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AMARANTH [RAJGIRA] –An underexploited crop plant with high nutritional value.

LODHA A.S

Dr.Arwind B Telang

ABSTRACT

The genus *Amaranthus* includes approximately 60 species, most of which are cosmopolitan weeds (*A. retroflexus* L., *A. hybridus* L., *A. powellii* S. Watt., *A. spinosus* L.) and cultivated amaranth species which can be used as food grain, leafy vegetables, forage and ornamentals. *Amaranthus paniculatus* linn. (family Amaranthaceae) is commonly known as 'rajgira' [kingseed] Or 'ramdaana' [sent by god]. The Amaranthaceae family consists of hardy, weedy, herbaceous, fast growing, cereal like plants, with a seed yield of up to 3 tons/hectare. Amaranth belongs to the so called improper cereals (pseudocereals) and called the third millennium crop plant due to its high nutritional value and modest demands at growing. The present paper briefly describes crop importance, nutritional value and utilisation of grain amaranth (Rajgira), one of the underexploited crop plant with high nutritional value.

Keywords – Rajgira , weed, pseudocereal , nutrition, underexploited.

INTRODUCTION

Modernisation of agriculture has several negative side effects felt throughout the world. These effects include biased technological development of use of only some high energy demanding plant species, monoculture production, reduced genetic diversity in agriculture etc. As a result, global food security has become increasingly dependent on only a handful of crops.

Even if humankind has, over time, used more than 10,000 edible species, today only 150 plant species are commercialized on a significant global scale. 12 of these [150] species provide approximately 80% dietary energy from plants and over 60% of the global requirement for proteins and calories are met by just four species; rice, wheat, maize and potato (FAO-2005).

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The narrowing of the number of crops upon which global food security and economic growth depend has placed the future supply of food and rural incomes at risk. The mentioned facts with profound environmental consequences and concern for loss of crop varieties stimulate organisations and scientists worldwide in retrieving, researching and disseminating the knowledge in production and utilisation of neglected, disregarded, underexploited and new plant species, or so called alternative crops. Alternative crops are plant species that are used traditionally for their food, fibre, fodder, oil or medicinal properties. They have an under-exploited potential to

contribute to food security, nutrition, health, income generation and environmental services. Rajgira is one such promising crop.

HISTORY & IMPORTANCE

The earliest archaeological record of pale-seeded grain amaranth is that of *A. cruentus*, found in Tehuacan Puebla, Mexico, about 4000 BC (Pal and Khoshoo, 1974; Sauer, 1979), making it one of the oldest known food crops; it probably originated in Central and South America (Grubber and van Sloten, 1981). Amaranth was a major grain crop in the pre-conquest Aztec empire (Sauer, 1950b; Pal and Khoshoo, 1974; Early, 1977; Haughton, 1978); ancient Mexicans made idols of a dough from seeds of the crop they called *huahtli*, which has been identified as grain amaranth (Sauer, 1950b; Marx, 1977).

Pale-seeded amaranths were also grown in Germany in the 16th century, India and Ceylon in the 18th century, the Himalayas in the early 19th century, and interior China and Eastern Siberia in the late 19th century (Sauer, 1977).

Although grain amaranth is a crop of north Americas, it went remarkable migration to Asia. It became increasingly popular among hill tribes in India, Pakistan, Nepal, Tibet and China. In Himalayas it is an important crop in some areas. It is being cultivated in more areas in non irrigated lands in northern as well as southern parts of India. In India, the seeds are most commonly used in the form of candy known as laddoos (Vietmeyer, 1978), though the seeds are sometimes boiled with rice (Oke, 1983). Amaranth seeds are parched, ground into flour, and eaten as gruel (*sattoo*) in Nepal, while like

chapattis in the Himalayas (Vietmeyer, 1978).

A. caudatus, *A. cruentus*, and *A. hypochondriacus* have been identified (NAS, 1975) as having the potential to increase world food production. *A. caudatus* is grown in the InterAndean Valleys of Peru and Bolivia (Sumar, 1983), *A. cruentus* is cultivated as a grain crop in Guatemala, and *A. hypochondriacus* is grown in Mexico (NAS, 1975). In Mexico, grain amaranth is used chiefly for making *alegría* candies from popped seeds and molasses (Early, 1977) and for preparing *atole*, a drink from roasted and powdered seeds mixed with syrup and water (Oke, 1983). In Peru, seeds are popped and ground into flour or bound with syrup and made into *belles* (Sumar, 1983).

NUTRITIONAL VALUE

A seed of grain amaranth is on average composed of 13.1 to 21.0% of crude protein; 5.6 to 10.9% of crude fat; 48 to 69% of starch; 3.1 to 5.0% (14.2%) of dietary fibre and 2.5 to 4.4% of ash.

Proteins have high digestibility (approx. 90%) and are rich with lysine – 0.34 g Lys/g N (which usually appears in grains as limiting amino acid). Amaranth seed is also a rich source of tryptophan and amino acids containing sulphur - these usually do not appear often enough in grains. This extremely balanced amino acid composition is the result of the fact that in amaranth 65% of proteins are found in the embryo and only 35% in the perisperm whereas in other grains amino acids in endosperm prevail (85% in average) and are poorer with essential amino acids. Amaranth's balanced amino acid composition is close to the optimum protein

reference pattern in the human diet according to FAO/WHO requirements .

Approximately 76% of fatty acids are unsaturated, the share of linoleic fatty acid is 25-62%, oleic acid 19-35%, palmitic acid 12 - 25%, stearic acid 2 - 8,6% and linolenic fatty acid 0.3 – 2.2%. The saturated/unsaturated fatty acid ratio ranges from 0.29 to 0.43. Amaranth oil has been reported to contain larger amounts (7-8% and 11%) of squalene (olive oil contains 1 % of squalene), which is often used and appreciated in cosmetics and medicine and produced from the liver of whales and sharks. Amaranth oil is a rich source of tocotrienols known to lower the LDL cholesterol.

The seed of grain amaranth is a rich source of iron (72-174 ppm), calcium (1300-2850 ppm), natrium (160-480 ppm), magnesium (2300-3360 ppm) and zinc (36.2-40 ppm) as well as vitamin riboflavin (0.19-0.23 mg/100g of flour) and ascorbic acid (4.5 mg/100 gm of flour), niacin (1.17-1.45 mg/100 g of flour), thiamine (0.07-0.1 mg/100 g of flour) and other microelements (Becker et al 1981).

The combination of amaranth and maize flour (50:50) nearly reaches the perfect score of 100 on the nutritionist's scale and also the combination of amaranth and wheat flour increases the nutritional value of baked products (National Academy of

Sciences 1984; Saunders, Becker 1984; Bressani 1989; Joshi, Rana 1991; Segura-Nieto et al 1994; Grobelnik Mlakar et al 2009).

Amaranth seed contains 0.27- 0.32 mg/g of sterols (Becker 1981; Plate Areas 2002). Starch mostly contains amilopectin

(93.6 – 95.2%). Amaranth starch granules are extremely small (0.8-2.5 μm) in comparison to the size of starch granules of other grains: rice 3-8 μm , wheat 3-34 μm , corn 5-25 μm . Smaller granules have a greater water-binding capacity, higher swelling power, lower gelatinization temperature and high resistivity to amylases. Due to the facts mentioned above, amaranth starch shows good gelatinization properties and freeze/thaw stability appreciated in food industry (Breene 1991; Lopez et al. 1994; Williams, Brener 1995; Bhandari, Singhal 2001; Pal et al 2001).

USES/ADVANTAGES

Amaranth – greens and grain have been used in a wide variety of food. Vegetable types (also leaves of grain one) are usually picked fresh, used as greens in salads or blanched, steamed, boiled, stir fried, or baked to taste. Cooked greens can be used as a side dish, in soups, as an ingredient in baby food, lasagne, pasta, pie, soufflé, etc. Amaranth grain, mostly rolled or popped can be used in muesli and in granola bars. Grain can also be germinated for sprouts, malted for beer production, fermented or can serve as a starchy material in spirit production. Furthermore, amaranth, like maize and buckwheat, can be popped through intense, short and dry

heat without addition of fat. Ground grain can be used as a flour ingredient in different mixtures for pancakes, bread, muffins, dumplings, crackers, cookies, pudding, etc. (Bejosano, Corke 1998; Early 1990; Berghofer, Schoenlecher 2002; Grobelnik Mlakar et al 2009).

Indians have been partaking of this ubiquitous food item for centuries, particularly during fasts where its flour is fashioned into rotis and puris. Though commonly thought of as a grain, rajgira is, in fact, the seed of a leafy green vegetable, amaranth, a super-food in its own right. In India this vegetable goes by the name of chauli (north) cheera (Kerala) and thotakora (Andhra).

The amaranth plant grows wild and is presently enjoying a revival of interest for the following reasons: It is easily harvested. It produces a lot of fruits (and thus seeds) which are used as grain. It is highly tolerant of arid environments which are typical of most subtropical and some tropical regions. Due to its weedy life history, amaranth grains grow very rapidly and their large seedheads can weigh up to 1 kilogram and contain a half-million seeds.

In India, rajgira lends itself to delicious and wholesome ladoos, and chikkis. Amaranth is packed with healthy nutrients like fibre, iron, and protein. It also has three times the fibre of wheat. It is gluten-free, and a good source of starch and energy. The flour made from rajgira seeds is rich in calcium, magnesium, folate, potassium, phosphorus, vitamins A, C and e, and antioxidants. Amaranth also helps reduce bad cholesterol. People have also found it beneficial to prevent the premature graying of hair.

It is a versatile food and can be made into pastas, breads, porridges, and chapatis. The seeds can be tossed into salads and soups. Amaranth can be cooked like rice. Amaranth flour, which has a pleasant, nutty

taste, can also be used in place of regular flour for baking; Truly, a superfood, amaranth is worth eating not only during fasts but also all year round!

COMPARISON BETWEEN QUINOA & RAJGIRA

Why the craze over Ecuadorian grain quinoa, when we have nutrition powerhouse rajgira-its Indian version.

Quinoa (pronounced keenvah) has been a rage among diet-keepers. This pseudo-grain—from the Andean region of Ecuador, has gained the reputation of wonder food with qualities of not just weight loss, but also high protein and fibre content. Amaranth [Rajgira] is as much a star as quinoa, only far less advertised.

At an average of around Rs 120-150 per kg, it is also three times cheaper than its Ecuadorian counterpart. Both pseudo-grains contain 18 of the 20 amino acids that the body requires for its daily protein intake.

The two that they lack are easily produced by the body. Thus they have been termed as 'complete proteins'. While one cup of cooked quinoa has about eight grams of protein, a cup of rajgira gives 9.5 grams.

Like quinoa, rajgira too is gluten-free..

Most high-protein diets lack fibre from grains, which is essential for good bowel movement. To make up for this, dieters consume a lot of psyllium husk

(Isabgol) to keep digestion going. Rajgira is a better option, and a richer source of fibre.

Many studies have highlighted the positive impact of fibre on blood pressure levels. Both 'grains' due to their high fibre

(both soluble and insoluble) content help control hypertension

One key difference between the two is their impact on blood sugar levels. Rajgira is high on the glycemic index (GI) — developed for diabetics as a tool, ranked on a scale of 1 to 100 the GI is a food's ability to elevate blood sugar after it's eaten — and causes blood sugar levels to rise faster.

One way to enjoy its maximum nutritional benefits, is to combine it with other grains like sorghum (jowar) or barley (jov), which will positively impact blood sugar levels. With a lower GI, quinoa actually scores over rajgira, thereby impacting blood sugar levels positively, making it excellent for diabetics. Like quinoa rajgira too

is rich in minerals. Most of the minerals that the body needs — phosphorus, magnesium (responsible for vitamin D and calcium absorption) and iron — are found in them. Additionally, Vitamin E and magnesium are more abundantly available in rajgira than quinoa.

CONCLUSION

Due to its unique properties and versatile usage, grain amaranth

[Rajgira] has gained an increased attention. Similarly grain amaranth has some agricultural advantages and noted ability to grow successfully in adverse environmental conditions such

as high irradiance, temperature and drought. The plant has the ability to grow in wild conditions like a weed & is easily harvested. It has the potential as a crop for use as food, feed, and in industrial

applications. It is used in traditional dishes and as an ingredient in food formulation. Amaranth grain is

used in the form of flour, flakes, sprouts, or grain undergoing fermentation, popping, malting, extrusion cooking, special compounds isolation, etc. Raised attention on grain amaranth and its utilisation is pointed out also by approved and funded projects carried out in many parts of the world.

Food items made from Rajgira like bread, biscuits, pasta, rotis, puris, chikkis, kheer etc are most consumed and therefore appropriate carriers for protein enrichment. It is a super healthy food rich in proteins, healthy fats, minerals, elements, fibres, vitamins & antioxidants.

Grain amaranth has been tested and by many authorities recognised as a gluten-free foodstuff suitable for incorporation into the diet for celiac disease patients. On the other hand, lack of gluten is a limiting factor for application of grain amaranth into the composite flour for leavened products. Another fact limiting composite bread acceptance is a distinct aroma and flavour of amaranth grain.

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Role of Mathematics in Computer Programming

Mr. Ashish K. Adhav

Abstract:

As Mathematics Grows More Complex, Computers will Rule. My Study magnifies how mathematics helps the computer programmers in programming. My stance was that all computer programming advances depended almost solely on mathematics advances, and therefore a thorough knowledge in mathematics would help programmers greatly when they're working with real-world challenging problems. There are areas of mathematics that concern themselves directly with programming and are to do with evaluating algorithms and classifying languages and such-like. In computer programming the quality of dealing with ideas in a sequential, logical, constructive, critical, analytical, complex and decision making can be do only by a good mathematician. Logics are at the heart of many areas of computer programming. A solid understanding of mathematical logics would be helpful for computer programmers grasp basic computer science concepts more quickly and would better prepare them for advanced computer programming. However it has been observed that in most of the computer programs there is lack of logical sequence. Hence use of mathematics to understand and write the computer program in a well structured and specific way stepwise is the necessity.

Keywords: Mathematics, Computer programming, logic.

Introduction:

Solving Real World Problems Requires Logic. Suppose a person owned an ice cream shop that saw hundreds of customers daily. The owner decides that it is important to know what the most popular flavors of ice cream are on a monthly basis to ensure that there is enough inventories in stock. A simple computer program that stores the orders can be created, and it will keep track of the demand on each of the different ice cream flavors. This will require a programmer to give storage and counting instructions to a computer based on customers' ice cream orders. Even in the simplest example, the programmer must tell the computer to count each ice cream order and keep track of how many times chocolate was ordered versus vanilla. Now suppose the owner wants to find out how many combinations of flavors are possible. What if someone orders a combination of vanilla, chocolate and mint chocolate chip, for example? Permutations and combinations are other mathematical concepts that a programmer may need to understand to answer a real-world question.

The connection between Math and Computer programming is obvious to any computer scientist. Computer science is built on foundations of mathematics and logic. The language

of computers is the language of math. Doing Computer Programming without Mathematics is like running a Marathon without shoes. Math and computer science influence each other. The improvement in one is dependent on and affected by the upcoming of the other. Math came into existence for dealing with the obstacles in analyzing real life situations. The goal of mathematics is to help solve problems in or give new perspectives to physics, chemistry, biology, arts, architecture, interior design, astronomy, and all fields imaginable. Similarly, when the rate of advancements in these fields slowed down, computer science helped gear them up.

Let us take an example. The laws of planetary motion, motion of satellites (moons) are predicted by analyzing huge amounts of data (numbers) collected over the years. When the amount of data in astronomy increased to such an extent that analyzing it manually became tedious, time consuming and almost impossible, computers began to be used to store lots of information and software's like Microsoft Excel for quicker and more accurate analysis.

Math is an inherent part of computer programming. Most of the logic of programs in any programming language has its roots in math. For example python has a module named math which performs all the mathematical operations like factorial, logarithm, exponential, sine, cosine, tangent etc. Even the basics of computers: binary numbers also have their base in math. The binary digits- 0 for no current flow and 1 for current flow comes from Boolean algebra which is a branch of mathematics. The logical operators like and, or, not, ex-or etc are also taken from Boolean algebra.

There is a branch of mathematics called discrete mathematics. It is used for the development of digital computers which operate in discrete steps. Matrix algebra, 3-d geometry, graph theory etc are also very useful in many computer applications. The graphics are used for making computer games.

We saw how math has influenced computer science. But the relation between the two is definitely not one way. Computers are used for research in math. They are used for proving or testing hypothesis very quickly and accurately. In addition, the application of math in computer science encourages mathematicians to do research in various aspects of mathematics. Computer mathematics can be divided into three large branches. The first is connected with the use of computers in areas involving scientific and practical activities and can be characterized as the analysis of mathematical models. The second branch deals with working out techniques and algorithms for solving typical mathematical problems arising during the investigation of mathematical models. The third branch deals with the problem of simplifying man-computer interactions, including the theory and practice of programming problems for computers, in particular, automation of programming problems.

Objectives:

1. To aware the computer programmers about the importance of mathematics to develop analytical skills, to improve quantitative ability.

2. To help the computer programmers to recognize the usefulness of mathematics in computer programming.
3. To make the programmers acquire the knowledge and competency in mathematics.
4. To guide students for the use of mathematics in computer technology.
5. Making realize the programmers to learn problem solving strategies and abilities with the help of mathematics.
6. To help programmers understand the role of mathematics for skill building for a bright future.

Literature review:

Mathematics is a language consisting of a system of abstract symbols, useful for recording quantitative facts and theorems. It is, also a system of abstract symbolic logic, useful for analyzing quantitative data and for drawing logical inferences from such data. All sciences deal to a greater or lesser degree with quantitative facts and theorems; therefore, the use of mathematics is essential to research and teaching in all sciences, including economics. The usefulness of mathematics has been greatly increased by the development of electronic digital computers which not only increase the magnitude of the mathematical problems which can be solved, but also very drastically decrease the time required to solve them. The very ease and automaticity of solving previously unsolvable problems through the use of electronic digital computers encourage such extensive use of mathematics in economic analysis that a reconsideration of the use and abuse of mathematics is long overdue. The purpose of this paper is to accomplish such reconsideration. Another use of mathematics in economics is the development of mathematical models for economic analysis and prediction; however, these models involve a higher order of abstraction than mere economic description (Hill, Lewis E., American Journal of Economics & Sociology).

Mathematical logic is used in the decision making, so it is used in computer programming. As Venn diagrams are helpful in understanding the concepts of logic, they are also helpful in the programming. For instance, De Morgan's laws are used in writing statements involving decisions and Venn diagrams are helpful in understanding these laws.

Calculations are also important in the science of computers. The text you read on the computer screen is presented in a particular format. Calculations are certainly needed for these.

Geometry is used in the development of graphics. Actually a graphics screen resembles the co-ordinate plane. Just as we have points in the co-ordinate plane, we have pixels on the graphics screen. Though there are endlessly many points in any bounded part of the plane, while the number of pixels on the graphics screen is limited, yet the techniques of coordinate geometry can be used in drawing various figures on the graphics screen.

Various transformations play a part in the development of software. Two such transformations are famous as 'pop and push transformations'. As the graphs are useful in understanding different kinds of transformations, these help understand, in particular the Pop and Push transformations too.

The classical computer programming language namely 'the C language' makes a lot of use of mathematics. Different graphics commands of this language are based on the mathematical logic. The commands for making the background make use of hexadecimal numbers (Article by Sanjeev K.Sharma)

The book (Concrete Mathematics a foundation for computer science) introduces the mathematics that supports advanced computer programming and the analysis of algorithms. The primary aim of its well-known authors is to provide a solid and relevant base of mathematical skills - the skills needed to solve complex problems, to evaluate horrendous sums, and to discover subtle patterns in data.

Now, computers are starting to give mathematics the lab instruments they have been missing. A study by Klarreich (2004) discusses the role computers play in mathematics. The authors stated that computers' power is enabling mathematicians to make quantum leaps into mathematics. Computers take only seconds to calculate and create beautiful graphics of three-dimensional shapes. Computers can solve complex problems and computers can remediate students in mathematics. Mathematics has of course a profound influence on computer science. Nearly every branch of mathematical knowledge has been brought to bear somewhere. A problem dealing with discrete objects called "binary trees", which arise frequently in computer representations of things and the solution to the problem actually involved the complex gamma function times the square of Riemann's zeta function. Thus the results of classical mathematics often turn out to be useful in rather amazing places.

Research Methodology:

1. Introduction: This study has been undertaken to study the application of mathematics in computer programming. Also to enable the computer programmers to understand the usefulness and effectiveness of mathematics required for programming:

2. Setting Objectives:

3. Data Collection: This study comes under descriptive research. The raw data is taken from the primary source. To find out the obstacles of the computer programmers related to mathematics while doing the computer programs I have decide and collected to take the case of Master in computer application [MCA], 3rd year students.

4. Data Analysis:

The sample has been collected from Ahmednagar College computer science department (Master in computer application [MCA], 3rd year students.), Ahmednagar, Maharashtra.

STREAM	EFFICIENCY IN PROGRAMMING	REMARK
<i>B.Sc [Math]</i>		
GRADUATION	65.00%	Very good
POST GRADUATION	80.00%	
<i>B.Sc [Electronics]</i>		
GRADUATION	56.00%	Need improvement
POST GRADUATION	42.00%	
<i>B.Sc [C.S]</i>		
GRADUATION	77.00%	Very good
POST GRADUATION	86.00%	

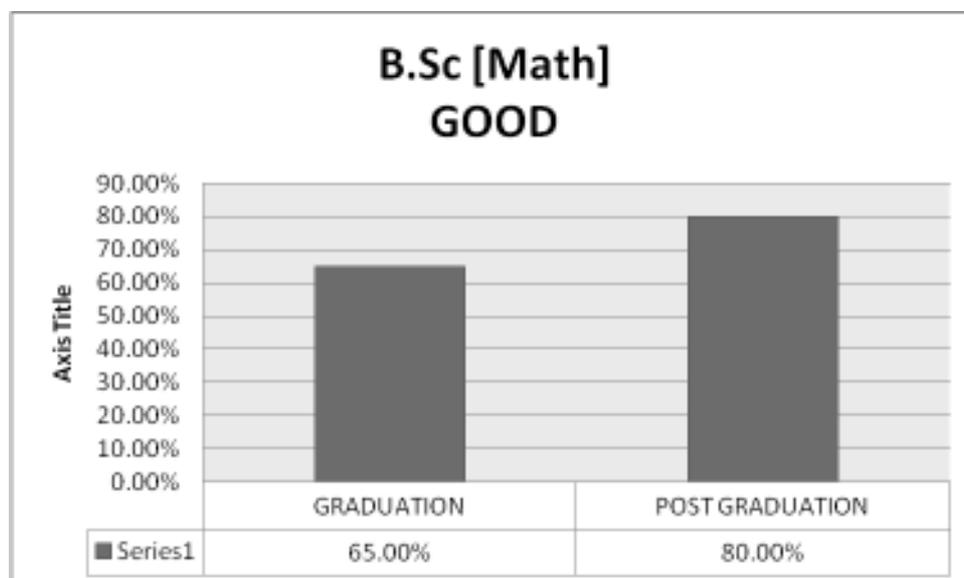


Fig-.I

It has been observed that nearly 20% of the computer programmers with background of B.Sc [Math] is facing problem in programming and has improved a lot uptill their post-graduation level

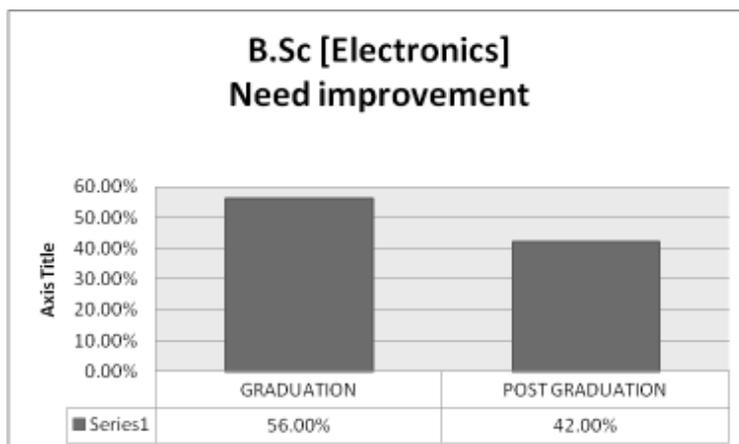


Fig-II

58% of the computer programmers with background of B.Sc [Electronics] is facing problem in programming

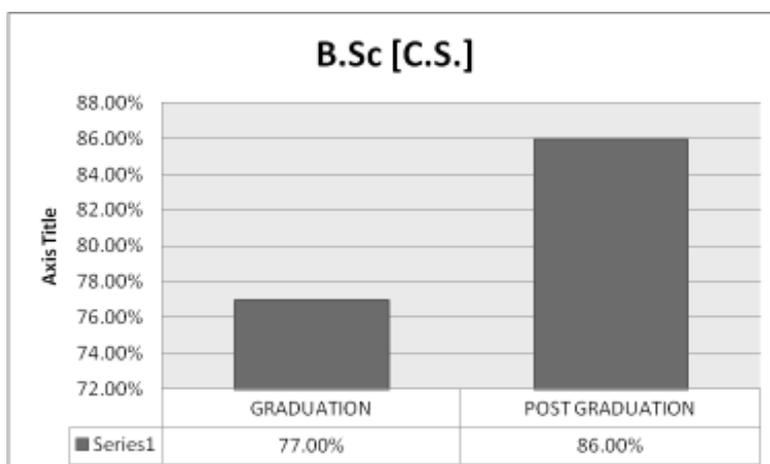


Fig-III

Whereas 14% of the computer programmers with background of B.Sc [C.S] is facing problem in programming.

5. Main Study:

The students of B.Sc [math] and the students of B.Sc [C.S] have mathematics as one of their major subject in graduation. So it was being noticed that their efficiency in computer programming by using mathematics was very good than that of the students of B.Sc [Electronics].

Also it was being noticed that the B.Sc [Math] and B.Sc [C.S] completes a given task very early than that of B.Sc [Electronics] students. As the course of M.C.A is of three years, the syllabus is very vast and there are other subjects also so students pursuing M.C.A cannot solely concentrate on computer programming, hence the data taken is on the basis of their graduation level.

This study will help the computer programmers to understand importance of mathematics to develop analytical skills, to improve quantitative ability. They will come to know the usefulness of mathematics in computer programming. This will lead and encourage them to acquire the knowledge and competency in mathematics. They can use this knowledge in computer technology in more scientific way and thus making the programmers to learn problem solving strategies and abilities with the help of mathematics and thus this will help programmers understand the role of mathematics for skill building for a bright their future.

Findings of this study throw light on the importance of mathematics in writing the computer programs. Mathematics makes a lot of impact on the computer program; it saves the time and efforts. Math makes the logic behind the program clearer. The stepwise algorithm necessary for building program is nothing but the inductive thinking which is developed by the help of mathematics.

Limitations:

1. Because the uses of logic are so varied and opinions on the role of Mathematical logic in computer programming so diverse, this study restricts computer Programmer.
2. It's certainly clear that the practice of mathematics has improved considerable, but improvements in the process of performing mathematics is not satisfying argument for the important relationship of math and computer programming, as computers have revolutionized numerous unrelated fields.
3. Though mathematics plays a vital role in computer programming it is not right to say that a person good at math will do well in computer programming.
4. This research restricts to the Master in computer application [MCA], 3rd year students only.

Recommendations and suggestions:

1. Programmer should be well equipped with related mathematical tools for his program.
2. Discrete mathematics is most broadly applicable across all branches and levels of programming.

3. A strong understanding of linear algebra – especially in 3D, this is insanely necessary.
4. To help the computer programmers to appreciate the beauty of mathematics and computer technology to study and understand the computer world around them.

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Sustainable Use of Cyanobacteria in Seed Spices

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Chandradeep Jangir and Ikram Qureshi

With the introduction of green revolution technologies the modern agriculture is getting more and more dependent upon the supply of synthetic inputs (mainly fertilizers). Dependence on chemical fertilizers for future growth would mean further loss in soil quality and possibilities of water contamination. This situation has led to identifying harmless inputs like biofertilizers. Uses of biofertilizers in crop cultivation will undoubtedly help in safeguarding the soil health and also the quality of crop products. This may be relatively cheap and convenient for use. The cyanobacteria as the biofertilizers provide an extraordinarily wide-ranging contribution to human affairs in everyday life and are of economic importance. They are important primary producers and their general nutritive value is high. Application of high input technologies has resulted in significant increase in agricultural productivity. Cyanobacteria offer an economically attractive and ecologically sound alternative to chemical fertilizers for realizing the ultimate goal of increased productivity, especially in rice and wheat cultivation. In a wetland rice ecosystem, nitrogen fixation by free living cyanobacteria also significantly supplements soil nitrogen. Another success attempt was made on the cultivation of vegetables *viz.*, radish, spinach, methi, tomato and cucumber has been made in the soil media. These associate cyanobacteria fix N_2 about twice more efficiently than its free living counterpart indicating that the plant and/or its products released have positive influence on the nitrogenase activity of the associated cyanobacteria. The immobilized cyanobacteria can withstand exposure to fixed nitrogen better than its free-living counterpart and have better growth and nitrogen fixing ability. Traditional *Azolla-Anabaena* association and *Nostoc* can be used as biofertilizers. By viewing this information in mind, it may be presumed that as like other crops, cyanobacteria research may be useful for seed spices crops.

Keywords: Cyanobacteria, *Nostoc* and Biofertilizers

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Introduction:

Cyanobacteria have gained a lot of attention in recent years because of their potential applications in biotechnology. Literature describing the uses of cyanobacteria in industries, services sectors and provide an outlook on the challenges and future prospects of the field of cyanobacterial biotechnology. The cyanobacteria or blue-green algae are prokaryotic,

photosynthetic microorganisms. Cyanobacteria have been identified as a rich source of biologically active compounds with antiviral, antibacterial, antifungal and anticancer activities. Cyanobacteria represent a continually renewable biomass source that can release to the environment soluble organic substances as extracellular products also known as secondary metabolites, which can be mineralized by the microflora. These substances can be vitamins, enzymes, carbohydrates, peptides, amino acids and growth promoters and/or inhibitors for other organisms of the environment i.e., plants, fungi, bacteria (Kulik, 1995; Zulpa *et al.*, 2003). Several strains of cyanobacteria were found to accumulate polyhydroxy-alkanoates, which can be used as a substitute for non-biodegradable petrochemical-based plastics. Recent studies showed that oil-polluted sites are rich in cyanobacterial consortia capable of degrading oil components. Cyanobacteria within these consortia facilitated the degradation processes by providing the associated oil-degrading bacteria with the necessary oxygen, organics and fixed nitrogen. Cyanobacterial hydrogen has been considered as a very promising source of alternative energy, and has now been made commercially available. In addition to these applications, cyanobacteria are also used in aquaculture, wastewater treatment, food, fertilizers, production of secondary metabolites including exopolysaccharides, vitamins, toxins, enzymes and pharmaceuticals. Future research should focus on isolating new cyanobacterial strains producing high value products and genetically modifying existing strains to ensure maximum production of the desired products. Metagenomic libraries should be constructed to discover new functional genes that are involved in the biosynthesis of biotechnological relevant compounds. Large-scale industrial production of the cyanobacterial products requires optimization of incubation conditions and fermenter designs in order to increase productivity (Carlos, *et al.*, 2008).

Cyanobacteria, free-living photoautotrophic microorganisms, can derive energy from sunlight and carbon from the air (Castenholz, and Waterbury, 1989; Carr and Whitton, 1982). Some cyanobacteria are also able to fix atmospheric nitrogen and are therefore especially inexpensive to maintain. Filamentous cyanobacteria, including nitrogen-fixing strains that combine aerobic metabolism in their vegetative cells with anaerobic metabolism in their differentiated cells called heterocysts (Wolk, *et al.*, 1995), are widespread in many ecosystems, including polluted ones (Fogg, 1987; Gibson, and Smith, 1982; Sorkhoh, *et al.*, 1992). The viability and metabolic activity of these cyanobacteria, unlike those of heterotrophic microorganisms, are not subject to reduction by the decrease in the concentration of the pollutants that they may break down. Cyanobacteria have been shown to degrade both naturally occurring aromatic hydrocarbons (Cerniglia and Gibson, 1979; Cerniglia, *et al.*, 1980 a, b; Ellis, 1977; Narro, *et al.*, 1992) and xenobiotics (Megharaj *et al.*, 1987). This is also the first report that cyanobacteria can be genetically engineered to enhance their degradation of organic pollutants. Current systems for introducing organisms for bioremediation of polluted areas are restricted to the implementation of biodegradative microorganisms from soil (King, *et al.*, 1992), in general, surface waters contaminated with synthetic chemicals remain largely untreated by remediation programs. This is proposed

that the use of cyanobacteria be considered for low-cost, low-maintenance remediation of pollutants in surface waters. Many chemicals are released into surface waters either as a method of disposal or as a consequence of the technology of their utilization. In particular, the use of pesticides, many of which are toxic or contain toxic contaminants, is central to the high yields of modern agriculture. In the United States, pesticides are used annually at a rate of more than 4 lb (1.8 kg) per capita (Aspelin, *et al.*, 1992). Lindane is a toxic compound with potential longterm persistence. In 1976, 530,000 lb of lindane were applied in the United States on crops and for treatment of seeds (Eckerman, 1984). In California alone, 41,500 lb (18,800 kg) of lindane were sold in 1990 (State of California, 1991), whereas in 1991, U.S. usage of lindane on crops as a whole decreased to 65,500 lb (29,700 kg) (State of California, 1990). Of the total amount of lindane used, 50% has been applied directly to crops or used for treatment of seeds and 20% has been used for treatment of hardwood lumber.

