae, Hypericaceae, Menispermaceae, Oxalidaceae, Papaveraceae, Polygonaceae, Ranunculaceae, Salicaceae, Smilacaceae, Tiliaceae, Violaceae (1 genus and 1 species each) (Fig. 2; Table II). Habit-wise distribution reveals the use of 34 species (40%) of trees, herbs 32 (38%), shrubs 15 (18%), and lianas 3

(3.57%); of which 39 species are wild, 37 species are cultivated, and 14 species are semi-cultivated. Notably, high used forage genera in the region are: *Acacia*, *Brassica*, *Ficus*, *Prunus* (3 Species each), *Bauhinia*, *Cassia*, *Morus*, *Pyrus*, *Saccharum* (2 species each), etc.

Table 1: Relative disposition of forage plants employed under employed for fodder

S.No.	Division	Family	Genera	Species
1	Dicot	34	56	68
2	Monocot	4	14	16
	Total	38	70	84

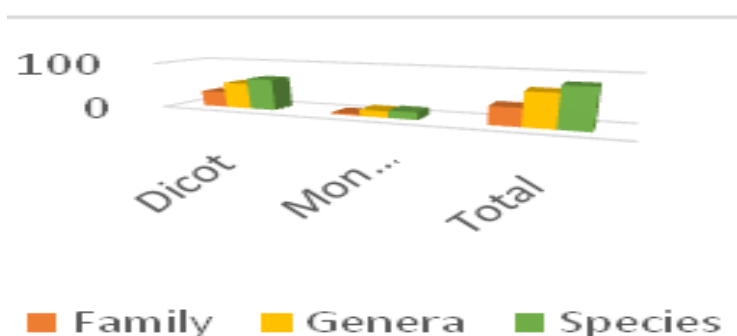


Fig. 1: Relative number of family, genera and species various plant divisions

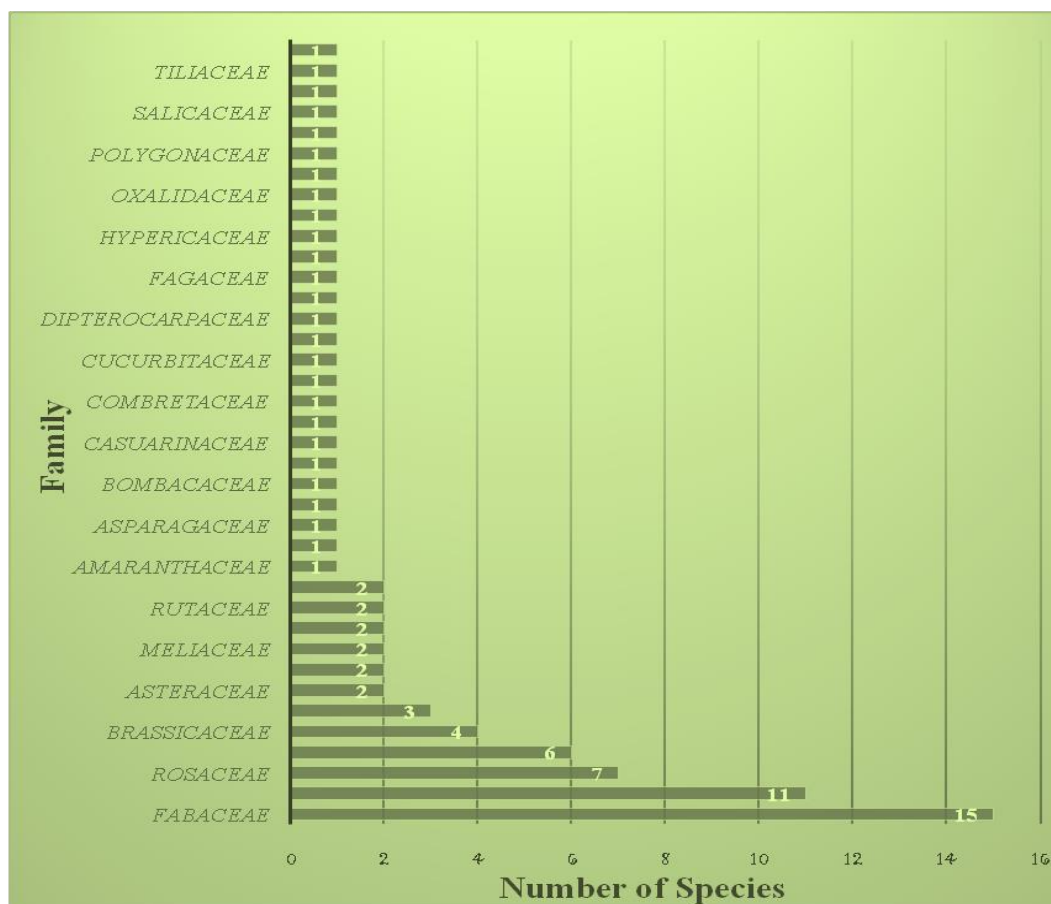


Fig. 2. Relative number of species and families employed for fodder purposes

Table II: Forage plant used by the local inhabitants in Renuka area of Sirmaur (Himachal Pradesh)

SN	Botanical Name	Vernacular Name	Family	Habit	Flowering/ Fruiting	Part Used	Wild/ Cultivated/ Semi cultivated
1.	<i>Acacia catechu</i> (Linn.f.) Willd.	Khair	Fabaceae	T	June-Oct	L., Br., B.	S.Cu.
2	<i>Acacia nilotica</i> (L.) Willd. ex Delile.	Babul		T	July-Dec	L., S., YP.	W.
3	<i>Acacia pennata</i> (L.) Willd.	Biswal		Li	Oct-Jan	L., S., YP	C.
4.	<i>Albizia lebbek</i> (L.) Benth.	Siris		T	FL: April-May; Fr: Dec-Jan	L.	S.Cu.
5	<i>Bauhinia vahlii</i> Wight & Arn.	Taur		Li	April-July	L.	W.
6.	<i>Bauhinia variegata</i> L.	Kachnar		T	Feb-April	L.	S.Cu.
7	<i>Butea monosperma</i> (Lam.) Taub.	Dhak, Palas		T	Feb-May	L.	S.Cu.
8	<i>Cassia fistula</i> L.	Amaltas		T	March-July	L.	S.Cu.
9	<i>Cassia tora</i> L.	Chakunda		H	Oct-Feb	A.P.	W.
10	<i>Cicer arietinum</i> L.	Chana		H	Feb-April	L.S. Y.P.	C.
11	<i>Dalbergia sisso</i> Roxb.	Shisham		T	March-June	L.	S.Cu.
12	<i>Desmodium elegans</i> DC	Chaamle		Sh	June-Sept	L.	W.
13	<i>Indigofera cassioides</i> DC.	Kathi		Sh	March-May	L.	W.
14	<i>Trigonella emodi</i> Benth.	Jangali Kainth		H	June-Sept	W.P.	W.
15	<i>Vicia sativa</i> L.	Akri, Chatri-Matri		H	July-Aug	W.P.	C.
16	<i>Bambusa nutans</i> Wall. ex Munro	Baans	Poaceae	Sh	Sept-Dec	L	C.
17	<i>Cynodon dactylon</i> (L.) Pers.	Doob		H	July-Dec	L.	W.
18	<i>Dendrocalamus strictus</i> (Roxb.) Nees	Bans		Sh	Nov-April	L.	S.Cu.
19	<i>Eleusine coracana</i> (L.) Gaertn.	Mandua		H	Dec-March	A.P	W
20	<i>Hordeum vulgare</i> L.	Jau		H	Jan-Feb	A.P.	C.
21	<i>Oryza sativa</i> L.	Chawal		H	July-Sept	A.P., Br., G.P.	C.
22	<i>Panicum repens</i> L.	Couch Panicum		H	July-Sept	W.P.	C.
23	<i>Saccharum bengalense</i> Retz.	Sarkanda		H	Oct-Jan	W.P.	W
24	<i>Saccharum spontaneum</i> L.	Kaans		H	Sept-Dec	W.P.	C.
25	<i>Triticum aestivum</i> L.	Kanak		H	Jan-April	A.P.	C.
26	<i>Zea mays</i> L.	Makki		H	July-Aug	W.P	C.
27	<i>Fragaria vesca</i> L.	Jangli Strawberry	Rosaceae	H	May-July	A.P.	C.
28	<i>Prunus cerasoides</i> D. Don	Padam		T	Nov-May	L.	C.
29	<i>Prunus domestica</i> L.	Palam		T	March-Aug	L.	C.
30	<i>Prunus persica</i> (L.) Batsch.	Arau		T	Jan-June	L.	C.
31	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Kainth		T	Feb-March	L.	C.
32	<i>Pyrus communis</i> L.	Nashpati		T	April-Aug	L.	W.
33	<i>Rubus ellipticus</i> Smith	Akh		Sh.	March-April	L.	C.
34	<i>Artocarpus heterophyllus</i> Lam.	Kathal	Moraceae	T	Nov-April	F.	C.
35	<i>Ficus carica</i> L.	Fegde		T	March-August	W.P.	W.
36	<i>Ficus racemosus</i> L.	Gular		T	Fl: Spring;	L.	W.

					Fr: April-July		
37	<i>Ficus religiosa</i> L.	Peepul		T	Fl: Summer; Fr: Rainy season	L.	S.Cu.
38	<i>Morus alba</i> L.	Sehtoot		T	Feb-June	L., Tw	S.Cu.
39	<i>Morus serrata</i> Roxb.	Kimu		T	April-Aug	L., Tw	W.
40	<i>Brassica juncea</i> (L.) Czern	Sarson	Brassicaceae	H	Nov-April	A.P.	C.
41	<i>Brassica rapa</i> L.	Shalgam		H	Nov-April	L., S., Se.	C.
42	<i>Brassica oleracea</i> L.	Gobhi		H	March-Aug	W.P.	C.
43	<i>Capsella bursa-pastoris</i> (L.) Medik.			H	Nov-May	W.P.	C.
44	<i>Euphorbia hirta</i> L.	Doodhli	Euphorbiaceae	H	Nov-April	W.P.	W.
45	<i>Mallotus philippensis</i> (Lam.) Mull. Arg.	Kamala		T	Sept-April	L.	W.
46	<i>Phyllanthus emblica</i> L.	Amla		T	Fl:Feb-May; Fr: Oct-March	L.	S.Cu.
47	<i>Bidens pilosa</i> L.	Kumra	Asteraceae	H	Oct-April	W.P.	C.
48	<i>Sonchus asper</i> (L.) Hill.	Dudhi		H	March-April	W.P.	W.
49	<i>Punica granatum</i> L.	Anar	Lythraceae	T	May-Sept	L.	C.
50	<i>Woodfordia fruticosa</i> (L.) Kurz	Dahai		Sh	Jan-April	L.	C.
51	<i>Melia azedarach</i> L.	Bakain	Meliaceae	T	Feb-Sept	L.	S.Cu.
52	<i>Toona ciliata</i> M. Roem.	Toon		T	March-July	L.	S.Cu.
53.	<i>Ziziphus oenoplia</i> (L.) Mill. Gard.	Makai	Rhamnaceae	T	Sept-March	L., Br.	S.Cu.
54	<i>Ziziphus nummularia</i> (Burm. f.) Wight & Walk.-Arn.	Jharber		Sh	June-Sept	L.	W.
55	<i>Murraya koenigii</i> (L.) Spreng.	Kari patta	Rutaceae	Sh	April-May	L.	C.
56	<i>Zanthoxylum armatum</i> DC.	Timar		T	April-June	L.	C.
57	<i>Boehmeria macrophylla</i> Hornem	Gargela Bara-Siauru	Urticaceae	H	June-Jan	L., Y., Br.	W.
58	<i>Urtica dioica</i> L.	Bicchoobooti		H	June-Sept	A.P.	W.
59	<i>Achyranthes aspera</i> L.	Puthkana	Amaranthaceae	H	May-Oct	L.	C.
60	<i>Carissa spinarum</i> L.	Garnu	Apocynaceae	Sh	April-July	L.	W.
61	<i>Asparagus racemosus</i> Willd.	Shatavari	Asparagaceae	Sh	June-Nov	P.	W.
62	<i>Berberis lyceum</i> Royle	Kashmal	Berberidaceae	Sh	March-July	L.	W.
63	<i>Bombax ceiba</i> L.	Semal	Bombacaceae	T	Feb-May	L.	C.
64	<i>Celtis australis</i> L.	Khirk	Cannabaceae	T	April-May	L.	W.
65	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don.	Kaphal	Casuarinaceae	T	Nov-April	L.	W.
66	<i>Chenopodium album</i> L.	Bathua	Chenopodiaceae	H	May-Nov	A.P.	W.
67	<i>Terminalia chebula</i> Retz.	Harad	Combretaceae	T	Fl: April-June; Fr: Nov-March	L.	S.Cu.
68	<i>Ipomoea batata</i> (L.) Lam.	Shakrkan	Convolvulaceae	H	Oct-Dec	A.P., L.	C.
69	<i>Cucurbita pepo</i> L.	Kaddu	Cucurbitaceae	H	Aug-April	L.	W.
70	<i>Dioscorea bulbifera</i> L.	Zimikand	Dioscoreaceae	H	June-Dec	W.P.	W.
71	<i>Shorea robusta</i> C.F. Gaertn.	Sal	Dipterocarpaceae	T	March-July	L.	W.
72	<i>Rhododendron arboreum</i> Smith	Buransh	Ericaceae	T	March-June	L., Fl.	W.
73	<i>Quercus leucotrichophora</i> A. Camus	Baan	Fagaceae	T	April-May	L.	W.
74	<i>Flacourtia indica</i> Burm.f.	Kangu	Flacourtiaceae	Sh	Jan-June	Y.L.	C.

75	<i>Hypericum oblongifolium</i> Choisy	Basant	Hypericaceae	Sh	May-June	W.P.	W.
76	<i>Tinospora cordifolia</i> (Willd.) Hook. f.	Giloy	Menispermaceae	Sh	Jan-March	W.P.	W.
77	<i>Oxalis corniculata</i> L.	Amrul	Oxalidaceae	H	March-Dec	W.P.	W.
78	<i>Fumaria officinalis</i> L.	Pit papra	Papaveraceae	H	July-August	W.P.	W.
79	<i>Rumex hastatus</i> D.Don	Khatele	Polygonaceae	Sh	June-Oct	W.P.	W.
80	<i>Thalictrum foliolosum</i> DC.	Mamera	Ranunculaceae	H	July-Sept	W.P.	W.
81	<i>Populus deltoides</i> Marshall.	Poplar	Salicaceae	T	May-July	L.	C.
82	<i>Smilax aspera</i> L.	Salsa	Smilacaceae	Li	Sept-Nov	W.P.	W.
83	<i>Grewia asiatica</i> auct. non L.	Beul	Tiliaceae	T	Jan-July	L.	W.
84	<i>Viola pilosa</i> Blume	Banfsha	Violaceae	H	March-May	W.P.	W.

Abbreviations:

E: T-Tree; Sh- Shrub; H- Herb; Li- Liana

G: L.-Leaf; Br.- Branch; B.- Bark, Y.P.- Young pods; S.- Stem; A.P. – Aerial Parts; G.P.- Green pod; P.-Plant; Po-Pods; Tw.- Twig; Se-Seed; Y. br.-Young branches; Y.L.- Young leaf; F.-Fruit; Fl.-Flower.

H: W.-Wild; C-Cultivated; S. Cu.-Semi-cultivated.

CONCLUSION

There is immense diversity of forage plants in Renuka area of Sirmaur district and is represented by 84 species belonging to 70 genera under 38 families. Predominantly used fodder families belongs to Fabaceae (15 spp.), Poaceae (11 spp.), Rosaceae (7 spp.), Moraceae (6 spp.), Brassicaceae (4 spp.) & Euphorbiaceae (3 spp.). 46% of forage species are wild 37% are cultivated and rest of 16% are semi cultivated. Forage plants dominated by trees. Out of total 84 species, 34 are trees, 32 herbs, 15 shrubs & 3 lianas.

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PERIODIC CONE PRODUCTION AND INSTABILITY IN REPRESENTATION OF SEXUAL BEHAVIOUR BY INDIVIDUAL TREES IN *CEDRUS DEODARA*

KARUNA PHULAR

INTRODUCTION

Conifers the most ancient plant species having survived the most drastic climatic conditions like continental drift, climate oscillations, volcanism and the rapid spread of angiosperms, and are known as living fossils except Wollemi pine (*Wollemia nobilis*) (Claire G. Williams, 2009). Their persistence and successful survival suggests that conifers would have adapted many physiological and metabolic traits to resist the drastic climatic changes taking place in the environment. Hence, adaptations in its reproductive biology carry clues about evolution in seed bearing plants. Distinct reproductive characteristics of heterospory and diplohaplontic life cycle of conifers set them apart from other plant species. Such unusual reproductive characteristic is also represented in *Cedrus deodara* which belongs to the family Pinaceae that includes 11 genera all of which are monoecious and comprises 215 species.

Cedrus deodara an evergreen tree known as Himalayan cedar or deodar is native to western Himalayas in Eastern Afghanistan, Northern Pakistan, South Western Tibet and Western Nepal, is highly valuable economically and medicinally. The total area covered by deodar forest in India is estimated to be 2,03,263 hectares most of which is covered by Himachal Pradesh, Jammu and Kashmir, Sikkim, Arunachal Pradesh, Uttarakhand and Darjeeling Region of West Bengal with pure stands found at a height of 1800 to 2600m above the sea level and where the rainfall varies from 1000 to 1800mm. The tree attains huge dimensions and lives to a great age and thrives best in cool climatic conditions with optimum rainfall and sunlight (Maheshwari and Biswas 1970). Survival of *Cedrus deodara* in severe or harsh climatic conditions, its long life and large size gives a hint that like other conifers it must have acquired some genetic and physiological changes so as to evolve and survive extinction since 300 million years ago. As climatic conditions for living organisms at the end of Mesozoic era were becoming harsh and a decrease in the rate of rainfall started, conifers like deodar acquired a very important feature that is less dependency on water (Claire G. Williams, 2009). As dependency on water was reduced, another adaptation acquired by this species was winged pollens and seed, which allows the embryo to be transported and developed elsewhere. Along with this, it evolved in such a way that, it started producing seeds infrequently and showing dioecious and monoecious behaviour (Maheshwari, P., Biswas, C. (1970) and producing cones periodically that is once in every three to four years. As a rule *Cedrus deodara* shows monoecious reproductive behaviour with male and female cones occurring on the separate branches of the same tree but occasionally its dioecious behaviour has also been reported (Troup 1921; Maheshwari and Biswas 1970; Tewari 1994). Due to its vast availability in Himachal Pradesh and Uttarakhand and easy access, *Cedrus deodara* was an ideal species to understand the changing reproductive behavior in conifers.

METHODOLOGY

To record reproductive behavior of the species pure stands of mature trees were selected at three different sites namely, HFRI Campus forest (31°04'03.63"N and 077°10'21.9"E, elevation 1898 metres) Cheog Forest, Cheog, Himachal Pradesh, (31°04'02.44" N and 077°10'21.9" E, elevation 2181 mteres.) and Kanasar Forest, Chakrata, Uttarakhand (30°50'42.15"N and 77°50'1.47"E, and elevation 648 metres). At each site 300 mature trees of flowering/fruiting age were selected/marked. Every marked tree was observed for its reproductive behaviour and recorded as male, female, monoecious and neutral tree depending upon the appearance of male cones or female cones on a single tree or both on the same tree or no cones on a single tree. Trees bearing male cones, all throughout the three years of observation were recorded and marked as male trees. Trees bearing female cones for each year of observation were marked and recorded as female trees. Trees bearing both male and female cones were marked and recorded as monoecious trees. Trees which did not show any reproductive growth for all the three years were marked and recorded as vegetative\neutral trees. The reproductive behaviour of all the trees was continuously recorded for 3 years from 2014-2016.