Soil bacteria (Imai, *et al.*, 1991), fungi, an *E. coli* strain from rat feces (Francis, *et al.*, 1975) and some cyanobacterial strains that use lindane as a primary carbon source degrade it to g-2,3,4,5,6-pentachlorocyclohexene, a-, b-, and g-tetrachlorocyclohexene, or pentachlorobenzene, depending on the strain (Imai, *et al.*, 1991). The loss of lindane from rapidly and slowly growing cultures of two filamentous nitrogen-fixing cyanobacteria cannot be attributed to sequestration, because lindane was not lost from suspensions of boiled cells and could not be recovered from disrupted, lyophilized cells. Moreover, intermediate products of its degradation were observed, namely, g-2,3,4,5,6- pentachlorocyclohexene and (in a molar ratio of approximately 4:1) both 1,2,4- and 1,2,3-trichlorobenzene. The kinetics of the appearance and disappearance of these substances is consistent with the idea that the g-pentachlorocyclohexene is an intermediate in the production of 1,2,4- and 1,2,3-trichlorobenzene. Because trichlorobenzenes did not accumulate, they were either further degraded or volatilized. It merits emphasis that *Anabaena* sp. and *N. elliposporum* cometabolize lindane; i.e., they degrade it but are not dependent on it for their growth and viability.

Dominant nitrogen-fixer blue-green algae are *Anabaena*, *Nostoc*, *Aulosira*, *Calothrix*, *Plectonema* etc. Blue-green algae have the abilities of photosynthesis as well as biological nitrogen fixation. Like in many other biological systems, nitrogen fixation in Cyanobacteria is brought about by an enzyme known as nitrogenase (Mishra and Pabbi, 2004). Heterocysts provide microaerobic sites in O₂-producing cyanobacteria (Wolk, *et al.*, 1995), the presence of nitrate blocks the formation of heterocysts by the *Anabaena* sp. and by *Nostoc elliposporum*, so that low-O₂ sites for metabolism are presumably absent during continuous illumination. The activation, by nitrate, of anaerobic degradation of 4CB by a coryneform bacterium, NTB-1, was explained by the existence of a nitrate-dependent transport system specific for 4CB; that system increased the intracellular concentration of 4CB in the presence of nitrate (Groenenwegen, *et al.*, 1990). Because lindane did not detect intracellular,

lindane could not determine whether nitrate enhanced the rate of uptake. However, the stimulation of the rate of degradation of lindane by nitrate that observed may be attributable to increased availability of nitrogen to nitrate-supplemented cultures. The idea that vegetative cells grown on N₂-derived nitrogen may differ metabolically from vegetative cells grown on nitrate, in ways other than nitrate-metabolizing enzymes per se, is supported by the finding (Fleming, and Haselkorn, 1974) that at least eight proteins are synthesized by nitrate grown cultures of *Anabaena* sp. strain PCC 7120 that are absent from N₂-grown cultures. Alternatively, perhaps some protein involved in the transport or reduction of nitrate is also required for the transport or metabolism of lindane. Why the *Anabaena* sp. and *N. elliposporum* have the capacity to degrade lindane can currently be the subject only of conjecture. *Anabaena* sp. strain PCC 7120 and *N. elliposporum*, supplied with the *fcABC* operon from *Arthrobacter globiformis* (Tsoi, *et al.*, 1991), gained the capacity to dechlorinate 4CB; higher concentrations of 4CB (2 to 5 mM), used in the original study (Tsoi, *et al.*, 1991), inhibited growth of the cultures. The orientation of the *fcABC* sequence relative to the nearby pDU1 portion of pRL1408a and pRL1408b affected the extent of dechlorination, possibly because of the influence of a promoter in the pDU1 portion (Elhai, 1990), although other explanations are not excluded. Also, genetic engineering by addition of the *linA* gene enhanced the degradation of lindane by the two cyanobacterial strains, at least when they were grown with N₂. It appears likely that other biodegradative operons will also be expressed in cyanobacteria and that cyanobacteria will prove useful for biodegradative applications in surface waters. Biodegradation is increasingly being considered as a less expensive alternative to physical and chemical means of decomposing organic pollutants. Pathways of biodegradation have been characterized for a number of heterotrophic microorganisms, mostly soil isolates, some of which have been used for remediation of water.

Application of high input technologies has resulted in significant increase in agricultural productivity. Cyanobacteria offer an economically attractive and ecologically sound alternative to chemical fertilizers for realizing the ultimate goal of increased productivity, especially in rice cultivation. In a wetland rice ecosystem, nitrogen fixation by free living cyanobacteria also significantly supplements soil nitrogen. Cyanobacteria can both photosynthesize and fix nitrogen, and these abilities, together with great adaptability to various soil types, make them ubiquitous. Cyanobacteria also have a unique potential to contribute to productivity in a variety of agricultural and ecological situations. Cyanobacteria have been reported from a wide range of soils, thriving both on and below the surface. They are often also characteristic features of other types of sub-aerial environment and many intermittently wet ones such as rice fields. Most paddy soils have a natural population of cyanobacteria which provides a potential source of nitrogen fixation at no cost. Ammonia can be taken up by cyanobacteria through passive diffusion or as ammonium (NH₄⁺) by a specific uptake system. The amino acids arginine, asparagine and glutamine have also been reported to serve as nitrogen sources (Upasana and Sunil, 2004).

Nitrate and nitrite are important sources, which later reduce into ammonia. Many cyanobacteria are also capable of using atmospheric dinitrogen (N_2) as the source of nitrogen, and this is what is most commonly termed nitrogen fixation. Like in many other biological systems, nitrogen fixation in cyanobacteria is brought about by a high molecular weight, oxygen labile, metalloprotein enzyme known as nitrogenase. Nitrogenase reduces molecular nitrogen to ammonia in presence of hydrogen. Many studies have been reported on the use of dried cyanobacteria to inoculate soils as a means of aiding fertility, and the effect of adding cyanobacteria to soil on rice yield was first studied in the 1950s in Japan. The term 'algalization' is now applied to the use of a defined mixture of cyanobacterial species to inoculate soil, and research on algalization is going on in all major rice producing countries. The average of the results from all these studies have shown an increase in grain yield of 15-20% in field experiments. It has been suggested that the cyanobacteria introduced as a result of algalization can establish themselves permanently if inoculation is done consecutively for 3-4 cropping seasons (Upasana and Sunil, 2004).

The basic method of mass production involves a mixture of nitrogen fixing cyanobacteria in shallow trays or polythene lined pits filled with water kept in open air, using clean, sieved farm soil as a carrier material. To each pit 10 kg soil and 250 g single super phosphate is added and water is filled upto a height of 12-15 cm. Starter culture, a mixture of *Anabaena*, *Nostoc*, *Aulosira* and *Tolypothrix*, is inoculated in each multiplication unit. Malathion (5-10 ml per tank) or carbofuran (3% granules, 20 g per tank) is also added to prevent insect breeding. In hot summer months, the cyanobacteria form a thick mat over the surface after 10-12 days of growth in open sun. The contents are allowed to dry and the dried flakes are collected, packed and used to inoculate rice fields. The basic advantage of this technology is that farmers after getting the soil based starter culture can produce the biofertilizer on their own with minimum additional inputs. An inoculum of 10-12 kg is considered sufficient to inoculate one hectare of paddy field 3-4 days after transplantation. Unfortunately, the open-air algal biofertilizer production technology for production at farmers' level is not popular among the farming community (Singh, *et al.*, 2000; Upasana and Sunil, 2004).

The main limitations of this technology are:

1. due to open air nature of production it can be produced for only a limited period in a year (3-4 months in summer; production has to be stopped during rainy and winter season),
2. high level of contamination due to open type of production,
3. slow production rate,
4. low population density and hence need for heavy inoculums per hectare.

Therefore, efforts have also been made to improve the technology by developing new economically feasible protocols for production of quality inoculum so that these organisms can be practically exploited on a large scale. This is possible only if multiplication

is carried out under controlled conditions. The production technology has been substantially improved with introduction of new and cheap carrier materials that support higher cyanobacterial load with longer shelf life, thus considerably reducing the quantity of inoculum per unit area. The basic changes the technology has undergone include, a) indoor production of algal biomass under controlled conditions; b) a suitable and cheap growth medium for faster growth of the organisms, and c) mixing with a suitable carrier material. Indoor production involves the growth of algae in a unit that may be a polyhouse or glasshouse (Singh, *et al.*, 2000).

Carlos, *et al.*, (2008) reported that the individual unit in the polyhouses can be of either RCC, brick and mortar, or even polythene lined pits in the ground. The algae are grown individually as species, by inoculating separate tanks with laboratory grown pure cultures, so as to ensure the presence of each required strain in the final product. Once fully grown, the culture is harvested, mixed with the carrier material, presoaked overnight in water and multani mitti (in 1:1 ratio) and sun dried. The dried material is ground and packed in suitable size polythene bags, sealed and stored for future use. The final product contains 10,000 to 1,00,000 units or propagules per gm of carrier material and, therefore, 500 g material is sufficient to inoculate one acre of rice growing area. A number of field trials conducted with this material have shown promising results both in terms of nitrogen saving as well as crop yield (Table 1).

Table 1. Effect of cyanobacterial products on lettuce plants as a function of time, in a culture chamber experiment

Treatment	Infected plants (%)	
	Day 8	Day 12
Control (without mycelium)	0 cA	0 cA
Plant infected with mycelium	100 aA	100 aA
Plant infected with mycelium + 1.5 ml ether extract	54.5 bB	100 aA
Plant infected with mycelium + 1.5 ml water extract	100 aA	100 aA
Plant infected with mycelium +1.5 ml extracellular product	100 aA	100 aA

Small letters indicate significant differences ($p < 0.05$) between treatments for each day. Capital letters indicate significant differences ($p < 0.05$) between days, for each treatment.

Both free-living as well as symbiotic cyanobacteria (blue green algae) have been harnessed in rice cultivation in India. A composite culture of BGA having heterocystous *Nostoc*, *Anabaena*, *Aulosira* etc. is given as primary inoculum in trays, polythene lined pots and later mass multiplied in the field for application as soil based flakes to the rice growing field at the rate of 10 kg/ha. The final product is not free from extraneous contaminants and not very often monitored for checking the presence of desired algal flora. Once so much publicized as a biofertilizer for the rice crop, it has not presently attracted the attention of

rice growers all over India except pockets in the Southern States, notably Tamil Nadu. The benefits due to algalization could be to the extent of 20-30 kg N/ha under ideal conditions but the labour oriented methodology for the preparation of BGA biofertilizer is in itself a limitation.

The goal of optimal plant nutrition is to ensure that crop plants have access to adequate amounts of the plant nutrients required for high yields. The nutrients have to be present in the soil or provided through suitable sources on adequate amounts and forms usable by plants. There are two methods of application nutrients, first mainly through plant roots, i.e., soil dressing and the second through the foliar application. The soil dressing application is the suitable for give plant requirements at once time, then plants adsorb there needed gradually and slowly during the growing season. However, foliar fertilization, its necessary only for that plants which obtain additional nutrients such as N, P, K and or micro elements. The main advantage of foliar fertilization is the immediate uptake of the nutrients applied (Abd El-al and Faten 2009).

However, statistical analysis of the data on algalization in experimental fields has suggested that the effects of inoculation are inconsistent. The best results appear to be obtained when mixed inocula are produced from local stocks, and the biofertilizers are used in combination with a low level of nitrogenous fertilizer. Addition of fertilizer to rice fields generally leads to accelerated growth of algae. Cyanobacteria form a major component of the flora as long as nitrogen content is not very high. If high nitrogen fertilizer is used, green algae tend to dominate the soil flora. Surface application of fertilizer generally checks the growth of cyanobacteria but deep placement of urea does not prevent their growth. Most cyanobacteria inoculated in soil fail to dominate over the flora indigenous to soil receiving the inoculation, and inoculated species are able to dominate only when the indigenous flora is sparse. Thus, 'algalization' seems likely to be most useful where there are marked seasonal changes in land such as when ground is ploughed frequently before planting so that the natural soil inoculum is much reduced by the time of new paddy season. A number of studies have also been done on the selection of natural or mutant strains with the aim of maximizing the nitrogen fixing ability. These are strains that either show high levels of nitrogenase activity in laboratory studies, or in pot experiments, and it is, therefore, important to check whether they can also compete effectively with other native soil strains under field conditions (Mishra and Pabbi 2004).

Algae form a conspicuous part of the Antarctic vegetation and occupy bare patches of low lying rocks where melt water is plentiful (Komarek and Ruzicka, 1966). The blue green algae (cyanobacteria) are capable of fixing the atmospheric nitrogen and convert it into an available form of ammonium required for plant growth. Attempt towards the cultivation of vegetables *viz.*, radish, spinach, methi, tomato and cucumber has been made in the soil media in Antarctica (Joshi and Banerjee, 1988).

Kulshresth *et al.* (2010) was observed in particular *Capsicum annuum* was chosen and subjected to following three treatment with respective bio-fertilizer and a synthetic chemical –*Arthrospira platensis* (*Spirulina*), *Chlorella vulgaris* and urea. The concentration of urea applied was 0.1 mg/10ml, equal amount of pellets of the algae were taken, dissolved in 10 ml distilled water and used. The application of respective fertilizer was started ever since the first leaf-primordia were seen. Eventually the morphology parameters (Capsaicin, peroxidase and ascorbic acid) were monitored. A considerable increase in root-shoot ratio was observed initially followed by a decline, except for control set which showed consistent decline. A gradual decline in the leaf-area and the intermodal length was noted in all treatments including control set. Peroxidation activity was found to be maximum in controls set. Capsaicin content was more in *Spirulina* set. Control set followed by *Spirulina* showed high ascorbic acid content.

Nostoc and *Anabaena* as soil conditioners or biofertilizers for Tomato (*Lycopersicon esculentum*), *Anabaena* treatments showed significant increase in root length while *Nostoc* showed insignificant increase in root length and significant increase in shoot length (Al-Khiat and Ali 2006). Intermodal part of Chilli (NS 1701) was increased for first 3 months was observed with *Spirulina* and later there was a gradual decrease. On the other hand urea had shown gradual decrease after third month that could be due to stress on plant or as a result of senescence (Kulshresth *et al.* 2010).

Conclusion

Due to this important characteristic of nitrogen fixation, the utility of cyanobacteria in agriculture to enhance production is beyond doubt. Many studies have been reported on the use of dried cyanobacteria to inoculate soils as a means of aiding fertility. The term ‘algalization’ is now applied to the use of a defined mixture of cyanobacterial species to inoculate soil, and research on algalization is going on in all major cereal and spice producing countries. It has been suggested that the cyanobacteria introduced as a result of algalization can establish themselves permanently if inoculation is done consecutively for 3-4 cropping seasons.

In India, considerable progress has been made in the development of cyanobacteria based biofertilizer technology. It has also been demonstrated that this technology can be a powerful means of enriching the soil fertility and improving cereal and spice crops yields. However, the technology needs to be improved further for better exploitation under sustainable agriculture systems. It is important to obtain a much more detailed understanding of cyanobacterial population dynamics over the whole annual cycle in agriculture systems. Extensive field studies aimed at developing region specific high quality inoculum are also needed. Understanding the biology of drought resistant cyanobacteria may be useful in terms of extending this approach to dry crops.

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Toxicological effect of five plant oils on major stored grain pest of Coleopteron *Sitophilus oryzae*

Manisha Shelar-Sonavale

Abstract

In the present study five plant oils were taken to study their toxicity effect on primary stored grain pest *Sitophilus oryzae*, rice weevil.

Filter papers were treated with different concentrations of plant oils. Concentrations were prepared in acetone and desired dose was applied on Whatman No.1 filter paper. Observations were taken after 24 hrs, until we get 50% mortality.

In the present study, Highest toxicity was seen against Tagetes oil, Eucalyptus oil, Laung oil, Lowest activity was observed against Orange oil.

Key words: Toxicity, mortality, pest, plant oils

Introduction

In India, major loss in economy is caused due to infected grains, few reasons are unscientific storage, insect, rodents and microorganisms etc are about 10 per cent of the total food grains. (agritech.tnau.ac. in).

The invasions of stored grains by insects contribute great loss of quality and quantity. Chemicals were found to be more effective but due to their hazardous after effects to ecosystem. It became necessary to find effective alternatives to treat these insects and protect the food items.

The well known insect pest for attacking stored grains is *Sitophilus oryzae*. Rice weevil *Sitophilus oryzae* is one of the store product it feed on rice, beans, flour, spices, dried flowers, chocolates, nuts and even on dried museum specimens (Weston and Rattlingourd 2000). Larvae and adult both bore into grain kernel. It does considerable damage in short period; they are active flier and can infest grain in fields too. (Hafiz Ahmed 1983).

In the present study, toxicity study was done against *Sitophilus oryzae* using few plant oils. A different concentrations of Neem (*Azardicta indica*), orange (*Citrus reticulata*), Laung (*Schyzygium aromaticum*), (*Eucalyptus globulus*), Olive (*Olea europea*), Tagetes (*Tagetes erecta*) were used.

Melaleuca cajupati was studied for its contact toxicity, repellency, fumigant effect against *Sitophilus zeamais* and *Tribolium castaneum* showed potential of leaf essential oil to be used as biopesticide to control stored grain pest in future. (Koko *et al* 2009). *Murray exotica* was found active as insecticide against Maize weevil *Sitophilus zeamais*

and red flour beetle, *Tribolium castaneum*.(Wei Qing Li *et al* 2010). The effect of *Piper nigrum* oil was studied for its repellency, insecticidal and developmental inhibition assay against *Tribolium castaneum* results showed that larval survival and adult emergence decreased with increase in the concentration of essential oil.(Ravikant Upadhayay Gayatri Jaiswal 2007). Insecticidal effects of the essential oils of eleven plant species from Lamiaceae on *Sitophilus granaries* (L) (Coleoptera curculionidae) they studied at higher doses and longer exposure time resulted in maximum toxicity on *Sitophilus granaries* (Enrol Yildirim *et al* 2011).

Materials and Methods

Plant oils- Commercially available plant oils were used for the present study. The oils used were manufactured by Dr. Jain's,India.

Insect Rearing- Rice weevil *Sitophilus oryzae* adults were used to determine the toxicity property of plant oils. The insects were cultured in Rice grains in laboratory at 35-37°C and 70-80% R.H.

Toxicity Assay

For toxicity assay, different concentrations of each plant oils were made by dissolving oils in acetone and different concentrations were made by adding distilled water to make up different volumes.

Whatman No.1 filter paper was used to perform the experimentation. Filter paper dip method was used. Filter paper disc of 9cm in diameter was placed in each petri dish. Solutions of different concentrations of oils were made and required concentrations of oil were sprayed thoroughly on filter paper placed in the petri dishes by using syringe/micropipette. The filter paper in petri plate was exposed to open air for few minutes, so that acetone and water is evaporated. 10 adults of *Sitophilus oryzae* were released in each petri plate on filter paper. Petri plates were covered with the lid so that adults may not run away. Controls were treated with acetone, distilled water and without anything. Labeling was done accordingly. Graphical representation was done using Microsoft Excel.

OBSERVATION TABLE TOXICOLOGICAL EFFECT OF SOME PLANT OILS ON *SITOPHILOUS ORYZAE*

% Mortality Observations calculated after performing 4 sets of replicates

Name of the oil	Conc. Of oil	24 hrs
Neem oil	0.30%	1
	0.40%	1
	0.50%	1
	0.60%	2
	0.70%	6

Laung oil	0.10%	0
	0.20%	4
	0.30%	7
	0.40%	10
Orange oil	0.40%	1
	0.50%	2
	0.60%	5
	0.70%	10
Eucalyptus oil	0.10%	2
	0.20%	5
	0.30%	6
	0.40%	8
Tagetes oil	0.10%	5
	0.20%	8
	0.30%	10

- Control 1 treated with acetone
 2 treated with acetone with dw
 3 untreated control

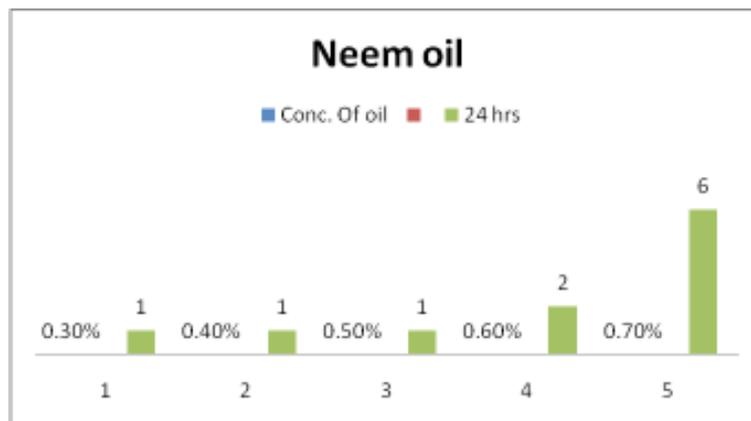


Fig 1 represents Neem oil concentration Vs Mortality.

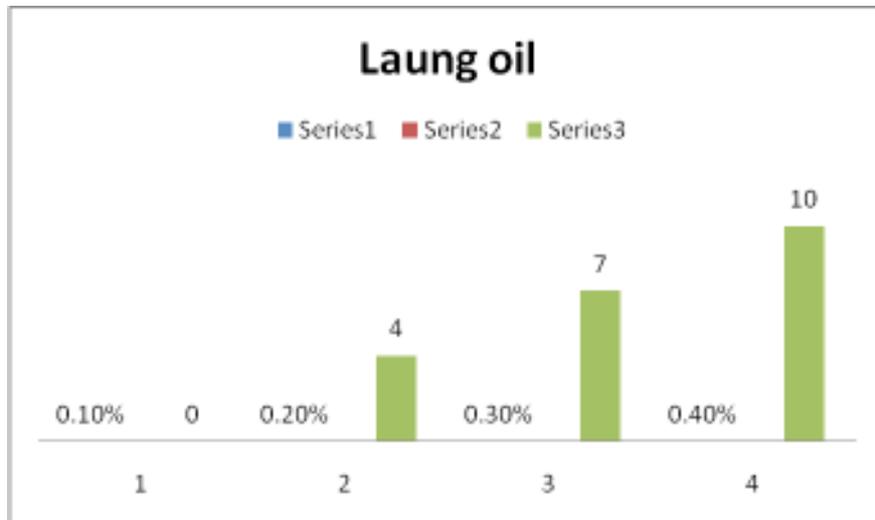


Fig 2 represents Laung oil concentration Vs Mortality

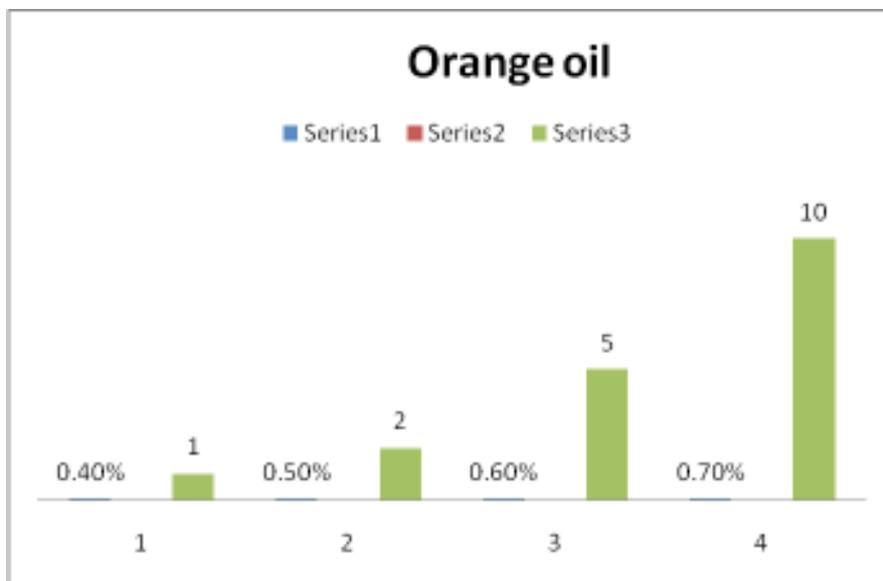


Fig 3 represents Orange oil concentration Vs Mortality

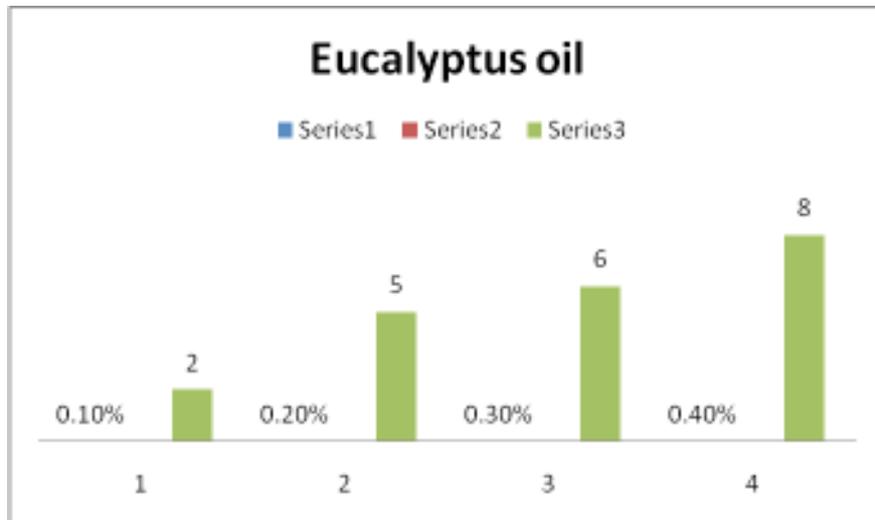


Fig 4 represents Eucalyptus oil concentration Vs Mortality

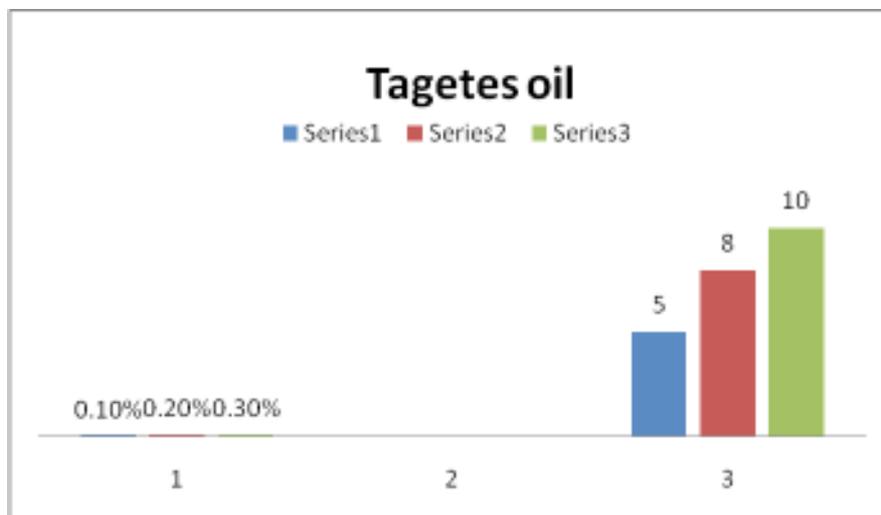


Fig 5 represents Tagetes oil concentration Vs Mortality
RESULTS AND DISCUSSION:

In the present study 0.7% concentration of neem oil (*Azadirachta indica*) showed LC50 after 24 hrs. whereas toxicological effects of neem showed maximum mortality 45.63% was found at exposure time maximum dose of 2.5% and minimum control 16.88% was seen after 24 hrs with 0.5% concentration was studied by Asifa Hameed et al 2012. *Tagetes erecta* oil showed 50% mortality after 24 hrs at 0.1%. Orange (*Citrus reticulata*) oil showed 50% mortality at 0.6% concentration. Mishra B.B in 2011 studied repellent activity against *Sitophilus oryzae* and *Tribolium castaneum* their study showed that minimum repellent activity was seen 78% and 80%. He also studied laung (*Schzygium aromaticum*) for its repellent activity 90% against *Tribolium castaneum* and *Sitophilus oryzae*. In our study Laung showed 70% mortality after 24 hrs against *Sitophilus oryzae*.

CONCLUSION

In the present study toxicity test was studied after 24 hrs of treatment showed that highest activity is seen at 0.1% *Tagetes* oil showing 50% mortality after 24 hrs. Eucalyptus oil showed 50% mortality 0.2%. Laung oil showed 70% mortality at 0.3%. Orange oil showed 50 % mortality at 0.6% concentration.

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Customer Awareness Of Frozen Food Products In Institution And Offices With Reference To Mother's Kitchenette Brand

By Rameshwar Jaju

1. Introduction:

The food Processing industry is one of the largest industries in India. It is ranked fifth in terms of Production, Consumption, Export and Expected growth. Food processing industry is widely recognized as a "Sunrise" industry in India having huge potential for uplifting agricultural economy, creation of large scale processed food manufacturing and food chain facilities and the resultant generation of employment and export earnings.

The food processing industry in India is a sunrise sector that has gained prominence in recent years. Availability of raw materials, changing lifestyles and relaxation in policies has given a considerable push to the industry's growth. This sector is among the few that serves as a vital link between the agriculture and industrial segments of the economy. The Ministry of Food Processing Industries, GoI, has estimated the size of the Indian food market at US\$ 191 bn (Rs 8,600 bn). The processed food market is projected to be over US\$ 100 bn, of which the primarily processed food market accounts for 60%, while the value-added processed food market is around 40%.

Processing of fruits and vegetables is a low 2%, around 35% in milk, 21% in meat and 6% in poultry products. By international comparison, these levels are significantly low - processing of agriculture produce is around 40% in China, 30% in Thailand, 70% in Brazil, 78% in the Philippines and 80% in Malaysia. Value addition to agriculture produce in India is just 20%, wastage is estimated to be valued at around US\$ 13 bn (Rs 580 bn).

The average annual growth of the food processing industry has been around 8% between FY01-FY06. The segments that have driven the growth are the beverages and meat & meat products and processed fish sectors. The food processing industry in India has a share of 1.5% in the total GDP of the country, and as part of total manufacturing accounts for 9%. India's share in world trade in respect of processed food is about 1.6%.

The fruits and vegetable processing industry is highly decentralized, and a large number of units are in the cottage / household and small scale sector, having small capacities of up to 250 tonnes /annum. Since 2000, the industry has seen significant growth in ready-to-serve beverages, fruit juices and pulps, dehydrated and frozen fruits and vegetable products,

pickles, processed mushrooms and curried vegetables, and units engaged in these segments are export oriented.

Table 1 Exports of Processed Fruits & Vegetable (Quantity in MT, Value in Rs Mn)

ITEM	2004-05	2005-06	CAGR			
	Quantity	Value	Quantity	Value	Qty	Value
Dried & Preserved Vegetables	351034.3	765.7	566238	1459.1	18.8	12.5
Mango Pulp	90988.6	300.8	134613	364.2	5.8	7.6
Pickle & Chutney	67193.3	120.5	133582	260.1	20.1	0.1
Fruits & Vegetables	80760.5	275.5	107335	270.2	9.6	10.9
TOTAL	589975.7	1462.7	501826	1359.5	15.2	9.9

(Source: Ministry of Food Processing Industries, Annual Report 2005-06)

1.1 Company Profile:

Petonia Foods is a Pune based company that has successfully climbed the value chain, offering products and services in the domain of frozen foods, storage and warehousing, for national and international customers. Continuous R & D, strict adherence to quality systems has ensured happy and loyal customers to the Petonia Foods.

Year of Establishment: The company established in 1947 with Ware Housing, 1956 with Cold storage and 1981 with Frozen Foods manufacturing unit and 1995 with export market as Oldest, Goldest, and Finest Manufacture.

Different products offered by Petonia Foods are categorized into following four types.

- ✓ Fruits and Vegetables
- ✓ Instant Snacks
- ✓ Parathas and Chapatis
- ✓ Instant Indian Dishes

Application Areas: It has wide range of products caters to various markets such as households, catering companies, IT Companies, hospitals and event Management

Cold Storage Solutions: Petonia foods provide cold storage facility to number of the products. They have storage facilities of over 6000 metric tons that consists of specialized storage facility of 2500 metric tons for items to be preserved under 18° C and 3500 metric tons for item to be preserved 0° C to +4° C.

Customization: Being a company related to food processing, main emphasis on the quality aspect and makes all possible efforts to meet clients' requirements. It provides

customization on wide range of food material as per clients' specification. It take pride in developing strategic partnerships with clients and due care is taken to ensure their satisfaction.

1.2 Basic Information in Table 2.

No.	Parameters	Description
1	Company Name	Petonia Foods Pvt Ltd
2	Business Type	Manufacturer
3	Product/Services	Frozen Vegetables, Frozen Fruits, Fruits Pulp, Frozen Indina Garvy, Currys, Ready Indina Dishes, Frozen Parathas, Samosa, And Snacks, Frozen Foods With Demans
4	Address	33 / A, Kondhwa Bhudruk, Pisoli Road,Pune 411048, Maharashtra
5	CEO	Mr. Mihir Parikh
6	Brands	Mother's Kitchenette
7	Number of Employees	101 - 500 People
8	E-mail	petuniafoods@gmail.com

2. Review of Literature:

AIFPA (All-India Food Processors' Association) sources said that India had the unique advantage of having diverse agro climatic zones and produces a wide variety of food crops. "We are the third largest producer of food commodities (601mt) in the world after China (853mt) and USA (608 mt). The country tops in the production of milk (over 100mt) and fruits and vegetables (150mt)." According to AIFPA, promotion of Frozen Food Industry and cold chains in a big way will enable preventing the losses and extending the shelf life of perishable commodities and processed products.

At present no form of preservation is as well as suited to provide maximum convenience as freezing. Although dehydratd foods offer convenience, they require reconstitution on an individual component basis to satisfy varying water needs, and then also require heating. Not so with frozen food. (*Food Science by Norman N Potter 5th Edition*)

According to Nisha Harchekar it is estimated that 300 million upper and middle class consume processed food. With the convenience needs of dual income families, 200 million more consumers are expected to move to processed food by 2010. The market size for the

processed foods is thus bound to increase from US \$102 billion currently to US \$330 billion by 2014-15 assuming a growth of 10%. The share of the value added products in processed foods would almost double from US \$44 billion currently to US \$88 billion during the same period, growing at the rate of 15%. This presents enormous opportunities for investment in processed food sector.