RESULTS AND DISCUSSION

Reproductive behaviour of *Cedrus deodara* is not certain. It changes remarkably in every flowering season. It has already been reported that deodar is a monoecious tree but occasionally it shows dioecious behaviour. At each site 300 mature trees varying in height from 19-55m were selected and marked. Every year from 2014-2016, reproductive behaviour of the marked trees were observed and recorded based on the occurrence of male or female cones on separate trees and male or female cones on the same tree. The best time to record the changes in the sexual behaviour of deodar is the beginning of June till the end of November. Male cones start appearing on the trees in the beginning of June and get ripen and shed their pollens in the beginning of September or end of October. The female cones start appearing in August mature till the end of November. The trees with either male or female cones were recorded as dioecious plants, i.e., male and female plants separately. Trees with both male and female cones appearing on the same tree were recorded as monoecious. Trees with no cones were recorded as neutral. A special characteristic trait, observed in monoecious trees was that the male cones appeared on the lower branches and female cones appeared on the upper branches of the tree. Male cones at young age appear to be smaller in size, upto 0.25 to 1cm in length and light green in colour. At maturity they attain a height of 2.5 cm to 4cm in length and 1 to 1.5 cm in width. Mature cones turn dark brown in colour after maturity and shed yellow coloured pollen grains at the time of pollination. Female cones started appearing inconspicuously and were hidden by the rosette of leaves. They were smaller in size when young and light green in colour. They became ovoid in shape and their size increased to 1.27cm to 2.5cm in length and 0.6cm in breadth at maturity. Pollination starts in the month of September or in the middle of October. After pollination there was no growth recorded in young fertilized cones until next spring. By next May they increased in size and became visible. Till November they were fully ripen and became dark brown in Colour. After fertilization Female cones shed their upper scales and only basal scales remain on the perpendicular axis of the cone.

YEAR-WISE CHANGE IN THE NUMBER OF TREES AT EACH SITE

It was observed that good seed year for *Cedrus deodara* comes in every three to four years. This periodic production of cones in *Cedrus deodara* has been recorded during the three years of our observations. Following are the results obtained showing the change in the reproductive behaviour of deodar.

Table 1:- Number of male (M), female (F), neutral (N) and monoecious (M\F) trees at three different sites.

	HFRI shimla			Chakrata forest			Cheog kanasar		
	2014	2015	2016	2014	2015	2016	2014	2015	2016
M	81	59	74	50	76	52	73	76	67
F	77	92	57	8	164	14	73	163	52
M\F	80	107	153	4	42	230	96	41	169
N	62	42	16	238	18	4	58	20	12
Total	300	300	300	300	300	300	300	300	300

OBSERVATIONS AT SITE 1:- HFRI CAMPUS, SHIMLA, HIMACHAL PRADESH

Out of 300 trees at site 1, HFRI campus, Shimla, in 2014, 81 trees were male, 77 were female, 80 were monoecious and 62 trees did not show any reproductive growth, i.e. they were Neutral, they remained in their vegetative state for all three years of observation. Again in 2015, 59 trees were male, 92 were female, 107 were monoecious and 42 were Neutral. The observation of 2016 showed that 74 were males, 57 were female, 153 were monoecious and 16 were vegetative. The above observations concluded that number of Neutral trees in this region decreased from 2014 to 2016 and the number of monoecious trees increased from 2014 to 2016. The change in the number of neutral trees and monoecious trees indicates that the trees in the region are transitioning from vegetative to reproductive phase. The number of male trees increased from 59 in 2015 to 74 in 2016, the number of female trees decreased to 57 in 2016 from 92 in 2015, the number of monoecious trees increased to 153 in 2016 from 107 in 2015 and the number of neutral trees decreased to 16 in 2016 from 42 in 2015. This change in the number of trees in 2015 and 2016 indicated that 2016 was a good seed year for deodar in this region.

At Site 1 some trees expressed a change in their reproductive behaviour from 2014 to 2016. Out of 300 trees, 119 changed their reproductive behaviour (8 changed to female from male, 8 changed to male from female, 5 changed to female from vegetative, 7 changed to male from neutral, 16 changed to female from monoecious, 17 changed to male from monoecious, 40 changed to neutral from male, 11 changed to neutral from female, 3 changed to monoecious from male, 4 changed to monoecious from female) and 181 trees did not show any change at all.

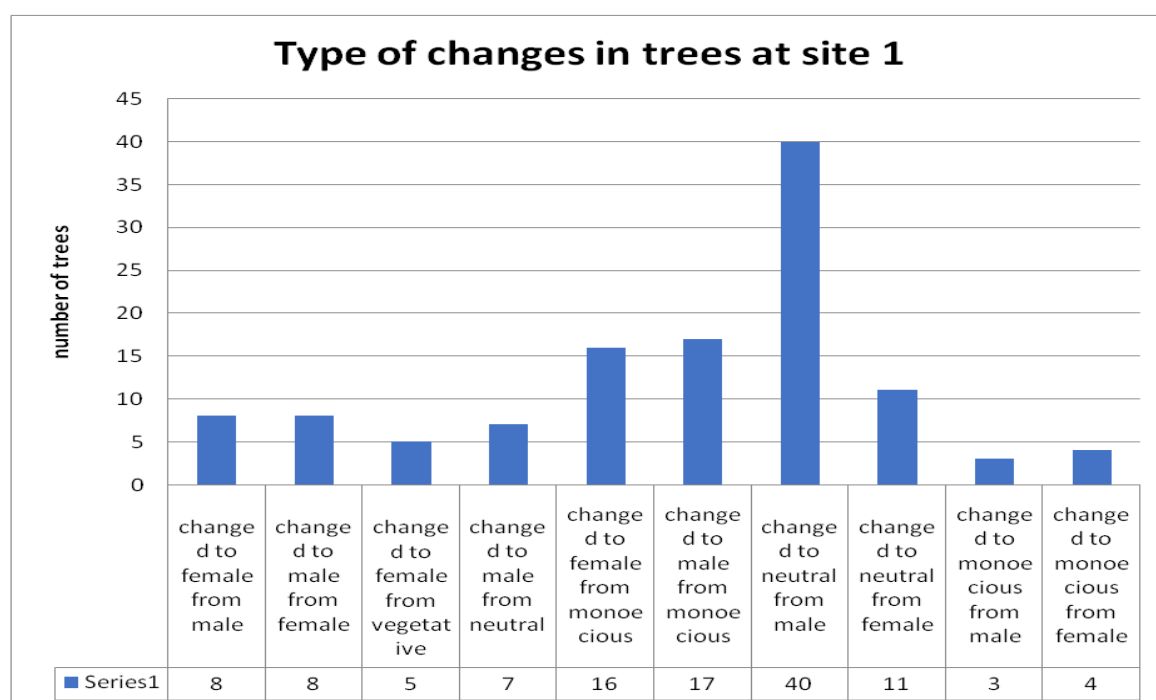


Figure 1:- Type of changes observed in trees at site 1

OBSERVATIONS AT SITE 2:-CHEOG FOREST, CHEOG, HIMACHAL PRADESH

Out of 300 trees at site 2, Cheog forest, Cheog, Himachal Pradesh, in 2014, 73 trees were male, 73 were female, 96 monoecious and 58 trees were neutral. Again in 2015, 76 trees were male, 163 female, 41 monoecious and 20 neutral. The observations of 2016 revealed that 67 were males, 52 females, 169 monoecious and 12 were neutral in this region. A decrease in the number of male trees was observed in 2016 from 2015, also there was a decrease in the number of female trees. The above observations indicated that the number of male and female trees were highest in the year 2015 as compared to 2014 and 2016. On the other hand number of monoecious trees and neutral trees decreased in 2015 as compared to 2014. In 2016 the number of male, female and neutral trees decreased but the number of monoecious trees increased. Such changes in the number of trees in this region indicated that the reproductive activity of the trees was highest in 2016 and therefore 2016 was a good seed year for Cheog forest.

The results of observations of site 2 revealed that out of 300 trees 44 changed their reproductive behaviour (3 changed to female from male, 5 changed to male from female, 12 changed to female from Neutral, 10 changed to male from beutral, 1 changed to female from monoecious, 0 changed to male from monoecious, 11 changed to neutral from female, 3 changed to monoecious from female) and 256 trees did not show any change at all in their reproductive behaviour.

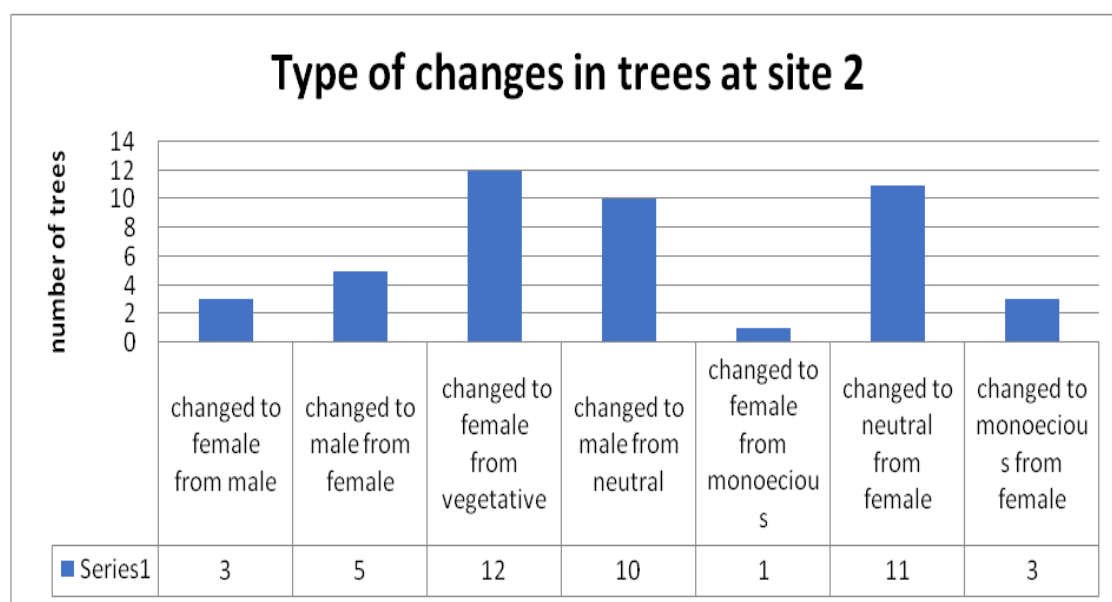


Figure 2:-Types of changes in trees at site 2

OBSERVATIONS AT SITE 3:-KANASAR FOREST, CHAKRATA, UTTARAKHAND

Out of 300 trees at site 3, Kanasar forest, Chakrata, Uttarakhand in 2014, 50 trees were male, 8 were female, 4 were monoecious and 238 trees did not show any reproductive growth, i.e. they were neutral. Observations of 2015 showed that 66 trees were male, 109 were female, 3 trees were monoecious and 94 trees were neutral. The observations of reproductive behaviour of deodar in 2016 showed that 52 were males, 14 trees were female, 230 trees were monoecious and 4 trees were neutral. The change in the number of trees during observations from 2014 to 2016 unveiled that number of neutral trees in this region has decreased from 2014 to 2016 and the number of monoecious trees has increased from 2014 to 2016 indicating that the trees of the region were reproductively active in the year 2015 and 2016 as compared to 2014 and mostly there was a dominance of monoecious behaviour of *Cedrus deodara*. The number of male trees decreased from 66 in 2015 to 52 in 2016, the number of female trees decreased to 14 in 2016 from 109 in 2015 but there was a drastic increase in the number of monoecious trees from 3 in 2015 to 230 in 2016 and the number of neutral trees decreased to 4 in 2016 from 238 in 2015. As the number of monoecious trees increased drastically in 2016 and the number of neutral trees drastically decreased in 2016, this change indicated that the reproductive activity of the trees in this region was highest in the year 2016 also most of the dioecious trees transitioned into monoecious trees. This change in the number of trees in 2015 and 2016 indicated that 2016 was a good seed year for deodar in this region.

Observations conducted in this region revealed that trees changed their expression of sexual behaviour from the year 2014 to 2016. Out of 300 trees 145 changed their reproductive behaviour (14 changed to female from male, 10 changed to male from female, 11 changed to female from vegetative, 13 changed to male from neutral, 15 changed to female from monoecious, 11 changed to male from monoecious, 39 changed to neutral from male, 25 changed to neutral from female, 2 changed to monoecious from male, 5 changed to monoecious from female) and 155 trees did not show any change at all in their reproductive behaviour.

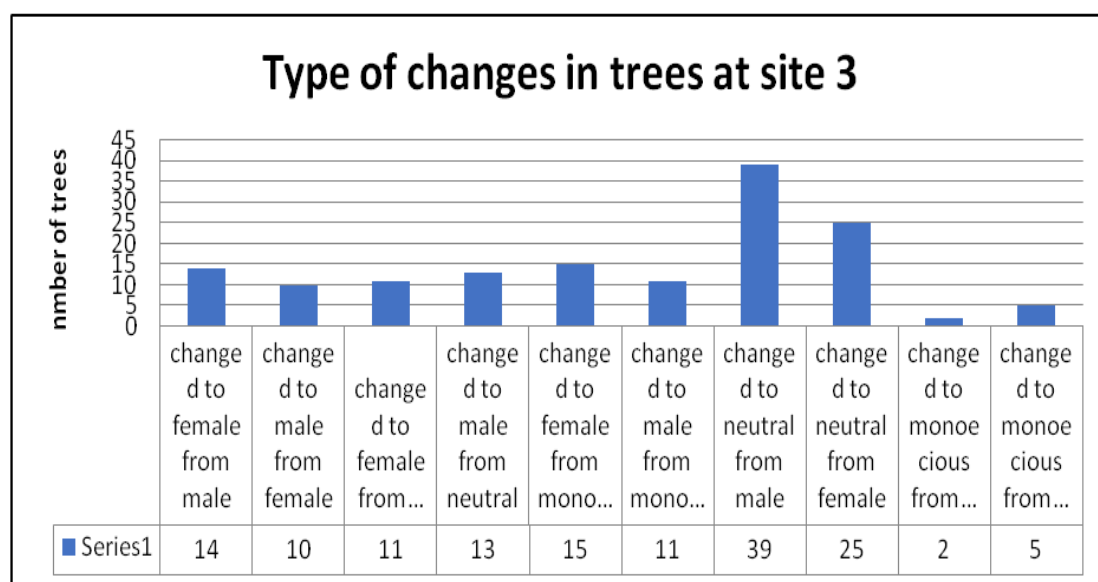


Figure 3:- Type of changes in trees at site 3.

CONCLUSION

Representation of sexual behavior by *Cedrus deodara* does not follow a definite pattern. They might be undergoing some physiological and metabolic changes influenced by environment which force them to change their sexual characteristic from monoecious to dioecious, dioecious to monoecious, monoecious to neutral and vice-versa, male to female and vice-versa. Therefore, it is very difficult to predict the changing nature of a tree in the next fruiting season also the cone production in *cedrus deodara* is periodic.. Monoecious behavior of the trees was found to be predominant than dioecious behavior. The uncertainty of the reproductive behavior of *Cedrus deodara* was confirmed by two observations. First, each year the number of male, female, monoecious and neutral trees kept changing. Each site witnessed change in the reproductive behaviour of individual tree. Adult sporophyte of *Cedrus deodara* species is capable of undergoing transition from one form to and some trees showing no change or reproductive growth in their reproductive cycle for three years. Increase in the number of dioecious and monoecious trees and decrease in the number of neutral trees at Cheog forest, HFRI campus in Himachal Pradesh and Kanasar forest, Chakrata in Uttarakhand, indicated that the trees at each site underwent change in their reproductive behavior, from vegetative to reproductive phase and vice-versa. A good cone crop is either followed by very little cone production or a crop failure the following year. The year 2016 could be considered as a good seed year at all three sites as the number of neutral trees decreased and the number of reproductive trees increased drastically. This increase in the number of monoecious trees in 2016 was significantly higher than that of 2015 and 2014; also the number of female trees decreased in 2016 compared to 2015 and 2014 at all the three sites. However, the number of male trees showed moderate change in 2016 compared to 2015 and 2014. This gives an idea that the male and mostly female trees have a tendency to change their reproductive state from dioecious to monoecious. This study has build up a foundation for further research on the factors responsible for the change in the reproductive behavior of *Cedrus deodara*.

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ECONOMICS OF COMMERCIAL CULTIVATION OF *FRITILLARIA ROYLEI*

ASHWANI KUMAR

INTRODUCTION

Fritillaria roylei Hook.f. is a herbaceous plant, 0.5-2 ft tall, commonly found in alpine slopes and shrubberies of the Himalayas, from Pakistan to Uttarakhand, at altitudes of 2700-4000 m. Flowers are yellowish-green to brownish-purple and usually with a chequered pattern in dull purple. Flowers are broadly bell-shaped, hanging looking down, borne singly on the stems, but sometimes in groups of 2-4. Petals are narrow-ovate, 4-5 cm long. Leaves are linear-lance like, often long-pointed, 5-10 cm, arrange oppositely or in whorls of 2-6 on the stem. Flowering occurs in June-July. *F. roylei* is being sold at very high price in the market which resulted into exploitation of the species at large scale and species has come under critically endangered status as per CAMP Workshop, 2010. This species is used in Ashtavarga which is a combination of eight rejuvenating drugs in preparation of the famous Ayurvedic tonic Chyavanprash (Goraya *et al.*, 2013). The bulb is supposedly antiasthmatic, antirheumatic, febrifuge, galactagogue, haemostatic, ophthalmic and oxytoxic. It is boiled with orange peel and used in the treatment of TB and asthma.

METHODOLOGY

An experimental trial was laid out in November, 2017 in Udaipur, Lahaul & Spiti, H.P, to study the effect of organic manures and spacings on Growth of *F. roylei*, one of important plant of the Ashtavarga group of Medicinal and Aromatic plants (MAPs).

EXPERIMENTAL LAYOUT

The experiment to carry out studies on the economics of commercial cultivation of *F. roylei* was laid out in Randomized Block Design (Factorial) with following details:

ALLOCATION OF TREATMENTS

TREATMENTS

Treatment code	Treatments
T ₁ :	Control (no FYM, no Vermicompost)
T ₂ :	FYM @ 5 ton per hectare
T ₃ :	FYM @ 10 ton per hectare
T ₄ :	Vermicompost @ 5 ton per hectare
T ₅ :	Vermicompost @ 10 ton per hectare
T ₆ :	FYM + Vermicompost @ 5 ton per hectare
T ₇ :	FYM + Vermicompost @ 10 ton per hectare

Spacings

Treatment code	Spacing
S ₁ -	20x20 cm
S ₂ -	20x25 cm
S ₃ -	25x25 cm

Treatment combinations	:	7x3 = 21
Design	:	RBD (factorial)
Replications	:	3
Bed size	:	1m x 1m
Sowing of seeds	:	November, 2017.
Sprouting	:	April, 2018
Flowering	:	May, 2018

OBSERVATIONS RECORDED

Five representative plants from each plot were selected in all the experiments for detailed observations on related parameter. All observations were recorded as per the methodology given below:

1. TOTAL DRY YIELD OF BULBS/HA (KG)

Five randomly selected bulbs from each plot were separated, washed with running water and dried at 40°C until constant weight was attained and their weight was recorded. The mean value was worked out and dry yield of bulbs was estimated on per hectare.

2. STUDIES ON THE ECONOMICS OF COMMERCIAL CULTIVATION OF *FRITILLARIA ROYLEI*

The economic viability of the production of *Fritillaria roylei* was analyzed through simple tabular analysis. Different components of production costs like seeds, labour, fertilizer, harvesting, drying, storage etc. were taken into consideration. The average market prices were used for calculation or returns. The following formulae were used for this purpose:

$$(i) TR = Q \times P_Q$$

Where, TR = Total Returns

Q = Total quantity produced on hectare basis

P_Q = Price of the harvested produce.

$$(ii) NR = TR - TC$$

Where, NR = Net Returns

TR = Total Returns

TC = Total cost (cost incurred on seeds/bulbs, preparation of land, compost, fertilizer, irrigation, harvesting, dry storage/planting and other miscellaneous items)

The final projections were given on hectare basis (Gupta, 2007).

Total cost for control (no FYM, no Vermicompost) (as per schedule of work & labour rates for 2014-15 onward, Kullu Forest Circle):

SN	Name of the item	Quantity	Schedule item	Rate	Amount
1	Collection of seeds Two labours for five days= 10 Days	10 Days	Page No. 3	170/Day	1700.00
2	Preparation of new nursery beds Earth cutting on pick work	10000 sqm.	Page No. 44	92.65/sqm	9,26,500.00
3	Sowing of seeds in the beds (line sowing).	10000 sqm	Page No. 45	9.35/sqm	93,500.00
4	Watering in nursery beds (hand watering). 16 times for the months April, May, June, July, @ 4 times per month.	10000 sqm X 16 = 160000 sqm	Page No. 45	1.82/sqm	2,91,200.00
5	Weeding and hoeing of nursery beds. (Twice a month) May, June, July, @ 6 times per month.	10000 sqm X 6 times= 60000 sqm	Page No. 45	11.54/sqm	6,92,400.00
6	Uprooting of bulbs/labour charges Two labours for ten days= 20 Days	20 Days	Page No. 3	170/Day	3400.00
7	Drying , storage etc. of bulbs One labour for 5 Days	5 Days	Page No. 3	170/Day	850.00
Total					20,09,550.00
Hike 32.35%			6,50,089.425 or 6,50,089.43		
Total			26,59,639.43		
Hike 25% for Lahaul (tribal area increase)			6,64,909.8575 or 6,64,909.86		
Total			33,24,549.29 or 33,24,549.00		

TC = Total cost for treatments other than control (as per schedule of work & labour rates for 2014-15 onward, Kullu Forest Circle):

S.No.	Name of the item	Quantity	Schedule item	Rate	Amount
1	Collection of seeds Two labours for five days= 10 Days	10 Days	Page No. 3	170/Day	1700.00
2	Preparation of new nursery beds Earth cutting on pick work	10000 sqm.	Page No. 44	92.65/sqm	9,26,500.00
3	Mixing of FYM/vermicompost.	10000 sqm	Page No. 45	3.04/sqm	30,400.00
4	Sowing of seeds in the beds (line sowing).	10000 sqm	Page No. 45	9.35/sqm	93,500.00
5	Watering in nursery beds (hand watering). 16 times for the months April, May, June, July, @ 4 times per month.	10000 sqm X 16 = 160000 sqm	Page No. 45	1.82/sqm	2,91,200.00
6	Weeding and hoeing of nursery beds. (Twice a month) May, June, July, @ 6 times per month.	10000 sqm X 6 times= 60000 sqm	Page No. 45	11.54/sqm	6,92,400.00
7	Uprooting of bulbs/labour charges Two labours for ten days= 20 Days	20 Days	Page No. 3	170/Day	3400.00
8	Drying , storage etc. of bulbs One labour for 5 Days	5 Days	Page No. 3	170/Day	850.00
Total				20,39,950.00	
Hike 32.35%				6,59,923.825 or 6,59,923.83	
Total				26,99,873.83	
Hike 25% for Lahaul (tribal area increase)				6,74,968.4575 or 6,74,968.46	

Total	33,74,842.29 Or 33,74,842.00
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TC = Total cost on hectare basis including material cost (as per schedule of work & labour rates for 2014-15 onward, Kullu Forest Circle):

Treatments	Quantity (In Kg)	Rate (Local market rate in Rs. Per Kg)	Amount (In Rs.)	Total amount (In Rs.)	Total amount
T ₁ : Control (no FYM, no Vermicompost)	0	0	0	0	33,24,549.00*
T ₂ : FYM @ 5 ton per hectare	5000	5	25000	25000	33,99,842.00**
T ₃ : FYM @ 10 ton per hectare	10000	5	50000	50000	34,24,842.00**
T ₄ : Vermicompost @ 5 ton per hectare	5000	15	75000	75000	34,49,842.00**
T ₅ : Vermicompost @ 10 ton per hectare	10000	15	150000	150000	35,24,842.00**
T ₆ : FYM + Vermicompost @ 5 ton per hectare	2500 FYM 2500 Vermicompost	5 15	12500 37500	50000	34,24,842.00**
T ₇ : FYM + Vermicompost @ 10 ton per hectare	5000 FYM 5000 Vermicompost	5 15	25000 75000	100000	34,74,842.00**

Note

* denotes the total amount after adding the estimate amount of Appendix –I (Rs. 33,24,549.00) required for raising plants in one hectare.

** denotes the total amount after adding the estimate amount of Appendix –II (Rs. 33,74,842.00) required for raising plants in one hectare.

RESULTS

1. TOTAL DRY YIELD OF BULBS/HA (KG)

The data presented in Table 9.1 revealed significant total dry yield of bulbs/ha (Kg) during first year experiment. Data presented in table indicated significantly highest total dry fresh yield of bulbs/ha (668.6 Kg) in T₇ (FYM + Vermicompost @ 10 ton per hectare) while lowest total dry yield of bulbs/ha (358.8 Kg) was noticed in T₁ (control). Among different planting densities, significantly highest total dry yield of bulbs/ha (603.1 Kg) was observed in S₁ (20x20 cm) and lowest total dry yield of bulbs/ha (458.4 Kg) was found in S₃ (25x25 cm). The interaction study revealed highest total dry yield of bulbs/ha (776.6 Kg) in T₇ S₁ combination (FYM + Vermicompost @ 10 ton per hectare at 20x20 cm) while lowest total dry yield of bulbs/ha (305.2 Kg) was recorded for T₁ S₃ combination (Control at 25x25 cm).

Table 1: Effect of organic manures and spacings on total dry yield of bulbs/ha (Kg)

Treatments	S ₁ (20x20cm)	S ₂ (20x25cm)	S ₃ (25x25cm)	Mean
T ₁ : Control (no FYM, no Vermicompost)	414.3	356.9	305.2	358.8
T ₂ : FYM @ 5 ton per hectare	450.7	390.6	357.9	399.7
T ₃ : FYM @ 10 ton per hectare	608.9	561.9	493.0	554.6
T ₄ : Vermicompost @ 5 ton per hectare	591.9	470.3	421.2	494.5
T ₅ : Vermicompost @ 10 ton per hectare	660.4	621.6	528.2	603.4
T ₆ : FYM + Vermicompost @ 5 ton per hectare	719.1	653.4	551.4	641.3

T ₇ : FYM + Vermicompost @ 10 ton per hectare	776.6	677.3	551.9	668.6
Mean	603.1	533.1	458.4	
	Significant	Significant	Significant	

The data presented in Table 1 revealed significant total dry yield of bulbs/ha (Kg). Data presented in table indicated significantly highest total dry fresh yield of bulbs/ha (668.6 Kg) in T₇ (FYM + Vermicompost @ 10 ton per hectare) while lowest total dry yield of bulbs/ha (358.8 Kg) was noticed in T₁ (control). Among different planting densities, significantly highest total dry yield of bulbs/ha(603.1 Kg) was observed in S₁(20x20 cm)and lowest total dry yield of bulbs/ha(458.4 Kg)was found in S₃(25x25 cm). The interaction study revealed highest total dry yield of bulbs/ha (776.6 Kg) in T₇ S₁ combination (FYM + Vermicompost @ 10 ton per hectare at 20x20 cm) while lowest total dry yield of bulbs/ha (305.2 Kg) was recorded for T₁S₃ combination (Control at 25x25 cm).

2. TOTAL RETURNS (IN RS.) ON HECTARE BASIS

Perusal of data in Table 12.1 revealed significant total returns (in Rs.) on hectare basis. Data presented in table indicated significantly maximum total returns (in Rs.) on hectare basis (66,86,211) in T₇ (FYM + Vermicompost @ 10 ton per hectare) while minimum total returns (in Rs.) on hectare basis (35,88,133) was noticed in T₁ (control). Among different planting densities, significantly maximum total returns (in Rs.) on hectare basis (60,31,310) was observed in S₁(20x20 cm)and minimum total returns (in Rs.) on hectare basis (45,84,000)was found in S₃(25x25 cm). The interaction study revealed maximum total returns (in Rs.) on hectare basis (77,65,833) in T₇ S₁ combination (FYM + Vermicompost @ 10 ton per hectare at 20x20 cm) and minimum total returns (in Rs.) on hectare basis (30,51,733) in T₁S₃ combination (Control at 25x25 cm).

Table 2: Effect of organic manures and spacings on total returns (in Rs.) on hectare basis

Treatments	S ₁ (20x20cm)	S ₂ (20x25cm)	S ₃ (25x25cm)	Mean
T ₁ : Control (no FYM, no Vermicompost)	41,43,333	35,69,333	30,51,733	35,88,133
T ₂ : FYM @ 5 ton per hectare	45,06,667	39,06,000	35,79,200	39,97,289
T ₃ : FYM @ 10 ton per hectare	60,89,167	56,18,667	49,29,600	55,45,811
T ₄ : Vermicompost @ 5 ton per hectare	59,19,167	47,02,667	42,11,733	49,44,522
T ₅ : Vermicompost @ 10 ton per hectare	66,04,167	62,16,000	52,82,133	60,34,100
T ₆ : FYM + Vermicompost @ 5 ton per hectare	71,90,833	65,34,000	55,14,133	64,12,989
T ₇ : FYM + Vermicompost @ 10 ton per hectare	77,65,833	67,73,333	55,19,467	66,86,211
Mean	60,31,310	53,31,429	45,84,000	
	Significant	Significant	Significant	

3. NET RETURNS (IN RS.) ON HECTARE BASIS (NET RETURNS = TOTAL RETURNS (IN RS.) ON HECTARE BASIS - TOTAL COST)

Total cost for control (no FYM, no Vermicompost) (Appendix – I), total cost for treatments other than control (Appendix – II) and total cost on hectare basis including material cost (Appendix – III) were calculated as per schedule of work & labour rates for 2014-15 onward, Kullu Forest Circle. Then net return (in Rs.) on hectare basis has been calculated (net returns = total returns (in Rs.) on hectare basis - total cost).

Data reported in Table 3 revealed significant net returns (in Rs.) on hectare basis. Data presented in table indicated significantly maximum net returns (in Rs.) on hectare basis (32,11,369) in T₇ (FYM + Vermicompost @ 10 ton per hectare), while minimum net returns (in Rs.) on hectare basis (2,63,584) was noticed in T₁ (control). Among different planting densities, significantly maximum net returns (in Rs.) on hectare basis (25,99,367) was observed in S₁ (20x20 cm) and minimum net returns (in Rs.) on hectare basis (11,52,057) was found in S₃ (25x25 cm). The interaction study revealed maximum net returns (in Rs.) on hectare basis (42,90,991) in T₇ S₁ combination (FYM + Vermicompost @ 10 ton per hectare at 20x20 cm) and minimum net returns (in Rs.) on hectare basis (-2,72,816) in T₁S₃ combination (Control at 25x25 cm).

Table 3: Effect of organic manures and spacings on net returns (in Rs.) on hectare basis (Net Returns = Total Returns-Total cost)

Treatments	S ₁ (20x20cm)	S ₂ (20x25cm)	S ₃ (25x25cm)	Mean
T ₁ : Control (no FYM, no Vermicompost)	8,18,784	2,44,784	-2,72,816	2,63,584
T ₂ : FYM @ 5 ton per hectare	11,06,825	50,61,58	1,79,358	5,97,447
T ₃ : FYM @ 10 ton per hectare	26,64,325	21,93,825	15,04,758	21,20,99
T ₄ : Vermicompost @ 5 ton per hectare	24,69,325	12,52,825	7,61,891	14,94,680
T ₅ : Vermicompost @ 10 ton per hectare	30,79,325	26,91,158	17,57,291	25,09,258
T ₆ : FYM + Vermicompost @ 5 ton per hectare	37,65,991	31,09,158	20,89,291	29,88,147
T ₇ : FYM + Vermicompost @ 10 ton per hectare	42,90,991	32,98,491	20,44,625	32,11,369
Mean	25,99,367	18,99,486	11,52,057	
	Significant	Significant	Significant	

CONCLUSION

Treatment of FYM + Vermicompost @ 10 ton per hectare gave maximum net return (Rs. 32,11,369) on hectare basis while minimum net return (Rs. 2,63,584) on hectare basis was recorded in Control. Maximum net return (Rs. 25,99,367) on hectare basis was observed in spacing of 20x20cm and minimum net return (Rs. 11,52,057) on hectare basis was observed in spacing of 25x25cm. This species is being sold at very high price in the market. Keeping in view of the market demand, there should be emphasis on the cultivation practices of this species.

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TREND ANALYSIS OF GROWTH IN AREA, PRODUCTION AND PRODUCTIVITY OF VEGETABLE CROPS IN HIMACHAL PRADESH

DHARAM PAUL

INTRODUCTION

During last two decades, interest in vegetable production has increased rapidly as a result of greater appreciation of the value of vegetable food and large population being vegetarian. The importance of vegetables in balance diet needs more emphasis in the developing countries where high percentage of population is suffering from malnutrition.

India is the second largest producer of vegetables in the world next to China. Himachal Pradesh offers most suitable climate for the production of vegetables like peas, tomato, cauliflower, capsicum, cabbage, bean etc., during summers when these cannot be grown in the plains and offers a ready market for these vegetables. Thus Himachal farmers have an absolute advantage in producing vegetables over other crops while there is comparative advantage in their production in Himachal Pradesh as compared to other parts of the country (Singh, 1990). Vegetable acreages in the State have increased from 25.01 thousand hectares in 1995-96 to about 67.9 thousand hectares in 2011-12. Production of vegetables has increased from 422 thousand metric tonnes to 1356.6 thousand metric tonnes (excluding potatoes) during the same period (GOHP, 2012).

Keeping in view the importance of vegetables in agriculture sector a quantitative assessment to study the district- wise trends in area, production and productivity of vegetables in the State is helpful in reorienting the programs and priorities of agricultural development so as to achieve higher rate of growth. An attempt has been made in this paper to work out the district- wise trend of growth in area, production and productivity of vegetable crops in the Himachal Pradesh during 1995-96 to 2011-12. It is hoped that such a study will help the State in assessing the development of agricultural sector in general, vegetable cultivation in particular and helpful for further policy- formulation.

METHODOLOGY

The present study confines the State and district-wise compound annual growth rate in area, production and productivity of vegetables in Himachal Pradesh. Detailed time series secondary data in respect of area, production and productivity were collected from the Directorate of Agriculture, Himachal Pradesh for the period 1995-96 to 2011-12. The study has been based upon following analytical part:

COMPOUND ANNUAL GROWTH RATE

To calculate the district-wise trends in area, production and productivity of vegetables in the State, compound annual growth rate has been used:

COMPOUND ANNUAL GROWTH RATE IS DEFINED AS:

$$Y = a b^t$$

$$\text{C.A.G.R.} = (b - 1) \times 100$$

Where b is antilog of log b

$$\text{Log } b = \frac{\sum t \log y - \frac{\sum t \sum \log y}{N}}{\sum t^2 - \left(\frac{\sum t}{N} \right)^2}$$

Where C.A.G.R. = Compound annual growth rate

Y = Dependent variables (i.e. area, production and productivity)

a = Constant term

t = Time period or years from 1995-96 to 2011-12

N = Number of years

RESULT AND DISCUSSIONS

Trend of Growth in Area, Production and Productivity of Vegetables in the State

In order to examine the trend of growth in area, production and productivity of vegetables in Himachal Pradesh, annual compound growth rates have been worked out for the period 1995-96 to 2011-12. The figures in the table 1 reveal the trend in area, production and productivity of all vegetables in the State during the above mentioned period. The study reflects the fact that the area, production and productivity under all vegetables has registered an increasing trend of growth in the State. Compound annual growth rate in area, production and productivity of the State is estimated 7.28, 8.09 and 0.89 respectively.

Table 1 Compound Annual Growth Rate in Area, Production and Productivity of Vegetables in Himachal Pradesh

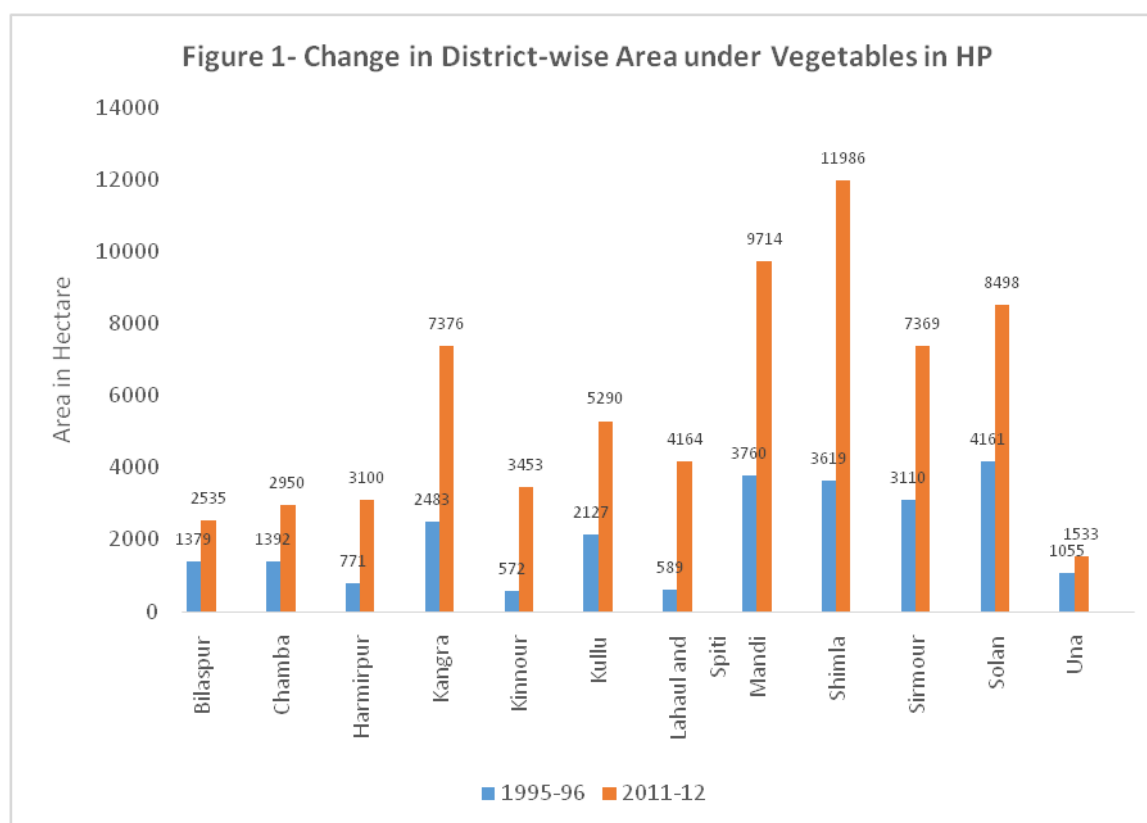
Period	Area '000' ha.	Production '000' M.T.	Productivity (M.T./ha.)
1995-1996	25.018	422.400	16.99
2011-2012	67.968	1356.600	19.96
C.A.G.R.	7.28	8.09	0.87

Note: C.A.G.R.-Compound Annual Growth Rate

Source: Government of Himachal Pradesh, Directorate of Agriculture, Shimla.