American Frozen Food Institute (AFFI) President and CEO Kraig R. Naasz submitted testimony in support of food safety to the Subcommittee on Health of the House Committee on Energy and Commerce. In representing the frozen food industry, Naasz outlined the premium importance the industry puts on food safety and the steps that have been and can be taken to ensure the safety of our food supply.

R. H. Jaju states that Indian processed food industry is the sunrise sector due to availability of raw material, changing life style, globalization, large domestic demand, demographic trends and increase in per capita income etc.

As per the Philip Kotler the branded products must be differentiated. Physical products are varying in their potential for differentiation. Many products can be differentiated in form- the size, shape, or physical structure of product. Most products can offered with varying features that supplements their basic function.

3. Objectives:

The objective of the study is to identify the current market potential, which will be of critical importance to the company and it will enable them to deploy suitable strategies to increase the sales in the retail market, improve the service and make the future strategies.

Primary:

1. To find out customer awareness for frozen food products in Pune market particularly emphasis on the institutes and offices.
2. To find out the brand awareness of Mother's Kitchenette in Pune city.

Secondary:

1. To analyze the market demand of Frozen food products.
2. To find out the consumers perception and suggestion about the product.

To identify competitive positioning of Mother Kitchenette brand with concern to

- i. Product- Taste, ease of preparation
- ii. Price.
- iii. Packaging
- iv. Availability.

4. Research Methodology:

Marketing research is systematic design, collection analysis and reporting of data relevant to a specific marketing situation facing an organization. Every marketer need research

marketing in wide variety of activities, ranging from market potential and market share studies.

Market survey is all about the collecting data from the most widely used marketing research technique. Its purpose is to collect specific data concerning the market that can not be from the company's internal record or from external published source of data market survey may be of various types.

Table 3 Research Methodology

Data source	Primary data (field survey)
Area of Research	Pune city
Research instrument	Questionnaire
Sample Plan	Personal Interview
Sample Unit	Customer, Retailer, Working staff
Sampling method	Non probability/ stratified sampling method
Sample Size	>500 individual customer

4.1 Research Plan

- Area of study : The study was conducted in Hadapsar, Deccan, Pune Camp, Shivaji Nagar, Aundh, Katraj, Kalyani nagar, Magarpatta, Hingewadi, Nigadi, Bhosari , Indrayani nagar, Chinchwad, etc .area of Pune.
- Nature of Research: The research is exploratory and qualitative in nature and the goal was to clarify the concepts, gather information, gain insight, and eliminate impractical ideas.
- Data and its Source : The study was largely based on primary data, which was collected from Retailer, and consumer. The study also made use of secondary information, which was collected from various sources like magazines, newsletter, and World Wide Web.
- Research Approach: Primary data was collected by using the survey method approach. This method has been found most appropriate and feasible for collecting primary data.

4.2 Sources of Data Collection: There is common misconception that the term 'data' refers to facts expressed in numerals. This misconception is due to the wrong way in which data have come to be associated with statistics. But all that the word data means is facts. Therefore 'collection of data' means the collection of facts about an object, situation or problems.

There are two sources of data collection

1. Primary Data
2. Secondary Data

Primary Data:

The data which is collected freshly from the source is called the primary data.

Methods which are used during collection of primary data are;

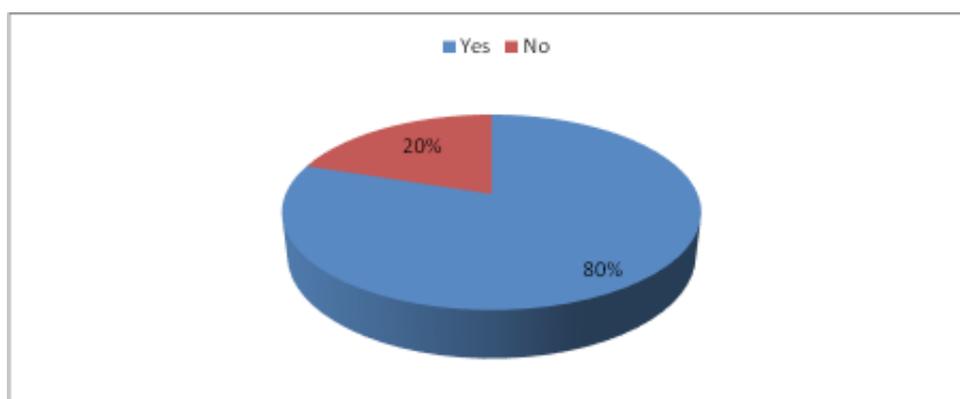
- Direct personal interview with the owner.
- Personal interview with the retailer.
- Through observations.

Secondary Data: The data which is collected with reference to the primary data is called secondary data. Data that are already assembled are called secondary. Before a researcher goes to collect fresh data on a problem, he tries to find out what data are already available from existing sources. Major sources of secondary data are company files, trade associations, Government Departments, research organizations and publications. Some of the important sources I used here were Publications by Journal of Food Science and technologist, Agricultural Today, Ministry of Food Processing Industries India, Websites like Google, company website etc.

5. Data Analysis and Interpretation:

1. Awareness about the frozen food products as shown in Graph 1.

Options	Respondents	%
1. Yes	320	80.00
2. No	80	20.00

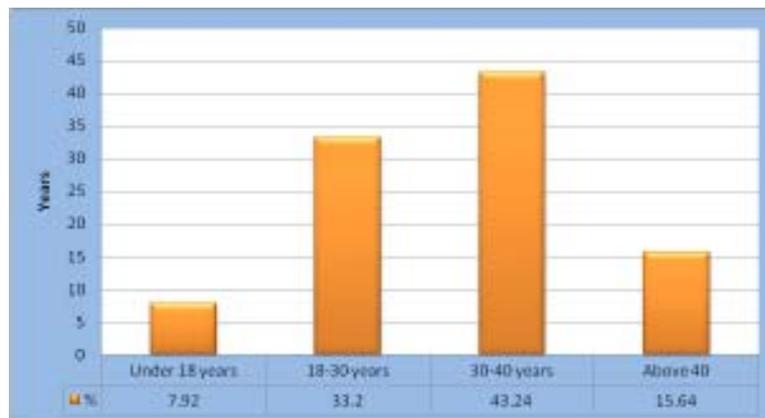


Graph 1: Awareness about the frozen food products

Analysis: Awareness of Frozen food products is increasing day by day in the urban region. Now awareness reaches up to the 80%.

2. Age group of the Respondents as shown in Table 2.

Options	Respondents	%
a. Under 18 years	25	7.92
b. 18-30 years	107	33.20
c. 30-40 years	138	43.24
d. Above 40	50	15.64

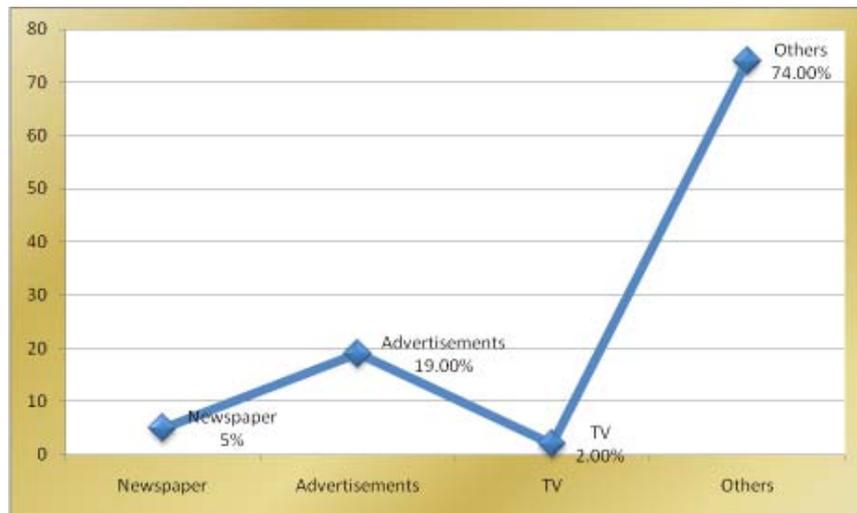


Graph 2: Age group of the Respondents

Analysis: Most of the customer and the Staff members are in the age group of the 30-40 years. They easily adapt the changing life style with the frozen products.

3. Source for getting information of Frozen Food products.

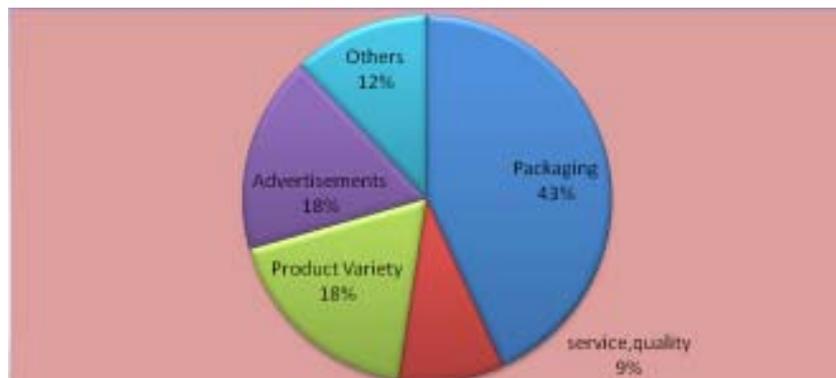
Options	Respondents	%
a. Newspaper	16	5.40
b. Advertisements	61	18.92
c. TV	6	1.93
d. Others	237	73.75



Graph 3 : Source for getting information of Frozen Food products

Analysis: Main source for reaching to the customer apart from the Advertisements are work of mouth, by friends and it contributes to 73.75% of the information source. Though TV is considered a good communication source it contributes to merely 1.93%.

4. Feedback of the Staff person of Institutions and offices as Shown in Graph 4.



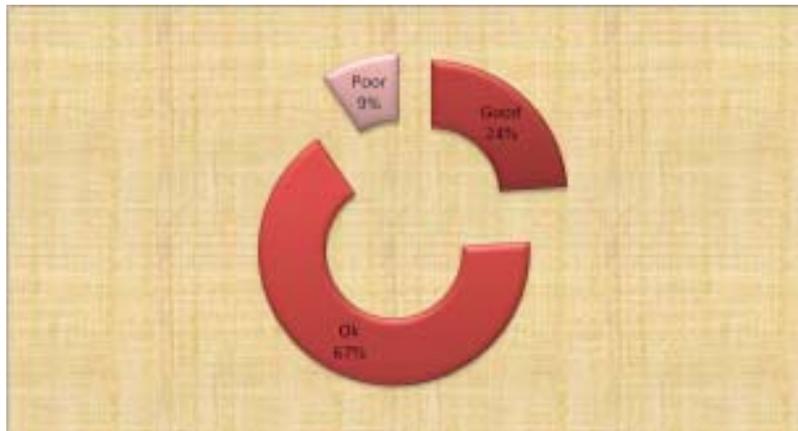
Graph 4: Feedback of the Respondents

Analysis: Finally with respect to the Feedback or Suggestions it mainly focuses on the Packaging aspect i.e. at 43%. It suggests that attractive packaging is must for the stiff

competition in the market. Also it contributes the Advertisements campaign, product variety and service quality.

5. Opinion about the service quality by the staff person of Institutions and offices as shown in Graph 5.

Options	Respondents	%
a. Good	24	24.00
b. Ok	67	67.0
c. Poor	9	9.00



Graph 5: Feedback of the Respondents

Analysis: Though a Petonia food is the new entrant in the local market its service quality rates well. Over 70% of the customer satisfied with its service quality.

6. Suggestions:

Company can apply the distribution effectiveness, customer service and cost cutting to increase the market share. Strategy of the company depend upon the 4 P's i.e. an out of these mainly focusing on the Promotional strategy. Three are following recommendations I suggested in the duration of two months.

- **Advertisements:** This is the indispensable activity that any company has to follow. Advertising through TV, posters, newspaper, will help the company to increase the market share.

- **Brand Awareness campaign:** It is useful to create awareness among the customer about the Mother's Kitchenette Brand. It is done with help of brand ambassador, promotional activities like leaflets, pamphlets, radio etc.
- **Availability:** As per my study the availability of the petunia food are less so it should be made available throughout the Pune retail outlets.
- **Attractive packaging:** This must be the prime task of the company. Most of the customer and employees of the company suggest that company has to work on their Packaging. It helps to differentiate the product than the competitors.
- **Demonstration:** Demonstration in the society or outside the retail malls which increase awareness among the customer.
- **Discount And Schemes:** Providing season based discount to attract the customers.
- **Participation In Exhibition:** In the competitive environment exhibition participation is most important thing to reach maximum number customer.

7. Conclusion

- The conclusion is that due to less awareness about the frozen products and instant products company has low market share in the Pune city.
- If company concentrates on the four P's of marketing mainly emphasizing on the Promotional activity it will increase its demand and the market share.
- Also unavailability of the Mother's Kitchenette Brand in the market it results into negligible demand of the particular brand.
- Attractive packaging is the one main ingredient on which company should focus to attract to the customer on the first sight.

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Status Of Emplpoyability, Competencies, And Skills Amongst Students Pursuing Management Education

By Mr. Ritesh S. Shinde

Abstract:

The present study explores need and development of competency, skill and employability of management students. Development of competency, skill and employability is requiring in management study in B schools. Employability refers to a person's capability for gaining and maintaining employment. For individuals, employability depends on the knowledge, information, skills and qualities. It is not enough to collect various certificates but it is more important to become employable. Recruiters looking for managers who are ready to deliver results from day one. But it is not just about getting job, understanding own strength and identifying opportunities to develop potential will help to find the right fit in terms of chosen career and role in society whether it be in industry or business. Now days in B schools maximum students are lacking in employability and related skills, because of this they are unfit to this competitive world and hence lead to unemployment and stagnation in career. This study focused on current status of employability, competency and various skills needed in management students and leads and guide to institutes how to develop these skills in students. Students have to make self assessment about identifying our strength and weaknesses in view of competencies and skills, also to the employability this is needed for an impressive personality. However the students pursuing management education, lack in such competency and skills and employability, hence it is need of the time that these schools should take efforts.

Keywords: - Competency, Skill, Employability, Management Education, B-School

Introduction:-

Management education shows a growth in an economy. It is the key to productivity, efficiency, value creation and performance. On account of globalization, liberalization and privatization business has been booming along with increase in volume and scope of business management education has also expanded to a greater extent. Now we are having about 4500 B-schools (including 13IIMS) with 3, 60,000 total seats imparting management education

On account of global competition and technological development, corporate sector has become more dynamic with changes and challenges. Business opportunities based on creativity and innovativeness is abundantly available. Business risks are taking new routes

and business problems are becoming inter functional. Companies are creating complex organizational structures and process. They are applying new management theories, techniques and models. Corporate sector is totally knowledge based and is focusing on higher goals, loyalty, commitment and image building. Companies are trying to achieve internationalization in character and culture. Thus the needs and demands of corporate sector are changing and influencing relationship between business and management education.

In view of these companies are asking for global, visionary, techno managers with broad knowledge, wider skills creativity, innovativeness and desire for continuous improvement. They need thought leaders, fast decision makers, team builders having strategic thinking, analytical ability and practical ability. Now managers have to play multifaceted roles. Business ethics, business research, leadership and communication have become important.

Considering the above scenario, rethinking, reinvention, reinvestment and re – engineering of management education have become the need of time. Management education is requiring international standards .It is expected that B-schools should develop corporate personality. They should have cross disciplinary programs and teach smart in latest knowledge by using latest information and communication technology .B-school should shift from functional to sectoral areas. Similarly future managers are to be groomed for uncertainties, unpredictable technology and unfamiliar culture. In the light of this, proposed action plan for B-schools is drafted and presented. It would also be useful to Institutes of other professional education by a little modification.

The current curriculum in management education does not teach students in facing the challenges in business environment. How to manage uncertainty and complexity are not taught in business schools. It merely teaches the concepts with case studies. It does not focus on the challenges arising out of rapid growing technology and the challenges involved in running an enterprise. (M S Rao, 2010). More than 70% of our MBA students are not employable (Employability refers to a person's capability for gaining and maintaining employment) . The former president of India A.P.J. Abdul Kalam has appropriately said that India is not facing the problem of unemployment but of employability. The Management graduates, unfortunately, do not possess skills besides the academic and technical skills. Top three most important general skills identified were integrity, reliability and team work, while the top three most important specific skills are entrepreneurship, communication in English and use of modern tools and technology (Subhash Jagota, Business and Management magazine, *for Emerging Business managers, Chronicals*).

Types of the Competencies:-

1. Global Knowledge :- Knowing something about everything, everything about something
2. Domain Knowledge :- Knowledge in the concern subject

3. Cultural diversity: - The quality of diverse or different cultures, as opposed to monoculture, as in the global monoculture, or a homogenization of cultures, akin to cultural decay.
4. Global Mind set

Types of Skill:-

1. Leadership Skill 2. Decision Making Skill 3. Communication skill 4. Peoples Skill 5. Interpersonal Skill 6. Problem Solving Skill 7. Team Management Skill 8. Negotiation Skill 9. Motivational Skill 10. Listening Skill 11. Presentation Skill 12. Technical Skill

What Do employers really want?

Basic: - Professionalism, Communication, Teamwork, Planning and organizing, problem-solving

Essential :- Working on own initiative, Drafting and speaking, Leading and co-operating, Decision Making, Time Management, Researching and Analyzing, creativity and data handling.

Helpful:- Lateral Thinking, Learning new skills faster, accepting responsibilities, listening carefully, supporting and motivating colleagues, negotiating, planning operations, and actions, working deadlines, and prioritizing.

Therefore, there is a need to focus on the skills that organizations expect from management graduates coming out of business schools and B schools should conduct workshops, seminars lectures and crash courses to implement the same skills in the management graduates.

Objectives of the Study:-

1. To focus on status of Employability, competencies, skills among students perceiving management education.
2. To describe the students' self-perceived level of competence for performing Employability skills necessary for careers in corporate world.
3. To help the Institute to improve Employability, competency and required skill of B school students.
4. To Explore whether the lack of Employability, competency and required skill of management students cause unemployment amongst B-school
5. To motivate B School management to conduct training courses to improve Employability, competency and skill of management students.
6. To understand what type of employability, competencies and skills expected by employers.
7. To help in the development of own personality of the management students.

8. To enable management students to enhance their potential.

Nature and Scope of the Study:-

The nature of the research is descriptive, which will help the B Schools to check and improve Employability competency and required skills of their students.

Literature Review:-

The notion of graduate employability is a contentious issue that is both difficult to conceptualise and measure. In the UK, public interest in graduate employability reflects the massification of Higher Education over the past two decades. It is, however, given little attention in other societies, many of which prefer to consider the 'work-readiness' of graduates as a means of guaranteeing economic competitiveness in an increasingly global market-place (Little, 2003).

Some definitions of employability focus on graduates' abilities to synthesise personal and academic skills (Pierce, 2002; Knight & Yorke, 2004), nearly two-thirds of all graduate vacancies are open to graduates from any discipline with the type of skills required dependent upon the role to be carried out within a particular organisation (Raybould & Sheard: 2005).

McMillan and Weyers (2006) suggest that employers now expect as standard that all graduates have underlying technical/ discipline competences. Employers, therefore, expect graduates to demonstrate the personal competences (soft skills) which they now often are looking for as the factor which distinguishes them from other candidates.

Employability as an individual's ability to gain initial employment, maintain employment, move between roles within the same organization, obtain new employment if required and (ideally) secure suitable and sufficiently fulfilling work. Hillage and Pollard's (1998)

A set of achievements – skills, understandings and personal attributes – that make graduates more likely to gain employment and be successful in their chosen occupations, which benefits themselves, the community and the economy. Yorke and Knight (2004 a)

Graduates valued the following as employability skills: working under pressure; oral communication skills; accuracy; time management; adaptability; initiative; independent working skills; team working skills; taking responsibility and organizational skills. Sometimes programs of study make these skills explicit, often however they are left to float in the margins of what the module is about. Brennan et al (2001)

Thompson, and McGrath (1990) indicated that competencies were associated with knowledge and skills for implementing certain assignments or projects effectively.

Human resource Management specialist defines a set of competencies as a tool to serve as a common language throughout the entire organization to consistently plan personnel, conduct performance reviews, and determine the training program (Kravetz, 2008).

There is a distinction between competencies and knowledge, skills, and abilities (KSAs). Knowledge refers to a body of information about the theoretical and practical understanding of a subject, acquired by a person through experience or education. Skills refer to the application of data or information with manual, verbal, or mental proficiency. Skills can be tested to measure quantity and quality of performance, usually within an established time limit. Examples of skills include typing and computation using decimals (Kravetz, 2008). Ability means the sufficiency of strength to accomplish something, especially the physical and mental quality to perform activities. Examples include planning and implementation. KSAs are fundamental aspects of competencies, but competencies are more behavior-based rather than skill-based. In brief, each competency requires several KSAs. While KSAs may underlie competencies just as personal traits may underlie competencies, the KSAs are not the exact competencies. That is to say, having the KSAs does not automatically mean that one has a certain competency (Kravetz, 2008): one may know how to do a certain task without being able to complete the task proficiently.

Research Methodology:-

This study has been undertaken to check the statue of employability, competency and skills required by management students to work in corporate world and suggest management schools to go out of syllabus and conduct training programmes to implement same skills.

This is descriptive research in which secondary data is being used. The related data is collected through magazines, different websites, journals and books.

This secondary data enables to focus on the status of required skills amongst management students and also describe students self perceived level of competency and skill. Definitely this research will be helpful for the B schools in improving the various skills, competencies and employability of the students. This research also focuses whether the lack of Employability, competency and required skill of management students cause unemployment amongst B-school.

For motivating B schools to conduct training courses for improving skills of students this research will be helpful. Through this research B schools can understand what type of employability, competencies and skills expected by employers. For Developing own personality and potential of the students to prepare for the jobs this research definitely helpful for management students

Data is gathered from “National Employability Report- MBA Graduates- 2012”.

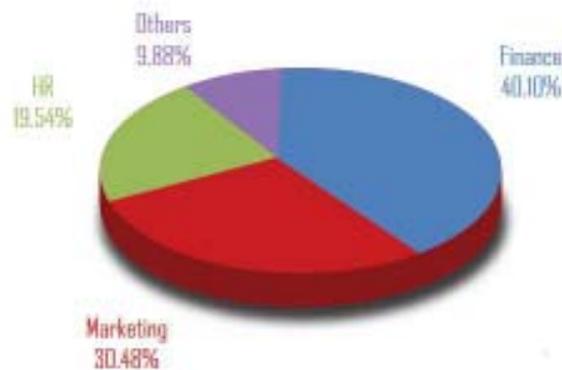
Research Steps:-

1. Introduction
 2. Setting Objectives
 3. Data Collection (secondary data)
- Data of distribution of MBA graduates across different specialization

- Data of Employability of MBA graduates across different roles
- 4. Main Study: - With the Help of collected secondary data, checking the status of employability and skills of management students, and suggest the guidelines to management schools and students.
- 5. Data Analysis
- 6. Finding out the Limitations of the research
- 7. Recommendation and suggestions
- 8. Conclusion.
- 9. References

Data Analysis:-***Students in Indian B schools******Distribution of MBA graduates Across Different Specializations***

The specialization in MBA graduates take up while studying, we found that a good 40.1% of the MBA graduates have majored in finance, 30.48% in Marketing and 19.54% in HR and the remaining 9.88% were found to have majored in General Management, Operations and other management fields. This shows that Finance remains the most popular major among MBA students and Operations the least.



(Fig.- 1)

Employability***Employability of MBA graduates across different Roles***

ROLE	EMPLOYABILITY
<i>Analytical Roles</i>	
Business Consulting	2.52%
analyst	7.98%
<i>Client Interaction Related Roles</i>	
Corporate/Institutional Sales	10.56%
B2C Sales	21.72%
Customer Service	16.01%
<i>Functional Roles</i>	
BFSI Roles	7.69%
HR Roles	9.63%
Marketing Roles	6.99%
<i>Operational Roles</i>	
ITes/BPO	32.28%
Operations	15.04%

Note:- B2C sales includes selling direct to customer and via channels

BFSI Industry includes **Banking**, Financial Services and Insurance

Employability of MBA Graduates across different roles

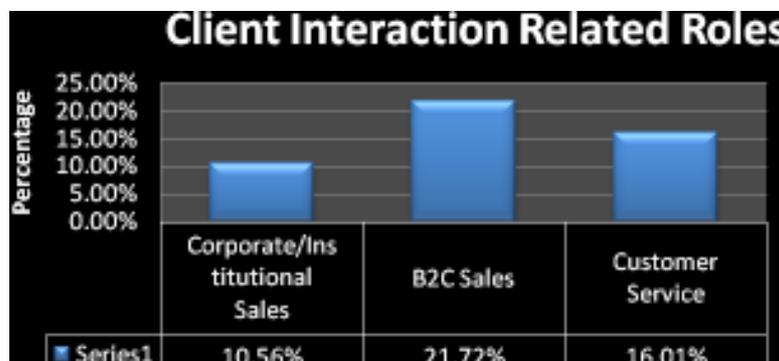
1. Analytical Role :



(Fig.- 2)

Business Consulting and Analyst:- Employability of MBA graduate is exceptionally low (2.52%) in Business consulting whereas it is just 7.98% for the Analyst function. This is because the consulting role involves analyzing business and other data from quantitative and analytical stand-point and providing recommendations to the clients on a day- to- day basis. This, in turn, requires good command over spoken and written English, analytical ability and the ability to think on their feet. On the other hand, analysts are generally back-end personnel. They do not have to meet clients on a regular basis. So, they may not be very strong in spoken English, although they require strong written English and analytical skills.

2. Client Interaction Related Roles:



(Fig.-3)

Corporate Sales (B2B)/Consumer (B2C) Sales: Corporate sales is selling to a customer who is either a business entity or an institution. Jobs in corporate sales involve selling products, services or solutions. For instance, a sales person selling recruitment solutions to corporations shall be considered to be in corporate sales. Consumer and channel sales, on the other hand, comprise selling of a product directly to a customer or through a channel of distributors/retailers. For instance, the selling of life insurance or consumer banking products in the BFSI sector. The employability in corporate (B2B) sales (10.56%) is almost half of that in Consumer (B2C) sales (21.72%). This is because a corporate sales role requires better command over English, both written and spoken. Not only does it require very clear spoken English, but also involves considerable written communication through emails, where the correctness of the email builds credibility of the product/service sold. In contrast, B2C sales hardly involve any written communication. Also, a role in corporate sales, generally, entails more hard-selling comprising

solution-selling, conscientious follow-up and handling multiple stake-holders. This not only necessitates higher order analytical skills to do precise requirement analysis, and suggesting solutions, but also being more socially confident and extraverted.

3. Functional Roles



(Fig.-4)

Employability across these functions lies below 10%. While marketing records the lowest employability at around 7%, BFSI (7.69%) and HR jobs (9.63%) follow closely. The analysis shows that approximately 47–50% candidates lose out on jobs in these domains due to lack of domain knowledge, whereas 59% lose out due to lack of language and cognitive skills. There is an immediate and pressing need for institutions to impart better training in domain skills. Cognitive Ability

4. Operational Role



(Fig.-5)

Operations and ITeS/BPO: The employability in the area of Operations is 15.04%, which is nearly half of that in the ITeS/BPO sector. The prime reason behind this is that, though the jobs in BPO sector require a good command over spoken English, they do not require much skill in written English. Their work involves minimal written communication. The nature of the work being repetitive, they require just basic quantitative and analytical skills. An Operations managerial-level job, on the other hand, would require a better command over English and better cognitive skills. Since a person in Operations is responsible for execution and delivery at the ground level, high level of conscientiousness and ability to work under stress (emotional stability) is a must. Emotionally stable people are even-tempered and relaxed. They can face stressful situations without getting upset. Managers with high Emotional Stability can keep their cool under a tense situation and may avoid a fatal rash decision.

Limitations of the Study:-

1. This research is only applied to the B schools in India
2. This research is restricted to a major class and not for the exceptions those who are studying in B schools.
3. This research is only applied to the MBA students of the B schools.

Recommendations and Suggestions:-

1. Seminars and workshops to be conducted by B schools on every weekend.
2. Experts from different fields (from Industry) should be called as and when possible for guidance.
3. A committee of teachers and students should be formed for observation and feedback of performance of students.
4. Continuous evaluation for B school students.
5. Meditation programs should be conducted on regular basis for reducing the mental stress.
6. Training programs should be conducted to improve the competency.
7. Remedial classes to be conducted for special students.
8. This research is a guideline to the management graduates to update oneself by attending training programmes, seminars, conferences, exhibitions and reading professional magazines.

Conclusion:-

This study concludes the current status of employability and skills of B school students. There is a need of improvement of employability and various skills in management students which is expected by the employers. Going out of syllabus it is possible to improve employability and skills in management students by conducting training programmes.

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“ Seasonal Study of Major & Minor Parameters of Tamraparni River Water Found in Chandgad Area”

By Prof. R.N.Salunk,

By Dr. S.P.Bandiwadekar,

By Prof. S. M. Patil.,

By Prof. D. A. Kumbhar

By R.B.Madkholkar

ABSTRACT:-

Major & minor parameters of Tamraparni river water were studied for a period of two years. Major & minor parameters like PH, Suspended solids, Conductivity, Alkalinity, Ammonia, Hardness, Ca, Mg, Chloride, Fluoride, Nitrate, Phosphate, Total Iron, Colour, Turbidity, Temp, Algae, Protozoans were estimated & tabulated seasonally. Water samples were collected from downstream direction in a plastic container of 2 liters capacity with necessary precaution from sixteen selected stations of the river. In present investigation, it was observed that in different seasons, parameters varied significantly & from the data obtained it is evident that the water sample collected from sampling station-10 to 16 is slightly polluted. A proper treatment is essential to this water before providing it to the people for drinking and domestic use.

1) INTRODUCTION The Research Paper entitled “ Seasonal Study of major & minor parameters of Tamraparni river water found in Chandgad area ” is undertaken to check the quality of water from Tamraparni river. Tamraparni River is one non-perennial type. This river is flowing in Chandgad taluka in Kolhapur district. The River runs from West from Chandgad city at 25 Km to East at 52Km away from Chandgad city. The main source of water for river is rain water in rainy season while in Winter & Summer seasons water from Zambre & Jangmatti dams. The river is in irregular shape from origin to where it is to be joined by Ghatprabha river at Daddi in Karnataka. The population of Chandgad taluka is about 1,80,781. Out of these people about 80,000 people use water from Tamraparni river for drinking, irrigation and domestic purposes.

Water is most abundant & familiar liquid, widely distributed in nature. About four-fifth of the surface of the earth is covered with water. It occurs in nature in the free state & also in the combined state. The important source of water in nature are rain water, river water, spring water, well water, & sea water. In India large & small rivers are the principal

sources of water. According to central pollution control board 90% of the water supplied in India to the town & cities is polluted. Today pollution of water resources have been most exploited due to increase in population, modern agricultural concept, industrialization, urbanization, deforestation, increasing in living standards & broad spheres of human activities. (Sharma 2005).

Water has been a potential carrier of toxic, inorganic & organic materials, non biodegradable matter, pathogenic microbes which can endanger health & life. The growth & distribution of the plankton depends upon physico-chemical parameters of water, like amount of dissolved gases, temp., transparency of water, intensity of incident light, etc. Water quality monitoring practices are more useful to prevent diseases, hazards as well as to check the resources from going further polluted. Thus monitoring of Tamraparni river water quality, has become a need of the hour.

The investigation will be done during two successive years 2009-2010 and 2010-2011.

2. MATERIALS AND METHODS

Chandgad tahsil is situated on the bank of Tamraparni river. Sixteen sampling stations were selected on the basis of residential area, surrounding land use, highly flushed (flooded) area (in rainy season). Water samples were collected from downstream direction in a plastic container of 2 liters capacity with necessary precaution from selected stations of the river. Water samples were collected quarterly beginning from the month of July 2009 to May 2010 also July 2010 to May 2011. Description of some study stations is as below.

Station -01 :- This station is located upstream at Village Zambre. Human activities are low. About 3 km away from this station Tamraparni river originates. Around this highly hilly & forest area.

Station -02 :- It is located near Umgaon town. This station is 2 km away from station 1. Human activities are slightly high as compared to station 1. People commonly use water for domestic, drinking & agriculture purpose.

Station -03 :- It is located near Daatha mandir. It is close to Chandgad & 3 km away from station 2. Agricultural waste is constantly flowing into the river, also devotees of Goddess immerse their pantheon (pooja material) directly into the river.

Station -04 :- This station is located about 4 km away from station 3. It is located near Ravalnath temple at Chandgad. Chandgad is taluka place in Kolhapur district in the state Maharashtra. Most of people use water for drinking, agricultural also domestic purpose. Here majority of people immerse their pooja material directly into the river. At this river path is small, hence it is highly flooded area in rainy season only.

Station -08 :- It is located near Doulat sugar industry at Halkarni. It is about 27 km away from station 4. The discharge of industrial waste as well as domestic waste into this station. Here most of the people use water for drinking, agricultural, domestic & industrial purpose.

Station – 11 :- This station is located near the village Kowad at the downstream of river. It is 30 km away from station 8. It is highly populated also agriculture area . Here path of river is large . Lot of agricultural waste & domestic waste are drained in to the river. Moter vehicles & animals are constantly washed. Water at this station is slightly polluted.