DISTRICT- WISE COMPOUND ANNUAL GROWTH RATE IN AREA

The table 2 presents the district-wise compound annual growth rate in area under vegetable crops in Himachal Pradesh. The figure 1 shows that the total area under vegetables in all the districts of the State has increased rapidly. In the year 1995-96 the total area under vegetable crops was highest in district Solan (4164 hectare) and it was lowest in district Kinnour (572 hectare) whereas in the year 2011-12 the total area under vegetable crops was highest in district Shimla (11986 hectare) and lowest in district Una (1533 hectare).



District- wise compound annual growth rate in area under vegetable crops was highest in district Kinnour (14.68 per cent) followed by district Lahaul and Spiti (13.27 per cent), Hamirpur (11.14 per cent), Kangra (10.47 per cent), Mandi (7.97 per cent), Chamba (6.81 per cent) Shimla (6.54 per cent), Kullu (5.78 per cent), Sirmour (5.44 per cent), Solan (5.07 per cent), Bilaspur (4.33 per cent) and lowest in district Una (3.76 per cent). In the year 1995-96 out of total area 25018 hectare under vegetable the percentage share of district Solan (16.63 percent) was highest and district Kinnour was lowest (2.30 per cent) whereas in the year 2011-12 out of total area 67968 hectare under vegetable crops the percentage share of district Shimla was highest (17.64 per cent) and lowest in district Una (2.26 per cent).

DISTRICT- WISE COMPOUND ANNUAL GROWTH RATE IN PRODUCTION

Climatic conditions prevailing in State are conducive for production of vegetable in high hills, cold and dry zones. The analysis reveals that the district – wise compound annual growth rate in production of vegetable crops in Himachal Pradesh (table 2). District Kinnour was most suitable for the production of vegetables having 15.18 per cent compound annual growth rate followed by district Lahual & Spiti (12.03 per cent), district Kangra (11.66 per cent), Hamirpur (11.28 per cent) , Mandi (9.77 per cent), Bilaspur (8.09 per cent), Chamba (7.92 per cent), Shimla (7.44 per cent), Solan (6.98 per cent), Sirmour (6.02 per cent), Kullu (5.78 per cent) and lowest in district Una (3.52 per cent).

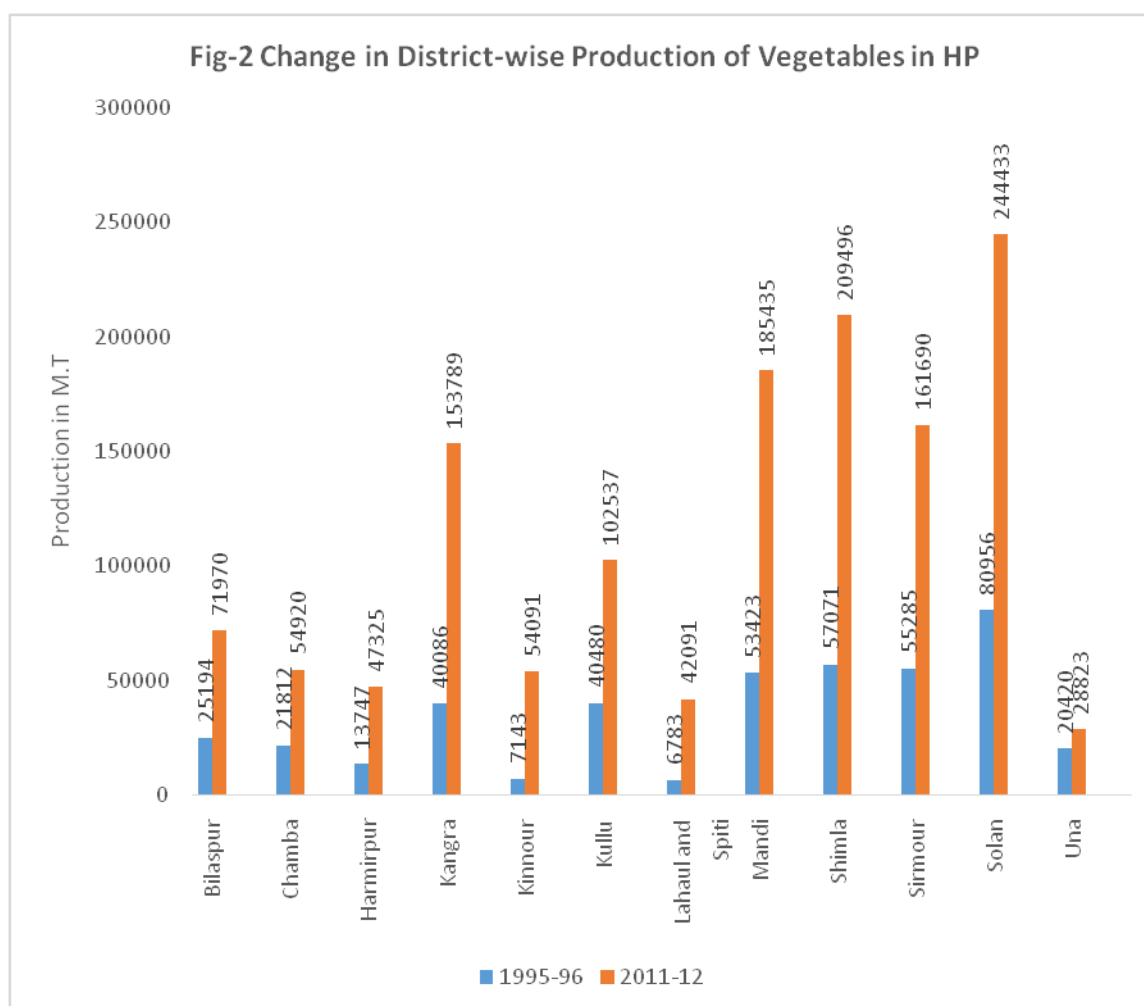
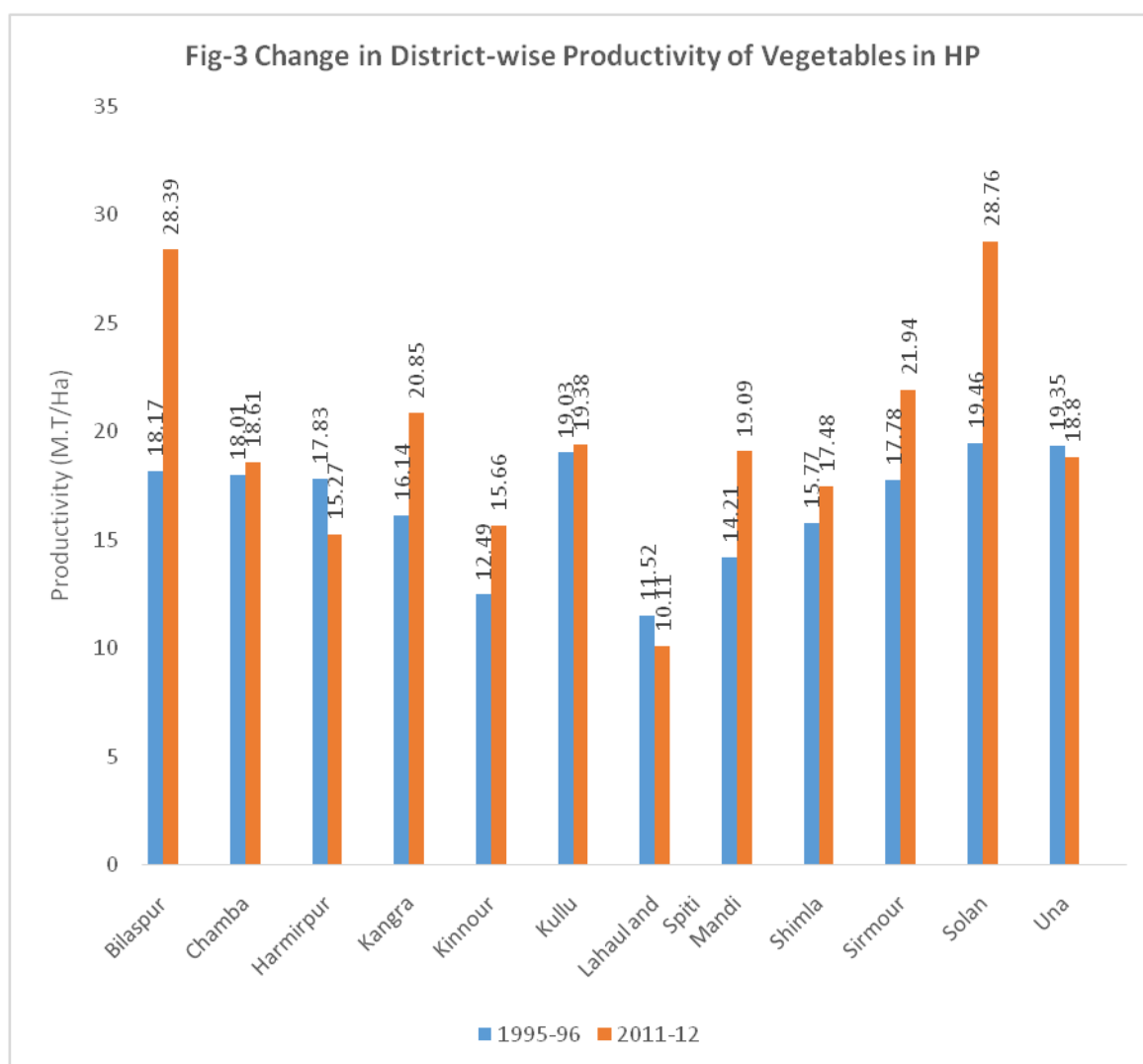


Figure 2 shows that out of the total production of vegetables in the year 1995-96 i.e. 422400 M.T. the production of district Solan was highest i.e. 80956 M.T. and lowest was district Lahaul & Spiti i.e. 6783 M.T., whereas in the year 2011-12 out of total production of vegetables i.e. 1356600 M.T. the production of district Solan was also highest i.e. 244433 M.T. and lowest in case of district Una i.e. 28823 M.T.

DISTRICT- WISE COMPOUND ANNUAL GROWTH RATE IN PRODUCTIVITY

The table 2 shows the change in productivity of vegetable crops among different districts in Himachal Pradesh. Figure 3 shows the comparative analysis of productivity of vegetables among the various districts of Himachal Pradesh. Out of all twelve districts of Himachal Pradesh in the year 2011-12, the productivity of district Solan was observed highest (28.76 per cent) and lowest district was Lahaul & Spiti (10.11 per cent). The compound annual growth rate in the productivity of vegetable crops is highest in district Bilaspur (3.80 per cent) followed by Solan and Kangra districts (with 1.95 per cent and 1.58 per cent respectively). The compound annual growth rate in the productivity of vegetable crops was observed negative in the districts viz. Kullu, Lahaul & Spiti and Una. Kullu and Lahaul & Spiti districts faced the problems of hilly and dissected topography, low extent of irrigation, less developed agricultural infrastructure, low rainfall, apparently and district Una faced the problem of hot weather condition.



After analyzing this table, there is concrete policy measure to increase the productivity of the vegetables in the State. The study suggested vegetable cultivation under protected conditions through green houses, poly houses, net house, poly- tunnels etc. for protecting the vegetable crops from ill weather conditions.

DISTRICT – WISE COMPOUND ANNUAL GROWTH RATE IN AREA, PRODUCTION AND PRODUCTIVITY

The Figure 4 reflects the comparative analysis of district- wise compound annual growth rate in area, production and productivity of vegetable crops in Himachal Pradesh. District- wise analysis revealed that compound annual growth rate in area was highest in Kinnour (14.68 per cent) and lowest in district Una (3.76 per cent). On the other hand in district-wise compound annual growth in production district Kinnour also observed as highest district (15.18 per cent) and district Una was also estimated lowest district (3.52 per cent). In case of productivity of vegetable crops district Bilaspur was at the top having 3.80 per cent compound annual growth rate and districts Kullu, Lahaul & Spiti and district Una registered negative compound annual growth rate.

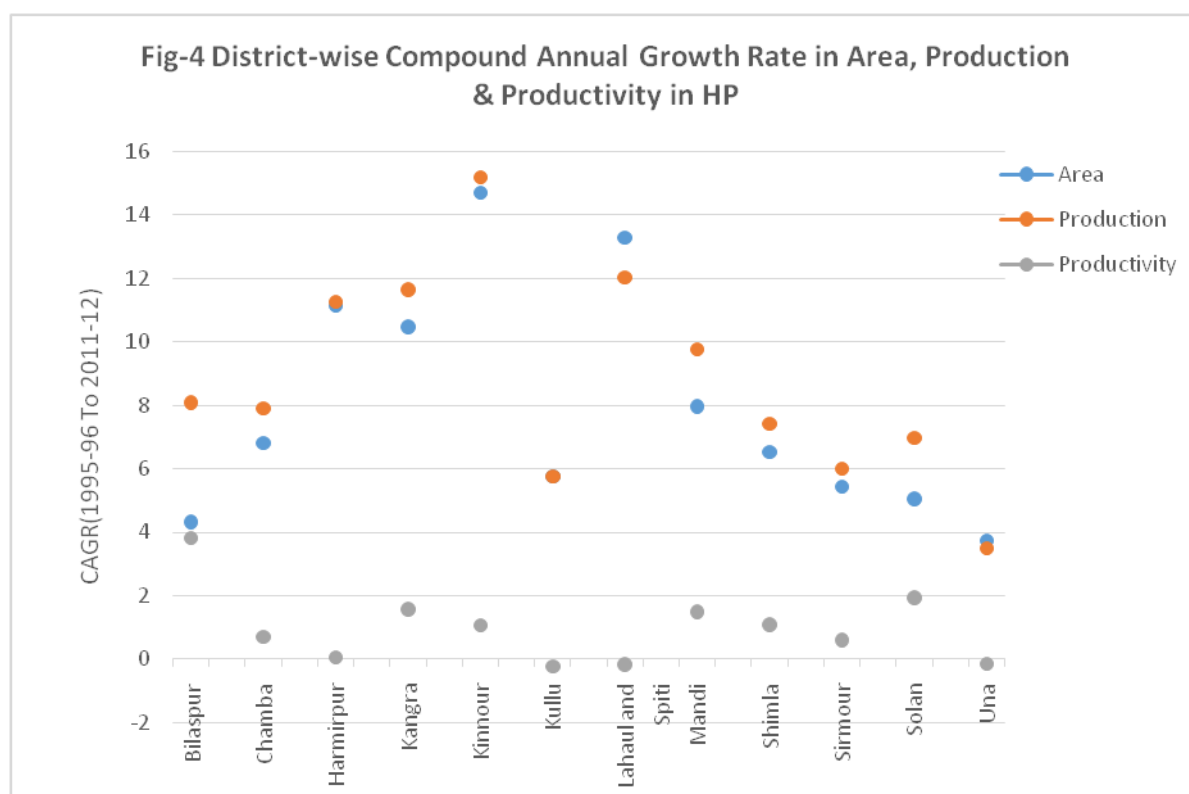


Table 2: District –Wise Compound Annual Growth Rate in Area, Production and Productivity under Vegetables in Himachal Pradesh

District	Area (ha.)			Production (M.T.)			Productivity (M.T./ ha.)		
	1995-96	2011-12	C.A.G.R.	1995-96	2011-12	C.A.G.R.	1995-96	2011-12	C.A.G.R.
Bilaspur	1379 (5.51)	2535 (3.73)	4.33	25194 (5.96)	71970 (5.30)	8.09	18.17	28.39	3.80
Chamba	1392 (5.56)	2950 (4.34)	6.81	21812 (5.16)	54920 (4.05)	7.92	18.01	18.61	0.72
Hamirpur	771 (3.08)	3100 (4.56)	11.14	13747 (3.25)	47325 (3.49)	11.28	17.83	15.27	0.07
Kangra	2483 (9.92)	7376 (10.85)	10.47	40086 (9.49)	153789 (11.34)	11.66	16.14	20.85	1.58
Kinnour	572 (2.30)	3453 (5.08)	14.68	7143 (1.69)	54091 (3.99)	15.18	12.49	15.66	1.07
Kullu	2127 (8.50)	5290 (7.78)	5.78	40480 (9.58)	102537 (7.56)	5.78	19.03	19.38	-0.20
Lahaul & Spiti	589 (2.35)	4164 (6.13)	13.27	6783 (1.61)	42091 (3.10)	12.03	11.52	10.11	-0.14
Mandi	3760 (15.03)	9714 (14.29)	7.97	53423 (12.65)	185435 (13.67)	9.77	14.21	19.09	1.49
Shimla	3619 (14.47)	11986 (17.64)	6.54	57071 (13.51)	209496 (15.44)	7.44	15.77	17.48	1.10
Sirmour	3110 (12.43)	7369 (10.84)	5.44	55285 (13.10)	161690 (11.92)	6.02	17.78	21.94	0.62

Solan	4161 (16.63)	8498 (12.50)	5.07	80956 (19.17)	244433 (18.02)	6.98	19.46	28.76	1.95
Una	1055 (4.22)	1533 (2.26)	3.76	20420 (4.83)	28823 (2.12)	3.52	19.35	18.80	-0.12
Total H.P.	25018 (100.00)	67968 (100.00)	7.28	422400 (100.00)	1356600 (100.00)	8.09	16.99	19.96	0.87

Note: 1) Figures in parentheses denote the percentage of the total
 2) Potato is excluded from total area under vegetables in the state

Source: Government of Himachal Pradesh Directorate of Agriculture, Shimla.

CONCLUSION

The foregoing analysis presents a dismal picture of potential for the cultivation of vegetable crops in the State and shows that there is great trend of growth in area, production and productivity of vegetable crops in Himachal Pradesh during 1995-96 to 2011-12. The district-wise compound annual growth rate in area under vegetables in Himachal Pradesh shows that Kinnour, Lahual & Spiti, Hamirpur and Kangra districts registered the highest compound annual growth rate during the study period as compared to other districts of the State. Whereas the percentage share of area under vegetable crops, Shimla, Mandi and Solan are still leading districts accounting 17.64, 14.29 and 12.50 per cent share of under vegetable crops of the State respectively. As far as the production is concerned, the district-wise growth in production of vegetable crops show that district Kinnour registered highest compound annual growth rate (15.18 per cent) followed by districts of Lahual and Spiti, Kangra, Hamirpur, Mandi, Bilaspur, Chamba, Shimla, Solan, Sirmour and Kullu. It is lowest in district Una (3.52 per cent). On the other hand, the district-wise compound annual growth rate of productivity of vegetable crops is observed highest in districts Bilaspur, Solan, Kangra, Mandi, Shimla, Kinnour, Chamba, Hamirpur and Sirmour. Whereas in remaining three districts i.e. Kullu, Lahual & Spiti and Una have negative compound annual growth rate.

The productivity of particular crop depends on the availability of irrigation or timely rainfall, fertilizer application and adoption of other improved sophisticated techniques. Agriculture development in the State can be increased by accelerating the productivity of the land. There is a little scope for increasing arable land in hilly State like Himachal Pradesh. In order to step up the production of vegetables in the State, it is necessary to apprise the farmers about the latest technical know-how. In order to ensure increase in production of vegetables in the State following points need to be taken into consideration while formulating plans for vegetable production:

Area suited for vegetables production should be identified.

The farmers should be apprised about the package of improved practices of different vegetable crops.

Arrangement should be made to provide sophisticated technical guidance at appropriate time.

The State government should educate farmers about the metric and also economics of vegetable cultivation.

To reduce the risk of the farmers, crop should be covered by insurance.

The study revealed that the district of Kinnour, Kangra, Chamba, Hamirpur, Bilaspur, Mandi, Shimla and Solan are most suitable for production of vegetables. In these districts soil and climate conditions are most favored for the cultivation of vegetable crops on commercial scale in the State.

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MEDICINAL PLANTS OF CHANAN SACRED GROVE OF SHIMLA DISTRICT (H.P)

AMIT & PANKAJ GUPTA

INTRODUCTION

Sacred grooves are the oldest existing spiritually charged holy places where the clusters of trees having special ecological, religious and cultural importance exist. Sacred grooves are the ancient systems of conserving biodiversity, forests and ecosystems. As per the IUCN, these are regarded as the “Sacred Natural Sites”. Many rare and endangered varieties of flora and fauna are preserved in these sacred groves. In India, there are thousands of sacred grooves and in Himachal Pradesh there are around 550 sacred grooves out of which maximum lies in Kullu and Shimla district. Sacred grove has rich repository of variety of plant species. Most of these plants find their use in traditional medicines, folk uses and in modern industry. Sacred groves are believed to be the factories of medicinal plants. Sacred groves are sites where medicinal plants are well-preserved. Local people in the study area possess traditional knowledge of medicinal plants to treat various human ailments.

Medicinal plants are used in the Ayurvedic, Unani and other traditional systems of medicine and in plant –based pharmaceutical industries. Most of the medicinal plants are collected from wild and these medicinal plants are significantly threatened in current scenario due to destructive harvesting. Anderson *et al.* (2005) studied the Tibetan sacred sites and landscapes of Menri in the eastern Himalay and revealed a complex integration of biodiversity, conservation, sanctity, and human plant use. Kumar, *et al.* (2011) carried out survey in Shankaracharyasacred grove which is one the sacred groves of Kashmir. The study revealed that the forests in this sacred grove have plants with medicinal & magico-religious value for both Hindus and Muslims. Chandrakar *et al.* (2014) highlighted the importance of small groves in harboring the variability among the endemic and endangered species of flora and fauna. Duggal *et al.* (2017) conducted the study in Jabalpur forest division to document the sacred groves and their biodiversity and enumerated 300 plant species out of which 164 were medicinally important. Chauhan (1999) documented the most valuable and multifaceted knowledge of 174 medicinal and aromatic plants of Himachal Pradesh. Singh and Thakur (2014) studied the medicinal plants of Shimla hills and 63 plant species in 126 medical conditions in human beings. In this paper an effort has been made to present the details of the medicinal plants found in *Chanan* sacred grove.

STUDY AREA

This study was conducted in “*Chanan* sacred grove” of Chanshal valley in Dodra-Kwar (31°11'9"N latitude to 78°05'2"E longitude) of Chirgaon block which is one of the remotest areas of Shimla district, Himachal Pradesh. Sacred grove is located at a distance of about 165 km from Shimla, the district headquarter. The sacred groove is dedicated to local deity Janglik Jakh / Dodra Jakh. The sacred grove is divided by seven *thach* (open grounds or open areas), the first being the Kund *thach* followed by Rohni *thach*, Lama *thach*, Buckren *thach*, Odari *thach*, Rohli *thach* and Banda *thach*. The sacred groove is surrounded by Gajyani *thach* from upper side and by Dodra village from lower side. *Kalapani* forest is an integral part of

sacred grove. Different rituals are performed where local communities reaffirm their commitment to the forest and the deity.

DATA COLLECTION

For achieving the objective of study, the data was collected by personally visiting the sacred grove and using the predesigned formats and personally interviewing the experienced local persons, shepherds, women, etc. For carrying out the focused group discussion both males and females of different age groups were involved, and their views were recorded on traditional ethno-botanical wisdom linked with the use of bioresources. For documentation of medicinal plants the local name and ethno-botanical aspect of plant was documented. Audio-visual documentation was done by using the standard tools, HR cameras and recorders. The information was later transcribed and used suitably to interpret the data collected from the field. The secondary data was collected from relevant published and unpublished literatures by visiting different libraries. An effort was made to enlist the plants used for various purposes, like medicinal, edible, etc.

RESULTS AND FINDINGS

During the study, 38 different plants were enumerated in the sacred grove. The most commonly used plant parts for herbal preparations in the area are leaves, seeds, whole plant, and roots. These plants are not only the source of nutrition and food but also serve multipurpose role such as medicine, fodder, fuel, agriculture, tools, and fencing. Out of 38 plants, there were twenty herbs, six shrubs, nine trees, two climbers and one parasitic plant. These plants belong to 25 families. Maximum plants belong to Asteraceae (4) family followed by Rosaceae (3), Ranunculaceae (3) and Solanaceae (3) family. Few species of fungi have also been reported. The ethno botanical uses of different parts of plants were documented.

#	Local Name	Botanical Name	Family	Uses
1.	Amarvela	<i>Cuscuta reflexa</i> Roxb.	Convolvulaceae	Fever
2.	Atish	<i>Aconitum heterophyllum</i> Wall.	Ranunculaceae	Fever, Stomach pain
3.	Banaksha	<i>Viola serpens</i> Wall.	Violaceae	Fever
4.	Bankakdu	<i>Podophyllum hexandrum</i> Royle	Berberidaceae	Warts in cattle
5.	Bishkandru	<i>Morina longifolia</i> Wall.	Caprifoliaceae	Stomach disorders
6.	Bhang	<i>Cannabis sativa</i> Linn.	Cannabaceae	Toothache, Hallucination
7.	Bhekhhal	<i>Prinsepia utilis</i> Royle	Rosaceae	Body pain
8.	Bhojpatra	<i>Betula utilis</i> D. Don.	Betulaceae	Nose bleeding
9.	Bajardanti	<i>Potentilla fulgens</i> Wall	Cinquefolis	Toothache
10.	Bras	<i>Rhododendron arboreum</i> Sm.	Ericaceae	Jaundice
11.	Chakloud	<i>Berberis lyceum</i> Royle	Berberidaceae	Piles
12.	Chhambra	<i>Artemisia vulgaris</i> L.	Asteraceae	Jaundice
13.	Chukri	<i>Rheum australe</i> D. Don.	Polygonaceae	Toothache
14.	Datura	<i>Datura stramonium</i> Linn.	Solanaceae	Cough
15.	Dhakh	<i>Solanum nigrum</i> L.	Solanaceae	Skin diseases
16.	Dudhli	<i>Taraxacum officinale</i> Wigg.	Asteraceae	Stomach disorders
17.	Fedu	<i>Ficus palmate</i> Forsk	Moraceae	To bring out spines from skin
18.	Ganj	<i>Dioscorea deltoidea</i> Wall. ex Kunth	Dioscoreaceae	Gastric
19.	Hinser	<i>Rubus ellipticus</i> Simm.	Rosaceae	Diarrhea
20.	Jangli Pudina	<i>Mentha longifolia</i> L.	Laminaceae	Stomach ache
21.	Jari doop	<i>Jurinea dolomiaea</i> Boiss.	Asteraceae	Gout
22.	Kantkari	<i>Solanum xanthocarpum</i> L.	Solanaceae	Chest pain

23.	Kashmol	<i>Berberis aristata</i> DC.	Berberidaceae	Jaundice
24.	Kuja	<i>Rosa moschata</i> Nil	Rosaceae	Diarrhea
25.	Khanor	<i>Aesculus indica</i> Colebr.	Sapindaceae	Improving milk quality in cattle
26.	Khod	<i>Juglans regia</i> Linn.	Juglandaceae	Memory booster
27.	Kungshi	<i>Urtica dioica</i> L.	Urticaceae	Blood pressure, Paralysis
28.	Mohra	<i>Aconitum deinorrhizum</i> Stapf.	Ranunculaceae	Body pain, Toothache
29.	Malora	<i>Rumex hastatus</i> L.	Polygonaceae	Wounds and cuts
30.	Neela Posta	<i>Meconopsis aculeata</i> Royle	Papaveraceae	Ribs and legs pain
31.	Nirbisi	<i>Delphinium chitralicum</i> Wall. ex Royle	Ranunculaceae	Piles
32.	Panja	<i>Dactylorhiza hatagirea</i> (D. Don.) Soo	Orchidaceae	Infertility in males
33.	Reminia	<i>Robinia pseudoacacia</i> L.	Fabaceae	Wounds on skin
34.	Shaileya	<i>Galinsoga parviflora</i> Cav.	Asteraceae	Skin disease
35.	Simrath	<i>Rhododendron campanulatum</i> D. Don.	Ericaceae	Itching
36.	Thuna	<i>Taxus wallichiana</i> Zucc.	Taxaceae	Anti-inflammation
37.	Timbri	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Toothache
38.	Tosh	<i>Abies spectabilis</i> (D. Don.) Spach	Pinaceae	Asthma
FUNGI				
	Fulru	<i>Royoporus badius</i> (Pers.) De	Amanitaceae	Inedible
	Puili Gucchi	<i>Morchella esculenta</i> (L.) Pers	Morchellaceae	Edible
	Gobar chattri	<i>Cantharellus</i> spp.	Cantharellaceae	Inedible
	Kali Gucchi	<i>Morchella elata</i> Fr.	Morchellaceae	Edible
	Kandua Chattri	<i>Macrolepiota procera</i> (Scop.) Singer	Agaricaceae	Edible

Sacred groves, personifying villages and its environs are spots of natural vegetation ranging from a few trees to several acres of forest land and water sources dedicated to the local deities, who have framed certain rules which provide security to these eco-cultural landscapes. Sharma and Gupta (2013) surveyed the villages in Himachal and documented the Primacy of Animism & Panentheism in Himachal Himalay as an Instinctive System of Ecological Restoration. In village Shakroriin Himachal there are seven sacred sites lying in the natural premises of village, which are linked with the folk deities. Sacred groves are present in Chanshal valley and local people are well-conversant with traditional concept of conserving medicinal plants. The local communities had linked the medicinal plants with their socioreligious tradition and due to these tradition and as a mark of respect for the local deity, the medicinal plants are well-preserved. The beliefs of local community and faith in the local deity helps in effective conservation of medicinal plants. Singh and Thakur (2014) studied the medicinal plants of Shimla hills and reported 63 plant species. Similarly, Chanan sacred grove has rich repository of medicinal plants like Atish (*Aconitum heterophyllum*), Bishkandru (*Morina longifolia*), Chukri (*Rheum australe*) etc. In the sacred grove 38 medicinal plants were reported which cure 23 different diseases in humans. Maximum number of reported plants find their use for fever (3 species), in body pain (2 species), for toothache (5 species), to jaundice (3 species), for stomach ache (4 species), skin diseases (3 species) and diarrhea (3 species). The study suggested the need to conserve the indigenous knowledge on traditional medicinal plants by proper documentation, identification of plant species used, and herbal preparation. New researches may be promoted and carried out on medicinal plants for the welfare of humanity.

CONCLUSION

Sacred groves are valuable because of their cultural, religious and ethno-medicinal value and they have an important role in ecosystem conservation. The findings of the present study will probably be useful in understanding the significance of sacred groves, biodiversity and forest resources in ecological, biological, pharmacological along with ecofriendly facets. The sacred groves are the ancient successful forest conservation methods and the government must use such methods in conserving other forest areas. The lessons learnt from the sacred groves must be used while framing the modern conservational norms. The enforcement of laws, forestry extension in the adjacent areas, motivation, and campaign among the people can stop the depletion of forest.



Timbri (*Zanthoxylum armatum*)



Neela Posta (*Meconopsis aculeata*)



Bhojpatra (*Betula utilis*)



Amarvela (*Cuscuta reflexa*)



Puili Gucchi (*Morchella esculenta*)



Kantkari (*Solanum xanthocarpum*)

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Part 3

ASSORTED IDEAS

CARBON TiO_2 COMPOSITE AND ITS APPLICATION

POONAM

INTRODUCTION

In recent years, photo-catalytic process has been used as a low-cost, environmental friendly, and sustainable treatment technology in waste-water treatment. Increasing demand and shortage of clean water sources due to rapid development of industrialization, population growth and long-term droughts have become an issue worldwide. Chlorination has been most commonly used in disinfection process. The disinfection by products generated from chlorination is mutagenic and carcinogenic to human health.

In 1972, Fujishima and Honda discovered the photo-catalytic splitting of water on TiO_2 electrode. This event marked the beginning of a new era in heterogeneous photo-catalysis. In heterogeneous photo-catalysis system, photo-induced molecular transformation or reactions take place at surface of a catalyst. TiO_2 as a durable photo-catalyst has been applied to a variety of problems of environmental interests in addition to water and air. TiO_2 based photo-catalysts used for total destruction of organic compounds in polluted air and waste water. It has been shown to be useful for destruction of microorganisms such as bacteria and viruses, for inactivation of cancer cells, for odor control, for photo-splitting of water to produce hydrogen gas and for fixation of nitrogen and for cleanup of oil spills.

TiO_2 acts as sensitizer for light-reduced redox processes due to their electronic structure. It has a filled valence band and an empty conduction band, when a photon having energy equal or greater than the band gap between conduction and valence band, an electron from filled valence band is excited to an empty conduction band. So in valence band a hole is created. Excited state electron and hole can combine and release the energy as heat or react with electron donor and electron acceptor adsorbed on the photo-catalyst surface. In absence of electron scavenger and hole scavenger stored energy is dissipated in few nanoseconds by recombination. If scavengers present to trap hole and electron then recombination is prevented. TiO_2 have many applications. But its use is limited because of high recombination rate. And have large band gap energy leading to light absorbance in UV region of spectrum. Both these limitations can be overcome by Carbon- TiO_2 nano-composites. This review paper aims to give an overview of understanding the Carbon- TiO_2 composite and a short outline of application also discussed.

ADVANTAGE OF TiO_2 CARBON COMPOSITES

Composite is a combination of one or more materials with TiO_2 . Material may be metal, metal oxide, metal sulphide. Carbon- TiO_2 composite which have been researched due to increase in production of carbon nanotubes and graphene and here we will discuss about their composite with TiO_2 . TiO_2 have numerous application ranges from photovoltaic cells to environmental remediation. But its use is limited due to its large band gap and have fast rate of recombination of photo-generated conduction band electron and valence band hole. By making composite with non- TiO_2 material are very promising means to extend the usefulness of TiO_2 into visible wavelength. By making these composite recombination rate decreases so increase their usefulness in photo-catalytic activity. Other methods to decrease charge carrier

recombination includes increasing crystallinity which can be done by high temperature calcinations of dopants. In composite there is reduction of recombination of photo-generated electron hole pair.

CARBON TiO₂ COMPOSITE

Carbon Nanotubes: - Carbon nanotubes TiO₂ composites have led to their use across much application. Two TiO₂ polymorphs are typically being used anatase and rutile with anatase phase has higher photo-catalytic activity than rutile. It is observed that high charge carrier mobility in anatase which is 89 times faster than in rutile. The CNT_s have excellent mechanical properties and a large specific surface area. The mixture of Titania and CNT_s has large surface area when pollutants can absorb. CNT_s also have electronic properties. They also exhibit metallic conductivity. CNT_s have a large electron storage capacity and therefore may accept photo-excited electrons in nano-composites with titanium, so hindering the recombination. Photo-generated electron-hole pair have a recombination time of 10^{-9} s, but chemical interaction with adsorbed pollutant species has a time scale of 10^{-8} - 10^{-3} s. So this composite increases the recombination time. CNT_s also provide large surface area and enhance photo-catalytic activity.

Graphene and Graphene Oxide TiO₂: - Graphene has high electron mobility and surface area. Graphene is a carbon allotrope that exists in a honeycomb 2D crystal structure. Graphene oxide is produced by oxidation of highly pure graphite. It has various oxygenated functional groups on the surface of GO sheets. Graphene oxide has many unique properties. These include high dispersibility in various polar solvents and ability to attach diverse molecular structures on its surface by hydrogen bonding. G and GO are used to form composite material with TiO₂ and improve their photo-catalytic performance. This is due to-

- Enhancement of surface area of TiO₂ due to its interaction with 2D structure of G and GO.
- Enhancement of adsorption of aromatic substances due to pi-pi interaction with aromatic network of G and GO.
- Decrease the rate of recombination of positive holes and photo-generated electrons due to substantial electronic conductivity of G and GO that acts as an electron sink for photo-generated electrons on the surface of TiO₂.

APPLICATION

The TiO₂/G composite and TiO₂/GO photo-catalytic application for de-composition of water contaminants. Environmental pollutants can be removed by photo-catalysis. TiO₂ composites have enhanced photo-catalytic activity than bare TiO₂ because it inhibits the recombination of photo-induced electrons and holes and also increases the life time of photo-generated electrons and holes. It also narrows the band gap and red shift in light absorption that also increases the photo-catalytic activity. Carbon nanotubes, Graphene and Graphene oxide also have large surface area so increase the adsorption of pollutants on the surface of nano-composites.

TiO₂/G and TiO₂/GO have many applications and are helpful in removing environmental water pollution. Example: photo-catalytic degradation of dyes, photo-catalytic degradation of chemicals and pharmaceuticals. Groundwater is contaminated with many chemicals e.g. caffeine and pharmaceuticals. These composites are useful in degradation of these

pharmaceuticals. Carbamazepine was removed from water using TiO_2/G . The herbicide 2,4 Dichlorophenoxy acetic acid used in complete world in agriculture also present in waste water. It was efficiently removed by using TiO_2/G nano composites which is doped with Pt under UV-Vis light. Bisphenol A, which is also a environmental pollutant is also removed by photo-degradation with the help of TiO_2/G composite.

Other environmental photo-catalytic applications of these TiO_2 nano composites include the removal of fulvic acid, a natural organic matter. Fulvic acid increases the level of heavy metals and adsorbed organic pollutants in drinking water.

CONCLUSION

TiO_2 carbon composites are very helpful in removal of contaminants from water. The rate of photo-degradation is enhanced in comparison to bare TiO_2 . The decrease in band gap energy leads to absorbance in visible region of spectrum. These also have higher adsorption of aromatic pollutants e.g azo dyes by pi-pi interaction of dyes with aromatic network of Graphene and Graphene Oxide. So they play an important role in protection of environment.