Station – 16 :- This station is located in between village Kamewadi (Maharashtra) & Daddi (Karnataka) at the downstream of the river. It is about 30 km away from the station 11 . It is last station & about 4 km away from this Tamraparni river join to Ghatprabha river at Daddi in Karnataka. Lot of agricultural waste & domestic waste are drained in to the river. Most of the people use water for drinking, agricultural, domestic & industrial purpose. Water at this station is slightly polluted.

Water quality analysis :-

Sampling of water was carried out at the sixteen study stations three times in the years from the month of July 2009 to May 2010 also July 2010 to May 2011, covering rainy ,winter,& summer seasons. The parameters like Colour, Suspended solid , PH ,Electrical conductivity, TDS,(Pocket meter) Temperature, Turbidity (Secchi disc), were determined in the field at the time of sample collection , while remaining chemical & biological parameters was carried out in the college laboratory as per standard methods (APHA 1992, 18thEd.). The results obtained were evaluated with the standards prescribed by BIS 1991 &WHO.

Parameters & Methods employed in the Physical ,Chemical & Biological examination of Samples

Sr.No.	Parameters	Type	Method
1	Colour	Qualitative	By Visual
2	Temperature	Quantative	By Thermometer
3	Suspended solid	Qualitative	By Filtration on paper
4	PH	Quantative	By PH Paper strip & Ph meter
5	Alkalinity	Quantative	Color indication Titration
6	Total Hardness	Quantative	Titrimetric (EDTA)
7	Calcium	Quantative	Titrimetric (EDTA)
8	Magnesium	Quantative	By Difference (between total hardness & calcium)
9	Chloride	Quantative	Titrimetric (Argentometric)
10	Fluoride	Quantative	Colorimetric (SPADNS)

11	Nitrate	Quantative	By Nitrate paper strip
12	Ammonical Nitrogen	Quantative	Colorimetric (Nesslerization)
13	Phosphate	Quantative	Colorimetric (Stannous Chloride Ammoniummolybdate)
14	Total Iron	Quantative	Colorimetric (Phenanthroline)
15	Residual Chloride	Quantative	Colorimetric (Ortho Tolidine)
16	Algae		Microscopic
17	Protozons		Microscopic



Kolhapur District map.



Chandgad Taluka map showing Tamraparni river.



Pictures shows Flooding Condition on river bank in rainy season.



Pictures shows path of river in rainy season.





Pictures shows environmental surrounding of chandgad taluka.





Pictures shows path of river in winter season.





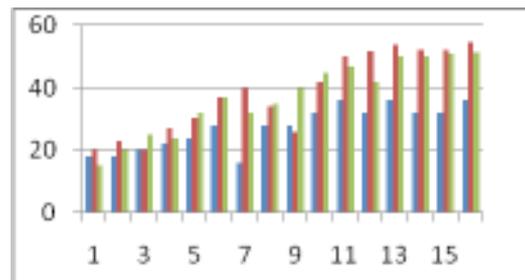
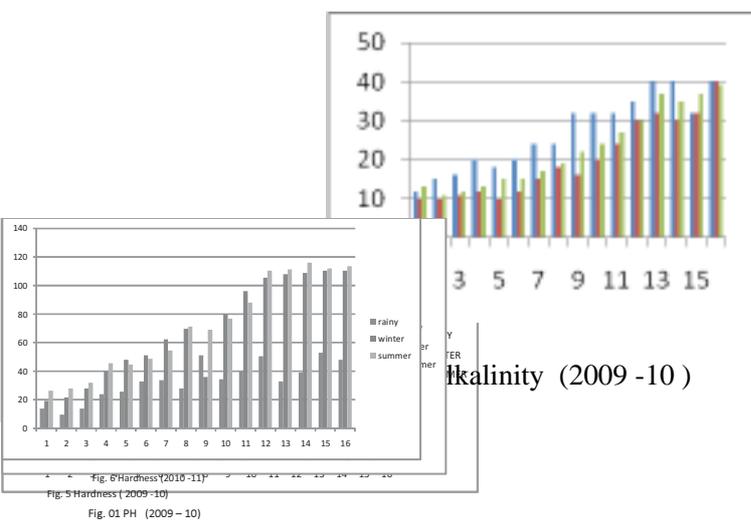
3. OBSERVATIONS

The results of various physicochemical parameters at different sampling stations after seasonal observation (sampling stations 01 to 16) during study period July 2009 to May 2011 have been mentioned in table 01 & 02.. These results obtained were evaluated with standards prescribed by BIS (1991) & WHO.

Name of village	Parameter	Colour	Temperature °C	Suspended solid	PH	Conductivity ohm ⁻¹	Alkalinity Mg/l	Hardness Mg/l	Ca Mg/l	Mg Mg/l	Chloride Mg/l	Fluoride Mg/l	Nitrate (NO ₃) Mg/l	Ammonia Mg/l	Phosphate Mg/l	Total Iron Mg/l	Algae	Protozoa	
																			Seasons
Zambre 1	Rainy	Radsh	21	Low residue	7.3	0.032x10 ⁻³	12	12	6.4	1.36	13.9	1	50	-	-	0.6	Present	Present	
	Winter	Colourless	19	No residue	7.2	0.042x10 ⁻³	10	30	13.76	3.94	14.4	1.5	25	-	0.2	0.2	-	-	
	Summer	colourless	26	No residue	7.8	0.077x10 ⁻³	13	40	14.4	6.22	18.99	1	25	-	-	-	-	-	
Umgaon 2	Rainy	Radsh	21	Low residue	7.2	0.030x10 ⁻³	15	13.8	5.12	2.1	14.99	1	50	-	-	0.6	Present	Present	
	Winter	colourless	19	No residue	7.3	0.040x10 ⁻³	10	35	14.72	4.92	15.9	1.5	50	-	0.2	0.2	-	-	
	Summer	colourless	26	No residue	7.8	0.082x10 ⁻³	11	43	16.32	6.48	19.99	1	25	-	-	-	-	-	
Shripadwadi 3	Rainy	Radsh	21	Low residue	7.4	0.040x10 ⁻³	16	9.6	4.16	1.32	12.4	1	50	-	-	0.6	Present	Present	
	Winter	Radsh	19	Low residue	7.4	0.056x10 ⁻³	11	35	13.44	5.23	16.9	1.5	50	-	0.2	0.2	-	-	
	Summer	colourless	26	Low residue	7.6	0.070x10 ⁻³	12	40	13.76	6.37	21.49	1.5	25	-	-	-	-	-	
Chandgad 4	Rainy	Radsh	21	Low residue	7.5	0.052x10 ⁻³	20	24	8.96	3.65	14.99	1	50	0.5	-	0.6	Present	Present	
	Winter	Radsh	18	Low residue	7.7	0.088x10 ⁻³	12	38	11.2	6.51	22.49	1.5	25	-	-	0.2	0.2	-	-
	Summer	colourless	27	Low residue	7.9	0.085x10 ⁻³	13	45	17.4	6.7	17.99	1.5	10	-	-	0.2	0.2	-	-
Naganwadi 5	Rainy	Radsh	22	Low residue	7.5	0.055x10 ⁻³	18	28	11.2	4.08	15.99	1	50	0.5	-	0.6	Present	Present	
	Winter	Radsh	19	Low residue	7.6	0.056x10 ⁻³	10	40	16	5.58	23.49	2	25	0.5	0.1	0.4	-	-	
	Summer	colourless	26	High residue	7.9	0.100x10 ⁻³	15	47	18.96	6.91	24.49	1.5	10	0.5	0.2	0.4	-	-	
Konewadi 6	Rainy	Radsh	21	High residue	7.5	0.060x10 ⁻³	20	32	11.52	4.97	14.06	1	50	-	-	0.6	Present	Present	
	Winter	Radsh	19	High residue	7.8	0.052x10 ⁻³	12	42	16.96	6.08	26.48	2	25	0.5	0.1	0.4	-	-	
	Summer	colourless	26	Low residue	7.8	0.108x10 ⁻³	15	50	17.92	7.79	25.98	1.5	10	0.5	0.4	0.4	-	-	
Daate 7	Rainy	Radsh	22	High residue	7.9	0.060x10 ⁻³	24	32	11.84	4.89	16.99	1	50	0.5	-	0.2	Present	Present	
	Winter	Radsh	19	Low residue	7.8	0.067x10 ⁻³	15	50	17.6	7.87	27.98	2	25	0.5	0.2	0.4	-	-	
	Summer	colourless	25	No residue	8.2	0.114x10 ⁻³	17	56	19.2	8.94	28.98	2	25	1	0.4	-	-	-	
Halkarni 8	Rainy	Radsh	21	High residue	7.6	0.088x10 ⁻³	24	44	13.44	7.42	14.99	1	50	0.5	0.1	0.4	Present	Present	
	Winter	Radsh	20	Low residue	7.9	0.079x10 ⁻³	18	60	17.92	10.22	25.98	2	25	1	0.21	0.2	-	-	
	Summer	colourless	26	Low residue	8.3	0.120x10 ⁻³	19	59	18.24	9.9	31.98	2	25	1	0.4	0.4	-	-	
Mangaon 9	Rainy	Radsh	21	High residue	8	0.065x10 ⁻³	32	64	19.2	10.88	16.49	1.5	50	0.5	0.2	0.4	Present	Present	
	Winter	Radsh	19	Low residue	7.5	0.074x10 ⁻³	16	60	15.04	10.92	27.91	2	25	1	0.4	0.4	-	-	
	Summer	colourless	26	No residue	8.4	0.116x10 ⁻³	22	67	19.92	11.53	33.48	1.5	10	1	0.2	0.2	-	-	
Mahalewadi 10	Rainy	Radsh	21	High residue	8	0.073x10 ⁻³	32	48	17.6	7.38	17.49	1	10	0.5	0.2	0.4	Present	Present	
	Winter	Radsh	19	Low residue	8	0.083x10 ⁻³	20	65	20.16	10.89	30.38	2	50	1	0.4	0.4	-	-	
	Summer	colourless	26	No residue	8.5	0.100x10 ⁻³	24	70	23.04	11.41	42.48	1.5	50	1	0.2	0.2	-	-	
Kowad 11	Rainy	Radsh	21	V.high residue	8.2	0.074x10 ⁻³	32	72	15.36	13.76	20.99	1.5	25	0.5	0.2	0.6	Present	Present	
	Winter	Radsh	19	High residue	8.1	0.108x10 ⁻³	24	90	23.4	16.27	29.98	2	50	1	0.2	0.2	-	-	
	Summer	colourless	26	Low residue	8.5	0.129x10 ⁻³	27	80	25.28	13.29	34.98	2	50	1	0.2	0.2	-	-	
Kalkundri 12	Rainy	Radsh	21	V.high residue	8.2	0.082x10 ⁻³	35	59.2	13.12	11.19	18.4	1.5	50	1	0.2	1	Present	Present	
	Winter	Radsh	19	High residue	8.1	0.113x10 ⁻³	30	80	19.2	14.77	35.48	2	10	1	0.4	0.6	-	-	
	Summer	colourless	26	Low residue	8.6	0.120x10 ⁻³	30	90	30.4	14.48	36.96	1.5	10	1	0.4	0.4	-	-	
Dundage 13	Rainy	Radsh	21	V.high residue	8.2	0.074x10 ⁻³	40	63.2	17.6	11.08	20.99	1.5	50	1	0.2	0.6	Present	Present	
	Winter	Radsh	19	High residue	8	0.097x10 ⁻³	32	67	20.8	11.22	37.48	2	50	1	0.6	0.4	-	-	
	Summer	colourless	26	Low residue	8.6	0.140x10 ⁻³	37	90	29.52	14.69	38.48	1.5	25	1	0.4	0.4	-	-	
Chinchane 14	Rainy	Radsh	22	V.high residue	8.2	0.075x10 ⁻³	40	64	16.6	11.51	19.99	1	50	1	0.1	0.6	Present	Present	
	Winter	Radsh	20	High residue	8	0.110x10 ⁻³	30	80	21.76	14.15	38.48	2	50	1	0.4	-	-		
	Summer	colourless	27	Low residue	8.7	0.162x10 ⁻³	35	95	32.64	15.15	42.48	2	10	1	0.6	-	-		
Rajgoli 15	Rainy	Radsh	22	V.high residue	8.3	0.081x10 ⁻³	32	68	16.96	12.4	22.04	1.5	50	1	0.1	1	Present	Present	
	Winter	Radsh	20	High residue	7.8	0.100x10 ⁻³	32	73	22.4	12.14	40.48	2	50	1.5	0.4	0.2	-	-	
	Summer	colourless	28	High residue	8.7	0.164x10 ⁻³	37	110	32.96	18.72	44.98	2	25	1.5	0.6	0.4	-	-	
Kamewadi 16	Rainy	Radsh	22	V.high residue High residue	8.2	0.085x10 ⁻³	40	64	20.8	10.49	18.49	1	50	1	0.1	1	Present	Present	
	Winter	Radsh	20	High residue	8	0.115x10 ⁻³	40	75	23.04	12.62	41.48	2	25	1.5	0.2	0.2	-	-	
	Summer	colourless	27	High residue	8.9	0.170x10 ⁻³	39	110	35.52	18.09	48.98	2	10	1.5	0.6	0.4	-	-	

Table No. 1 (July 2009 to May 2010.)

Table No. 2 (July 2010 to May 2011)



4. Discussions

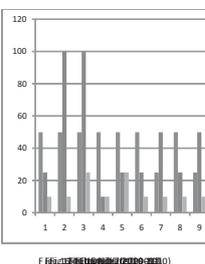
Total 17 parameters of water were taken for the investigation. The results obtained during study period is shown in the observation tables 1&2. It has been observed that there is seasonal variation in the values of parameters. The parameters values were different at different sampling stations which may related to the degree of pollution. The parameters show variations as follows.

01) Colour :-

The colour of the sample usually observed through eyes on site after taking the sample in a glass test tube. In rainy season & Some samples of water in winter season are of red brown colour due to erosion of soil, also high amount of iron, copper, algae, protozoans etc. (Manjunath 2009). Colour in water may be due to presence of fine particles in suspension or certain mineral matter in solution. (Sharma 2005)

02) Temperature :-

It is one of the important physical factor. It is variable according to the seasons. It is found to be high during summer season (April and May) and low during winter season i.e. December and January. During study period minimum temp recorded is 18 °C and maximum is 27 °C . Cool water is generally more palatable & pleasing to consume. Higher water temperatures promote the growth of micro-organisms in the water & may increase taste, odour & corrosion problems. (Manjunath 2009)



03) Suspended solids :-

Total Suspended Solids (TSS) is comprised of organic and mineral particles that are transported in the water column. TSS is closely linked to land erosion and to erosion of river channels. TSS can be extremely variable, ranging from less than 5 mg L⁻¹ to extremes of 30,000 mg L⁻¹ in some rivers. TSS is not only an important measure of erosion in river basins, it is also closely linked to the transport through river systems of nutrients (especially phosphorus), metals, and a wide range of industrial and agricultural chemicals. In most rivers TSS is primarily composed of small mineral particles. TSS is often referred to as turbidity and is frequently poorly measured.

In present study , Most of water samples in rainy season contains very high residue, due to rain water run –off , hence colour of water is red brown & Some samples of water in winter & summer seasons are no residue.

04) PH :-

Basically, the pH value is a good indicator of whether water is hard or soft. The pH of pure water is 7. In general, water with a pH lower than 7 is considered acidic, and with a pH greater than 7 is considered basic. The normal range for pH in surface water systems is 6.5 to 8.5, and the pH range for ground water systems is between 6 to 8.5. external factors that can cause fluctuations in the river pH include agricultural runoff, acidic mine drainage (AWD), and fossil fuel emissions such as carbon dioxide, which creates a weak acid when dissolved in river . In present study, Hydrogen ion concentration (PH) was positively correlated with conductance & alkalinity. It was fluctuated from 7.2 to 8.9 in all seasons of both the years i.e. water contains bicarbonate & carbonic acid (Sharma ,2005, BIS -1991) . In summer season PH of some samples were found higher i.e. slightly alkaline (fig.1& 2), because of less water in river basin contains large number of inorganic pollutants. PH has no direct effect on human health , all biochemical reactions are very sensitive to variation of PH . For most reaction as well as for human beings natural PH is considered as best & ideal . Extremes in pH can make a river inhospitable to life. Low pH is especially harmful to immature fish and insects. Acidic water also speeds the leaching of heavy metals harmful to fish.

05)Total Alkalinity: -

The alkalinity of water is its capacity to neutralize acids. Alkalinity is a measure of an aggregate property of water. Alkalinity of water is usually due to presence of carbonate , bicarbonate & hydroxide compound of calcium, magnesium, sodium & potassium. These components results from dissolution of mineral substances in soils & from atmosphere. The total alkalinity in both the years ranged from 10 to 54.6 mg / lit. in all seasons (fig 3 & 4). The maximum alkalinity was recorded as 54.6 mg /lit. At kamewadi in winter season. BIS has set a desirable level of alkalinity in drinking water to be 200 mg/lit. where as its value has been prescribed to be 600 mg/lit. in the absence of alternative source. So alkalinity

values of all water samples are not beyond the desirable limit. In present investigation alkalinity of water is less than hardness of water, hence water must be sulphates of calcium & magnesium. (Sharma 2005)

06) Electrical conductivity :-

Electrical conductivity is the ability of a substance to conduct the electric current. In water it is property caused by the presence of various ionic species. It gives rapid method to get idea about the dissolved solid in water. In this project the minimum conductivity recorded is $0.030 \times 10^{-3} \text{ohm}^{-1}$ and Maximum is $0.180 \times 10^{-3} \text{ohm}^{-1}$ which is within limit. The result shows low conductivity for less polluted water due to absence of ionic impurities, while medium conductivity for slightly hard water.

07) Hardness :-

Hardness of water is the terms used to indicate the capacity of water to give leather with soap. Soaps are soluble in water in large extent, but the presence of certain substances inhibit the solubility of soap in water. Hardness of water is mainly due to calcium & magnesium ion & it occur due to discharge containing salt of calcium & magnesium. Total hardness of Tamraparni river water ranges from 9.6 to 116 mg/lit (fig 5 & 6). There was an increase in hardness from source to end point i.e. from the source point the river water is of very soft & at the end point it is to be slightly hard. In present investigation water at rainy season is become a soft & water at winter & summer seasons is slightly hard. The hardness of water is not a pollution parameter but indicates water quality. Very low hardness in water diminishes its buffering capacity & can lead to corrosion of water pipes. Again that regular consumption of very soft water may have an adverse effect on the body's mineral balance. (Manjunath 2007). In present study, total hardness was positively correlated with chloride, Ca & Mg.

08) Calcium & magnesium :-

Calcium & magnesium are essential elements for man & for plant growth. High calcium content in water are undesirable for washing, bathing & laundering. Calcium & Mg. ions in good tilt. Small concentration of calcium carbonate combat corrosion of metal pipes. The Ca & Mg. values fluctuated from 4.16 to 38.4 mg/lit. (fig 7 & 8) & 1.0 to 18.72 mg/lit (fig 9 & 10) in all sampling locations during all seasons of both years. The Ca & Mg. values increases from Zambre to Kamewadi, because hardness of water in down stream goes on increases but all these values are not beyond the desirable limit. (B.I.S. 10500,1992).

09) Chloride :-

Chloride is one of the major inorganic anion in water. In potable water salty taste produced by chloride concentration. Chloride is not strictly a pollutant but high chloride contents may harmful to metallic pipes as well as for agricultural crops. Moreover it also affects microorganisms, which are important in food chains of aquatic life. (N.E.P.T.VOL.9) Natural water generally consist of chloride ion due to the dissolution of salt deposits, discharge

of effluent from industries , irrigation drainage & sea water intrusion in coastal regions. The values of chloride in all locations are ranged in between 12.4 to 53.47 mg/lit (fig 11 & 12) . The maximum chloride contents were due to addition of natural contaminants and pollutants in the Tamraparni River.

10) Fluoride :-

Minimum fluoride content in river water at all locations is 0.5 & maximum is 2 mg/lit (fig 13 & 14) . Fluoride occurs in all natural water supplies. It may be present in detrimental concentrations in ground waters. Fluoride largely occur in chemical wastes from industries. Water drawn from subsurface through some geological formations may also contain high amount of fluoride. In present investigation at some locations in summer season, fluoride concentration were found to be higher , which causes reduction in the teeth of young children. It also reduce the decaying & missing teeth. (Sharma 2005).

11) Nitrate : -

Nitrate is a major ingredient of farm fertilizer and is necessary for crop production. When it rains, varying nitrate amounts wash from farmland into nearby waterways. Nitrates also get into waterways from lawn fertilizer run-off, leaking septic tanks and cesspools, manure from farm livestock, animal wastes (including fish and birds), and discharges from car exhausts. Nitrates stimulate the growth of plankton and water weeds that provide food for fish. This may increase the fish population. However, if algae grow too wildly, oxygen levels will be reduced and fish will die. Nitrates can be reduced to toxic nitrites in the human intestine, and many babies have been seriously poisoned by well water containing high levels of nitrate-nitrogen. The U.S. Public Health Service has established 10 mg/L of nitrate-nitrogen as the maximum contamination level allowed in public drinking water. In present study , Nitrate was fluctuated from 10 – 100 mg/lit (fig 15 & 16). . Location at Umgaon & Shripadwadi in winter season 2011 shows high values of nitrate, it is due to highly forest areas as well as maximum agricultural run- off . (BIS 1992). Nitrate values of majority of the samples in rainy season are slightly higher than the permissible limits, due to monsoonal runoff & land drainage. The presence of nitrate in large quantities in drinking water may causes illness in infants “Methemoglobin” or nitrate cyanosis known as “BlueBabySyndrome” (Manjunath 2007).

12) Phosphates: -

The element phosphorus is necessary for plant and animal growth. Nearly all fertilizers contain phosphates (chemical compounds containing the element, phosphorous). When it rains, varying amounts of phosphates wash from farm soils into nearby waterways. Phosphates stimulate the growth of plankton and water plants that provide food for fish. This may increase the fish population and improve the waterway’s quality of life. If too much phosphate is present, algae and water weeds grow wildly, choke the waterway, and use up large amounts of oxygen. Many fish and aquatic organisms may die.

Phosphorus is an essential element for life, both as a nutrient for plant growth & as an important element in the metabolic process of all living things. The phosphate content of water bodies was found in the range of 0.1 to 0.6 mg/lit. The highest value 0.6 mg/lit. was recorded in summer season 2011, due to fall in water level. Low concentrations phosphorus is a limiting factor for regulating the growth of producers (Algae & Plants). A small excess of this induces algae blooms in water bodies. In present study phosphate values increase from Zambre to Kamewadi because of phosphorus can come from human & animal wastes, farm and lawn fertilizer, industrial waste & destruction of wetland.

13) Total Iron :-

Iron in water may be present in dissolved, colloidal or suspended form. Maximum & minimum Iron concentration is 0.2 to 1.0 mg/lit. At all stations in rainy season contains higher concentration of iron. Iron in water can cause staining of cloths & utensils. High amount of iron in water gives a reddish & turbid appearance. It is harmful to aquatic system. (BIS 1992). In summer season it may be low or absent because of fall in water level, also low agricultural run-off.

14) Ammonia :-

The ammonia values varied between 0.5 to 2.0 mg / lit. The work presented here ammonia in water due to decaying plants, sewage & industrial discharge, use of ammonia containing fertilizers. Ammonia in water is toxic to the fish and plants. Ammonia makes a powerful cleaning agent when mixed with water. For this reason, it is one of the most common industrial and household chemicals. Ammonia is toxic to fish and aquatic organisms, even in very low concentrations. When levels reach 0.06 mg/L, fish can suffer gill damage. When levels reach 0.2 mg/L, sensitive fish like trout and salmon begin to die. As levels near 2.0 mg/L, even ammonia-tolerant fish like carp begin to die. Ammonia levels greater than approximately 0.1 mg/L usually indicate polluted waters.

5. CONCLUSION

During the study period July 2009 to May 2011 it is observed that, values of parameters increase from location 1 to 16 i.e. from origin to where it joins to Ghatprabha river. This is probably due to human activities such as constantly adding of sewage from the villages located on the bank, funeral places on the bank, washing clothes, cattle and vehicles also most of the surrounding land is used for agricultural, forest etc. purposes. In general all the parameters are within the range of standard values prescribed by various agencies. The water of Tamraparni River at the station 10 to 16 is slightly contaminated during the course of study and it is unfit for consumption, domestic and irrigation purposes directly.

Some samples are acidic & some are alkaline in nature. Different types of protozoans (Amoeba, Opalina, Euglena, Noctiluca, Paramoecium, Euplotes, Ceratium) are present in samples. Majority of samples are softer because their hardness becomes less than that of standard values. All the samples of water consist of algae to a small extent. So treatment is essential before it is used for drinking or for irrigation.

6. SUGGESTIONS

Now a days water pollution is a National Environmental Issue the whole mankind is affected by this problem. Therefore all the units of society should try to fight this problem. We are the real destroyer of the environment. We should preserve the moral values like, love for nature ,aesthetics, pity, love for animals. In order to live happily all such problems should be faced properly & eradicated. Besides, if the human beings want to live a life of better hygiene then following technique should be adopted in home.

- 1) Filter the water using muslin cloth to remove suspended particulate matter & heating the water to boil for 15 min. They destroy all pathogenic microorganisms in water as well as remove temporary hardness.
- 2) The vessel used to store drinking water should be preferably stainless steel, with a lid & cleaned using only with soap & detergent (Not with soil & ash)
- 3) Separate cup should be used to take the water from vessel.
- 4) The store water should never be touched with hand.

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A Study On 10 Selected Indian Corporates Initiative Towards A Green World: A Birds Eye View

By Ms. Swati P. Anavatti

ABSTRACT

Amid the global ecological crisis around climate change, India stands at a moment in time where she has the responsibility of acting responsibly and ethically towards the environment. The researcher in her paper wants to talk about selected 10 Indian companies with regards to their initiatives towards the Green movement and the responsible actions on the environment for its sustainability so as to provide a green and clean environment for the next generation. Also applying green processes to the workplace that creates a healthy environment for employees, reduces waste, and recognises the role that businesses play in leading the way for social change. The researcher does this through quantitative study of the motivations and contextual factors that induce ecological responsiveness ranging from day to day business practises to the ecological design of their business.

Even though the Green movement started more than a decade ago it is becoming the trend now. Building green isn't just a cost saving strategy. It is a brand growth strategy. A green building is also an opportunity for businesses to communicate achievement and values with their stakeholders, communities, vendors, and employees. It takes more than selling a green product to be called a Green business. The true nature of going green goes so much deeper than that...

1.1 Going Green: The Concept

Going green may seem to be the latest trend, but it is a trend with a variety of benefits for business owners. Applying green processes to the workplace creates a healthy environment for employees, reduces unnecessary waste and recognizes the role that businesses play in leading the way for social change. For the business that is thinking about going green, a variety of reasons exist to take the plunge.

The term Green is meant to define the concept of renewable, sustainable and eco-friendly processes, products and energy.

1.2 Going Green: The Need.

Energy Reasons for going Green

The use of oil by industrialized nations is responsible for a large portion of the air, water and food pollution in the world. Alternative energy that is renewable, sustainable and

has little to zero harmful side-effects is called “green energy”. This includes such resources as biomass, fuel cells, hydro, solar, wind, tidal waves and thermal forms of harnessing the earth’s natural elements.

Environmental Issues

The first concerns facing those living in the world today are major environmental ones. Toxins have leached out of industry facilities and factories into water supplies such as streams, rivers and into the world’s oceans. Marine and aquatic life have suffered as a result of these poisonous chemicals contaminating ocean beds, wetlands and marshlands.

Erosion

Erosion occurs for many reasons such as over-development of land, whether it’s for new housing developments, industry growth or agriculture.

Sustainability

The larger value of going green relates to maintaining the health of the environment. Utilizing sustainable methods can prevent the waste of natural resources, helping reduce the risk of depletion on the long run. Going green can be as simple as making sure lights are turned off in unused offices—thus preventing the waste of electricity—or as elaborate as utilizing alternative forms of energy (i.e., solar or wind energy). In either case, the goal of making these changes is to preserve natural resources by using those that are sustainable, or by taking measures to reduce the amount consumed.

Reduced Waste

Going green can improve the overall efficiency of a business. Reducing unnecessary waste can trim operating costs for the business, for example. Turning off lights in vacant offices can save energy, save on utility costs and increase the company’s bottom line. Printing less cuts down on paper usage, and can lower the budget spent on printing materials.

Improved Workplace

Providing green options within a company can offer overall workplace improvements. Green cleaning supplies can help employees who suffer from respiratory and other health-related conditions, because green products contain fewer chemicals that are connected to physical problems. Some companies have taken going green even a step further, by converting leftover food waste from the lunch cafeteria into methane to supply the building with energy.

Public Response

While public response alone is not necessarily the best motivation for going green, it might be a good side effect. With green initiatives increasing in popularity, economic studies have shown that companies utilizing green technology and selling green products are seeing an increase in profits. Companies such as Wal-Mart and Target have incorporated green changes such as composting and recycling, changing transportation routes to save gas, reducing packaging, and stocking their shelves with greener products. As a result, these

companies have seen customers respond positively to the changes, with green product sales alone jumping somewhere around 20 percent as of 2010.

1.3 Going Green: The Green Path.

Common characteristics of green companies:

- * Use natural gas for boiler fuel.
- * Recycle biodegradable waste.
- * Minimum use of plastic material; use recyclable packaging materials.
- * Use biomass and solar radiation as sources of renewable energy.
- * Generate electricity from hydroelectric plants.
- * Reduce toxic emissions, etc.

Industrialization is good for any economy, but it is not without vices — deterioration of the environment is one of the major setbacks. Fumes and other wastes generated from factory plants pollute the environment. Besides, several companies don't even follow proper waste disposal methods.

With time, thankfully, the environment protection laws in India have become stringent and companies have also become more conscious of their duty towards preserving the environment. Several companies have installed eco-friendly plants and adopted practices that will benefit the environment.

1.4 Going Green: The Selected Companies.

1. INFOSYS

OZONE – Infosys' Health, Safety and Environmental Management System (HSEMS) enunciates their philosophy and commitment towards environmental protection and management of health and safety of our employees, contractors and visitors.

Awareness and employee engagement

They encourage their employees to get actively involved in initiatives that work towards the improvement of society and the environment. Several employee-driven eco groups have been instituted at their development centres and they encourage them to participate in campaigns that inculcate eco-friendly lifestyles.

Energy

Opportunities for energy conservation were identified in all their operations, for both the physical and IT infrastructure. Some of the significant initiatives that have been taken up are listed here:

- Installation of wind turbines at our campuses in Pune, Bangalore and Mangalore
- Installation of occupancy sensors in conference rooms and rest rooms
- Introduction of LED lamps in lieu of fluorescent tubes

- Installed Variable Frequency Drives (VFD) in condenser pumps on chillers
- Initiative to replace old and inefficient utilities such as DG sets, pumps and motors
- Setting up of a strong monitoring system for the Environmental Management System as per ISO 14001 guidelines

These measures have resulted in a reduction of the per capita power consumption by over 3.85% during the year.

Infrastructure development

Their persistent efforts to build the most sustainable infrastructure were acknowledged last year with two of our buildings, one each in Jaipur and Thiruvananthapuram campuses, being awarded the LEED Platinum rating, the highest standard for Green Buildings by the Indian Green Building Council (IGBC). Continuing this commitment, all their new buildings that are under construction have been registered for LEED rating from the IGBC and are designed with a high performance envelope. This reduces the solar heat gain, while providing natural light.

Green power

They have worked with electricity and power regulators in Karnataka and at the Centre for making green power cheaper, an achievement that is significant not only for Infosys but would also benefit the community at large. A similar initiative is being taken up in other parts of the country.

Water

Recognizing the immense importance of water as a natural resource, they have successfully achieved their target of reducing their employee 'per capita' fresh water consumption in their Indian campuses by 6.80% during 2010-11 through various water conservation initiatives. As part of their corporate goal to become a water-neutral organization, they have built rainwater harvesting reservoirs in their Mysore, Hyderabad, Pune and Mangalore campuses with a combined water holding capacity of over 300 million litres. They have also built state-of-the art waste water treatment plants to recycle and reuse the waste water generated in their campuses for flushing, landscaping and air-conditioning requirements.

Waste management

They have embarked on recycling all organic waste generated at their campuses with the establishment of a biogas plant in their Mysore campus. A second plant is under construction in their Pune campus. The biogas generated will be used as cooking fuel in the food courts and the final treated waste will be used as manure in their gardens. Effective waste management has been achieved by ensuring environment friendly methods of disposal or disposal as per regulations.

2. Oil & Natural Gas Corporation – ONGC**HSE Policy**

Exploration and production of hydrocarbon involves risk and close interaction with surrounding environment. To safeguard the working and surrounding environment, ONGC has adopted a well-defined HSE policy focusing on Occupational Health, Safe Operation and control of pollution.

Renewable energy

ONGC's holistic focus on sustainable growth ensures its thrust on pursuing renewable sources of energy, decreasing their internal carbon footprint and exploring unconventional hydrocarbons. They are setting up a 102 MW Wind Farm in Rajasthan, in addition to a 51 MW Unit already working successfully in Bhuj, Gujarat.

Energy conservation

ONGC has well defined energy policy which focuses on various aspects of energy conservation. The introduction of environment friendly and energy efficient technologies led to an estimated savings of INR 409.23 Crores during 2011-12.

Green Building

ONGC acknowledges that buildings have major environmental impact over their entire lifecycle. Hence, ONGC has taken up concept of constructing green building, the essence of which would be to address all these issues in an integrated and scientific manner with due compliance to the guidelines of GRIHA (Green Rating for Integrated Habitat Assessment). As part of its commitment to sustainable development, ONGC has taken up development of Green Buildings at Delhi, Mumbai, Kolkata & Dehradun.