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CHARACTERIZATION OF MAGNETOHYDRODYNAMIC TRIPLY DIFFUSIVE CONVECTION IN A SPARSELY DISTRIBUTED POROUS MEDIUM: DARCY-BRINKMAN MODEL

KAKA RAM, VINOD KUMAR, PANKAJ KUMAR & JYOTI PRAKASH

INTRODUCTION

The onset of thermohaline instability in porous medium has its importance in many problems of practical interest e.g. in the fields of oceanography, engineering geology, nuclear engineering, the predication of ground water movement in aquifers, chemical process industry, food processing industry, solidification, electrochemistry, centrifugal casting of metals and rotating machinery, geophysics, petroleum industry, biomechanics, disposal of waste material, assessing the effectiveness of fibrous insulation etc. The thermohaline instability in porous medium has been extensively studied. For detailed study one may be referred to Nield, Murray and Chen, Nield and Bejan, Vafai, Radko, Eliahi *et al.*, Zeeshan *et al.*, Lombardo and Mulone.

Only two component systems have been studied by these researchers. However, it was discovered later that there are many physical situations in which more than two components (in porous and nonporous medium) are present. For example, the oceans contain many salts having concentrations less than a few percent of the sodium chloride concentration. Multi-component concentrations also exist in magmas and substratum of water reservoirs. Griffiths, Poulikakos, Pearlstein *et al.*, Rudraiah and Vortmeyer, Rionero and Prakash *et al.* have theoretically studied the onset of convection in a triply diffusive fluid layer. The essence of the works of these researchers is that small salinity of a third component with a smaller mass diffusivity can have a considerable effect upon the nature of convection; and ‘oscillatory’ and direct ‘salt finger (stationary convection)’ modes are simultaneously possible under a wide range of conditions.

Banerjee *et al.* derived a characterization theorem for thermohaline convection which disallows the existence of oscillatory motions of neutral or growing amplitude in an initially bottom heavy configuration for the certain parameter regime. Prakash *et al.* extended the work of Banerjee *et al.* to double and triply diffusive convection configurations in a porous and non porous medium and paved the way for further theoretical and experimental investigations in this field of enquiry. As a further step an analogous characterization theorem, in the parameter space of the system alone, is derived for magnetohydrodynamic triply diffusive convection in porous medium which disallows the existence of oscillatory motions of growing amplitude in an initially bottom heavy configurations. In the present paper, the following result is obtained in this direction.

Magnetohydrodynamic triply diffusive convection in a sparsely distributed porous medium with one of the components as heat, with diffusivity K , cannot manifest itself as oscillatory motions of growing amplitude in an initially bottom heavy configuration if the two concentration Rayleigh numbers R_1 and R_2 , the Lewis numbers T_1 and T_2 for the two

concentrations with diffusivities K_1 and K_2 respectively, the Viscosity ratio Λ , the Darcy number D_a , the Heat capacity ratio E , a constant E_1 analogous to E corresponding to first concentration component and a constant E_2 analogous to E corresponding to second concentration component satisfy the inequality

$$R_1 + R_2 \leq \left[\frac{\left(\frac{27\pi^4}{4} \Lambda + 4\pi^2 D_a^{-1} \right)}{\left(1 + E \left(\frac{\tau_1}{E_1} + \frac{\tau_2}{E_2} \right) \right)} \right]$$

It is further established that this result is uniformly valid for any combination of rigid and free boundaries.

MATHEMATICAL FORMULATION

Let us consider a viscous finitely heat conducting Boussinesq fluid layer, saturating sparsely distributed porous medium, of infinite horizontal extension statically confined between two horizontal boundaries $z = 0$ and $z = d$ which are respectively maintained at uniform temperatures T_0 and $T_1 (< T_0)$ and uniform concentrations S_{10}, S_{20} and $S_{11} (< S_{10}), S_{21} (< S_{20})$ in the force field of gravity and in the presence of uniform vertical magnetic field, $\vec{H}$. (see Fig.1). It is assumed that the saturating fluid and the porous layer are incompressible and that the porous medium is a constant porosity medium. It is further assumed that the cross-diffusion effects of the stratifying agencies can be neglected. The Brinkman extended Darcy model has been utilized to study the triply diffusive convection in porous medium.

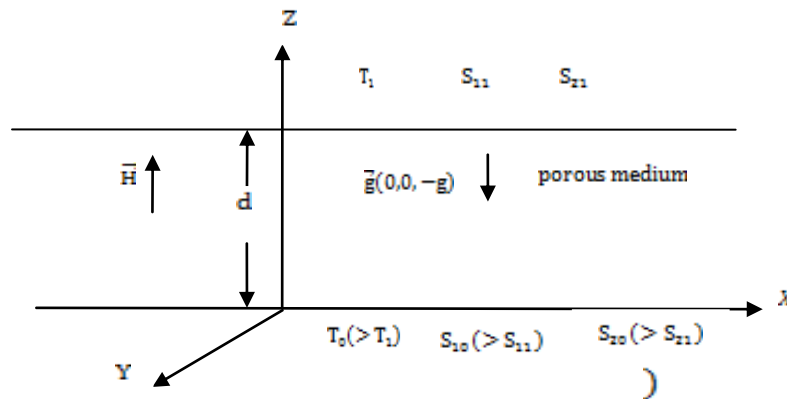


Fig.1. Physical configuration.

The equations that govern the motion of triply diffusive fluid layer in a sparsely distributed porous medium (Darcy-Brinkman Model) under the action of a uniform vertical magnetic field, in the non-dimensional form, are given by (Griffiths [4], Prakash et al. [11, 14]):

$$\Lambda(D^2 - a^2)^2 w - (p + D_a^{-1})(D^2 - a^2)w = R a^2 \theta - R_1 a^2 \phi_1 - R_2 a^2 \phi_2 - Q D(D^2 - a^2)h_z, \quad (1)$$

$$(D^2 - a^2 - E \sigma p) \theta = -w, \quad (2)$$

$$\left(D^2 - a^2 - \frac{E_1 \sigma p}{\tau_1} \right) \phi_1 = -\frac{w}{\tau_1}, \quad (3)$$

$$\left(D^2 - a^2 - \frac{E_2 \sigma p}{\tau_2} \right) \phi_2 = -\frac{w}{\tau_2}, \quad (4)$$

$$(D^2 - a^2 - p\sigma_1)h_z = -\frac{1}{\epsilon} Dw, \quad (5)$$

The Eqs. (1)-(5) are to be solved by using the following boundary conditions:

$$w = \theta = \phi_1 = \phi_2 = Dw = h_z = 0 \text{ at } z = 0 \text{ and at } z = 1,$$

(when both the boundaries are rigid and perfectly conducting) (6)

$$\text{or } w = \theta = \phi_1 = \phi_2 = D^2w = h_z = 0 \text{ at } z = 0 \text{ and at } z = 1,$$

(when both the boundaries are free and perfectly conducting) (7)

where z is the real independent variable such that $0 \leq z \leq 1$, D is the differentiation w.r.t. z , a^2 is square of the wave number, $\sigma > 0$ is the Prandtl number, $\sigma_1 > 0$ is the magnetic Prandtl number, $T_1, T_2 > 0$ are the Lewis numbers for two components respectively, $R > 0$ is the Rayleigh number, $R_1 > 0$ and $R_2 > 0$ are the two concentration Rayleigh numbers, $Q > 0$ is the Chandrasekhar number, $\Lambda > 0$ is the Viscosity ratio, $Da > 0$ is the Darcy number, w is the vertical velocity, θ is the temperature, ϕ_1 and ϕ_2 are the two concentrations, h_z is the vertical component of the perturbation in the initially external imposed magnetic field, $p = p_r + ip_i$ is the complex growth rate where p_r and p_i are the real constants and as a consequence the dependent variables $w(z) = w_r(z) + iw_i(z)$, $\theta(z) = \theta_r(z) + i\theta_i(z)$, $\phi_1(z) = \phi_{1r}(z) + i\phi_{1i}(z)$, $\phi_2(z) = \phi_{2r}(z) + i\phi_{2i}(z)$ and $h_z(z) = h_{z,r}(z) + ih_{z,i}(z)$ are complex valued functions of

the real variable z . Here $E = \epsilon + (1 - \epsilon) \frac{\rho_s C_s}{\rho_0 C_f}$ is a positive constant and E_1 and E_2 are also constants analogous to E but corresponding to concentration rather than heat, where ϵ is the porosity of the porous medium, ρ_s, C_s and ρ_0, C_f stand for density and heat capacity of the solid (porous matrix) material and fluid respectively. The suffix '0' denotes the values of the various parameters at some suitably chosen reference temperature T_0 and concentration S_0 .

It may further be noted that Eqs.(1)-(7) describe an eigen value problem for p and govern magnetohydrodynamic triply diffusive convection in a sparsely distributed porous medium for any combination of dynamically free and rigid perfectly conducting boundaries.

MATHEMATICAL ANALYSIS

Now we prove the following theorem:

Theorem: If $R > 0, R_1 > 0, R_2 > 0, Q > 0, p_r \geq 0, p_i \neq 0$, and

$$R_s = R_1 + R_2 \leq \left[\frac{\left(27 \frac{\pi^4}{4} \Lambda + 4 \pi^2 D_a^{-1} \right)}{1 + E \left(\frac{T_1 + T_2}{E_1 + E_2} \right)} \right]$$

then a necessary condition for the existence of nontrivial solution $(w, \theta, \phi_1, \phi_2, p)$ of Eqs.(1)-(5) together with boundary conditions (6) or (7) is that $R_s = R_1 + R_2 < R$.

Proof: Multiplying Eq. (1) by w^* (the superscript * henceforth denotes complex conjugation) on both sides and integrating over vertical range of z , we obtain

$$\begin{aligned} & \Lambda \int_0^1 w^* (D^2 - a^2)^2 w \, dz - (p + D_a^{-1}) \int_0^1 w^* (D^2 - a^2) w \, dz = \\ & R a^2 \int_0^1 w^* \theta \, dz - R_1 a^2 \int_0^1 w^* \phi_1 \, dz - R_2 a^2 \int_0^1 w^* \phi_2 \, dz - Q \int_0^1 w^* D (D^2 - a^2) h_z \, dz. \end{aligned} \quad (8)$$

Using Eqs. (2)-(5) and the fact, that $w(0) = 0 = w(1)$, we can write

$$R a^2 \int_0^1 w^* \theta \, dz = -R a^2 \int_0^1 \theta (D^2 - a^2 - E \sigma p^*) \theta^* \, dz, \quad (9)$$

$$R_1 a^2 \int_0^1 w^* \phi_1 \, dz = -R_1 a^2 \tau_1 \int_0^1 \phi_1 \left(D^2 - a^2 - \frac{E_1 \sigma p^*}{\tau_1} \right) \phi_1^* \, dz, \quad (10)$$

$$R_2 a^2 \int_0^1 w^* \phi_2 \, dz = -R_2 a^2 \tau_2 \int_0^1 \phi_2 \left(D^2 - a^2 - \frac{E_2 \sigma p^*}{\tau_2} \right) \phi_2^* \, dz. \quad (11)$$

$$\begin{aligned} Q \int_0^1 w^* D (D^2 - a^2) h_z \, dz &= -Q \int_0^1 D w^* (D^2 - a^2) h_z \, dz = \\ & Q \epsilon \int_0^1 (D^2 - a^2 - p^* \sigma_1) h_z^* (D^2 - a^2) h_z \, dz. \end{aligned} \quad (12)$$

Combining Eqs. (8)-(12), we obtain

$$\begin{aligned} & \Lambda \int_0^1 w^* (D^2 - a^2)^2 w \, dz - (p + D_a^{-1}) \int_0^1 w^* (D^2 - a^2) w \, dz = \\ & -R a^2 \int_0^1 \theta (D^2 - a^2 - E \sigma p^*) \theta^* \, dz + R_1 a^2 \tau_1 \int_0^1 \phi_1 \left(D^2 - a^2 - \frac{E_1 \sigma p^*}{\tau_1} \right) \phi_1^* \, dz \\ & + R_2 a^2 \tau_2 \int_0^1 \phi_2 \left(D^2 - a^2 - \frac{E_2 \sigma p^*}{\tau_2} \right) \phi_2^* \, dz - Q \epsilon \int_0^1 (D^2 - a^2 - p^* \sigma_1) h_z^* (D^2 - a^2) h_z \, dz. \end{aligned} \quad (13)$$

Integrating various terms of Eq. (13), by parts, for an appropriate number of times and making use of either of the boundary conditions (6)-(7), it follows that

$$\begin{aligned} & \Lambda \int_0^1 (|D^2 w|^2 + 2a^2 |Dw|^2 + a^4 |w|^2) \, dz + (p + D_a^{-1}) \int_0^1 (|Dw|^2 + a^2 |w|^2) \, dz \\ & = R a^2 \int_0^1 (|D\theta|^2 + a^2 |\theta|^2 + E \sigma p^* |\theta|^2) \, dz \\ & - R_1 a^2 \tau_1 \int_0^1 \left(|D\phi_1|^2 + a^2 |\phi_1|^2 + \frac{E_1 \sigma p^*}{\tau_1} |\phi_1|^2 \right) \, dz \\ & - R_2 a^2 \tau_2 \int_0^1 \left(|D\phi_2|^2 + a^2 |\phi_2|^2 + \frac{E_2 \sigma p^*}{\tau_2} |\phi_2|^2 \right) \, dz \\ & - Q \epsilon \int_0^1 (D^2 - a^2) h_z^* |h_z|^2 \, dz - Q \epsilon p^* \sigma_1 \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) \, dz. \end{aligned} \quad (14)$$

Equating the real and imaginary parts of both sides of Eq. (14) and cancelling $p_i \neq 0$ throughout from the imaginary part, we get

$$\begin{aligned}
& \wedge \int_0^1 (|D^2 w|^2 + 2a^2 |Dw|^2 + a^4 |w|^2) dz + (p_r + D_a^{-1}) \int_0^1 (|Dw|^2 + a^2 |w|^2) dz \\
& = Ra^2 \int_0^1 (|D\theta|^2 + a^2 |\theta|^2 + E\sigma p_r |\theta|^2) dz - R_1 a^2 T_1 \int_0^1 \left(|D\phi_1|^2 + a^2 |\phi_1|^2 + \frac{E_1 \sigma p_r}{T_1} |\phi_1|^2 \right) dz \\
& - R_2 a^2 T_2 \int_0^1 \left(|D\phi_2|^2 + a^2 |\phi_2|^2 + \frac{E_2 \sigma p_r}{T_2} |\phi_2|^2 \right) dz - Q\epsilon \int_0^1 |(D^2 - a^2)h_z|^2 dz - \\
& Q\epsilon p_r \sigma_1 \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz
\end{aligned} \tag{15}$$

and

$$\begin{aligned}
& \int_0^1 (|Dw|^2 + a^2 |w|^2) dz = -Ra^2 E\sigma \int_0^1 |\theta|^2 dz + R_1 a^2 E_1 \sigma \int_0^1 |\phi_1|^2 dz + R_2 a^2 E_2 \sigma \int_0^1 |\phi_2|^2 dz + \\
& Q\epsilon \sigma_1 \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz
\end{aligned} \tag{16}$$

We write Eq. (15) in an alternative form as

$$\begin{aligned}
& \wedge \int_0^1 (|D^2 w|^2 + 2a^2 |Dw|^2 + a^4 |w|^2) dz + p_r \int_0^1 (|Dw|^2 + a^2 |w|^2) dz + D_a^{-1} \int_0^1 (|Dw|^2 + \\
& a^2 |w|^2) dz = \\
& Ra^2 \int_0^1 (|D\theta|^2 + a^2 |\theta|^2) dz - R_1 a^2 T_1 \int_0^1 \left(|D\phi_1|^2 + a^2 |\phi_1|^2 \right) dz - R_2 a^2 T_2 \int_0^1 \left(|D\phi_2|^2 + \right. \\
& \left. a^2 |\phi_2|^2 \right) dz - Q\epsilon \int_0^1 |(D^2 - a^2)h_z|^2 dz + p_r \left[Ra^2 E\sigma \int_0^1 |\theta|^2 dz - R_1 a^2 E_1 \sigma \int_0^1 |\phi_1|^2 dz - \right. \\
& \left. R_2 a^2 E_2 \sigma \int_0^1 |\phi_2|^2 dz - Q\epsilon \sigma_1 \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \right]
\end{aligned} \tag{17}$$

and derive the desired result from the resulting inequality obtained by replacing each terms of this equation by its appropriate estimate.

We first note that since $w, \theta, \phi_1, \phi_2$ and h_z satisfy $w(0) = 0 = w(1), \theta(0) = 0 = \theta(1), \phi_1(0) = 0 = \phi_1(1), \phi_2(0) = 0 = \phi_2(1)$ and $h_z(0) = 0 = h_z(1)$, we have by Rayleigh-Ritz inequality (Schultz[19])

$$\int_0^1 |Dw|^2 dz \geq \pi^2 \int_0^1 |w|^2 dz, \tag{18}$$

$$\int_0^1 |D\theta|^2 dz \geq \pi^2 \int_0^1 |\theta|^2 dz, \tag{19}$$

$$\int_0^1 |D\phi_1|^2 dz \geq \pi^2 \int_0^1 |\phi_1|^2 dz, \tag{20}$$

$$\int_0^1 |D\phi_2|^2 dz \geq \pi^2 \int_0^1 |\phi_2|^2 dz, \tag{21}$$

$$\int_0^1 |Dh_z|^2 dz \geq \pi^2 \int_0^1 |h_z|^2 dz. \tag{22}$$

Following Banerjee et al. [1], it can be easily proved that

$$\int_0^1 |D^2 w|^2 dz \geq \pi^4 \int_0^1 |w|^2 dz. \tag{23}$$

Combining inequality (18) and (23), we get

$$\int_0^1 |D^2 w|^2 dz \geq \pi^4 \int_0^1 |w|^2 dz. \tag{24}$$

Now by using inequality (18) and (24), we have

$$\int_0^1 (|D^2 w|^2 + 2a^2 |Dw|^2 + a^4 |w|^2) dz \geq (\pi^2 + a^2)^2 \int_0^1 |w|^2 dz. \quad (25)$$

Further, since $p_r \geq 0$, we note that

$$p_r \int_0^1 (|Dw|^2 + a^2 |w|^2) dz \geq 0. \quad (26)$$

Now multiplying Eq. (2) by θ^* and integrating the various terms on the left hand side of the resulting equation by parts for an appropriate number of times by making use of the boundary conditions on θ , namely $\theta(0) = 0 = \theta(1)$, we have from the real part of the final equation

$$\begin{aligned} \int_0^1 (|D\theta|^2 + a^2 |\theta|^2 + E\sigma p_r |\theta|^2) dz &= \text{Real part of } \int_0^1 \theta^* w dz, \\ &\leq \left| \int_0^1 \theta^* w dz \right|, \\ &\leq \int_0^1 |\theta^* w| dz, \\ &\leq \left(\int_0^1 |\theta|^2 dz \right)^{1/2} \left(\int_0^1 |w|^2 dz \right)^{1/2} \quad (\text{using Schwartz inequality}). \end{aligned} \quad (27)$$

Combining the above inequality with inequality (19) and the fact that $p_r \geq 0$, we have

$$(\pi^2 + a^2) \int_0^1 |\theta|^2 dz \leq \left(\int_0^1 |\theta|^2 dz \right)^{1/2} \left(\int_0^1 |w|^2 dz \right)^{1/2},$$

which gives that

$$\left(\int_0^1 |\theta|^2 dz \right)^{1/2} \leq \frac{1}{(\pi^2 + a^2)} \left(\int_0^1 |w|^2 dz \right)^{1/2},$$

and thus inequality (27) gives

$$\int_0^1 (|D\theta|^2 + a^2 |\theta|^2) dz \leq \frac{1}{(\pi^2 + a^2)} \int_0^1 |w|^2 dz. \quad (28)$$

Further, combining the above inequality with inequality (19), we get

$$\int_0^1 |\theta|^2 dz \leq \frac{1}{(\pi^2 + a^2)^2} \int_0^1 |w|^2 dz. \quad (29)$$

Now, since $h_z(0) = 0 = h_z(1)$, using the same procedure as is used to obtain the inequality (23), we have

$$\int_0^1 |D^2 h_z|^2 dz \geq \pi^2 \int_0^1 |Dh_z|^2 dz, \quad (30)$$

and thus by making use of inequalities (22) and (30), we can write

$$\begin{aligned} \int_0^1 |(D^2 - a^2) h_z|^2 dz &= \int_0^1 (|D^2 h_z|^2 + 2a^2 |Dh_z|^2 + a^4 |h_z|^2) dz \\ &\geq (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz. \end{aligned} \quad (31)$$

Now using inequalities (20), (21) and (31), it follows that

$$\begin{aligned}
& R_1 a^2 \tau_1 \int_0^1 (|D\phi_1|^2 + a^2 |\phi_1|^2) dz \\
& + R_2 a^2 \tau_2 \int_0^1 (|D\phi_2|^2 + a^2 |\phi_2|^2) dz + Q\epsilon \int_0^1 |(D^2 - a^2)h_z|^2 dz \\
& \geq (\pi^2 + a^2) \left(R_1 a^2 \tau_1 \int_0^1 |\phi_1|^2 dz + R_2 a^2 \tau_2 \int_0^1 |\phi_2|^2 dz \right) + Q\epsilon (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \\
& \geq (\pi^2 + a^2) \left\{ \frac{\tau_1}{E_1 \sigma} \int_0^1 (|Dw|^2 + a^2 |w|^2) dz - \frac{R_1 a^2 E_2 \tau_1}{E_1} \int_0^1 |\phi_2|^2 dz - \frac{Q\epsilon \sigma_{1\tau_1}}{E_1 \sigma} \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz + \right. \\
& \left. \frac{\tau_2}{E_2 \sigma} \int_0^1 (|Dw|^2 + a^2 |w|^2) dz - \frac{R_2 a^2 E_1 \tau_2}{E_2} \int_0^1 |\phi_1|^2 dz - \frac{Q\epsilon \sigma_{2\tau_2}}{E_2 \sigma} \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \right\} + \\
& Q\epsilon (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \\
& , \text{ (utilizing Eq. (16))} \tag{32}
\end{aligned}$$

and thus

$$\begin{aligned}
& -R_1 a^2 \tau_1 \int_0^1 (|D\phi_1|^2 + a^2 |\phi_1|^2) dz - R_2 a^2 \tau_2 \int_0^1 (|D\phi_2|^2 + a^2 |\phi_2|^2) dz \\
& - Q\epsilon \int_0^1 |(D^2 - a^2)h_z|^2 dz \\
& \leq (\pi^2 + a^2) \left[\frac{R_1 a^2 E_2 \tau_1}{E_2} \int_0^1 |\phi_1|^2 dz + \frac{R_2 a^2 E_1 \tau_2}{E_1} \int_0^1 |\phi_2|^2 dz \right] + (\pi^2 + a^2) \frac{Q\epsilon \sigma_{1\tau_1}}{\sigma} \left(\frac{\tau_1}{E_1} + \frac{\tau_2}{E_2} \right) \int_0^1 (|Dh_z|^2 + \\
& a^2 |h_z|^2) dz - (\pi^2 + a^2) \left(\frac{\tau_1}{E_1 \sigma} + \frac{\tau_2}{E_2 \sigma} \right) \int_0^1 (|Dw|^2 + a^2 |w|^2) dz - Q\epsilon (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + \\
& a^2 |h_z|^2) dz \\
& . \tag{33}
\end{aligned}$$

Again, using Eq.(16), we obtain

$$\begin{aligned}
& \frac{R_1 a^2 E_2 \tau_1}{E_2} \int_0^1 |\phi_1|^2 dz \leq \frac{\tau_2}{E_2 \sigma} \int_0^1 (|Dw|^2 + a^2 |w|^2) dz + \frac{R a^2 E \tau_2}{E_2} \int_0^1 |\theta|^2 dz - \frac{Q\epsilon \sigma_{2\tau_2}}{E_2 \sigma} \int_0^1 (|Dh_z|^2 + \\
& a^2 |h_z|^2) dz \\
& , \tag{34}
\end{aligned}$$

and

$$\begin{aligned}
& \frac{R_2 a^2 E_1 \tau_2}{E_1} \int_0^1 |\phi_2|^2 dz \leq \frac{\tau_1}{E_1 \sigma} \int_0^1 (|Dw|^2 + a^2 |w|^2) dz + \frac{R a^2 E \tau_1}{E_1} \int_0^1 |\theta|^2 dz - \frac{Q\epsilon \sigma_{1\tau_1}}{E_1 \sigma} \int_0^1 (|Dh_z|^2 + \\
& a^2 |h_z|^2) dz \\
& . \tag{35}
\end{aligned}$$

Now using inequalities (34) and (35), we can write

$$\begin{aligned}
& \frac{R_1 a^2 E_2 \tau_1}{E_2} \int_0^1 |\phi_1|^2 dz + \frac{R_2 a^2 E_1 \tau_2}{E_1} \int_0^1 |\phi_2|^2 dz \leq \left(\frac{\tau_1}{E_1 \sigma} + \frac{\tau_2}{E_2 \sigma} \right) \int_0^1 (|Dw|^2 + a^2 |w|^2) dz + R a^2 E \left(\frac{\tau_1}{E_1} + \right. \\
& \left. \frac{\tau_2}{E_2} \right) \int_0^1 |\theta|^2 dz - \frac{Q\epsilon \sigma_{1\tau_1}}{\sigma} \left(\frac{\tau_1}{E_1} + \frac{\tau_2}{E_2} \right) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \\
& . \tag{36}
\end{aligned}$$

Using this inequality (36) in inequality (33), we get

$$\begin{aligned}
& -R_1 a^2 \Gamma_1 \int_0^1 (|D\phi_1|^2 + a^2 |\phi_1|^2) dz - R_2 a^2 \Gamma_2 \int_0^1 (|D\phi_2|^2 + a^2 |\phi_2|^2) dz \\
& \quad - Q\epsilon \int_0^1 |(D^2 - a^2)h_z|^2 dz \\
& \leq (\pi^2 + a^2) R a^2 E \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \int_0^1 |\theta|^2 dz - Q\epsilon (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz \\
& \leq \frac{R a^2 E}{(\pi^2 + a^2)} \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \int_0^1 |w|^2 dz - Q\epsilon (\pi^2 + a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz.
\end{aligned}$$

(using inequality (29)) (37)

Also from Eq. (16) and the fact that $\mathbf{p}_r \geq \mathbf{0}$, we obtain

$$\begin{aligned}
& p_r \left[R a^2 E \sigma \int_0^1 |\theta|^2 dz - R_1 a^2 E_1 \sigma \int_0^1 |\phi_1|^2 dz - R_2 a^2 E_2 \sigma \int_0^1 |\phi_2|^2 dz - Q\epsilon \sigma_1 \int_0^1 (|Dh_z|^2 + \right. \\
& \left. a^2 |h_z|^2) dz \right] < 0
\end{aligned}$$

(38)

Now, if permissible, let $R_s = R_1 + R_2 \geq R$. Then, in that case, we derive from Eq. (17) and the inequalities (18), (25), (26), (28), (37) and (38) that

$$\begin{aligned}
& \left[\Lambda (\pi^2 + a^2)^2 + D_a^{-1} (\pi^2 + a^2) - \frac{R_s a^2}{(\pi^2 + a^2)} \left(1 + E \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \right) \right] \int_0^1 |w|^2 dz + Q\epsilon (\pi^2 + \\
& a^2) \int_0^1 (|Dh_z|^2 + a^2 |h_z|^2) dz < 0
\end{aligned}$$

(39)

which clearly implies that

$$R_s > \frac{\left(\frac{\Lambda (\pi^2 + a^2)^3}{a^2} + D_a^{-1} \frac{(\pi^2 + a^2)^2}{a^2} \right)}{\left(1 + E \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \right)},$$

so that we necessarily have

$$R_s > \left[\frac{\left(\frac{27\pi^4}{4} \Lambda + 4\pi^2 D_a^{-1} \right)}{\left(1 + E \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \right)} \right], \tag{40}$$

since the minimum value of $\frac{(\pi^2 + a^2)^3}{a^2}$ (for $a^2 = \frac{\pi^2}{2}$) is $\frac{27\pi^4}{4}$ and the minimum value of $\frac{(\pi^2 + a^2)^2}{a^2}$ (for $a^2 = \pi^2$) is $4\pi^2$.

Hence if $R_s = R_1 + R_2 \leq \left[\frac{\left(\frac{27\pi^4}{4} \Lambda + 4\pi^2 D_a^{-1} \right)}{\left(1 + E \left(\frac{\Gamma_1}{E_1} + \frac{\Gamma_2}{E_2} \right) \right)} \right]$, then we must have

$$R_s = R_1 + R_2 < R. \tag{41}$$

This establishes the theorem.

The essential content of the theorem from the physical point of view are that magneto hydrodynamic triply diffusive convection in porous medium with one of the components as heat with diffusivity K cannot manifest as oscillatory motions of growing

amplitude in an initially bottom heavy configuration if the two concentration Rayleigh numbers R_1 and R_2 , the Lewis numbers T_1 and T_2 for the two concentrations with diffusivities K_1 and K_2 respectively (with no loss of generality $K > K_1 > K_2$), the Viscosity ratio Λ , the Darcy number D_a , the Heat capacity ratio E , a constant E_1 analogous to E corresponding to first concentration component and a constant E_2 analogous to E corresponding to second concentration component satisfy the inequality

$$R_1 + R_2 \leq \left[\frac{\left(\frac{27\pi^4}{4} \Lambda + 4\pi^2 D_a^{-1} \right)}{\left(1 + E \left(\frac{T_1}{E_1} + \frac{T_2}{E_2} \right) \right)} \right].$$

It is further established that this result is uniformly valid for the quite general nature of the bounding surfaces.

CONCLUSION

The linear stability theory is used to characterize the onset of magnetohydrodynamic triply diffusive convection in sparsely distributed porous medium using the Darcy-Brinkman model. The layer is considered to be heated and soluted from below. The porous medium is taken as isotropic and homogeneous. A mathematical theorem is derived which provides a classification of the neutral or unstable magnetohydrodynamic triply diffusive configuration into two classes namely the bottom-heavy class and top-heavy class and then strikes a distinction between them by means of characterization theorem which disallow the existence of oscillatory instability in the former class. It is further established that this result is uniformly valid for the quite general nature of the bounding surfaces. The work done in the present paper will certainly pave the way for further theoretical and experimental investigations in this field of enquiry.

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REVIEWING THE BLIND SEARCHING TECHNIQUES OF AI

SUKHJEET SINGH

INTRODUCTION

Intelligence agent is a problem solver which has an ability to pick an optimal decision at a given situation on the basis of his previous knowledge. When we think about Artificial intelligence every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it ^[1]. To solve a problem in the real world we had to follow some step by step Techniques Where on a single step we had to decide about the next step towards the goal. Here in many cases we do not have pre knowledge about the path to analyze that we are following the right path or going in the wrong direction. These Types of Techniques are called Blind Searching Techniques or Uninformed state space searching techniques. To make an artificial agent which can simulate as human beings for the same type of problems? We have some techniques which we are going to analyze.

SOME REAL WORLD EXAMPLES

In **rubix cube** if we are not perfect in this game then we are just moving from one state to another reachable next state of cube. Here we have not any idea we going solve it or making it more complex.

In **Maze Problem** we can only see the immediate paths from current state. When we choose one of them and the further paths reveal themselves.

COMPLEXITY CRITERIA

For each algorithm we will analyze for the following Complexity Criteria.

Time Complexity: How much time does the algorithm run for before finding a solution. ^[2]

Space Complexity: How much space does the algorithm need? We will use the number of space in the OPEN list as a measure of space complexity ^[2]. How much successors of current state had to consider at the present state are called OPEN list of States. These all open nodes needs to store in memory for taking the best decision on the basis of algorithm technique.

Completeness: this property of technique is guaranteed to find the goal if it is present in the state space.

Optimality: if there is more than one goal present in state space then this property of searching technique to find out the best one according to search criteria. by this we analyze the quality of solution.

CHARACTERISTICS OF STATE SPACE

State Space is a whole domain of state which are able to reach in single of multiple steps from initial state whether it contains a goal or not.

It contains a start state and a goal state but absence of goal node is also possible in some cases.

It may be finite or infinite.

Branching factor of a search tree is number of children at each node. if it is not uniform calculate average branching factor. For example in fig. 3 have branching factor is 2.

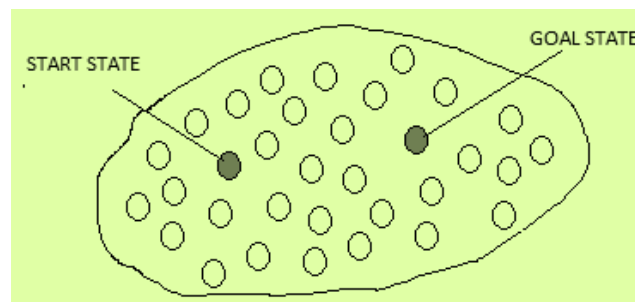


Fig.1 Finite State space

BLIND SEARCHING TECHNIQUES

GENERATE & TEST

TECHNIQUE

In this searching Technique we just choose randomly one state out of those states which are reachable from current state in single step. Or in other words we choose one neighbor state and then test whether it is a goal state or not. Testing can be done by matching the characteristics of the chosen state with given characteristics of Goal state. If matched properly then it success otherwise repeat it again for this state.

PROBLEMS IN GENERATE & TEST TECHNIQUE.

Loopback: it may be possible that we came back on the state which we are passed away because a last visited state is also a neighbor state of the new state. It is possible because in this technique doesn't maintain record of already visited states

Completeness: in the case if goal state is not present it will never be terminated at all.

Above limitations can be resolved by accounting following two types of lists

OPEN LIST: contains all states which are needs to remain in memory for consideration in decision.

CLOSED LIST: Contains already visited states.

DEPTH FIRST SEARCH

TECHNIQUE

In this technique we use a stack. Pick a reachable next state check whether it is a goal, if not pick next state reachable from this state and push this state into a stack. By doing it repeatedly if we reach on limit of space pick a state from the top of the stack in LIFO manner and then repeat the whole process again till the destination state achieved or till the empty stack.

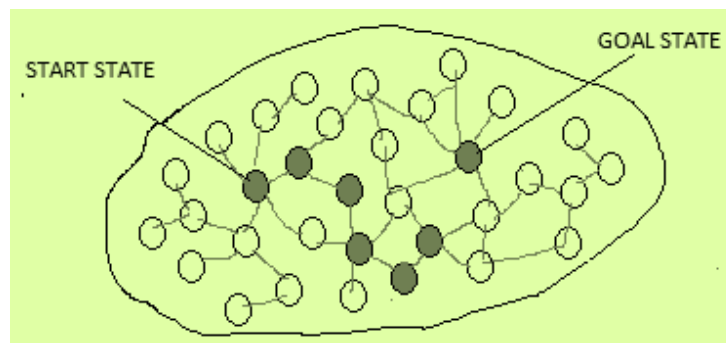


Fig 2. DFS as in State space

If we represent the whole state space as a decision tree as shown in fig. 3.

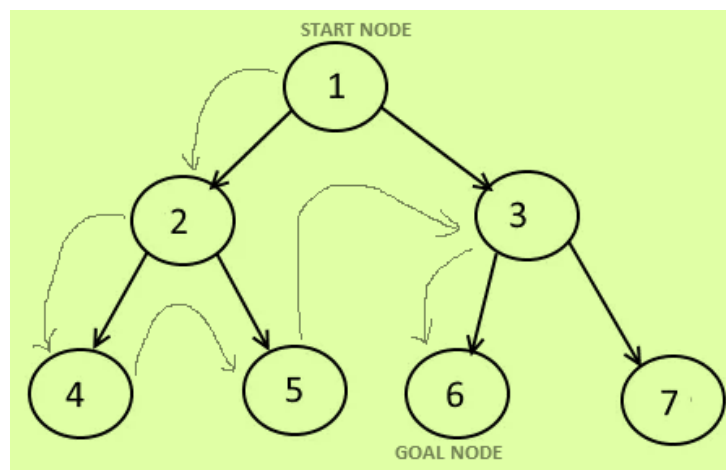


Fig. 3 DFS as in Decision Tree.

As in Fig. 3 our start node is 1 and Goal Node is 6. In DFS we follow the following path: 1 → 2 → 4 → 5 → 3 → 6

COMPLEXITY ANALYSIS OF DFS

Space Complexity: It is a big advantage of DFS that it takes a **Linear Memory**. At a time we need to store only OPEN list in memory which is equal to the $O(bd)$ where b is branching factor of Search tree and d is the maximum depth of the tree.

Time Complexity: it depends on the position of goal node in a tree. If it is present in the extreme left of the tree then DFS will find it after scanning d nodes. If goal is on the most right position of tree then it will find it after scanning all tree which has complexity b^d . Thus on the average its time complexity is

$$= b^{d/2} \text{ for the large } d^{[2]}$$

Completeness: if space is finite then DFS is always complete but not true in the case of infinite search state space. Because it will never backtrack.

Optimality: DFS drives down in tree till the dead end and then tries other part. It stops when the first solution is found which is not a guarantee to be the best one.

BREADTH FIRST SEARCH (BFS)

Technique: instead of using stack as in DFS we are using Queue for maintaining an OPEN list in BFS. In this technique we first expand and scan all the possible immediately reachable states of the start state. Then expand another level of all immediately reachable states from

these all states, after storing these into the queue than scan these all in First in First Out (FIFO) Manner.

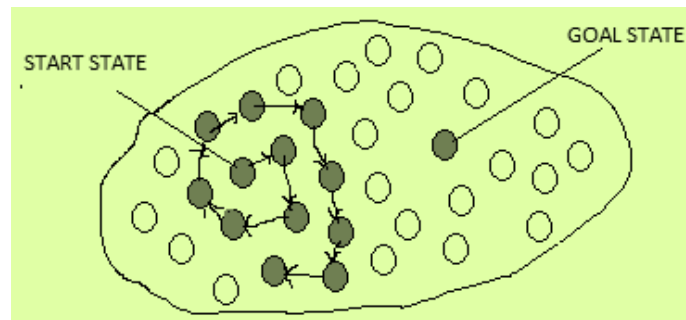


Fig. 4 Representation of BFS in state space

Same process in the representation of search tree is as shown in the following figure. We search the tree level by level until finding the goal or end of the space.