Biodiversity Conservation

Apart from complying with the environmental legal requirements, ONGC, as a responsible corporate citizen has taken many initiatives to conserve nature and minimize impact of their operations. Various initiatives taken by ONGC in operational and outside operational areas are:

Mangrove Plantation:

ONGC has undertaken massive mangrove plantation drive in operational areas. In the Phase 1 of the project, 12 lakh saplings and about 5 lakh seeds and prop gules were planted in the erosion-prone area along the coast of the Dhadar river at Ankleshwar. Following the success of the Phase 1 of 'Mangrove Restoration and Conservation Education Project' at Ankleshwar, ONGC has gone for the continuation of the mangrove plantation at Ankleshwar and Hazira.

Project Eastern Swamp Deer:

ONGC is also working for protection of eco-system of the North-Eastern region of the country, particularly the state of Assam. The region of Kaziranga in upper Assam is home to the famed one horned Rhinoceros and the Eastern Swamp Deer.

ONGC received 'Greenies Eco Award' for green initiatives and practicing best policies for environment protection amongst PSU's, ONGC was conferred with 'Greenies Eco Award'.

3. ICICI Bank Ltd.

ICICI Bank's Green initiatives aimed at customers are driven by the objective of collaborating with each of our customers and making 'Green' a part of all our lives. These initiatives range from Green offerings/ incentives, Green engagement to Green communication to our customers.

Objective

ICICI Bank's Green initiative is to make healthy environment in the organisation i.e.; to create intrapersonal skills amongst the customer and understanding between employees of the organisation.

Green Products & Services

Instabanking: It is the platform that brings together all their alternate channels under one umbrella and gives customers the convenience of banking anytime anywhere through Internet banking, i-Mobile banking, IVR Banking. This reduces the carbon footprint of the customers by ensuring they do not have to resort to physical statements or travel to their branches.

Vehicle Finance: As an initiative towards more environment friendly way of life, Auto loans offers you 50% waiver on processing fee on car models which uses alternate mode of energy. The models identified for the purpose are, Maruti's LPG version of Maruti 800, Omni and Versa, Hyundai's Santro Eco, Civic Hybrid of Honda, Reva electric cars, Tata Indica CNG and Mahindra Logan CNG versions.

Home Finance: ICICI Home Finance offers reduced processing fees to customers who purchase homes in 'Leadership in Energy and Environmental Design' (LEED) certified buildings.

Green Communication: ICICI Bank has extensively capitalized on the existing internal media- statements, inserts, Credit Card Charge slips- to reach out to the customers and seek their collaboration in the 'Go Green' movement. The communication on Online Bill pay, Online Funds Transfer and Subscribing to e-statements are aimed at migrating customers to 'paperless' and 'commute-free' mode of conducting some of their banking transactions.

4. WIPRO

CORE MISSION

"Environment management is a global concern today. It can have far-reaching adverse effects on the environment if not dealt with immediately. It is our responsibility to leave a clean and abundant environment for future generations. Wipro Limited, a leading player in Global IT and R&D services, is committed towards environmental sustainability by

minimizing the usage of hazardous substances and chemicals which have potential impact on the ecology. It has joined hands with WWF India, one of the largest conservation organizations in the country, to directly deal with issues of climate change, water and waste management and biodiversity conservation”.

Wipro develops eco-sustainability

Energy efficiency: 25% improvement in energy efficiency in the last 6 years due to adoption of green building standards based on LEED framework 44% reduction in use of printing paper through effective automated controls and behavioural changes.

Water efficiency: 32% of water requirement is met through water recycling and harvesting.

Waste management: Four biogas plants convert food waste to cooking fuel translating into a net reduction of 100 tons per annum

5. IDEA CELLULAR LTD

Idea Cellular, part of the Aditya Birla Group which is India’s first truly global conglomerate, is one of the oldest players in the Indian telecom industry and has played a key role in the development of mobile telephony, particularly in rural India. As part of a socially responsible corporate group, Idea has and continues to adopt policies, and business strategies to effectively integrate emerging environmental, social and economic considerations.

Whether it’s through conserving energy, recycling, or finding innovative solutions to environmental and social challenges, Idea is committed to being a respectful, responsible and positive influence on the environment and the society in which they operate. Efficient power management, infrastructure sharing, use of eco-friendly renewable energy sources, leveraging the latest in technology to reach out to a large audience in most energy efficient manner such as video and teleconferencing, smart logistics, etc. are some of the best practices in their network infrastructure and day-to-day business operations, to ensure a clean and green environment.

In their effort to give back to the environment and reduce the collective carbon foot print of the telecom sector in India, Idea pioneered the concept of ‘Shared Telecom Infrastructure’ services, along with a few other industry leaders in the wireless space. This initiative is committed towards continuous innovation endeavours; optimization of future tower rollouts; and enhanced operational efficiencies leading to a substantial reduction of carbon foot print. With a subscriber base of nearly 10 crore, they have an opportunity to influence a large mass of people by promoting green initiatives through their various communication programs and customer service initiatives.

It was Idea which germinated the thought of ‘Use Mobile, Save Paper’ in the minds of millions of mobile users in India, with its aggressive yet thought provoking campaign. Idea designed the campaign to highlight numerous ways of saving paper, and thereby saving the

green cover necessary for the health of the planet, by using a range of mobile based value added services in day-to-day activities to replace paper.

6. INDUSIND BANK LTD

IndusInd Bank has a comprehensive plan to reduce its carbon footprint. Some of the initiatives being undertaken under this plan are solar-powered ATMs, thin computing, e-archiving, e-learning, e-waste management, paperless fax, energy conservation, CNG cars and also supporting finance programs with incentives to go green.

Green Initiatives

The goal of the Green Banking Project is to promote sustainable business practices to offset the effects of climate change through energy and resource conservation, while protecting the environment for future generations. As part of the project, the Bank has launched “Hum aur Hariyali” campaign under which a number of green initiatives have been taken:

Introduction of Paperless Fax: A shift has been made to receive faxes as soft copies instead of on paper. This initiative has been introduced in many departments and has reduced usage by 50,000 sheets of paper over a period of 6 months only in the corporate office which has resulted in substantial savings in both paper usage and energy consumption.

Solar ATM: With the commencement of the Green Banking Initiative in the Bank, one of the key deliverables was enabling the ATM and signage’s with Solar energy. The Solar ATM at Opera House uses photovoltaic cells mounted on the roof of the building. These cells convert sunlight into electricity and this clean and renewable form of energy is used to power the ATM.

Other Key Initiatives

- Green data centre at Indiabulls.
- Replacement of CRT monitors with LCD which results in 50% power savings. The target is 500 monitors this year
- Disposal of computer hardware after contents are destroyed (technically called degaussing) to agencies which recycle the plastic recovered from the tapes.
- Commenced the usage of A4 bagasse paper at all their Mumbai branches and Corporate Office. Shortly it will be rolled out to other locations. Advantage economical in terms of costing over normal paper and it is eco-friendly
- Switched over to cleaner fuels like CNG /LPG factory fitted Cars. Over a period of 6 months, most of the new buys are CNG enabled vehicles.

All the premises are now shifted to using CFL bulbs. This way the Bank is making an impact on optimum utilisation of resources relating to energy, paper and travel.

7. Indian Tobacco Company – ITC

Inspired by a vision to serve a larger national purpose and abide with the strong value of Trusteeship, ITC has crafted innovative business models to create larger societal capital while simultaneously delivering long term shareholder value. ITC is an exemplar in Sustainability and is the only company in the world of comparable dimensions to be Carbon, Water and Solid Waste Recycling Positive.

The ITC Sustainability App demonstrates the company's endeavour in Sustainable Business Practices.

Renewable Energy

ITC commitment to the environment is manifest in its constant endeavour to enlarge its positive carbon footprint. This is achieved not only through enhanced energy conservation, but also through use of renewable energy sources and expanding carbon sequestration through its large scale Social and Farm Forestry Programmes. Improved utilisation of carbon neutral fuels such as biofuels in the Paperboards and Specialty Papers Business and the commissioning of 13.8 MW wind power projects in Maharashtra and Tamil Nadu contributed to increased utilisation of renewable energy.

Green Hotels

ITC Hotels pioneered the concept of 'Responsible Luxury' in the hospitality industry, drawing on the strengths of the ITC group's exemplary sustainability practices. Responsible Luxury personifies an ethos that integrates world-class green practices with contemporary design elements to deliver the best of luxury in the greenest possible manner. The Responsible Luxury commitment of ITC Hotels blends elements of nature to deliver a unique value proposition to guests, conscious of their responsibility to be planet positive.

Today, these unique interventions have made ITC Hotels the 'greenest luxury hotel chain in the world' with all its premium luxury hotels LEED (Leadership in Energy and Environmental Design) Platinum certified.

Waste Recycling

ITC has implemented a number of measures in waste management to create a positive environmental footprint as part of its enduring commitment to sustainable natural resource management. All ITC units are mandated to achieve total recycling of waste generated by their operations. All the units have made significant progress in achieving this target, recycling over 99.9% of waste generated by its operations.

In 2007, ITC also initiated a unique project - Wealth Out of Waste (WOW) - a recycling programme to create awareness on the 'Reduce-Reuse-Recycle' approach, and inculcate the habit of source segregation

8. TATA METALIKS LIMITED

Tata Metaliks has given a green slant to all of its business and plant operations in a bid to reduce its carbon footprint and mitigate its environmental impact.

At Tata Metaliks (TML) every day is Environment Day. While most organisations are still formulating their strategy on climate change, the company has already rolled up its sleeves and begun to tackle the issue.

One of these initiatives has to do with increasing the green cover around the plant. The Ministry of Environment and Forests mandates that 33 per cent of the area around a plant should consist of greenery. TML's 197-acre plot has already achieved a green cover of 33.46 per cent. The green cover provides several benefits: the plants absorb carbon dioxide, give out oxygen and also helps suppress noise and reduce dust.

Other initiatives to protect the environment are the replacement of a petrol-operated motorbike used by employees for movement within the plant with an electric two-wheeler, and the use of video conferencing for communication between the company's sites at Kharagpur, Kolkata and Redi. A solar heater has been installed in the canteen to reduce the consumption of fuel. Promoting the use of email, CFL lamps, printing on both sides of the paper, etc are other earth-friendly initiatives introduced by the company.

Using nature

TML has also adopted the use of natural fertiliser made with compost and vermiculture; in this it has taken the help of ladies of a local self-help group.

Furthermore, TML has constructed 16 houses in Kharagpur for its employees that have a unique environment friendly feature — they remain cool in summer and warm in winter. The roof terraces of these buildings are filled with a layer of upturned kulhads (small clay pots), topped with an inch of cement.

Through all these initiatives, TML has clearly expressed its commitment to the planet. The company deserves commendation for pursuing economic development in tandem with environment protection.

9. Tamil Nadu Newsprint & Papers Ltd. – TNPL

Environment Protection and management are integral part of TNPL's activities. TNPL has taken several measures for protecting the environment in line with its commitment for sustainable development. In its choice of raw materials, sources of energy, and production processes, as well as in product development, the objective is to minimize the pollution load on environment. In all its business operations TNPL takes social, economic and ecological considerations seriously.

TNPL is an unfolding saga of commitment to sustainable development. Guided by principles of environmental responsibility, TNPL manufactures and markets paper using materials and processes that help minimize waste, conserve resources and protect Earth's

bio diversity. Its unfailing commitment to clean production techniques with minimum pollution load stand out as a bench mark in the industry.

Harnessing of wind energy, adoption of greener technologies, resource conservation, responsible waste management and minimal pollution loads make TNPL one of the most environmentally compliant mills in the world.

By using bagasse as primary raw material, TNPL preserves over 40000 acres of forest land from depletion every year.

TNPL Effluent Water Lift Irrigation Society (TEWLIS)

Effluent water from the process is treated in a state-of-art effluent treatment system, through an “Activated Sludge Process”. The treated effluent water conforming totally to the Pollution Control Board norms is utilized for irrigating the dry barren lands around the mill.

Wind Farm:

TNPL has affirmed to pursue its commitment to renewable energy. The company set up 15MW Wind farm power project at Devarkulam and Perungudi, which are backward villages of Tirunelveli District in the year 1993-94. The initial installed capacity of 15 MW has been enhanced to 35.5 MW as of March 2007 in 5 phases with an average generation of around 5.5 crores units per annum.

The State government has bestowed the Green Award on September 15 2012 on the Tamil Nadu Newsprint and Papers Limited (TNPL). This award has been given to the TNPL in recognition of its initiatives taken to protect environment adopting environment friendly technologies in the process. It also recognises the TNPL’s proactive role in reducing the use of fossil fuels, increasing the green cover, encouraging non-conventional and energy efficient systems as well as recycling and reuse of solid and liquid wastes.

10. SUZLON LTD (5th Largest wind turbine maker)

Green Objective

“At Suzlon, we want to go beyond our corporate duties and dispel apathy to create social consciousness on environmental change. Working towards this, we initiated P.A.L.S, (Pure Air Lovers Society) a group of environmentally responsible individuals who encourage sustainable development so our existence doesn’t affect the planet in a negative manner”.

The global headquarter of wind turbine maker Suzlon Energy Limited in Pune was certified as an eco-friendly building by the US Green Building Council.

The headquarter named One Earth received the Platinum certification of Leadership in Energy and Environment Design (LEED), a green environment rating system that complies with the standards of the US Green Building Council.

All large corporations have an impact on its surroundings; its people, cultures, ecology, economy and infrastructure. At Suzlon they have designed Corporate Social Responsibility Programs that address these impacts. Suzlon’s Corporate Social Responsibility efforts are

directed towards minimizing negative impacts and optimizing positive impacts of their business on the external environment.

1.5 RECOMMENDATIONS AND CONCLUSION:

A Green Business Starts With Small Steps

Environmentally friendly actions don't have to be large to have an impact. Consistently reducing the amount of energy, water, and paper our businesses use can make a huge difference, both to the environment and to our pocketbooks. How much paper would you save over the course of a year, for instance, if you always ran double-sided copies? A small easy way to go green - but a big result!

Go green by:

1. Turning off equipment when it's not being used.
2. Encouraging communications by email, and reading email messages onscreen.
3. Reducing fax-related paper waste by using a fax-modem and by using a fax cover sheet only when necessary.
4. Producing double-sided documents whenever possible.
5. Not leaving taps dripping.
6. Installing displacement toilet dams in toilet reservoirs. Placing one or two plastic containers filled with stones (not bricks) in the toilet's reservoir will displace about 4 litres of water per flush - a huge reduction of water use over the course of a year.
7. Finding a supply of paper with maximum available recycled content.
8. Choosing suppliers who take back packaging for reuse.
9. Instigating an ongoing search for "greener" products and services in the local community. The further your supplies or service providers have to travel, the more energy will be used to get them to you.
10. Before deciding whether you need to purchase new office furniture, see if your existing office furniture can be refurbished. It's less expensive than buying new and better for the environment.

Although it may seem like recycling is a sustainable waste management program, it can be costly. Source reduction, reuse, and more efficient use of everyday office staples like water bottles and paper can have a greater impact on the environment without driving up operating costs.

Within your company, you may want to look into setting up a Waste Management Team that will focus on one area of the sustainable waste management program at a time. This could be setting different goals to hit every week/month/year to help reduce the carbon footprint of the company.

A few easy ways to start include the following:

Invest in a water cooler and encourage the use of reusable water bottles by employees.

Use electronic files whenever possible, print double-sided copies, and communicate via email rather than printed memos.

Set up a three-stream waste system that sorts waste into recycling, compost (i.e., food), and trash.

Attracting New Customers

One thing now that potential new customers are looking at more and more is how a business takes responsibility for its impact on the environment. Enhancing the corporate responsibility of your business is one of the best ways to grow it, and establishing and maintaining a reputation as a business with environmentally friendly practices and a commitment to environmental sustainability is a proven way to elevate your profile.

Thousands of businesses round the world that are finding if they implement environmental practices they get more new customers, which naturally will increase the worth and profit of the business.

A Healthier Working Environment

A healthier and greener working environment can help to improve your company output and the morale of your workforce. Here's a short list of things you can do to get started:

Experiment with this, but try using your air conditioning sparingly. Remember your employees need to be comfortable in their jobs.

Keep the use of lights in the office to a minimum. Ensure they're turned off every night and over the weekend.

Buy energy-saving light bulbs. If you can't avoid having the lights on in the office, you may as well save what you can while using them.

Buy energy-efficient appliances. It may seem obvious, and it may mean spending a little more on certain items, but in the long run it will reduce your outgoing expenses.

Encourage employees to car share or to bike to work. The more people you have sharing cars, the more money they'll save while also doing their bit for the environment.

Sustainability

One of the greater values of a company's going green is the benefit to the environment. Making the most of sustainable methods can help to prevent the waste of natural resources within the business. This will only reduce the risk of depletion of these resources in the long term.

Going green at work can be as easy as making sure lights are turned off when not in use or as involved as installing alternative energy sources, like solar panels or wind turbines.

Whatever it is that your business decides to do to become sustainable, remember that source reduction and efficiency will not only help to save the environment but can also benefit your workforce, reduce your operating costs, and elevate your brand value.

“As more and more people understand what’s at stake, they become a part of the solution and share both in challenges and opportunities presented by the climate crisis.”-
Al Gore, former US *Vice President*.

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Capital Structure : A Comparative Study

By Anish Kataria

By Dr. R.K Katewa

Abstract

The capital structure of a business concern is very important especially for its equity shareholders and creditors. A sound capital structure gives reliance on the company to both. In this paper, a comparative ratio analysis has been carried out of leading public and private sector companies of India. For this, debt equity ratio and total assets to total liabilities ratio have been calculated and interpreted.

Introduction

Capital structure of a company means its long-term financial strength. It depends upon a number of factors like its net worth, production capacity, sales, management performance, goodwill, debts, assets, liabilities etc. A sound capital structure is an indication of good business performance of the company and it will give reliability to its shareholders and creditors. To know about the capital structure of a company, the ratio analysis of its financial statements' various items is used. Ratio is the process of maintaining significant relationship between the items of financial statements in order to analyze the performance and financial position of firm. In this paper, four leading companies of India namely, Oil and Natural Gas Corporation (ONGC), Oil India Limited (OIL), Tata Steel and Steel Authority of India Limited (SAIL) are under study and ratio analysis has been made for ten years from 2002-03 to 2011-12.

Debt Equity Ratio

The debt equity ratio is worked out to ascertain the relative proportion of debt and equity in financing the assets of the firm. This ratio is sufficient to assess the soundness of long-term financial position i.e. capital structure. It portrays the proportion of total funds acquired by a concern by way of loans. As observed by Bierman and Derbin, "The ratio gives a measure of the proportion of the long-term capital that has been supplied in the form of debt." It is calculated by applying this formula:

$$\text{Debt Equity Ratio} = \text{Debt} / \text{Equity}$$

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The term 'debt' includes the total indebtedness of the company as shown by its long-term and short-term obligations. The term 'equity' refers to net worth of a firm. Net worth comprises the total of share capital (both preference and equity) and reserves and surplus minus miscellaneous expenses, if any. A large debt equity ratio indicates the unsatisfactory long-term financial position of the enterprise since the debt would be more than equity. Higher ratio would indicate a lesser safety margin for creditors and other external lenders and would pose danger signal for the enterprise.

The debt equity ratio of the companies under study has been calculated and presented in Table 1

Table 1
Debt Equity Ratio of the Companies under Study
(2002-03 to 2011-12)

(in Times)

Year	ONGC	OIL	Tata Steel	SAIL
2002-03	0.46	0.28	2.06	1.28
2003-04	0.33	0.24	2.24	1.31
2004-05	0.52	0.24	2.54	1.55
2005-06	0.41	0.48	1.96	1.60
2006-07	0.58	0.39	1.54	1.78
2007-08	0.53	0.41	1.68	1.25
2008-09	0.55	0.38	1.93	1.83
2009-10	0.58	0.39	1.79	2.30
2010-11	0.54	0.35	1.84	2.92
2011-12	0.58	0.43	1.95	3.37
Average	0.508	0.359	1.953	1.919
S.D.	0.083	0.081	0.283	0.726
C.V. (%)	16.41	22.61	14.52	37.84

Source : Annual reports and accounts of the companies under study from 2002-03 to 2011-12.

Table 1 shows that the debt equity ratio was fluctuated throughout the period under study for ONGC, OIL and Tata Steel while for SAIL, this ratio shows increasing trend except in the year 2007-08.

Table 1 shows the equity of ONGC was less than the debts in all years under the study. The ratio was fluctuated throughout the study. It was increased in one year and then decreased

in the next year respectively. It was 0.46 times in 2002-03 and decreased to 0.33 times in 2003-04. Again, it increased to 0.52 times in 2004-05 and finally reached to 0.58 times in 2011-12. Declining trend in the debt equity ratio in alternate years is an indicator of reducing long-term debt of the company. The average for the period under study was 0.508 times, standard deviation and coefficient of variation both were suggesting low ratio and low fluctuations indicating a favorable position and a satisfactory atmosphere for long term lenders.

The debt equity ratio shows a fluctuating trend in OIL during the period of study. It varied from 0.24 times (lowest) in 2003-04 and 2004-05 to 0.48 times (highest) in 2005-06. The average ratio was lowest at 0.359 times among selected companies. So, the financial conditions of OIL was satisfactory. This shows that the company generate its own resources through equity share capital and retained earnings. Coefficient of variation was a bit higher which should be kept in control.

This ratio shows fluctuating trend in Tata Steel throughout the period of the study. This ratio was 2.06 times in 2002-03 and followed by 2.24 times and 2.54 times in 2003-04 and 2004-05 respectively. Then, it was decreased to 1.96 times in 2005-06 and further by 1.54 times in 2006-07. It was 1.68 times in 2007-08 and rose up to 1.93 times in 2008-09 but it decline to 1.79 times in 2009-10 and again increased to 1.84 times and 1.95 times in 2010-11 and 2011-12 respectively. The average ratio was 1.953 times, highest in selected companies. This shows that the financial condition of the company was not satisfactory and it is not the good indicator for long term lenders. This ratio shows increasing trend in SAIL throughout the period of study except in the year 2007-08. This ratio was 1.26 times in 2002-03 and followed by 1.31 times in 2003-04, 1.55 times in 2004-05, 1.60 times in 2005-06 and 1.78 times in 2006-07. In the year 2007-08, it declined to the lowest i.e., 1.25 times during the period of study. While it again followed the increasing trend in rest of the years and reached to 3.37 times in 2011-12 highest in all the four companies under study. A very high ratio with highest fluctuations as its coefficient of variation was highest, is unfavorable from the owner's point of view. This causes hindrance in the firm's operations due to the increasing pressure and interference of creditors in management.

Total Assets to Total Liabilities Ratio

This ratio refers to the relationship between total assets and total liabilities. This is an important ratio for finding out the long-term financial strength i.e. capital structure of an enterprise. It is also known as 'debt to total capital ratio'. The debt of firm includes long-term borrowings plus current liabilities and total assets consist of fixed assets plus current assets. The higher the ratio, the higher is the degree of the stability of the capital structure and lesser will be the indebtedness of the concern. This ratio can be expressed as:

Total Assets to Total Liabilities Ratio = Total Assets / Total Liabilities

The following Table 2 shows the ratio of total assets to total liabilities of ONGC, OIL, Tata Steel and SAIL in a comparative manner.

Table 2
Total Assets to Total Liabilities Ratio of Companies under Study
(2002-03 to 2011-12)

(in Times)

Year	ONGC	OIL	Tata Steel	SAIL
2002-03	3.17	4.55	1.49	1.78
2003-04	4.01	5.13	1.45	1.76
2004-05	2.91	5.17	1.40	1.65
2005-06	3.42	3.09	1.51	1.63
2006-07	2.71	3.59	1.65	1.72
2007-08	2.89	3.47	1.59	1.80
2008-09	2.81	3.65	1.52	1.55
2009-10	2.74	3.58	1.56	1.44
2010-11	2.89	3.84	1.54	1.34
2011-12	2.74	3.30	1.51	1.30
Average	3.029	3.937	1.522	1.597
S.D.	0.409	0.745	0.070	0.183
C.V. (%)	13.50	18.93	4.60	11.46

Source : Annual reports and accounts of the companies under study from 2002-03 to 2011-12.

It can be seen from Table 2 that the total assets to total liabilities ratio in ONGC had a fluctuating trend from 2002-03 to 2011-12. It was 3.17 times in 2002-03 which was improved to 4.01 times in 2003-04. Then, it was decreased to 2.91 times in the year 2004-05 and further rose up to 3.42 times in 2005-06. It again decreased in 2006-07 up to 2.71 times while came up to 2.89 times in 2007-08. This ratio was again fell down to 2.81 times in 2008-09 followed by 2.74 times in 2009-10 while it again increased to 2.89 in 2010-11 and came down to 2.74 times in 2011-12. The ratio was higher than the standard norm 2:1 each time and average ratio was 3.029 times. This shows that the company has sound financial position. Standard deviation and coefficient of variation were also satisfactory.

It is apparent from the Table 2 that OIL recorded a fluctuating trend in total assets to total liabilities ratio, as its coefficient of variation was highest among selected companies. It ranged between 5.17 times (maximum) in 2004-05 to 3.30 times (minimum) in 2011-12. It can be concluded that solvency position of the company was not good but throughout the period of study the ratio was high than the standard norm 2:1, this shows that the company had improved its financial position and it is a good sign from investor's point of view.

In Tata Steel, total assets to total liabilities ratio marked a fluctuating trend during the period of study. It was 1.49 times in 2002-03 which was decreased to 1.45 times in 2003-04 and 1.40 times in 2004-05, but it came up to 1.51 times in 2005-06 followed by 1.65 times in 2006-07. It again decreased to 1.59 times in 2007-08 followed by 1.52 times in 2008-09. In the year 2009-10, the ratio was slightly increased to 1.56 times while fell down to 1.54 times and 1.51 times in the year 2010-11 and 2011-12 respectively. The ratio was less than 2:1 norm during the study period. It is suggested that the company should try to improve it earlier.

It is evident from Table 2 that the total assets to total liabilities ratio in SAIL registered a fluctuating trend throughout the period of study. It was ranged between 1.80 times in 2007-08 to 1.30 times in 2011-12. The ratio was 1.78 times in 2002-03 which was decreased to 1.76 times in 2003-04 followed by 1.65 times in 2004-05 and 1.63 times in 2005-06 while the ratio was increased to 1.72 times in 2006-07 followed by 1.80 times in 2007-08. Thus, it can be said that the financial position of the company was cannot be called satisfactory in these two years. But after wards, the ratio was fell down in rest of the years, i.e. 1.55 times in 2008-09, 1.44 times in 2009-10, 1.34 times in 2010-11 and finally reached up to 1.30 times in 2011-12, which was the lowest ratio throughout the comparative study of all the four companies under study. The ratio was lower than the standard norm 2:1 throughout the period of study, so it is suggested that the company should improved its financial position.

So finally it is revealed that the ratio was highest in OIL followed by ONGC, SAIL and Tata Steel.

Conclusion

According to above analysis of debt equity ratio and total assets to total liabilities ratio of the companies under study, it was concluded that OIL and ONGC had sound capital structure and their long term financial strength was satisfactory for the period from 2002-03 to 2011-12 whereas Tata Steel and SAIL need improvement.

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A Study to Assess the Knowledge of Diabetic Patients towards Self Care Activities for Longevity of Life.

By Viji P.T

By Mahipal Singh

Introduction

Diabetes has a deleterious effect on quality of life and the health promoting behaviors of an individual. The past 25 years have seen many developments in diabetes that have changed the concept and management of diabetes. It would be interesting to know what changes have profoundly altered the management of diabetes. In recent years attempts have been made to prevent complications due to diabetes through reduction of risk factors, changes in lifestyle behaviors, control of diabetes status and an overall improvement in quality of life by complying with their mandatory treatment regimen.

Diabetes mellitus is a chronic illness, which cannot be cured, but can be controlled with regular exercise, diet and drug and proper knowledge of diabetes. Regular and proper administration of drug can provide desired outcome, control diabetes and prevent complications. Undiagnosed or inadequately treated diabetes mellitus develop multiple complications leading hospital admission due to diabetes.

Need for the study

Diabetes may lead to severe complication including heart disease, kidney disease and blindness. Early diagnosis, prompt, effective treatment and education of diabetes in the management of their condition can lead to substantial reduction in these complications, with consequent improvement in quality of life as well as reduced healthcare cost. As a major epidemic of the 21st century, diabetes poses a threat to public health and is associated with increased physical, psychological and social morbidity and mortality if left untreated. In order to combat the above mentioned ill effect of diabetes, these patients need to obtain adequate knowledge and favorable attitude towards management of the condition.

Self care activity is just as important as diet, drug and exercises for diabetic patients. Since treatment cannot be effective unless the patient understands the disease and takes positive steps to combat it. Diet, physical exercise and drugs are the three cornerstones of diabetes treatment, the fourth is self care activity. The nurses play an important role in assessing the level of knowledge and teaching the patients with diabetes mellitus towards the self care activities.

Statement of the Problem

A study to assess the knowledge of diabetic patient towards self care activities for longevity of life in selected hospital at M.L.B. Medical College, Jhansi.

Objectives of the study

1. To assess the knowledge of Diabetic patient related to self care activities.
2. To associate the level of knowledge with their selected demographic variables among patients with diabetes mellitus.

Assumptions

The study assumes that,

1. The patient may have some knowledge about the diabetic self care activities.
2. The knowledge improves the practice of diabetic self care activities.

Research Methodology**Research Approach and Research Design**

The research design adopted for the study is non experimental descriptive research design. In this study the knowledge and practice of diabetic patients was assessed regarding the disease condition and self care activities of diabetes mellitus.

Research Setting

The study was conducted in M.L.B Medical college of Jhansi, U.P state. The criterion for selecting this setting because the hospital has a total bed strength of 700 beds and about 1300-1500 cases of diabetic patients attending the outpatient department per month and nearly 400-500 patients are admitted per month.

Population

The population of the present study included all diabetic patients both male and female between the age group of 40- above 70 years who attended diabetic OPD and ward of MLB Medical College, Jhansi during the period of data collection.

Sample

In the study, sample were diabetic patients both male and female between the age group of 40- above 70 years admitted in MLB Medical College, Jhansi during the period of data collection and who fulfilled the inclusive criteria.

Sample Size & Sampling Technique

The total sample size was 500 diabetic patients. The technique that was adopted for this study was simple random technique.

Data Collection Tool

The researcher prepared tool with the help of Literature review and by expert's suggestion and send for content validation. The tool consisted of two parts. Part I consist of

demographic variables, Part II consists of structured questionnaire to assess the level of knowledge of diabetic patients regarding self care activities.

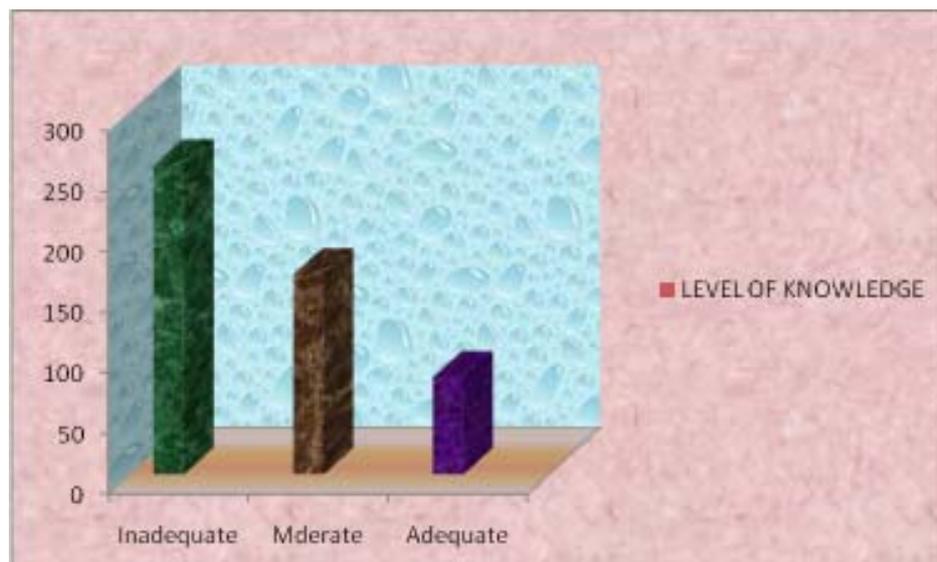
The purpose of the study was explained to the samples and obtained formal permission from each participant. Proper guidance and adequate explanation given to the participant on the data collection tool. The data collection tool was given to the sample and advised to choose the appropriate the option in the demographic variables and choose the correct answer in the knowledge questionnaire

Data Analysis

The data collected were analyzed in terms of objectives by using descriptive and inferential statistics.

Study Results

The percentage distribution of samples based on the level of knowledge about the diabetic patients related to self care activities



Shown that out of 500 samples majority 51% had inadequate knowledge, 33% had moderate knowledge while only 16% have adequate knowledge.

The results clearly indicate that there is lack of knowledge and information regarding self care activities in diabetic patients. There was a significant association between knowledge towards self care activities in diabetic patients with socio demographic variables such as gender, age, marital status, type of the family, educational status, dietary habits and

duration of diabetes and There was a no significant association between knowledge towards self care activities in diabetic patients with socio demographic variables such as religion, information about diabetes and occupational status.

Conclusion

Several implications can be drawn from the present study for nursing practice. As diabetes mellitus places the patients in several restrictions and life style changes, the educational material prepared by nursing personnel both in the hospital and community can be helpful in prevention and management of complications of diabetes mellitus, reducing mortality and morbidity and also can help the diabetic patients to be self responsible for their own care through expert nursing practice and teaching. Thus it improves the quality of life for the individual diabetic patients, but also for the family and the community. The nurse plays an important role in the prevention of complications, as well as promotion of health. Education programmes with effective teaching strategies make it easy for people to understand the concepts of providing quality care in a better way. Having knowledge about the complications motivates people to follow healthy practices in their daily life.