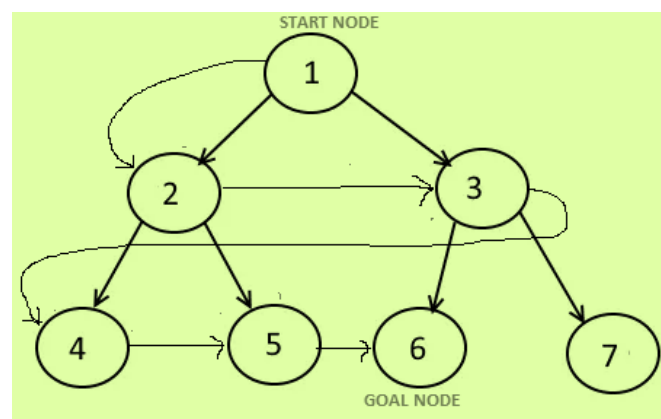


Fig. 4 Representation of BFS as in search tree

As per the above figure BFS finds goal as following

$$1 > 2 > 3 > 4 > 5 > 6$$

COMPLEXITY ANALYSIS OF DFS

Space Complexity: BFS have disadvantaged that it needs an Exponential Memory space. At a level of searching tree we need to store all Childs of that level in OPEN List in memory which is equal to the $O(b^d)$ where b is branching factor of Search tree and d is the maximum depth of the tree.

Time Complexity: it depends on the position of goal node in a tree. If it present in near the top level of the tree then DFS will found early.. If goal is on the most right position of tree then it will find it after scanning all trees which has complexity b^d . Thus on the average its time complexity is

$$= b^d(b+1)/2b \text{ for the large } d^{[2]}$$

Completeness: it does not matter that state space or tree is finite or infinite it always terminate if goal node is present. It is advantage of BFS

Optimality: it scans the tree level by level so it is guaranteed that it always found a solution which is most near to the starting point. So the quality of the solution is always optimal.

4. DEPTH FIRST ITERATIVE DEEPENING SEARCH (DFID)

Technique: as per the above analysis of DFS and BFS we know that DFS have advantages that it consumes less space but it creates a problem in infinite state space. BFS is better in finding best quality of solution. In this technique we use advantages of both the algorithms by setting up a limit on the depth of state space and then follow up Depth First search due to its advantage in.e. linear memory. This technique is called Depth Limit Search (DLS). If goal node find out in specified limit then terminate otherwise increase the limit again by one level deep and follow the same process again. Due to adding an additional functionality of increasing limit Depth Limit Search(DLS) become Depth First Iterative Deepening(DFID) search.

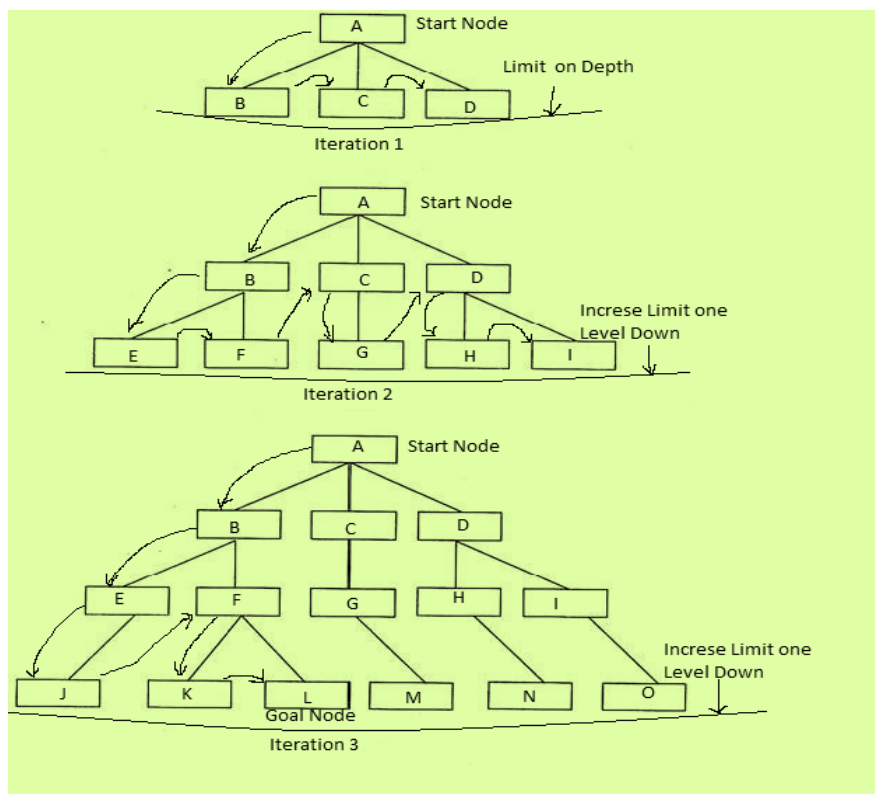


Fig. 6 Processing of DFID in the form of Iterations

COMPLEXITY ANALYSIS OF DFS

Space Complexity: It uses DFS approach for finding solution so it always consume linear space

Time Complexity: it depends on the position of goal node in a tree. If it present in near the top level of the tree then DFS will found early.. If goal is on the most right position of tree then it will find it after scanning all tree which has complexity b^d . Thus on the average its time complexity is

$$= b^d(b+1)/2b \text{ for the large } d^{[2]}$$

Completeness: it does not matter that state space or tree is finite or infinite it always terminate if goal node is present. It is advantage of BFS.

Optimality: it scans the tree level by level so it is guaranteed that it always found a solution which is most near to the starting point. So the quality of the solution is always optimal. This advantage inherited from BFS.

COMPARISON TABLE

Searching Techniques	Time Complexity	Space Complexity	Completeness	Optimal
DFS	$O(b^d)$	$O(d)$	Only in case of finite space	NO
BFS	$O(b^d)$	$O(b^d)$	YES	YES
DFID	$O(bd)$	$O(d)$	YES	YES

Where b is Branching factor and d is depth level of tree.

CONCLUSION

As per the above analysis that we can use Depth first search where we have foundation on memory limit And all solutions in the space have equal weight age whether it is nearer or far from starting point. DFS uses stack. Breadth First search can be used where memory foundation doesn't matter but quality of solution is our first preference. BFS use queue. FID is best because it contains both advantages of DFS and BFS.

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A NARRATIVE APPROACH FOR VISUALIZING 'JHANKI' OF HIMACHAL PRADESH

DEEPAK SINKAR

INTRODUCTION

Human beings have been graced with aesthetic sense and talent to create beauty along with the cerebral capacity. Since the beginning of civilizations till date, man has utilized his talent of creating beautiful to its fullest. He has been intrigued by the nature and its developments, and is aware that he has no power and understanding of the mysteries of the universe. This fear of this unknown has been inert since the prehistoric time to the contemporary age. I have been intrigued by the imagery that came across in my mind during the time of festivals, rituals, celebrations and in the discourse of daily worship.

In this research paper the extreme potent and rich culture of popular/folk arts of Himachal Pradesh has been studied through decoding some usual discourse. Each and every part of these performances has a specific symbolic significance which has been represented through external display. Such kind of forms is replete with emotion-based thinking of the respective community's beliefs, emotions, behavioral patterns and dogmas. The concepts that are compositely generated from all of these factors require some symbolic forms. The forms have the capacity to convey ideas and meanings. These forms, shapes, imagery and icons are Godliness of man with nature. To understand these intentions, there is a strong need to explore the fundamentals of composition and aesthetic beauty of its performance. Thus, the paper aims to explore such kind of significances in detail.

The art of Performance in folk arts are always surreal, fearsome to an extent and give an ethereal experience. At the same time, one is introduced to the creative and destructive energies of the universe through these forms; simultaneously giving the faith to the individuals in that hand that protects and takecare the universe. These actions are thus instrumental in the maintaining and accentuating the good will and faith on smallest to the largest supernatural powers and in the mystic of the cultural realm of human beings.

The ritualistic performance has tremendous amount of artistic appeal. The development of such iconography comes from the free spirit of common man living in a community, these are infect the direct creation of a group of minds who are thinking together and creating a singular piece of their combined emotions. These performances exist in all the layers of the society and are not limited to any particular group of people and thus are the masterpieces to understand the meaning of human life. These performances are divided in the community as '*kuladevata*' (the God of the family genealogy), '*gramdevata*' (God of the demarcated village/geographic area) and '*ishtadevata*' (the personal/individual Gods prayed by the immediate family). The strong faith in the power of these performative icons and the belief system as a whole is clearly reflected through the penetration and usage of this performance in the community. The embellishments of these deities have been transformed as per the changing traditions but the core meaning and concept is remained the same. What was popular some time back recurs to be popular again sometime in future; this parabola continues to create waves in pattern since history. When these performative icons are

compared on the parameters of culture, faith and modernity, these performances come out as highly creative and almost absolute forms of art.

In Himachal Pradesh, for instance, there are a number of occasions where *jhankis* are shown in a non- theatrical context. A quite common form is the representation of deities by children during the *jagratas*, all night rituals to worship the Goddess. This is sponsored by a village family in fulfillment of vow. In that representation, for personification of God and Goddess young boy and girls aged ten to twenty wear decorative dresses and sit in a special posture, motionless, enacted by another person, is brought into the act of performance. They usually sit opposite the assembled family members and neighbors, who then step forward one by one to bow before the God and Goddess, giving and offering, and receiving some sanctified food.

The village Gods are essential aspect of village life and thus are seen penetrating all aspects of living like religion, family caste and customs of the local living. During the evaluation of the location of the concept of '*atma*'/spirit, it has been observed that it influenced the iconographic development in order to sustain their insecurities and fear. The insecurity and fear in the human mind directly leads to creation of Gods in the mind. Similar circumstances lead to understating and misunderstandings about the iconography of Gods. Famous writer Durga Bhagwat quotes, 'Gods are the creations of Ghosts'. While studying the icons through psychological analysis, it has come across that the naïve hunter gatherer psyche of man still pertains to exist in our mind. The writings of Sigmund Freud and R. R. Merritt have conformed to these views. Based on this it has been observed that many ritualistic icons and totems have been created from the psyche of eroticism and fear of death.

In the given research three types of performance have been identified:

1. Symbolic performance
2. Exhibitionist performance
3. Ritualistic performance

In the first type i.e. the symbolic performance, it has been discovered that these actions are direct reflections on the mind of the society, as a whole and characters are the direct outcome of community thinking. These characteristic of Gods keep the community intact too. The representations also showcase gratitude towards the animals, birds, plants and trees and their relationship with humans. Additionally, the realistic and surreal, the actual and absolute image and the experience of the image by the mind of the devotee reflected in the performative icons along with the thoughts of the society.

The exhibitionist kind of performances happens after the culmination of all the concepts of mystic and supernatural embellishments. Eventually, the inner emotions and perceptions of human mind came out in the form of various actions which became the dramatic representations in the exhibitionist icons; while ascend of these icons into compositions and formations because the ritual installations. They emerge from the experience of nature and from the need to create something different from the daily living. The aesthetics in these icons is related with spontaneity and divine virtue.

And the third type of performances is related with the abstract concepts of Gods and has always been created with references of human and animal anatomy which are immediate source of inspiration to the creators. The images that imparted knowledge in the Pre-historic

times continue to attract and inspire the formation. It shows that the universal understating of forms and ideas remains constant through the passage of time. The combination of this universal and intercultural genesis as per the contemporary understating is the characteristics of the art forms. The icons of Gods have been conceived in a completely vacuumed space. Obviously, the fundamentals that have been instrumental in the conception and formation of the icons reflect the emotions, ideas clearly and aesthetically. The spontaneity and ease in the creation give the aesthetic beauty to these icons.

After analyzing this performance in details, it came across that these actions are not merely spiritual embodiments but are rather the art creations which come out of the creative genius. Since these performances are essential part of the individual and community life, they are inseparable from human psyche and have specific role in the contemporary living; it could rather be said that these performance are the life of its believers. These are created by common man completely unaware of the artistic sense. Of course, the performance gives experience of beauty because the elements are creating pleasure and beautiful experience: the purity intentions, passion and drive to construct. Thus, these icons are fulfilled with utmost element of beauty and aesthetic pleasure.

CONCLUSION

Art is an essential essence of the culture and religious heritage of human living and the fundamentals of art can be instrumental in the understanding of the various developmental ideas. During this research, exhibitions and ritual perform during religious practices in Himachal Pradesh has been proved that the cultural heritage continues to exist through art in the society. Some of the studied art forms are independent of religion but conform their creation in the public domain.

In order to study the performance of Gods in popular/folk art of Himachal Pradesh it has been proved that the performances are all human creation. Every symbol has a conformed meaning in the community living. The different performances of Gods are created during the festivities and celebrations to maintain the infinite faith of people in the mystical and other worldly existence. These performances have given direction to social living many times. Performances are the voice of the people, community, religion and art and are bonding a soul between them. It is the representation of the psyche of human mind.

The history from the first creation of image till today shows that humans created many representational and abstract forms of Gods in order to depict the supernatural, mystic mysterious concepts. Such performance is reflection of the social living and managed to mark their impressions in the heart of the individuals. The Visual performance that we see today, has been developed over the concepts and experiences of generations and have layers of meaning attached to them.

It has been observed that the rural performances conform to the rural way of life since they emerge from the psychological needs of the rural communities and thus are spread across all casts, groups, religions and levels in their respective communities. The mother Goddess, Gods that perform certain actions/miracles, ardent devotees and numerous rituals have been developed out of the same necessities.

The icons were created with utmost emotional justifications in particular situations, for specific reasons to complete certain designated activities and fulfil particular desires. The rhythmic movements in the exhibitionist icons ignite the emotions of amazement, fear, death. These icons also spread certain messages, narrate ideas to the people. The icons of Gods that are accompanied by music, dance, makeup and dramatics are even more aesthetic and go towards art creations, while the ritualistic icons that take inputs from family traditions, castes and religions get an additional variety on compositions.

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DIGITAL OUT-OF-HOME ADVERTISING: MORE PERSUASIVE IN URBAN SPACE FOCUSING ON THE INDIAN CONTEXT

ABHIJIT KUMAR MOHANTY

INTRODUCTION

“Digital out-of-home” (DOOH) advertising is a constantly emerging marketing technique that promises to expand digital screens to reach out to consumers at any given time and place in an urban landscape. DOOH advertising is everywhere, the urban landscapes area flooded with DOOH, be it transit, mall or on a commercial location.). The Indian advertising industry is projected to be the second fastest growing advertising market in Asia after China. In contrast to other forms of advertising, by 2023, the market size of DOOH in India is expected to grow beyond Rs 500 crore, whereas the global DOOH market will reach \$26 billion. [1]

Technology moderates” everyday experiences in urban landscape more than anywhere else, and pervasive advertising (based on engagement and persuasion) is fast becoming an integral part of this modern era. Technology and innovation goes together to create an urge that customer takes it back with himself that further plays out to the revenue for the companies. Innovative advertisements leave a better impression that adds to the recall value of the brand. Urban spaces are transforming itself as a two-way communication hub in which pervasive advertising generally plays a deciding factor in shaping an emotionally charged environment that is pivotal for shaping the behaviour of customers. It is essential that the advertisement should appeal to the customers and influence their attitude, though process and purchase behaviour in favour of the advertised brand [3].

The latest trend of the effective advertisement emphasizes on “experience economy” which focuses on enhancing the Customer Experience (CX) by providing valuable experience. Experience economy. The experience society continues where the service society has left off – primarily focused on customers” affective and affirmative responses turning into a valuable and memorable customer experience rather than on tangibles and services themselves [2]. The customer’s effective responses could be in a form of positive feedback, word-of-mouth etc.

A highlighting feature of the experience economy and its “public spaces” [4] is the diversity of the media and information largely available for the customers that are being offered and consumed and that shapes the atmosphere. Böhme refers to [5] Advertising thus shapes and defines public space, becoming an everyday phenomenon in itself.

A new era of technology and innovation, in which traditional advertising is becoming less effective and fails to provide the valuable experience that people are looking for. Meaningful experiences can make a difference to consumers, because of the personal relevance for people with regard to their personal values and beliefs that are the basis of people's consumer behaviour and brand preferences.

LITERATURE REVIEW

Engagement User engagement is a quality of user experience that describes a positive human-computer interaction [9]. O'Brien and Toms [7] proposed six dimensions of user engagement: (1) Aesthetics, the visual appearance of the website, (2) Endurability, perceived task technology fit resulting in intention to recommend to others, (3) Felt Involvement, cognitive immersion in the task, (4) Focussed Attention, flow state that results in temporal and environmental disassociation, (5) Novelty, pleasurable cognitive stimulation and (6) Perceived Usability, the degree of cognitive effort and affective frustration experienced during use [8].

Persuasion Persuasion refers to the power of persons to alter attitudes and behaviour through information" (Cacioppo et al., 1991, p. 799). Therefore, persuasion represents an essential aspect of human communication and can be defined as the attempt to use communication to influence, i.e. to either change or maintain attitudes, beliefs and, ultimately, behaviour. Persuasion via advergames occurs passively too. (Smith and Just 2009) In a study done by Chu, Deng and Chuang [6], the perceived persuasiveness of a product page was measured with a scale containing four statements (7-point "strongly disagree/strongly agree" format). They were "I think this product page is credible," "I have a positive attitude toward this product page," "I am favourable to the product shown on this page," and "It is very likely that I will purchase the product shown in this page." These statements addressed all levels of belief, attitude, and intention suggested by Hoeken (1994) for measuring persuasiveness.

HYPOTHESIS

H_1 : There is a significant difference in engagement of DOOH over traditional advertising formats.

H_2 : There is a significant difference in the persuasiveness of DOOH over common advertising formats of text-only and display advertisements in smartphones.

METHODOLOGY

The methodology consisted of several steps, each of which will be discussed in this section. The first step was to select scales to measure experiences that span the construct domain and provide indicators of engagement and persuasion. Next, we will execute an experiment for different DOOH advertisement that employed the scaling measures of experiences and how users respond to different advertisement to evaluate advertising effectiveness. The final step is to test the research hypothesis to see if DOOH are better in terms of improving engagement and persuasiveness.

Experiment An experiment will be conducted in which participants will view given DOOH advertisement, after viewing the advertisement, participants have to complete a digital questionnaire prepared on Type form, an online survey tool.

Measures As indicated, to accomplish the objectives of this study, we needed measurement scales for a set of online experiences that could be used as indicators of user's attitude towards the advertisement displayed to them. Ideally, these scales should produce an acceptable fit in a measurement model and have good psychometric properties such as acceptable reliability and convergent and discriminant validity.

Engagement: User engagement was measured on a 7-point Likert scale (1= strongly disagree to 7 = strongly agree) with 6 items adapted from O'Brien and Toms' (2010) [7] User Engagement scale.

Persuasion: Persuasion scale was adapted from Chu, Deng and Chuang's (2014) [6] study where they were assessing the persuasiveness of e-commerce pages. Responses will be measured on a 7-point Likert scale. (1= strongly disagree to 7 = strongly agree).

CONCLUSION

Real-time adaptation of DOOHA systems is a promising way to enhance the relevance and impact of advertisements. We propose the elements, engagement and persuasion to enhance the customer experience. This allows considering the various adaptation opportunities systematically to select a feasible adaptation strategy. Field experiments will be performed in the continuation of this study, demonstrating the factors that shape the better customer experience to outperform the traditional medium in the given setting.

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