Recommendations

- A similar study can be undertaken with a large sample to generalize the findings.
- A similar study may be replicated with an experimental design with different setting like- community setting,
- A comparative study can be undertaken to assess the knowledge & practice of diabetic patients after using other teaching strategies i.e. booklet, SIM and planned teaching programme.
- A comparative study can be carried out on nursing personnel working in private & government hospital.
- An extensive teaching strategy protocol can be developed in all aspects separately. Example, Diabetic foot care, prevention of diabetic neuropathy.

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A Study to Assess The Life Satisfaction Level Among Elderly Living in Selected Oldage Homes of Indore City (M.P.)

By Mrs M.S. Vinsi

BACKGROUND

The concept of “old” has changed drastically over the years. Our prehistoric ancestors probably had a life span of 40 years, with the average individual living around 18 years. As civilization developed, mortality rates remained high as a result of periodic famine and frequent malnutrition. An improvement in the standard of living was not truly evident until about the middle of the 17th century. Since that time, assured food supply, changes in food production, better housing condition, and more progressive medical and sanitation facilities have contributed to population growth, declining mortality rates, and substantial increase in longevity. In 1990, average life expectancy in the United States was 47 years, only 4 percent of the population was age 65 or over.

Less than 5% of the population aged 65 and older live in nursing homes. A profile of the typical elderly nursing home resident is a white woman about 78 years old, widowed, with multiple chronic conditions. Much stigma is attached to what some still call “rest homes” or “old age homes”, and many elderly people still equate them with a place “to go to die”.

OBJECTIVES

1. To assess the life satisfaction level among elderly living in a old age homes.
2. To find out the association between life satisfaction of elderly with their sociodemographic variables

REVIEW OF LITERATURE

Tiwari S.C et al (2012) conducted an exploratory study on mental health problems among inhabitants of old age homes in Lucknow. The old age homes were selected randomly and the results shown that 45 elderly inhabitants who underwent the study, 37.7% were found depressive and 13.3% with anxiety disorder and 11.1% dementia

Zeinab A (2012) conducted a study on The Effect of Reminiscence on Self-Esteem, and Depression among 30 Elderly People from el Hana geriatric home. A pre-post quasi-experimental design was used. Socio demographic data sheet, mini mental state exam (MMSE) and geriatric depression scale were used. Findings indicated that reminiscence intervention significantly raised self-esteem, and was an effective intervention to help living-alone elderly adapt to the ageing process.

Buchalter J. K (2009) conducted a study on Life satisfaction of 51 older adults in nursing homes utilizing a convenience sample. The findings of this study indicated that the life satisfaction of older adults in nursing homes might have a predictable set point. If life satisfaction can then possibly be predetermined, future life arrangements by administrators and staff of nursing homes along with the families may view future life arrangements of older adults differently.

Okamoto H (2008) conducted study on effects of social activities on life satisfaction among the elderly: four aspects in men and women. data from 612 older adults aged 65 to 84 years sample were obtained and the result was social activity, socio demographic factors were controlled, older women with higher levels of engagement in personal activities had greater life satisfaction, whereas among men, none of the aspects of social activity was significantly related to life satisfaction.

RESEARCH METHODOLOGY

A descriptive study design was used in this study. The study was conducted in Aastha Vridha Seva Ashram, old age home of Indore city. The samples were the old age population between the ages of 60 – 80 years. The sample size was 100. Convenient sampling was used as the sampling technique. The target population for this study was the old age populations living in Aastha Vridha Seva Ashram, old age home of Indore city. Old age people were independent variable in this study and life satisfaction is the dependent variable in this study.

The method of data collection was by structured interview method. The investigator used a standardized tool of life satisfaction scale to assess the life satisfaction of old ages.

The structured interview schedule deals with the demographic variables of the samples includes Gender, Age in years, Religion, Occupation, Family support, Extend of mobility, Utilization of leisure time, Participation in social activity. The standard tool of life satisfaction scale had 54 points and includes 5 components: Mental, job, social, marital & family.

DATA ANALYSIS

Distribution of elderly with regards to their demographic variables.

Gender: 64% majority of sample were females and 36% were males.

Age: 44% majority of geriatrics were from age group of 60-65 years, 31% were in the age group of 65-70 years, 20 % were in the age group of 70-75 years and remaining 5% were in age group of above 80 years.

Religion: Majority (93%) of the subjects were Hindus and remaining 7% were Muslims.

Mobility: Majority (60%) was moving independently, 21% geriatrics were in room movements, 15% geriatrics were in house movements, and 4% were bed ridden geriatrics.

Leisure activity: Majority (37%) were enjoys leisure activity with their friends, 24% were engaged with their own activities, 25% were not has leisure activity and 14% has other activities.

Social activity: Majority 73% were not interested and 27% was engaged in social activities.

Assess the life satisfaction level among elderly living in a old age homes

Mean value and median value of life satisfaction towards life among elderly population in old age homes was 38.9 and 37.5 respectively and this value indicates that elderly populations were not satisfied on the level of life satisfaction.

The standard deviation 13.62 shows a moderately satisfactory rate.

n=100

Sample	Mean	Median	Standard Deviation
Elderly population living in old age home	38.9	37.5	13.62

Associate the life satisfaction of elderly their selected socio demographic variables.

There is significant association between level of life satisfaction towards mobility and family support. The rest of the variables such as age, sex, religion, occupation, leisure time & social activity were not having significant association with level of life satisfaction of elderly with their socio demographic variables.

NURSING IMPLICATIONS OF THE STUDY

Nursing Administration: Findings of the study can be used by the Nursing Administrator in creating policies and plans for providing education to the geriatric population in hospitals. **Nursing Education:** The nursing students develop an insight about care of geriatrics and implement the knowledge of the same while dealing with elderly clients. Educators will help students, colleagues and junior staff to be trained in using this knowledge. **Nursing Practice:** Contents of life satisfaction scale will help nursing professional working in hospital for providing quality care for the elderly people who are admitting in hospitals.

RECOMMENDATIONS: A similar study on a large scale across the whole district can be carried out in order to estimate the level of life satisfaction of elderly population for generalization of findings.

CONCLUSION

Increasingly, geriatric persons are using their newly found autonomy from work and nurturing roles to follow their improving interests and goals. A positive discernment of their life experience leads to life satisfaction while a negative self-evaluation results in despair and dissatisfaction. The study findings concluded that old age populations were not satisfied with their life satisfaction.

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Prison administration in India

By Prof. Dr. Smita Karve,

By Syed Ejaz Abbas'Naqvi', LL.M.

The Prison system was old punitive and deterrent penal system used by the Indian administrators i.e. kings in the ancient days and the medieval days. In the ancient age, the religious books i.e. Mahabharata, there are stories about how the parents of the Hindu Iconic God Krishna were arbitrarily imprisoned by King Kansa. In medieval Indian History the imprisonments of the various Sikh Gurus and Chatrapati Shivaji was example of imprisonment by the Regimes. The kings were using their power so arbitrarily that they often arrest and imprison their own kith and kins in their personal whims. The arrest of the Emperor Shahjahan by his own son Aurangzeb was a fine example of imprisonment without law. Afterword in the 19th and 20th Century certain degree of transparency has been formulated regarding the imprisonments of people. The Rulers, Nawabs, Zamindar and Kings were using anarchist approach regarding the imprisonment of the people under shadow of their personal whims, their religious approaches, Hindu Practicing Laws, Sharia law or the local Panchayati values or local native practicing laws. Later in 18th and 19th the Century the western Common laws were introduced by the Colonial Administration. The Governor General Lord Macaulay was into more and more codification of the provisions and proceedings governing prisoners. The British Government has set various principles about administration and management of Prisons on the line of western rules. That is the reason in indian continent the slogans of '*kala paani*' and '*ham angrezo ke zamanae ke jailor hain*' are quite popular in present day popular culture, which symbolizes extreme strictness etc. After the freedom, prison administration in the country has been a matter of intense debate and criticism at various public forums. The constitution has mandated that the State could only put any person into jail after following the legal procedures. The Constitution of India has also provided that after arrest of any person, the arresting authority is bound to physically present the detenu before the Judicial Magistrate. "Crime is the outcome of a diseased mind and jail must have an environment of hospital for treatment and care". - - Mahatma Gandhi.

'Prison' is a State subject under List-II of the Seventh Schedule to the Constitution of India. The management and administration of Prisons falls exclusively in the domain of the State Governments, and is governed by the Prisons Act, 1894 and the Prison Manuals of the respective State Governments. Thus, States have the primary role, responsibility and authority to change the current prison laws, rules and regulations. But the ultimate mandate is to reform the Prisoner instead of being deterrent.

But in the recent years, the Supreme Court of India has come down heavily on the sub-human conditions obtaining in prisons. In many States, the problems of dilapidated prison structure, overcrowding and congestion, increasing proportion of under trial prisoners, inadequacy of prison staff, lack of proper care and treatment of prisoners, etc., have been engaging the attention of the press and social activists. With a growing advocacy for the protection of human rights in the various walks of lives, the plight of prisoners has emerged as a critical issue of public policy. Adolescent Prisoner, Any person as who have been convicted of any offence punishable with imprisonment, or who having been ordered to give security under section 117, Cr.P.C., 1973. The Prisoners could be classified into Adult Prisoner , Casual Prisoner, Civil Prisoner, temporary detenues.

The existing statutes which have a bearing on regulation and management of prisons in the country are:

(i) The Indian Penal Code, 1860. (ii) The Prisons Act, 1894. (iii) The Prisoners Act, 1900. (iv) The Identification of Prisoners Act, 1920. (v) Constitution of India, 1950 (vi) The Transfer of Prisoners Act, 1950. (vii) The Representation of People's Act, 1951. (viii) The Prisoners (Attendance in Courts) Act, 1955. (ix) The Probation of Offenders Act, 1958. (x) The Code of Criminal Procedure, 1973. (xi) The Mental Health Act, 1987. (xii) The Juvenile Justice (Care & Protection) Act, 2000. (xiii) The Repatriation of Prisoners Act, 2003. (xiv) Model Prison Manual (2003).

The following criteria must be adopted for the establishment of prisons:

1. The State Government or the Union Territory Administration will establish sufficient numbers of prisons, as far as possible, and provide minimum needs essential to maintain standards of living in consonance with human dignity.
2. Prisons will ensure that prisoners retain all their rights as human beings within the limitations of imprisonment.
3. The Prisons shall ensure the following categories of the prisoners of the Prisons, a) woman, b) young offenders, c) under trials, d) convicts, e) civil prisoners, f) detenues and g) high security Prisoners.
4. The prisoners regime will prepare will prepare the prisoners a law abiding citizen, self supporting, reformed and socially rehabilitated life.
5. Diversified institutions shall be set up by the respective Government of the U.T. , State or of Central.
6. In order to manage the prisons as a unit , the Government shall laid down norms to govern them.

In last 3 decades many Commissions, Committees, and Groups have been constituted by the State Governments as well as the Government of India, from time to time, such as the All India Prison Reforms Committee (1980) under the Chairmanship of Justice A.N. Mulla

(Retd.), R.K. Kapoor Committee (1986) and Justice Krishna Iyer Committee (1987) to study and make suggestions for improving the prison conditions and administration, inter alia, with a view to making them more conducive to the reformation and rehabilitation of prisoners. These committees made a number of recommendations to improve the conditions of prisons, prisoners and prison personnel all over the country. In its judgments on various aspects of prison administration, the Supreme Court of India has laid down three broad principles regarding imprisonment and custody. Firstly, a person in prison does not become a non-person; secondly, a person in prison is entitled to all human rights within the limitations of imprisonment; and, lastly there is no justification for aggravating the suffering already inherent in the process of incarceration. The imprisoned person is entitled to all the political and social rights. However, Now the Supreme Court had been hard on the Political Criminals and hence it has observed that the imprisoned citizen can't be a candidate in the elections.

Probation, aftercare, rehabilitation and follow-up of offenders shall form an integral part of the functions of the Department of Prisons and Correctional Services. The development of prisons shall be planned in a systematic manner keeping in view the objectives and goals to be achieved. The progress of the implementation of such plans shall be continuously monitored and periodically evaluated.

Period spent outside the prison, such as release on leave/parole which are included as part of a sentence, should not be treated as broken periods. During such periods the prisoner shall be eligible for earning ordinary remission. For periods spent outside the prison which are not included as parts of a sentence (such as, bail, emergency release, escape and extradition) prisoners shall not be eligible for earning remission. In such cases, the prisoners should be considered as eligible to earn remission from the first day of the calendar month following the date of their re-admission.

Leave and special leave to inmates are progressive measures of correctional services. The release of a prisoner on leave not only saves him from the evils of incarceration but also enables him to maintain social relations with his family and the community. It also helps him maintain and develop a sense of self-confidence. Continued contacts with family and the community sustain in him a hope for life. The provisions for grant of leave should be liberalised to help a prisoner maintain a harmonious relationship with his family. The privilege of leave should, of course, be allowed to selective prisoners on the basis of well-defined norms of eligibility and propriety.

The objectives of releasing a prisoner on leave are:

- i) To enable the inmate to maintain continuity with his family life and deal with family matters,
- ii) To save him from the evil effects of continuous prison life.
- iii) To save him from the evil effects of continuous prison life,
- iv) To enable him to develop constructive hope and active interest in life.

Admittedly after conviction if leave is allowed to a prisoner, then such Leave is not a right but a concession which may be granted to convicts. This concession is subject to cancellation. The State Government/Inspector General reserves the right to debar/withdraw any prisoner, or category of prisoners, from the concession of leave.

Leave is not granted to the convicts of offences, those presence is considered dangerous or otherwise prejudicial to public peace, those who are Prisoners who are considered dangerous, those who are Prisoners convicted for offences such as dacoity, terrorist crimes, kidnapping, smuggling including those convicted under NDPS Act, those who are Prisoners committed for failure to give security, those who are Prisoners suffering from mental illness, And those who are Prisoners whose work and conduct have not been good during the preceding 12 months.

Like Parole , facility to Prisoner under term furlough could be availed to a prisoner who is sentenced to 5 years or more or rigorous imprisonment but has undergone 3 years of imprisonment excluding remission can be released on furlough. A prisoner, as described above, would beo entitled to 7 weeks of furlough in a year. The first spell could consist of 3 weeks, while the subsequent spells would consist of 2 weeks each. In order to be eligible to obtain furlough, the prisoner must

fulfil the following criteria:-

- a) Good conduct in the prison and should have earned three Annual Good Conduct Remissions' and continues to maintain good conduct;
- b) The prisoner should not be a habitual offender;
- c) The prisoner should be a citizen of India.
- d) The prisoner should not have been convicted of robbery, dacoity, arson, kidnapping, abduction, rape and extortion;
- e) The prisoner should not have been convicted of any offence relating to any offence against the State such as sedition;
- f) The release of the prisoner should not be considered dangerous or deleterious to the interest of national security or there exists reasonable ground to believe that the convict is involved in a pending investigation in a case involving serious crime;
- g) The convict is not such a person whose presence is considered highly dangerous or prejudicial to the public peace and tranquillity by the District Magistrate by his home district.

The Prisoners can be pardoned off, remitted, suspended, commute sentences from the Punishment of their conviction tenure by the Constitution Authorities i.e. President and the Governor. The Prisoners period of the Punishment may be commuted to lesser time Period by the President or the Governor of the respective State by Using Article 72 & 161 of the Constitution of India. The Leave, Parole, Probation and Furloughs are administrative matters

of the Jail Authorities in respect of the Prisoners. The Jail Officials are enjoying discretionary powers to grant the facilities to the jail inmates i.e. Prisoners. In Many a cases we found that Prison Offcals had acted arbitrary in granting pardon , furlough and parole. Recently in one such case where the prisoner Zaibunissa Kazi, a convict in Bombay Blast Case 1993, has been denied furlough. She has been asking that her age is 72 year and her bed ridden mother age is 93 years. She has been convicted for 6 years and already she has suffered 3.5 years of her punishment tenure. But her Parole Application also had been denied by the Jail Authorities, whereas the another convict in the same blast case, named Sanjay Sunil Dutt has been granted parole and furlough back to back by the same Jail Authorities. After large scale media debate and criticism, the Home Minister of Maharashtra has ordered using his discretion to allow Zaibunissa Kazi to be released on parole. As per Bombay High Court records monthly about one thousands of Application are being send to its Court for the same relives, after theirs Application are being rejected by the Prison Authorities on various grounds. Hence we can say that all are not so lucky convict like Sanjay Sunil Dutt in the eyes of the present Prison Rules.

* * *

Crime Against Women in India

By Adv. Mohan Sopan Gawai

Women's are half of the part of women species. They work hard for their families. They give love & affection to their children and family members. They do domestic work, political leaders and writer's give honor's by saying "women's are half in the sky" "where a woman weeps there will be no peace, there is no peace money" etc. however practically, women are neglected in every sect, tribe, religion, country. They are treated as servant in women treatment toward women's start from the family. It has crept to the society. Every society in the world is male dominated. Every walk of women life is filled with majority of men. In a parliament also, female M.p.s can be calculate in figures harassment humiliation, torture etc are done on women and crime against women are many types innumerable some of them are specially in India, China, etc. the parent want to have son. Hindu religion prescribed certain, 'karmas' for every hindu which can be completed only through procreating a son, or adopting a son. A hindu goes to hell if he does not have a son. To have a son only, the wife and husband get test a test at a time of pregnancy if the tests reveal that, the child in foetus in female, they won't hesitate to remove the female child in foetus by abortion. The parliament bans the said test and abortions. However in India the test and abortions of female children are still continuing. The same situation is going in several.

Even after the birth, the female child could not escape from the dangers. There are several devil parents, who throw their female children in the streets, rivers, etc., or brutally kill such children. A female child has to pass these two major hurdles in her life span. It does not mean that she has no dangers in her future life. Her future life is also full of dangers from her family members and society. She has to face several assaults, harassments, difficulties etc. parents prefer to give good education to their sons. They neglect their daughters, even though they are clever and have interest in education. They provide good facilities to their sons by selling their properties. At the same time, they try to retain their daughters in the homes, and instruct them to do domestic works. They fear that if their daughter studies more, they have to pay more dowry to bring the bridegroom of higher studies than her. The case of female child abuse could perhaps be attributed to growing social cynicism and apathy which are gradually replacing the earlier norms of community and family.

Sexual crimes against women occupy a significant place in every country. Rape is one of the most damaging and heinous crime. Five years child to eighty years old aged women are not excepted from the brutal acts. It is a deathless shame to women raped. It is surprised to learn that the statistics show that in India on an average a rape occurs every 54 minutes, a molestation every 26 minutes, a kidnapping every 23 minutes and a so-called Dowry

death every 42 minutes. It is shame to our civilized culture to hear that there are certain occasions, where father rapes his own daughter, or a brother rapes his sister. When we read this type of incestuous news we bow our heads. Of course, the Courts in few occasions punish the wrong –doer and send him to prison that too after a long procedure and time. During the trial, the women raped once again psychologically raped in the open court. Her life ends with that rape. No person comes forward to marry her. If the women- raped happens to be a wife, her husband divorces or leaves her. But at the same time. Courts do not pay any attention to the victim- girl. It is a ‘civil death’ to her. She could not get honour in family and society, without her fault or wrong. In my opinion, such girls/women must be compensated sufficient to lead her remaining life, and such compensation must be awarded from the wrong-doer besides imposing rigorous imprisonment. If the wrong –doer is not in a place to pay such amounts, the Government should grant compensation. When a person meets an injury/death by a traffic accident, the Motor Accidents Tribunal grants compensation from the owner of the vehicle or insurance companies. Similarly, the aggrieved women/girl should be helped by awarding compensation and providing economic freedom.

In majority of the families, in which both the wife and husband are employees, the husband works in office, but does not attend the domestic works. The wife has to play dual roles, i.e. as an employee in her office, and as a ‘servant’ or ‘dasi’ in home and to do domestic works. There is heavy burdon on her. The husband does not care to assist her. Besides these duties, she has to look after the entire family members. Further, she has to face criticisms from her neighbours, relative and colleagues, and sexual harassments from her superior officers.

In hindu society, the females are suffering with dowry violence. To perform her marriage, her father accumulates money and gives it in the shape of Dowry. There are certain Acts, and provisions prohibiting dowry giving and taking. But who will implement? Well- educated persons, positioned persons, viz. Advocates, doctors, police officers, ministers, Government employees, etc. are taking lakhs of rupees as dowry. Then who will prevent a common man, and who will save the aggrieved persons? The rich and American settled Dr.Ambadipudi, recorded in Ginnese Book as the Doctor enrolled at 18 years, was arrested and prosecuted for dowry harassment.

Since the human culture started in existence and developing, women help a lot. In the modern age also, women are working hard. The political leaders, writes say that “women are half of the globe, and they are half in the sky” However, in fact and practically, every neglected them. In some of the religions even to-day, women are treated as “salves”. The western countries say that they are very modernized in thinking. It is surprised to know that they had given voting rights to women in the beginning of 20th century. That too after a long struggle. In every walk of life, women are barely neglected. In India too, their situation is not different. In criminal kingdom also, women are seconds only. They could not become the leaders, except a few examples , such as Phoolan Devi. Entire criminal field is in the

hands of males. Males are strong, active having more freedom, having more access in the society. Females are weak, confined to homes, shy, having no freedom. These are the reasons why female delinquency has not spread so alarmly as that of male delinquency. However, a minor portion of women become delinquents due to special reasons. Their number in every society is very meager comparing to that of males. These minor female delinquents too incline to do meagre illegal activities, such as prostitution, stealing, chain –snatching purses, begging, fraud, etc. in rush areas, such as buses, cinema talkies, mandies. Etc. In exceptional circumstances only, they prepare to murder, burglary, plundering, kidnapping, house-breaking, etc. Generally, they do not use knives, pistols, etc. In Hyderabad City, there are several thousands of male criminals, and recorded rowdy sheeters, listed in the police records. It is surprised to note that there are only 50 female delinquents recorded in all the police Stations of Hydrabad upto August, 1997. Their number is very less in rural areas, and district head-quarters. There is a clear difference between male delinquency and female delinquency. In majority cases, the delinquents do criminal acts to fulfill their wants, luxuries, Whereas the female delinquents do criminal acts to feed their family members, especially their children. Recidivism is higher in males than females. Female delinquents easily tend for correction and reformation than male delinquents.

Wife loves her family, viz. husband and children whole-heartedly. Husband does not show such love and affection on his family member. Husband has an aim whether it may be economical or academic. He wants ‘recognition’ in the society. For it he works very hard. In doing so, he neglects his family members. For a husband, his family is part and parcel of his life, and is a part –time job. For a wife, family is her entire aim and goal. She does not know the outside world. Thus the clashes arise between them. Due to clashes, husband is vexed with wife, and habituates with another women. This causes annoyance to his wife. Such wife may commit suicide, or correct with another man, or may kill her husband or her husband’s lover. Such instances appear in newspapers. In some occasions, husband neglects his wife and children, and becomes addicted to drink, or to sit idle without earning. Clashes arise between wife and husband. Vexed with her husband, she developes illegal contacts with a third person. Naturally this third person having money or any such other qualities attracts her more that her husband. To have such relation permanently, such wife plans to kill her husband and succeeds in doing. This type of incidents too appears in newspapers.

Sexual crime against women a significant place in every country. Rape is one of the most damaging and heinous crime. Five years child to eighty years old aged women are not excepted from the brutal acts. It is a ‘deathless shame’ to women raped. It is surprised to learn that the statistics show that in India on an average a rape occurs every 54 minutes, a molestation every 26 minutes, a kidnapping every 23 minutes and a so-called Dowry death every 42 minutes. It is shame to our civilized culture to hear that there are certain occasions, where father rapes his own daughter, or a brother rapes his sister. When we read this type of incestuous news we bow our hands. Of course, the Courts in few occasions punish the

wrong-doer and send him to prison that too after a long procedure and time. During the trial, the women raped once again psychologically raped in the open court. Her life ends with that rape. No person comes forward to marry her. If the women-raped happens to be a wife, her husband divorces or leaves her. No person comes forward to marry her. If the women-raped happens to be a wife, her husband divorces or leaves her. But at the same time. Courts do not pay any attention to the victim-girl. It is a 'civil death' to her. She could not get honour in family and society, without her fault or wrong. In my opinion, such girls /women must be compensated sufficient to lead her remaining life, and such compensation must be awarded from the wrong-doer besides imposing rigorous imprisonment. If the wrong-doer is not in a place to pay such amounts, the Government should grant compensation. When a person meets an injury/death by a traffic accident, the Motor Accidents Tribunal grants compensation from the owner of the vehicle or insurance companies. Similarly, the aggrieved women/girl should be helped by awarding compensation and providing economic freedom.

The women are molested, humiliated, and sexually harassed in the society. Even educational institutions are not exception. Teaching, ragging, sexual harassment, compulsion for marriage, kidnapping, etc. have become very common in colleges. In Andhra Pradesh Agricultural University, Hyderabad in October, 1996 on male student poured acid on the face of female student, who refused to love and cohabit with him. Some of the professors, teachers, lectures, principals compel their female students for sex. Some of the bosses in offices compel the women employees for sex. Paula Jones, a female receptionist filed case against Mr. Bill Clinton, President of America alleging that he sexually harassed using his power while he was working as Governor. Gill, ex-Governor of Punjab was punished by the Court for his ill-behavior with one of his female subordinates.

Laid down certain guideline and home on 13th august, 1997 for the effective enforcement of the basic human right of gender equality and guarantee against sexual harassment at workplaces. The Supreme Court directed that it shall be the duty of the employer or other responsible persons in work places or other institutions to prevent or deter the commission of acts of sexual harassment and to provide the procedure for the resolution, settlement or prosecution of acts of sexual harassment of taking all steps required.

There are several Acts to take penal actions against the wrong-doers of sexual offences. However, they are not implemented completely and whole –heartedly.

In hindu society, the females are suffering with dowry violence. To perform her marriage, her father accumulates money and gives it in the shape of dowry. There are certain Acts, and provisions prohibiting dowry giving and taking. But who will implement? Well-educated persons, positioned persons, viz. Advocates, doctors, police officers, ministers, Government employees, etc. are taking lakhs of rupees as dowry. Then who will prevent a common man, and who will save the aggrieved persons? The rich and American settled Dr. Ambadipuri, recorded in Ginnese Book as the Doctor enrolled at 18 years, was arrested and prosecuted for dowry harassment.

A Descriptive Study to Assess The Level of Ego Integrity Among Male Geriatric Population in A Selected Geographical Area at Indore City (M.P)

By Mrs M.S. Vinsi

ABSTRACT

In psychology ego integrity can indicate mainly to the development of ego or mainly to one of the levels of development proposed by E. Erikson. He explains that human beings pass through eight stages of development, out of which ego integrity is the last stage. The study conducted was “A descriptive study to assess the level of ego integrity among male geriatric population in a selected geographical areas at Indore city (M.P.)” Method of data collection were interview schedule to assess socio demographic data and rating scale to assess level of ego integrity, sampling technique was simple random sampling for 150 males geriatric populations (60-80 years) living selected geographical areas of Indore (M.P). Data analysed by descriptive and differential statistics. Mean value of ego integrity towards life among male geriatric population was 146.64 this value indicates that male geriatric populations were very satisfied on the level of ego integrity. And the value of standard deviation for male geriatric population (23.22) showed that there will great variations from the value. To find out the association of level of ego integrity towards life of male geriatric population with selected Socio Demographic Variables ANOVA test has applied, results showed that male geriatric population variables such as age, marital status, family, mobility, sensory deprivation, leisure time is having significant association and rest of the variables such as religion, education & social activity were not having significant association with level of ego integrity towards life of male geriatric population as their calculated F value is less than tabulated F value at .05

INTRODUCTION

Erik Homburger Erikson, psychologist said, “It is human to have a long childhood; it is civilized to have an even longer childhood. Long childhood makes a technical and mental virtuoso out of man, but it also leaves a life-long residue of emotional immaturity in him” (Bhatia B.D,2008)

Generally personality traits are formed in opposites. We think of ourselves as optimistic or pessimistic, independent or dependent, emotional or unemotional, adventurous or cautious, leader or follower, aggressive or passive etc. Many of them are inborn temperament traits, but other characteristics, such as feeling either competent or inferior and many others acquired after birth, based on challenges and support we receive in growing up.

Late adulthood should be a time in a person's life where they feel fulfilled. They can look back on their memories and be happy with the way they have lived their life. Now a day too many elderly people are not satisfied and look depressed. Most fear of death of either loved one or for themselves

It is the crucial time for elderly people to get through one of the best, yet the toughest part of their mortal life.

This motivated the investigator to find out the ego integrity level among male and female geriatric population through comparative study, also the investigator is interested to find out the relationship of ego integrity among male and female geriatric population with selected socio demographic variables.

OBJECTIVES

- i) To assess the level of ego integrity towards life among male geriatric population.
- ii) To associate the level of ego integrity towards life of male geriatric population with selected socio demographic variables.

REVIEW OF LITERATURE

Angelini V et al (2012) conducted study on Age, Health and Life Satisfaction Among Older Europeans; the result indicated that age affects the self-reported level of life satisfaction among the elderly in Europe. i.e. age influences life satisfaction through two counterbalancing channels. On the one hand, controlling for the effects of all other variables, the own perceived level of life satisfaction increases with age. On the other hand, given the same true level of life satisfaction, older respondents were more likely to rank themselves as "dissatisfied" with their life than younger individuals

Beyaztas F Y et al (2012) conducted a study on life satisfaction level among elderly individual – age 65 or over who live with their families and those who dwell in rest house. Random sampling technique was used for selecting 71 elderly people. 21 individuals lived in rest house and 50 with their families. 46.2% suffered from unhappiness while 62% preferred to live with their family. Considerable number 36.6 % of the subject was not satisfied with their lives.

Park J et al (2011) conducted a study on the Religiosity, social support, and life satisfaction among elderly Korean immigrants, The study investigated the mediating role of social support to the relationship between religiosity and life satisfaction. Structural equation modeling was used to test the proposed hypotheses with a sample of 200 Korean immigrant older adults in New York City (mean age = 72.5, range = 65-89). Results indicated that religious engagement and social support could be significant factors to improve the quality of life among elderly Korean immigrants. Social services that facilitate religiosity and social support may be beneficial for Korean elders' life satisfaction.

RESEARCH METHODOLOGY

The research design of the study was descriptive research design. In the present study non-experimental survey research design was used. Data is gathered through door-to-door survey. In that demographic information was gathered from the randomly selected samples with a structured interview schedule. A rating scale to determine the stage of self-integrity in the age group 60 - 80 years within the family was applied after their consent. This study was conducted in the selected geographical areas of Indore city, M.P. The investigator found that the setting was appropriate to conduct this study. In this study the population was all male geriatric people (60 - 80years). The target population for this study was the male geriatric populations living in M.P. The accessible population for this study was the male geriatric populations living in the selected geographical areas of Indore city, M.P. Male geriatric people were independent variable in this study and ego integrity is the dependent variable in this study. Study sample size was 150 male geriatric populations living in Indore city who are between the ages of 60 – 80 years. The sampling technique used was Simple random sampling technique. The method of data collection was by Structured interview method and rating scale.

RESULTS**Distributions of male geriatric population with regards to their demographic variables**

Distributions of male geriatric population with regards to their demographic variables were 46% majorities of male geriatrics were from age group of 60-65 years. Majority (96%) of the subjects were Hindus and remaining 4% were Muslims. Majority (68%) was uneducated where as only 32% were educated. 90% of male geriatrics were married and 10% were widows. Majority (50%) had joint family, 36% have nuclear family and remaining 14% were in expanded family. Majority (78%) was moving independently, 14% male geriatrics was in house movements. Majority (62%) were not deprived of any sensory deprivation, 28% were had eye deprivation, 8% had other deprivation problems and remaining 2% had ear deprivation problems. Majority (34%) were enjoys leisure activity with their friends, 28% were engaged with their own activities, 26% were not has leisure activity and 12% has other activities. Majority (58%) was engage in social activities but 42% were not interested.

Sample	N	Mean	Median	Standard Deviation
Male Geriatric Population	150	146.64	151.35	23.22

The data presented in table indicates that mean score of ego integrity towards life among male geriatric population was (146.64) and this value indicates that male geriatric population were very satisfied on the basis of degree of ego integrity satisfaction scale.

Association of level of ego integrity towards life of male geriatric population with selected Socio Demographic Variables

To find out the association of level of ego integrity towards life of male geriatric population with selected Socio Demographic Variables ANOVA test has applied, results showed that male geriatric population variables such as age, marital status, family, mobility, sensory deprivation, leisure time is having significant association and rest of the variables such as religion, education & social activity were not significant with level of ego integrity towards life of male geriatric population as their calculated F value is less than tabulated F value at .05

DISCUSSION

The findings of the study were discussed with reference to the objectives stated and the findings of the other studies in this section. The present study undertaken was 'A descriptive study to assess the level of ego integrity among male geriatric population in a selected geographical areas at Indore city (M.P.). A detailed review of literature indicated that most of the studies indicating that ego integrity level of geriatric population is varying in males and females. This study was to assess and compare the ego integrity level of male and female geriatric population. The findings of the present study shows that the level of ego integrity and the life satisfaction of persons will vary according to the physical, mental or social environment. And also it reveals that the life satisfaction will vary in males. The result shows that the mean score of level of ego integrity of male geriatric population was 146.64 revealed that male geriatric population was very satisfied with ego integrity. The finding of the study shows that there is significant association between age, religion, education, marital status, type of family, work, mobility, and sensory deprivation.

NURSING IMPLICATIONS

The findings of this study have implications for nursing administration, nursing education, nursing research and nursing practice.

Nursing Administration: The study will help the nursing administrator to plan and organize to give health education.

Nursing Education: The student nurse can use the instrument (rating scale) prepared for this study to acquire information regarding the life satisfaction of elderly persons.

Nursing Research: The nurse researchers can use the findings of this study as baseline data to conduct further interventional research to identify the level of ego integrity and to determine the association of other demographic variable.

Nursing Practice: Findings will help nursing personnel to estimate effectiveness of care that has been rendered to the elderly clients.

RECOMMENDATIONS

On the basis of the findings of the study, it is recommended that the following studies can be conducted:

1. All the private, public and government sector institutions where intimated the findings of the study so as to improve the ego integrity level of geriatric persons will improve. And provide care according to their needs.
2. A comparative study can be conducted on level of ego integrity of geriatric population in urban and rural areas of the country.

CONCLUSION

After the detailed analysis, this study leads to the following conclusion:

Demographic variables show a major role in influencing the ego integrity level in geriatric population.

Hence based on the above-cited findings, it was concluded undoubtedly that the level of ego integrity of geriatric persons would vary in males.

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The effect of solvent on morphology and optical properties of laser sensitive azo dye films use in optical media.

By Mr. Pinaki Ranjan Samanta

By Mrs. Pritee Goyal

Abstract:-

In this paper mixture of laser sensitive azo dyes in different solvents were spin coated onto polycarbonate substrate to form thin films. UV-VIS-NIR spectra of reflection of the films were measured. It was found the solvent could greatly affect the optical properties of dye films and polycarbonate substrate. Dye solubility, polycarbonate behavior towards solvent was observed by spot test. Atomic Force Microscope (AFM) and scanning Electron Microscope (SEM) was applied to observe the morphology of the film surfaces as well as DVD CAT's for reflectivity. Results demonstrated that the reflectivity was closely related to the surface roughness of the film. High surface roughness has a strong scattering effect on light and will lower the reflectivity. When tetrafluoro propanol (TFP) and blended tetrafluoro propanol with Iso propyl alcohol (IPA) were employed as solvents, the surface roughness of the film was low and high reflectivity was reliably obtained.

Keywords: CD- DVD transition metal complex azo dye, Solubility, blending solvent, morphology, Reflectivity.

1 Introduction:-

Azo Ni (II) and Zn (II) metal complex dyes [1] are the most popular information recording materials in CD-R and DVD-R optical disks [3,4]. During the data writing process, the dye film which is spin- coated on substrates, absorbs the laser beam energy and undergoes thermal deformation such as decomposition, evaporation or dissolution. The written data could be reproducing by reading the difference in reflectivity between the portions where such deformation was formed and those without such deformation.

In a solution spin coating process, a layer of dye solution is applied to a surface from a solution (coating solution) comprising the material to be applied to the surface (coating moiety). Generally, the coating solution consists of a coating moiety and one or more volatile components (volatiles) which are not intended to remain on the surface being coated after the coating composition is dried.

The properties of the liquid constituents of a coating solution which carry, and preferably dissolve, the coating moiety (liquid carrier) can influence the uniformity of the finished

coating. Applicants have come to appreciate that, in selecting a liquid carrier, factors to consider generally include:

The amount of coating moiety which can be dissolved in the liquid carrier, the ability of a coating solution incorporating the liquid carrier to “wet” the surface to be coated; and the volatility of the liquid carrier; among the others.

The tendency of any of the components of the liquid carrier to swell or locally dissolve the surface of the substrate to be coated [11,12].

To achieve the uniform coating, it is generally required that no components of the coating solution causes swelling, degradation, or dissolution of the surface to be coated. The following points to be noted for uniform coatings:

The liquid carrier should not be so volatile that the coating moiety precipitates from the coating solvent during storage or during formation of a coating solution layer on a surface to be coated.

The liquid carrier is also preferably sufficiently volatile that it can be removed in a short time after the coating solution has been distributed on the surface to be coated, minimizing the per-piece cycle time.

Applying a coating of a coating moiety to a surface include the ability of the coating solution to flow into and fill in patterned surface features, for example, “wells”, “pits”, and “grooves” provided in the surface, with coating moiety, thereby providing a “patterned” surface coatings [6,7].

Surface Tension of the liquid. As the surface tension of the coating solution is reduced, it “wets” the surface to be coated increasingly well, requiring less of an excess of coating solution to be applied to the surface to ensure formation of a uniform Coating solution layer [10].

In this paper, we found that morphology of dye coating films deposited from different solvents differed from each other [2]. The morphological structure of the film surface was observed by AFM and SEM. It shown that solvents greatly affected the roughness of dye films resulting in the change of optical properties of the film [5], especially their reflectivity and in solution there are shifting absorption maxima wavelength (λ_{\max}) as well as lowering the absorption value [8,9].

2. Experimental:

2.1 Material

Molecular structure of studied dyes (PDS-2211 and PDS-2353) analyze and dyes was purchased from Mitshubishi Kagaku Media (MKM). The absorption maxima wavelength (λ_{\max}) shown. Tetrafluoro-Propanol with purity of 99.9% was purchased from China Fluoro Technology Ltd. The other solvents Iso propyl alcohol (IPA), 1-methoxy-2- propanol (PM Solvent) and Di acetone alcohol (DAA) with purity on > 99.5% was purchased Spectrochem India were analytical grade. All compounds were used as received without further purification.

2.2 Methods

2.2.1 Dissolution Technique

Pre mix Ni (II) PDS 2211 – Zn (II) PDS 2353 azo complexes dye powder in 60:40 ratio and mix properly in a mortarpaste. Then weigh accurately 1.3 gm of azo dye mix pour part by part into 100 gm of different solvents mixtures like TFP:IPA (80:20), TFP: DAA (80:20), TFP:PM (80:20) and TFP (100%) under magnetic stirrer at room temperature then sonicate at 50 deg C for 4 hour. Then check solubility of dyes in solvent / solvent mixture in the glass plate and spot test on filter paper.

2.2.2 Film preparation

The dye films were fabricated through spin-coating method. In contrast to the usual spin coating of dye solution, the time of solvent removal should be controlled less than 20 sec so as to prevent polymers drying on the polycarbonate surface. This can be realized by using high spin rate (4000 to 8000 rpm) by using concentrated dye solutions. Solutions of dyes in pure solvent and blending solvents were coated on to polycarbonate substrate and wait to evaporate solvent during spin process. The cast film were then dried overnight in a vaccum oven at 50 deg C.

2.2.3A Surface Changes (Imaging by SEM)

Surface morphology of the dye film was investigated with a Scanning electron microscope (SEM) made by ZEISS. A 5 X 5 mm piece was cut from the polymer sample and placed on the sample holder and was scanned within an area of 1 μ m at a magnification of 2 KX. At least three areas were imaged and the same results were obtained. Shows in Fig:1 (A) and Fig:1 (B).

2.2.3B Surface Changes (Imaging by AFM)

The surface topography and roughness of the dye films were determined with an Atomic force microscope (AFM).The sample was mounted on a piezoelectric scanner and the surface was scanned with a silicon nitride tip in contact mode within an area of 10 μ m². The surface roughness was calculated in terms of root mean square roughness (rms). Shows in Fig: 2 (A), (B), (C) and (D).

2.2.4 Measurement in UV- Vis Spectrophotometer

A Perkin Elmer 35 Lambda UV-VIS Spectrophotometer fitted with integrating sphere measured dye solution concentration scanning from 400 to 800 nm and measure transmittance and reflectance of dye film with 0⁰ and 8⁰ incident on to the sample surface for reflection spectrum. Shows in Fig. 3 and Fig. 4 (A) and (B).

2.2.4 Measurement of FT-IR

A Bruker Vector 22 fourier transform infrared spectrophotometer (FTIR), was used for detecting the formation of new functional groups or changes in the amount of existing functional groups. The spectra were recorded at a resolution of 4 cm^{-1} in the

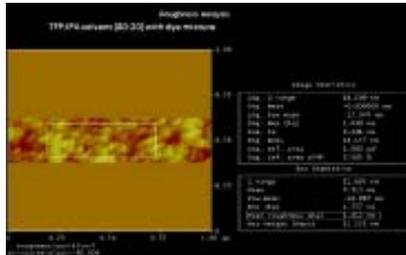


Fig. 2 (C)

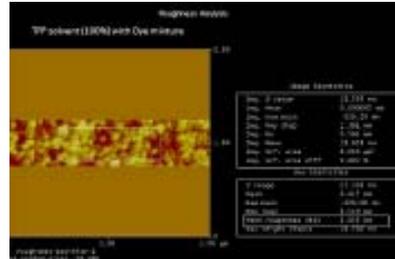
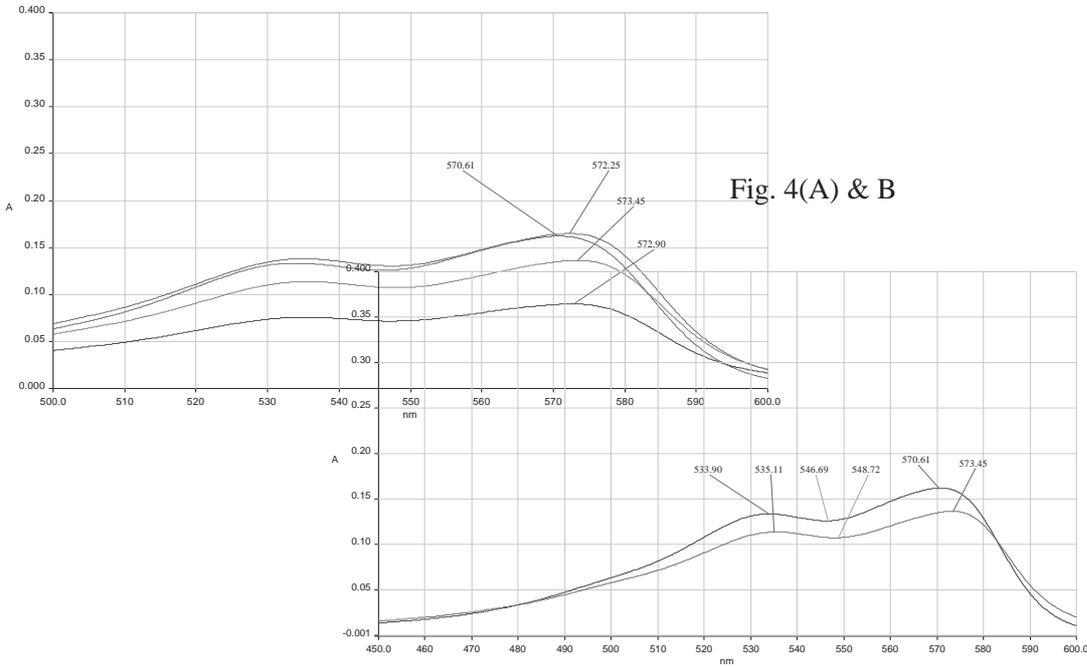


Fig. 2 (D)



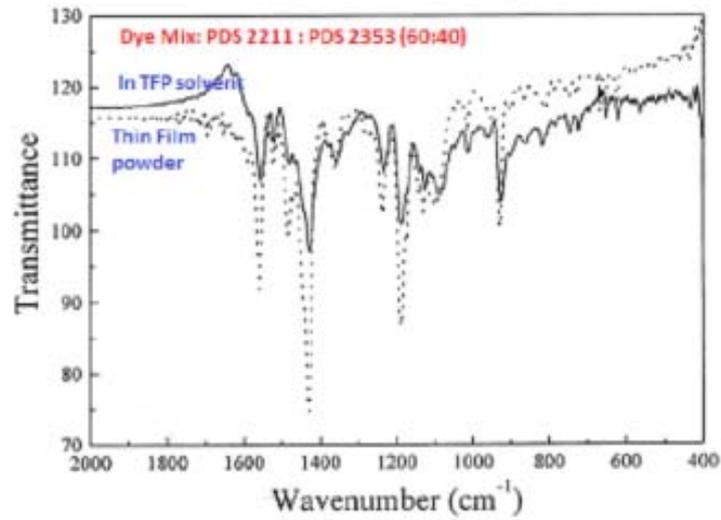


Fig. 5

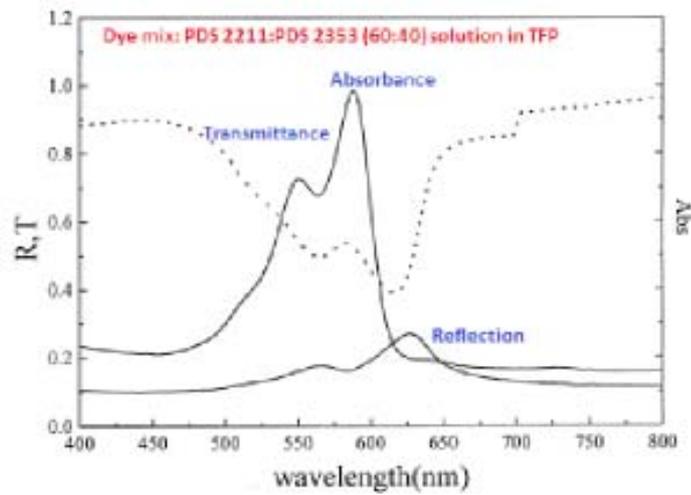


Fig. 3

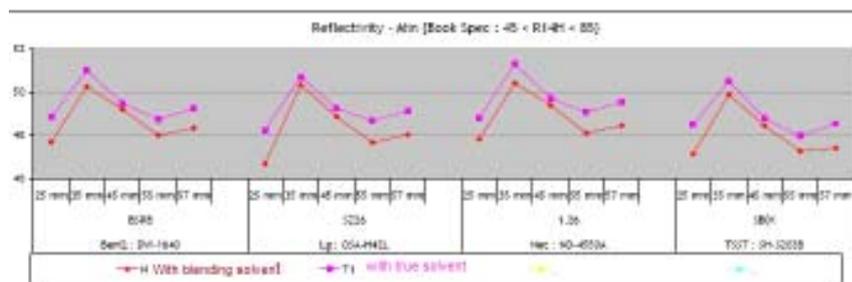
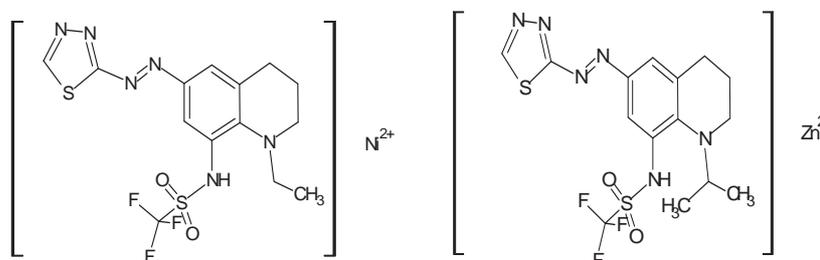


Fig. 6



Structure of PDS 2353 (60%)

Structure of PDS 2353 (40%)

3. Results and Discussion:

3.1 AFM and SEM observations of dye films

The morphologies of the dye film formed with different solvents were observed by AFM as shown in Fig. 2 (A), (B), (C) and (D). It is obvious that there are great difference among the films. For the dye film fabricated with pure TFP solvent as well as three blending solvents shows surface roughness increases in different blending solvents according solubility of dyes and crystalloid was formed. The film became much even when made from tetrafluoro propanol and TFP:IPA (80:20) blending solutions which shows roughness (Ra) less than 5 nm.

SEM picture Fig.1 (A) and Fig. 1 (B) shows dye particles distribution on film clearly indicates crystalloids/ coagulations of dye particles observed in case of blending solvent i.e TFP: PM (80:20) which shows high roughness more than 50 nm.

3.2 The Spectrum characteristics of azo dyes:

Fig. 3 shows the absorption spectra of dyes in Tetra fluoro propanol (TFP) and their reflection and transmittance for an 10-15 nm thick dye film on glass substrate in VIS-NIR wavelength region. The absorption spectrum of azo dye mixture in solution has a sharp peak

at 572 nm, the maximum value of the reflection spectrum shows a sharp peak at around 625 nm and it is red shift.

Fig. 4 shows the absorption spectra of same concentration of dyes in different solvents of Tetra fluoro propanol (TFP), TFP:IPA (80:20), TFP:DAA (80:20), TFP: PM (80:20) shows red shift of maxima wave length(λ_{max}) as well as peak intensity also reduced indicates dye solution concentration reduced due to crystallization of dye.

Fig. 5 The FT-IR spectra in the function regions (400-2000 cm^{-1}) of dye powder and film fabricated with tetra fluoro propanol are illuminated. It is clear that there are no appreciable changes in among the characteristics peaks of the thin film as well as those of the powder, which demonstrates that the solvent have no effect on the stability of dye structure.

4. Conclusions:

The optical properties of Ni (II) PDS 2211 – Zn (II) PDS 2353 azo complexes dye film prepared with blending solvent and pure solvent had been measured. The morphology, roughness and UV-VIS-NIR curve of film and solution were measured results shows surface roughness markedly effect DVD disc properties as its reflectivity effects since more even surface more reflectivity. The dye films have disordered structure and demonstrate anisotropic optical properties which strongly influence on recording medium.

When films are prepared with blend solvent with dominant iso propyl alcohol (IPA) co-solvent, the solubility of Zn (II) PDS 2353 azo complex leads to formation of aggregates and large phase separation occurs within the film. The bad solvent induces an even surface that easily oxidized and impact the performance of disc.

The large gap of different values of solvent boiling points have a disadvantage in studying deposition process since they prevent the kinetic effects on the formation of thin films. Indeed a fast vaporizations of one solvents results in precocious quenching the dye mixture and consequently they changes their surface morphology before vaporizations of second solvent and analysis of film formation process will be more complex.

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The influence of solvent effects on polycarbonate film use in optical media for data storage.

By Mr. Pinaki Ranjan Samanta

By Mrs. Pritee Goyal

Abstract:

Unlike non polymeric materials, polymer do not dissolved instantaneously and dissolutions controlled by either the disentanglement of polymer chain or by diffusion of the chain through a boundary layer adjacent to the polymer solvent interface. This study reveals that dissolution of amorphous polycarbonate resin in Methyl Ethyl Ketone (MEK) solvent and a mixed solvent (MEK :IPA = 60:40), studied dissolution and mechanism phenomena, solubility behavior of polycarbonate resin in solvent and characterization.

Keywords: Polycarbonate Resin, Solubility, blending solvent, morphology.

1.Introduction:

Polycarbonates resin is an amorphous engineering thermoplastic, characterized by outstanding mechanical, optical, electrical and thermal properties have become very attractive business article. **Polycarbonate resin** is used in a wide range of industries, automotive, building and construction, electronics, telecommunication, packaging, medical, and optical media [1,2]. Polycarbonates (PCs) have been able to replace more traditional materials like glass and metals in many products, such as automobile headlamps and stoplight lenses, corrective lenses, safety shields in windows, architectural glazing and the like. They can be applied to plastics vessels, parts of machines and in optical grades for compact discs (CDs, CD-ROMs and DVDs), optical fibers etc. Transparent PC resin features its outstanding optical clarity, its superior flow ability and thermal stability. PC resin stays completely transparent without discoloration at elevated temperatures.

However, the low hardness, low scratch resistance and degradation by ultraviolet radiation make a modification of PC surface properties necessary. The low surface energy of polycarbonate results in poor adhesion of additional coatings which have created numerous important technical challenges to be overcome by manufacturers [2]. Therefore, in many applications (e.g. in industry, technology, biology and medicine) it is necessary to change or improve some of the surface properties of polycarbonate without altering its bulk properties. Several techniques have been developed to modify the polymer surfaces for improved adhesion, wettability, printability and other technologically important characteristics. The

common methods of surface modification include mechanical or chemical treatment; and exposure to flames, photons and ion beams. But these methods are found to have problems such as: poor reproducibility and controllability. Moreover, they use a huge amount of toxic liquids during the process which are labeled as environmentally harmful. Among all the methods of modifying polymer surfaces to improve wettability and adhesion, low pressure plasma treatment has proved to be one of the most effective, ensuring uniformity as well as being non-polluting.

Polymer dissolution in solvents is an important area of interest in polymer science and engineering because of its many applications in industry such as microlithography, membrane science, plastics recycling, and drug delivery.

It is very complex mechanism of polymer dissolution process. Scientist Ueberreiter who outlined surface layer formation process revealed that the solvent begin its aggression by pushing the swollen polymer substance into the solvent and after some time diluted upper layer is pushed in the direction of the solvent stream and increases swollen surface layer till quasi stationary state is reached [3].

Polymer dissolution process two types of mechanism observed one is normal dissolution and second type of dissolution where no gel layer is observed. Polycarbonate dissolved in solvent shows normal dissolution start at glass transition temperature, decrease as temperature decreases in gel layer thickness. Below the temperature crack were observed running into the polymer matrix, this is due to freezing in of large amounts of stress energy in the polymer in the glass transition level [4,5].

Dissolution rate decreases with increase of molecular weight of polymer and it is non-linear behavior. Dissolution behavior not only effect of the polymer molecular weight but also its polydispersity. Polydisperse samples dissolved about twice as fast as mono disperse polymer [6].

The solubility of a given polymer in various solvents is largely determined by its chemical structure. Polymers will dissolve in solvents whose solubility parameters are not too different from their own. This principle has become known as 'like dissolves like', and, as a general rule, structural similarity favors solubility. Dissolution of an amorphous polymer in a solvent is governed by the free energy of mixing [7,8].

$$\Delta G_m = \Delta H_m - T\Delta S_m$$

Where ΔG_m is the Gibbs free energy change on mixing, ΔH_m is the enthalpy change on mixing, T is the absolute temperature, and ΔS_m is the entropy change on mixing. A negative value of the free energy change on mixing means that the mixing process will occur spontaneously. Otherwise, two or more phases result from the mixing process. Since the dissolution of a high molecular weight polymer is always associated with a very small positive entropy change, the enthalpy term is the crucial factor in determining the sign of the Gibbs free energy change. Solubility parameters were developed to describe the enthalpy of mixing.

This paper presents how a true solvent and true/non solvent mixture interact when applied on polycarbonate surface.

2. Experimental:

2.1 Material

Molecular structure of studied poly(Bisphenol –A carbonate) resin (Macrolon) with average molecular weight 58,000 to 60,000 provided by Bayer Materials Science . Methyl Ethyl Ketone and Iso propanol with purity of > 99% was purchased from Ranbaxy Fine Chemicals Ltd (RFCL) were analytical grade. All compounds were used as received basis without further purifications.

2.2 Methods

2.2.1 Dissolution Technique

Weigh 5 gm of polycarbonate resin pour part by part into 100 gm of true solvent methyl ethyl Ketone (MEK) or mixture of solvents (MEK : IPA = 60:40) under magnetic stirrer at room temperature or at 50 deg C for 1 hour. Then check solubility of amorphous polycarbonate resin in the solvent in the glass plate

If there are no deformation or stickyness or swelling, it may not soluble in solvent.

2.2.2 Film preparation

The polymer films were fabricated through spin-coating method. In contrast to the usual spin coating of polymers , the time of solvent removal should be controlled less than 20 sec so as to prevent polymers drying on the glass surface. This can be realized by using high spin rate (4000 to 8000 rpm) by using concentrated polymer solutions. Solutions of polymer in pure solvent and mixed solvents were coated on to glass substrates (50 X 50 mm) wait to evaporate solvent. The cast film were then dried overnight in a vaccum oven at 50 deg C.

2.2.3A Surface Changes (Imaging by SEM)

Surface morphology of the polymer was investigated with a Scanning electron microscope (SEM) (ZEISS). A 5 X 5 mm piece was cut from the polymer sample and placed on the sample holder and was scanned within an area of 10 μ m at a magnification of 500X. At least three areas were imaged and the same results were obtained. Shows in Fig:1 (A) and Fig:1 (B).

2.2.3B Surface Changes (Imaging by AFM)

The surface topography and roughness of the polymer films were determined with an Atomic force microscope (AFM).The sample was mounted on a piezoelectric scanner and the surface was scanned with a silicon nitride tip in contact mode within an area of 10 μ m². The surface roughness was calculated in terms of root mean square roughness (rms). Shows in Fig: 2 (A) &(B)



AFM 2D image

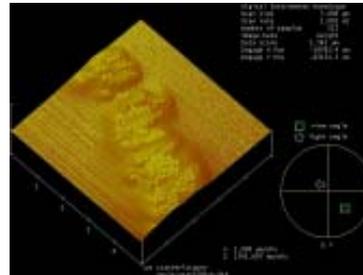
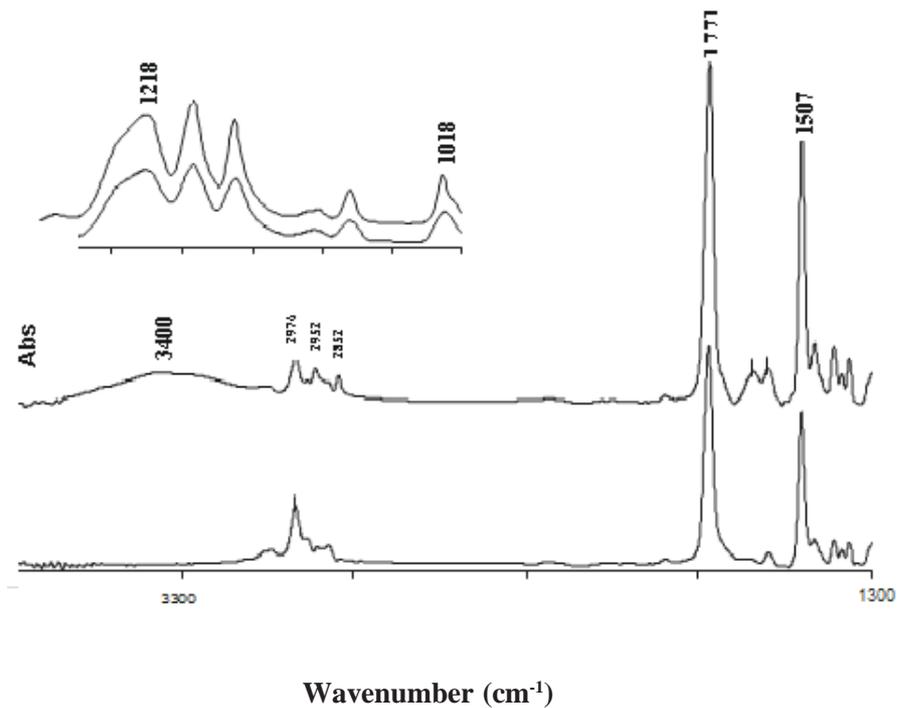
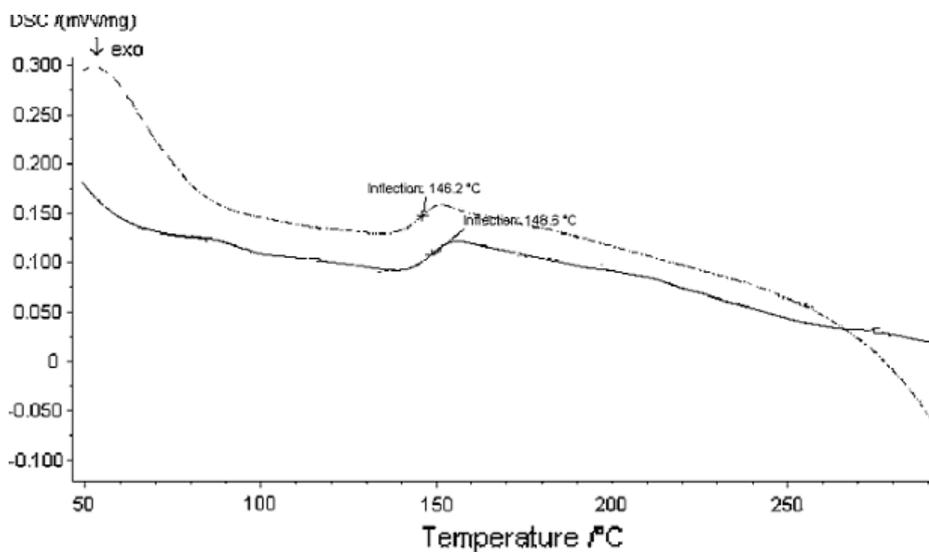


Fig 2(B) AFM 3D image

Polycarbonate insoluble / swelling in MEK:IPA(60:40) solvent indicates in AFM picture also. Surface roughness high (approx ~70 nm).



FT- IR Chromatogram Fig 3



DSC Thermogram Fig 4

3. Results and Discussions:

Optical microscopy allows direct visual observations of the dissolution process and formation of gel layer. It provides information about the structure of different layers (solvent, gel and polymer layer) formed which can govern the dissolution process. Since solvent and polymers are transparent, it is necessary to use dye in the solvent to track penetration of solvent into the polymer matrix.

SEM picture Fig 1(B) in above indicate poor solubility or insoluble of polycarbonate in blending solvent whereas in case of true solvent its smooth film shows in Fig 1(A).

AFMM picture Fig 2(B) in above indicate poor solubility or insoluble of polycarbonate shows high roughness in blending solvent whereas in case of true solvent its smooth film very low roughness shows in Fig 2(A).

FT-IR spectra (Fig 3) of polycarbonate resin in true solvent shows single peak at 2974cm^{-1} but in case of blending solvent it shows two additional peaks near 2974cm^{-1} and one extra hump at 3400cm^{-1} . formation due to hydrolysis of carbonate bonds [9]. The behavior of blending solvent into polycarbonate characterized.

DSC thermograms (Fig 4) clearly indicates decrease in glass transition temperature 146.2 deg C in case of blending solvent (measured it at inflection point) than 148.5 in case of true solvent which could be due to chain scission of polycarbonate resin.

Non polymer dissolution process generally controlled by the external mass transfer resistance through a liquid layer adjacent to the solid-liquid interface. However in case of polymer. Solvent involves two transport process i.e solvent diffusion and chain disentanglement. When an uncross linked, amorphous polymer e.g polycarbonate is in contact with compatible solvent e.g Methyl Ethyl Ketone will diffuse into the polymer and it forms gel-like swollen layer along with two separate interface but in some other polymers cracks observed and no gel layer is formed.

Polycarbonate dissolution with MEK is inversely proportional to the polymer molecular weight upto 100000 the rate levels off at higher molecular weight.

Opaque films dissolved much faster than the thinner and transparent films. This phenomenon is related to the pores and cracks created in thicker film during annealing.

Mixed solvents were also studied. Solvent/non-solvent binary mixtures of MEK and isopropanol were used. A sharp transition between complete solubility and almost total insolubility was observed in a narrow concentration range near 60:40 (by volume) solvent/non-solvent for both mixtures. In the insoluble regime, the polymer swelled up to three times its initial thickness and temperature decreases shows different dissolution behavior. For MEK/ IPA, penetration rates increased with increasing MEK concentration.

4. Conclusions:

Detailed analysis of polymer film and solution clearly indicates that polymer dissolution involve two transport process. The solvent penetrates and swell the polymers causing a transition from the glassy to a rubbery states and two interfaces are formed , a swelling interface and gel solvent interface, both move each other. When the concentration of the penetrate in the polymer exceed its critical value chain disentanglement begins and true dissolution occurs. The glassy core disappear slowly and polymer dissolved.

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वेद, वेदान्त और सर्व उपनिषदों में जो तत्त्व है, वही श्रीमद् भागवत महापुराण में तात्त्विक रूप से वर्णित है।

By Shri Hira Prasad Pandey

Under The Guidance Of Dr. Vyas Prasad Pandey

प्रस्तावना,

श्रीमद् भागवत महापुराण श्री कृष्ण की वाङ्मयी मूर्ति है। श्रीमद् भागवतजी का मुख्य विषय है निष्काम भक्ति! जहाँ भोगेच्छा है। वहाँ भक्ति नहीं होती। भोग के लिए की गयी भक्ति से भगवान प्रसन्न नहीं होते। भोग के लिए भक्ति करने वाले को संसार प्यारा लगता है। भगवान नहीं, भगवान के लिए भक्ति करो भक्ति का फल भगवान की प्रसन्नता होनी चाहिए संसार सुख नहीं। वेद कल्प वृक्ष है, और वेद कल्प वृक्ष का श्रीमद् भागवत परिपक्व फल है। जिस प्रकार फल वृक्ष का सार कहलाता है।

उसी प्रकार श्रीमद् भागवत महापुराण वेदों का सार है। इसमें कर्मकाण्ड और ज्ञान काण्ड उपासना काण्ड का सूक्ष्म विवेचन करते हुए तीनों की प्रधानता भक्तिज्ञान और वैराग्य से युक्त है। कर्मकाण्ड यज्ञ प्रधान होने के कारण स्वार्थ से परिपूर्ण होने पर भी स्वर्गादि फल प्राप्ति की इच्छा रखता है। श्रीमद् भागवत महापुराण कर्मकाण्ड का विरोधी नहीं है। क्योंकि भागवत पुराण में हवन विधि दक्षिणा, दान, ब्राह्मण भोजन पूर्णाहुति का विस्तृत विवेचन ही नहीं। कर्तव्यता का उल्लेख भी है। विविध प्रकार के पाप कैसे शान्त होंगे। यह बात श्रीमद् भागवत में वर्णित है। परन्तु ये सभी प्रकार के कर्मकाण्ड विधियां भगवान श्री कृष्ण के प्रति समर्पण चाहती है, जो समर्पण निःस्वार्थ भाव से भक्ति एवं प्रेमकी ओर प्रवृत्त कराती है। देखा जाता है की भागवती इच्छावाले कर्मकाण्डी होते है लेकिन वह कर्मकाण्ड मात्र हवन कराने से ही सीमित नहीं होता है, अपितु ये लोग आत्म सुख के लिए भगवद् दर्शन करते है। भगवान के लिए जो भी कार्य होता है उन कार्यों में समर्पण बुद्धि होती है तभी तो चैतन्य महाप्रभुजी वल्लभा चार्यजी प्रभु पादजी स्वामी नारायण जी ये लोग आत्मकल्याण के लिए अनुष्ठान करते है और दूसरों से करवाते है और ये अनुष्ठान लोक हित के साथ समर्पण के प्रति मुख्य कारण होता है मनुष्यका सबसे प्रिय आत्मा है, आत्मज्ञान हो जाने पर सभी प्रकार के दुःखो की निवृत्ती हो जाती है। अविद्या को श्रीमद् भागवतजी में आत्मा के बन्धन का कारण माना गया है। जो मुक्ति का वाधक है। अविद्या से संसार बनता है, और संसार से जीव संसार में आशक्त होता है, आशक्ति ही विभन्न योनियों में ले जाने का कारण होती है,

जैसे सर्प, बिल्ली, बैल इत्यादि अविद्या के कारण प्राणी संसार के हर वस्तु से प्रेम करता है। शरीर स्त्री, पुत्र, द्रव्य (धन) इत्यादि पर जब कि आत्म कल्याण प्रिय है और आत्म कल्याण के लिए भगवान श्री कृष्ण प्रिय होने चाहिए। उनके प्रति परम भक्ति होनी चाहिए। वही भक्ति ही मुक्ति का साधन बनेगी, भक्ति जब आ जाती है तो ब्रह्म के प्रति जिज्ञासा होती है।

और ब्रह्म के प्रति जिज्ञासा होने पर जो भेद होते हैं वे सब विनष्ट हो जाते हैं जीव में केवल आनन्द भाव रहता है। सत्यज्ञान और अनन्त स्वरूप परब्रह्म है आकाश के समान निर्लेप ही नाम। गोत्र उपाधि से रहित है समस्त जगत का आश्रय भूत होने पर भी निराश्रित होकर सबके आश्रय का स्थान है।

जहां पर अंधकार (तम) दृश्य नहीं पडता तथा देह इन्द्रिय से अलग चैतन्य की प्रतीति होती है उस प्रतीति में जो अहम पद होता है वह आत्म साक्षात्कार का कारण माना जाता है। वही ब्रह्म जिज्ञासा का केन्द्र है तभी तो श्रीमद् भागवतजी के प्रथम श्लोक में जनमाद्यस्य यतः में ईश्वर के तटस्थ लक्षण का प्रतिपादन किया गया है जिसको प्राप्त कर सभी प्रकार के संशय और जहां कार्य और कारण स्वतः विनष्ट हो जाते हैं। सृष्टि का मुख्य कारण अद्वितीय परम ब्रह्म एक ही है और उसी के शरण में जाना है सदब्रह्म मुख्य ज्ञेय है।

और उसी का शरण वास्तव में मान्य है, पहुँच जाने पर जितने संशय हैं, सब विनष्ट हो जाते हैं विनष्ट के स्थिति में यह ज्ञात हो जाता है कि यतो वा इमानि भूतानि जायन्ते इसका अभिप्राय यह है कि समस्त जगत उसी परमेश्वर से उत्पन्न हुआ है और उसी में लीन हो जायेगा और उसके अतिरिक्त जगत की कुछ भी सत्ता नहीं है। इसके शरण में जाना ही हमारा परम कर्तव्य है श्रीमद् भागवत धर्म उस दीक्षा को दर्शाता है कि जिसमें किसी प्रकारके पाप सम्भव नहीं है।

हेतु क्या है ?

भागवत आश्रय धर्म के अनुष्ठान का विशेष फल बताता हुआ। परमात्मा के परम ज्योति का प्रकाशक भी बताया गया है। इसमें निष्काम-भाव से प्रवृत्त होना ही आनन्द का कारण है, श्री विष्णु के प्रति परम भक्ति प्राणायाम इत्यादि द्वारा जगत के सभी पदार्थों के प्रति अनिच्छा (इच्छा का न होना) अष्टांग-योग द्वारा विशेष ध्यान करते हुए समाधिष्ठ होकर वैकुण्ठ की प्राप्ति ही परम लक्ष्य है, तभी तो योगी लोग शंख, चक्र, गदाधारी भगवत श्री जगन्नाथ का शुरु में सगुणरूप में उपासना करके अन्त में निर्गुण रूप में चिन्तन करके सभी प्रकार के विकारों से मुक्त होकर उस परब्रह्म को पूरे विश्व का मुख पाद के रूप में दर्शन करके आनन्द को प्राप्त करते हैं। भक्ति में सदाचार एक विशिष्ट मार्ग है उसके अपना ने से ही परम श्रेय की प्राप्ति होती है परमात्मा की भक्ति करने के लिए भक्ति ज्ञान और वैराग्य की आवश्यकता पडती है जैसे मोदक (लड्डू) बनाने के लिए चने का बेसन, घी और शक्कर की आवश्यकता पडती है यदि इसमें

एक भी वस्तु की कमी हो तो मोदक नहीं बनेगा ऐसे ही भक्ति में ज्ञान वैराग्य और प्रभु की भक्ति परम आवश्यक है। परमात्मा को राजी करना शक्य है। परंतु जगत को राजी करना अशक्य है। जैसे दूध में पत्थर डाल कर मिलायेगे तो नहीं मिलेगा क्योंकि पत्थर और दूध विजातीय वस्तु है इसलिए नहीं मिलेगा। परंतु दूध में शक्कर मिलायेगे तो मिल जायेगा क्योंकि यह सजातीय वस्तु है। ऐसे ही पेड के पत्तों में जल डाले तो पेड का विकास नहीं होगा और पेड के जड में जल सिचन करेगे तो पेड का विकास होगा ऐसे ही आदिनारायण परमात्मा को राजी करेगे तो संसार अपने आप प्रसन्न हो जायेगा।

श्रीमद् भागवत महापुराण में व्यवहार का ज्ञान, ज्ञानयोग, कर्मयोग, समाजधर्म, स्त्रीधर्म, आपद्धर्म, राजनीति आदि का ज्ञान भरा है।

ग्रन्थराज श्रीमद् भागवत शास्त्र यह परिपूर्ण नारायण का स्वरूप है। अतिशय दिव्य है नारायण के चिन्तन बिना एक क्षण नहीं बैठना चाहिए। इसका हेतु यह है कि प्रत्येक प्राणी जीव मात्र की सेवा में लग जाये और किसी के प्रति कोई भेदभाव न रहे। ज्ञान और वैराग्य आ जाने पर देश के प्रति अधिक से अधिक भक्ति का होना परम श्रेष्ठ है।

अभ्यास की जरूरत क्यों है ?

निरन्तर संसारिक वृत्तियाँ ही अनित्य है इस शरीर को भी छोड़ कर इस संसार से जाना है। इस हेतु प्रत्येक प्राणी में परमात्म भाव आ जाये, अग्नि परीक्षामें पास हो जाये। यही इसका मूल लक्ष है।

उदाहरण के लिए : रघुकुल में सबसे उत्कृष्ट राजा रघु हुए। इसी कारण से रघुवंश के नाम से यह कुल प्रसिद्ध हुआ।

रघु जैसा तेजस्वी राजा मनुकुल में उत्पन्न नहीं हुआ। इन्होंने विश्वजित यज्ञ में सर्वस्वदान करके स्वयं मुनिवर जीवन निर्वहन करते थे।

मिट्टी के पात्र में भोजन भूमिशयन इनका मुख्य लक्ष्य था।

उसी समय इनकी अग्नि परीक्षा आ गयी। अग्नि परीक्षा एक ऐसी परीक्षा है कि किस तरह से उचित मार्ग को अपनाया जाय उसी समय चतुर्दश विद्या को प्राप्त करके ऋषि कौत्स वर तन्तु को गुरु दक्षिणा देने हेतु रघु से चतुर्दश कोटि सुवर्ण मुद्राओं के याचना कि यह एक ऐसी अग्नि परीक्षा थी कि रघु धन रहित हो गये थे। फिर भी विश्व सम्राट थे। यदि कौत्स वापिस कर देते तो रघुकुल में एक बदनाम की नई परिपाटी प्रारम्भ हो जाती। ऐसी स्थिति में रघुने सुवर्ण मुद्रा प्राप्त करने के लिए कुबेर पर चढ़ाई करने की कामना की कुबेर भय में आकर रात्रि के समय सुवर्ण मुद्राओं की वर्षा किया दूसरे दिन दाता कुबेर से प्राप्त समस्त धन राशि कौत्स को देना प्रारम्भ किये। यह स्थिति अत्यंत रोचक और सारगर्भित थी इस कारण से कि चौदह कोटि सुवर्ण मुद्रा से अधिक कौत्स लेना नहीं चाहते थे और रघु जिस निमित्त से मुद्राएँ प्राप्त

की इसको लक्ष्य करके समस्त मुद्राएं देना चाहते थे ऐसी विषम परिस्थिति में रघु की यही अग्नि परीक्षा हुई कि कौत्स चौदह कोटि सुवर्ण मुद्रा लेकर गुरु दक्षिणा को देवे और शेष मुद्राएं न तो रघु के लिए होंगी न कि उनके उपभोग के लिए अपितु राज कोष में रख देने से किसी प्रकार का कोई दोष संभव नहीं होगा। श्रीमद् भागवत का महापुराण का आश्रय लेने से भक्ति पूर्ण रूप से आती है भक्ति सामाजिक है समष्टिगत है। इसका ज्ञान भागवत से ही संभव है।

लाभ ?

श्रीमद् भागवत के अध्यान से व्यक्ति में जो अहंकार अहं काम एवं क्रोधादि की भावनाएँ हैं उनसे विरति (अलगाव) हो जाती है। और विरति होते हैं मनुष्य में दास्य भाव आ जाता है। यही इसका लाभ है।

मर्यादा क्या आती है ?

उपनिषद् पुराण आदि पढ़ने के बाद जो ज्ञान प्राप्त होता है। वह प्रभु की कृपा से होता है और हमको अपने जीवन में हमेशा दास्यभाव रखना चाहिए। इस दास्य भाव के आ जाने से मनुष्य अपने आपको मर्यादित कर लेता है। मर्यादित स्थिति के आ जाने पर वह मर्यादा से कभी भी विमुख नहीं होता है, और अपनी सीमा का कभी उलंघन न करना अपनी सीमा में रहकर किसी को किसी भी प्रकार से कष्ट न देते हुये सब के प्रति प्रेम की भावना रखना।

सारान्स ?

भगवान श्री कृष्ण की कथा से वक्ता प्रश्नकर्ता और श्रोता तीनों वैसे ही पवित्र हो जाते हैं जैसे गंगा जीका जल या भगवान शालिग्राम का चरणामृत पीने से सभी पवित्र हो जाते हैं, इससे यह स्पष्ट होता है की सभी प्रकार के कलमष को धोकर अन्तःकरण को पवित्र करके और गंगाजल को मिलाकर प्राणी मात्र को अमरताकी और ले जाना ही श्रीमद् भागवत का अंतिम उद्देश्य है क्योंकि गंगा स्नान, दान करने से स्वयं की मुक्ति है। परंतु श्रीमद् भागवत ही एक ऐसा ग्रंथ है कि जिसके श्रवण मनन और ध्यान करने से समस्त जीवों की मुक्ति हो जाती है।

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Women Empowerment

By Sharda Rane & Dr Dayanand Shetty

Abstract

In pre-independence India, education among women was slow and limited to upper strata of society it tremendously increased in independent India. Surprisingly, the empowerment of women is one of the central issues in the process of development of countries all over the world, not just India. Empowerment of women can help improve women's position in society.

Role of Women in India

In India women has different perceptions which have their unique women and upliftment of family depending upon role played by women.

The recent century reveals different views as position of women has drastically changed. The structure class of family, caste, orthodoxy , rights and morals have turned and lead position of women to liberate with few unwanted burdens. The dual character of women has been displayed and philosophy states women to be sensitive. One part out of dual system reveals her to be fertile, patient and benevolent. The other part state women to be aggressive and resembles to be sign of power.

INDIA and WOMEN

As the olden days draws the picture that men has always been supreme to women in all forms of rights. In past there was no position for women to be equal with men. Women were outraged and prohibited to do activities freely. Before marriage they were condemned by parents and after marriage their voice was shut by husband. Thus this created inferiority in society. Society didn't have balance hence picture of modern tells different story then in the past. Sati custom was the dark patch which forcibly sent women to funeral after their husband death. British also made no difference for uplifting women's position in the society and Mughals era were worst.

During freedom struggle many freedom fighters began process of uplifting the status of women in India. Mahatma Gandhi were among them who invited and appreciated the help of women. Savitribai Phule along with Mahatma Phule lead an example that if one women is educated then whole family has benefit and importance of education. Thus Sarojini Naidu , Vijaya Laxmi Pandit, Mrs Aruna Asaf Ali and many came forward to liberate women and retain her importance in society. It was during this period liberation of women began in real sense. The example of it is when Mrs Indira Gandhi became the prime minister of India, she became role model all over the world and her work revealed the no women is

inferior to men. Thus women in India began to make their place in field of sports, politics, and various place were male dominated work orientation were scheduled.

With due that effect the Government of India made various provisions to make women get better opportunities. It saw to it the women to be given equal rights along with men. In all forms Government held provision to educate a girl with minimum expenditure and make full use of education for brighter future. Kalpana Chawla set an example to others along with other astronaut like Sunita Williams which

encouraged young girls to put their mind to work on the research in field of science in modern era.

The above point focuses on the positive side but there is still negative phase left. Mental suffering and physical tortures in in laws house of women still is problem of today. Dowry system is not eradicated were husbands demands for money continues to create threat for women. In some part of India in remote area bride burning and bride killing continues to threat the dream of women to stand equal along with men in society. Proper execution of law is required to get back right place for women in society.

The changing phase and the role of women in India could be classified in two periods.

(a) 2500 B.C. - 1500 B.C.

(b) 1500 B.C - 1800 A.D.

2500 B.C. to 1500 B.C. is the age of Vedas and women had freedom within this period. During this period men and women had equivalent status. As great scholars emerged in Vedic dynasty thus resulted in providing women an equal place in society during 2500-1500 B.C.

It was during the Brahmana at about 1500 B. C., followed by sutras and later Epics, next sruties about sruties A.D. 500 to A.D. 18000 downfall of women were witnessed.

Women in India and literature available have many contradictory views and those can be revealed through chronology when history is studied. As India underwent revolutions along with it position of women in India considerably changed. Better revolution lead to liberties and providing women more freedom, whereas few eras depicted deterioration of women. This was due to lack of Knowledge and more of superstition.

Status of women In Early Vedic Period.

Early vedic priod was about 2500 B.C. -1500 B.C. women enjoyed equalities and freedom in vedic period. They carried daily routine and had respected place in society. Looking after children washer prior responsibility. She clean and swept house, cow dungs was used in domestic work. Women decorate the house and served food with hostility which draw the picture that she was work oriented , Not only women carried responsibilities of house but also took active part in agriculture according to vedic samhitas its observed. Women actively carried out craft such as together work. She made her busy by making gur and drawing water. To nourish the diet of family women churned

buttermilk. Women developed keen interest on weaving mats and sewing during vedic age. Making wine and famous by name Indian National Army. Poet name Sarojini Naidu wrote poems which encouraged and made people happy through literature. Sarojini Naidu was first Governor of state, which lead to motivate other women to run the country and serve for nation.

Today Position of Women (21 CENTURY)

After independence women have opportunities and rights to choose women. Women could easily involve in politics, sports, journalism, and media job. Women also could actively have Government jobs and work in administration line.

This century has shown active involvement and excellence of women in field of science and technology.

Various articles and laws which have their provision in constitution of India are as follows, which helps women to be integral part of society.

(Article 42) — State should allow and provide secure justice and human condition of work as well as maternity relief.

(Article 14) — All India Women are equal

(Article 15(1)) — No discrimination by state

Article 39(d) — Equal pay will be given to equal work

(Article 15(3) — Special Provision to be made by state in favour of women and children.

(Article 51(A) — Practise derogatory to the dignity of women.

In pre-independence India, education among women was slow and limited to upper strata of society it tremendously increased in independent India. Surprisingly, the empowerment of women is one of the central issues in the process of development of countries all over the world, not just India. Empowerment of women can help improve women's position in society. Many studies have shown that majority of In 1979-1980 Mathura case lead women to turn activist. Young girl was raped by policeman in police station. The case was held with large protest from women and with help of media, it resulted in Establishing evidence Act, Thus Indian Penal Code and Criminal Procedure Code made the case and categorised. it as rape in custody also known as custodial rape. Thus women activist emerged, many non-governmental organisations were formed. Women also made group which protested alcohol which was the root cause of domestic violence. The protest against alcohol was seen in Himachal pradesh, Andhra Pradesh, Madhyapradesh , Orissa, also some other states .

The law of Shariyat and triple talaq system was also put to highlight. The Muslim women found these laws in appropriate. They raised their voice to convey their message in front of law and jurisdiction.

Another case name Imrana Muslim raped women by her father in law for 10 years. The

All Indian Muslim Personal Law Board punished the accused by pressure of women activist and media. . Muslim law practitioner or few people suggested Imarana to marry her father - in -la which was reason that protest of women and Imarana's decision could punish the accused by law. This was famous case in 2006.

Participation of women in politics have always being faced with problems. Lack of finance , increasing crimes and accused people in surrounds, more male dominant work place, unsafely and lack of security makes women hindrance to take part in politics.

If women is allowed in a political leader, since a seat of male is important than a seat is secured for women to emerge as leader has been drawn back and outlook in the politics.

This scenario changed when 33% reservation to women seats was passed in parliament on 9th march 2010 which guaranteed women's participation and active involvement by 33% reservation seats in the parliament. Rajyasabha had passed the bill which was day International women's Day which was positive change in Indian politics. In politics the today's truth reveals that a women if not married, or not much family responsibilities make it easy to reach top place is her husband is dead or she has no family boundaries.

This background understands change and still. It is revealed that out of 15 M.Ps of women one third have been candidates who had sport of family and could easily pursue her interest in family. But there are more cases where husband is not supportive. The reason is that politics is the public sector and hence she has to reveal and contacts her bosses which are male dominated, steady and slow change have developed opportunities for women to serve the country by entering politics. In villages in 1993 the constitution made provision of 30% of seats reserved for women in panchayat. "The Panchayt Raj" which is worked in village was opened for women and thus women became integrated part of village progress by working in panchayat samiti. She was provided opportunities to solve various problems of women and village by becoming prominent member of panchayat. The constitutional Amendment Act 1992 was to be enforced by all states and union territories where women were given place in panchayat.

There are 29 subjects in panchayat which solves wide range of problems dealing with agriculture, forecasting. The health and education and fisheries, family planning included other subjects which are deal by women when they become integral part of panchayat.

It was 2002 year which witness's 70 women legislature. Total seat were 783 and 6 women were in cabinet which clearly showed excellence of women in Indian politics. Pratibha Tai Patil became the President of India during the tenure 2007-20012 which encouraged other women to become a national figure.

Conclusion

Women empower needs to be taken at all levels governmental ,social , financial and legal .Government must build in legal framework where women get a chance to overcome the shackle they have been bound with for centuries.This is slow process as

years of conditioning of the male mind takes time to change. In this aspect, Governments, legal experts must facilitate this transition for smooth change over to an equal society where women of all castes, regions or religion consider themselves as their male counterparts, India and in deed this world can prosper only then.

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Gender And Higher Educatio

By Alka Naik

Abstract

This paper reviews various literature on gender and higher education. Gender inequality is more prominent in the educational systems than in others.

Studies show that when women are supported and empowered, all of society benefits. Their families are healthier, when children go to school, productivity also improves and income increases. This makes the communities sturdier.

Gender and Higher Education in India

A nation is usually defined by its shared history, culture, language and sometimes religion. To build a nation, therefore one must consider the past to build a common purpose for the future based on today's capabilities.

Education is very important for an individual's success in life. Education provides better teaching skills to the teachers and to the students it helps to prepare physically, mentally and socially for the world of work in later life. Education is the foundation of society which brings economic wealth, social prosperity and political stability. Education is a major aspect of development of any modern society since if there is a deficit of educated people then society will stop its further progress.

Education is the best investment for the people because well educated people have more opportunities to get a job which gives them satisfaction. Educated individuals enjoy respect among their colleagues and they can effectively contribute to the development of their country and society by inventing new devices and discoveries. Education in society prepares youngsters for adulthood so that they may form the next generation of leaders. It will yield strong families and strong communities.

Education is an important aspect of the work of society and it will raise the countryside issues and promote knowledge and understanding. To enable people to understand themselves and be equipped to understand their cultural identity.

A person who gets good education, can become a wise producer, dependable worker, a strong consumer and a better citizen because with education a man becomes a right thinker and a correct decision maker. Right education makes a human being a thorough individual.

“Thus education is the backbone of every individual's life”.

Higher Education is a major motorist of the worldwide knowledge-based economy, since economic competitiveness depends on the quality of human resources. It plays a key role in shaping society and building active citizens. The gender inequalities are interrelated with other strands of discrimination. This results in a multiple based discrimination and requires strategies to fight the existing exclusion. It is necessary that all participants of the higher education process are aware of structural discrimination in the society and are able to recognize this discrimination within their own behaviour.

Gender refers to the socially constructed attributes of being female or male, or of femininity and masculinity. Society has different concepts of a female and male gender, which influences the perception of how a person should behave and act. These concepts build up an ideology, which is reflected in regulations and structure in four spheres of life: (i) the family and household, (ii) the market, (iii) the community and (iv) the state.

“Gender tends not be value neutral.” “Gender involves differences in power, both power to and power over”.

Women bear almost all responsibility for meeting basic needs of the family, yet are systematically denied the resources, information and freedom of action they need to fulfil this responsibility. By improving educational opportunities for girls and women, it is possible to create an affirmative impact on some major issues, such as, Population control, Removal of HIV and AIDS, Harmony in the society, Better Health and Hygiene, Improvement in Productivity etc.

The current world food price crisis is having a severe impact on women. Around the world, millions of people eat two or three times a day, but a significant percentage of women eat only once. And now, many women are denying themselves even that one meal to ensure that their children are fed. These women are already suffering the effects of even more severe malnutrition, which inevitably will be their children's fate as well. The impact of this crisis will be with us for many years.

Studies show that when women are supported and empowered, the entire society benefits. Their families are healthier, more children go to school, agricultural productivity improves and incomes increase. In short, communities become more resilient.

Today's situation in Higher Education is shows unequal participation of women and men in the different stages of the higher education career.

The distribution of power and financial means is not the same for women and men as well as the personal benefits that result out of the education. This is a direct result of the biased situation in society, which is has a lot of benefits reserved for men, but also due to the old structures and the atmosphere within the institutions of higher education.

The higher education sector is also influenced by the existing gender categories and stereotypes of the society. The power division of society between men and women is reflected in education also.

The choice of subjects in higher education depends on the gender of the students. Even though the number of female graduates in mathematics, science and technology has slightly increased during the last few years, mostly men enrol in such subjects. And more than 80% of the women students are in “education” and “health & welfare”.

Generally women do not have access to higher positions in the same manner as men and therefore also have less access to money and powerful jobs this is also one of the cause for not opting for higher education.

Gender discrimination is found in all levels of higher education. It is different at the different levels. This affects both men and women and has a negative impact on a lot of individuals. Mostly the stereotypes are to the benefit of the men. Therefore higher education has a high impact on the future of a society, because research and development is a product of it. So special attention should be given to measures that overcome gender based discrimination.

Access to Higher Education:

The issue of accessibility to quality higher education is mainly due to the vast economic and social disparities, cultural and linguistic diversities, and extremely uneven opportunities of learning at the school level. Therefore, the question of access to higher education needs to be studied at the local, regional, national and international levels from transdisciplinary, inter-disciplinary and discipline-specific perspective. This necessitates to open Centres/Schools for promoting multi-disciplinary teaching and research.

Gender Differences

- ❖ Several social, economic and political reasons act as constraints to access and equity in higher education in India. Poverty leads to high drop- out rates even at primary, middle and secondary school levels. Lower status of women, lack of easy access, lack of implementation of existing programmes, inadequate utilization of resources, absence of political will and inadequacies in coordinated actions across all equity fronts within institutions seem to be the other reasons.

Duration and mobility within the institution

Students in higher education institutions are very much dependent on the lecturers and teachers as they judge on the work done by the students through exams and grades. Those decisions shape the future of students very much.

Horizontal mobility has a strong gender specific aspect. While looking at the mobile students, a lot of countries have a bigger participation of female students abroad. This is also due to the gender specific choice of subjects that lead women more into subjects that are usually more mobile, such as language, social sciences and cultural science. But on the other hand, the access to mobility is more restricted for female students in other parts of the world. In some countries, women are even not allowed to study or they face huge discrimination.

Women should be encouraged to apply for research or professor positions within higher education. One way of reaching this goal would be to introduce temporary gender quotas for specific positions, in order to create gender-parity. To overcome the continuing horizontal and perpendicular discrimination it is vital for the evolving of higher education that women and men are given the opportunity to engage and be successful in every field of study and every discipline.

Professional education of teachers and professors must include gender awareness trainings to avoid unfair treatment of students based on gender. The possibility for unequal treatment and judgment arises at the time of examination. Institutions must confirm that their examination procedures are transparent and all the students are treated equally.

Teachers also play an important role as role models for students to take a scientific job or to proceed in the academic career. The aim of every institution must be reaching an equal relation between women and men in higher positions of the university to provide role models apart from the typical subject and job division. Thus, this also has to be a substantial aspect for the selection of experts, if they are included in the curricula.

Women face disadvantages in subjects that focus on these countries and regions, when mobility becomes a key issue for the future job. Institutions need to confirm that institutional co-operation's are equally open for all students and that the support and counselling of the institution is supporting students in countries where even no legal equality is given.

A consistent **financial support** is needed for the additional expenses students with children have to pay. But childcare is not only a financial problem for students but also a problem of time and availability. Childcare has to be available for students' children during the time of classes. Flexible curricula are needed for parenting students to combine the unpredictability of childcare with their studies. Only good study conditions for student parents enable an equal division of the childcare between women and men.

Gender knowledge in education and research

Gender specific knowledge cannot be outsourced in specific lectures on "gender" but has to be integrated into the average courses and seminars. The definition of employability must include awareness regarding gender stereotypes and gender based discrimination. When courses include soft skills, gender knowledge has to be a part of those competences.

Recommendations

- ❖ "The most important and urgent reform needed in education is to transform it, to endeavour to relate it to the life, needs and aspirations of the people and thereby make it the powerful instrument of social, economic and cultural transformation necessary for the realization of the national goals. For this purpose, education should be developed so as to increase productivity, achieve social and national integration, accelerate the process of modernization and cultivate social, moral and spiritual values."

- ❖ The quality and standard of Indian higher education institutions must be enriched passionately and should be taken at high level through revolution, inspiration, imagination and regular monitoring. Though it is very difficult, is absolutely necessary to compete in the global economy. It is rightly said,
- ❖ ***“Internationalisation is changing the world of higher education, and globalisation is changing the world of internationalisation.” (Jane Knight)***

The new challenge before the country today is to become an advanced society by the year 2020, which requires that not only a vibrant economy driven by knowledge, but also a new society where justice and human values prevail has to be created.
- ❖ **Economics of Higher Education:**
Suggetions as solution to the problem of higer education in India-
- ❖ Widening the access to higher education system through effective innovative measures, such as a truly open system and networking of Universities.
- ❖ Universities need to diversify sources of income. Research contracts, consultancy, knowledge tranfer and fund raising.
- ❖ Compete and Collaborate nationally and internationally with other universities for funds.
- ❖ Compete for brains.
- ❖ Comprehensive reform of higher education is needed.
- ❖ Making institutions more responsible and more responsive .
- ❖ Geographical and gender disparities must be kept in mind by policy makers in planning and implementing the higher education system.
- ❖ Quality higher education at reasonable cost.
- ❖ Quick access to information.
- ❖ Direct partnership of industries with educational institutions for educational development.
- ❖ Certain portion of the profit must be diverted for education by all industries.
- ❖ Permit Dual degree programme.
- ❖ Appeal and taxing the individuals, who had the government, help in the past for their education and the industries.
- ❖ Monitor and control Private Universities.
- ❖ Higher Education to be developed as groundwork for social and economic growth of the Country.
- ❖ Student’s involvement should be encouraged.
- ❖ Political interference in the University must be totally stopped.
- ❖ Working facilities, Workload, Status and Pay of Teachers should be as per the international norms.

- ❖ Teachers should be encouraged and supported to attend various Conferences, Seminars, Workshops to update their knowledge .
- ❖ Setting up and maintain better contacts with alumni to evaluate teaching methodologies.
- ❖ Vocational education for Degree programmes.
- ❖ Educational loan system at all levels.
- ❖ Introducing 'earn while you learn' scheme for needy students.
- ❖ Well-equipped libraries.
- ❖ Colleges to assess local needs and frame their own syllabi/courses flexibly.
- ❖ Integration of physical education, sports, and yoga, meditation and recreation activities in the higher education system for the overall good of the younger generation is necessary. So the subjects like Health Management, Fitness Management and Sports Marketing must be included as subjects for specialisation.
- ❖ Due recognition should be given to the role of Open and Distance Learning Education.
- ❖ Proper orientation on assessment methods should be given to all the teachers.
- ❖ All the examination processes should be computerized to make the process automated and efficient.
- ❖ Along with the necessary and inevitable quantitative expansion of higher education, it is equally important to improve the quality of higher education f quality upgradation of Colleges and universities.
- ❖ Optimal use of audio-visual technologies and Internet.
- ❖ Active participation of students, teachers and users of services should be involved in framing the curriculum.
- ❖ Raising of student fees to some extent, in consultation with student bodies and Parent's organizations.
- ❖ Charging capitation fees and obtaining donations.
- ❖ Launching rewarding and specific courses for foreign students.
- ❖ Promoting income tax inducement for obtaining donations..
- ❖ Reorientation of educational programmes.
- ❖ Linking education with employment.
- ❖ Launching industry linked human resource development programmes.
- ❖ Better allocation/utilization of the resources already available.
- ❖ Reorganization of the educational system in the country in line with the changes.
- ❖ Innovative educational programmes and products, having high potential for raising resources must be developed.

- ❖ Avoid wastage and minimizing underutilization of facilities.
- ❖ Promotion of publication activities and printing College/University stationery.
- ❖ Encouraging taking up national/international and Government funded R&D projects.
- ❖ Using marketing strategies to attract funded projects from industry and other sources.
- ❖ Encouraging knowledge – based consultancy services at the institutions.
- ❖ Introducing loan schemes for students.
- ❖ Providing a rational student-teacher ratio.
- ❖ Setting up cost effective institutions, e.g., Open-Universities, Community Colleges;
- ❖ Taking up productive assignments from the Government.
- ❖ Encouraging a policy of rewarding merit in the institutions.
- ❖ Implementing a differential fee structure for different courses.
- ❖ Providing pay-and-use internet connection in campus.
- ❖ Encouraging donations by large companies.
- ❖ Introducing ‘earn while you learn’ scheme for needy students.
- ❖ Locally relevant higher educations to be imparted through vocational courses.
- ❖ Introducing a scheme for rewards/punishments to ensure accountability work.
- ❖ Undergraduate students should take up industry-related projects and come out with practical solutions.
- ❖ Experts from industries should be invited for special lectures and curriculum development.
- ❖ Introducing entrepreneurship development programmes for students;

Conclusions:

Today Indian student needs to develop a multifaceted personality to deal with the rapid changes in the world. This demands for the development of body, mind and spirit, through the educational processes in the institutions of higher education. Health consciousness and physical fitness for a healthy body should be an essential part of the university culture.

But, a healthy body alone cannot be attained and maintained without a healthy mind. Therefore, value education becomes a desirable moral necessity for meeting the challenges of the present World. Professional competence is of little value if professional ethics are forgotten. Similarly, brilliance is of no use if it is employed for anti-social activities.

In order to achieve all these ends effectively one has to see that the processes of education are properly regulated in terms of assessment and evaluation of learning. A close interaction between the teachers and the students in the evaluation of the progress of learning is desirable, so that teaching-learning process will not become artificial. The combination of physical

education, sports, yoga and recreation activities in the higher education system is very well desired for the overall good of the younger generation. The goal of Open University is to carry Higher, Technical and Vocational education to the home of a common man. It aims to bring education to the doorsteps of the needy. And there are large numbers of people who strive for education. The families below subsistence level do not send their children to school, many dropouts due to failure or bad habits, sometimes for survival of family etc. These people can improve their educational qualification anytime in future if they desire to.

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Medical Malpractice- An Ethical Analysis

By Asha Sundaram

By Prof. (Dr.) Smita Karve

The integration of two conspicuous professions, law and medicine is a subject of towering current concern and pertinence. Earlier there were many divergences and

disagreements, between facts and assertions of these two subjects. Recently a multi-layered interrelationship developed than differences between these two imperial pursuits. The lawyers, judges, medical professionals and the public find themselves struggling to address the novel defiances that medical law actualizes.

This category of law has emanated from being a field that was nearly fully concerned with medicine and drugs to now enclose the medical ethics, civil, contractual and criminal liability, and also to health care management and delivery through a world wide maneuver toward human rights in health. New advancements in medical proceedings and research are common as headlines. Medical law embraces countless of society's most hotly contested affairs.

A patient foresees medical treatment with all the insight and competence that the doctor possesses to bring remedy to his malady. In no case a doctor can fully convince, total elixir and relief. The doctor is presumed to exercise such circumspect concern and standard as taken by an ordinary doctor. In a medical negligence case tried in 1838 Tindal C.J. opined "Every person who enters into a erudite profession undertakes to bring to the exercise of it a reasonable degree of care and proficiency. He does not undertake, if he is an attorney, that at all events you shall gain your case, nor does a surgeon undertake that he will perform a cure; nor does he undertake to use the highest attainable degree of care³." There is a contractual fiduciary relationship between patient and the doctor.

The role of doctors in torment and torture, the question during Nuremberg trial is again a source of controversy. Recently the girl who died while vacationing in India was admitted in a hospital for an ailment was missing her internal organs when her body was returned to Britain, according to her parents who fear she may have been the victim of the illegal trade in human body parts. Evidence speaks that the said condition results from some malpractices done by the doctors during the treatment. Such simplified and pragmatic application of the notion of *res ipsa loquitur*, as a part of the general mode of inferring a fact in issue from another circumstantial fact, is subject to certain principles: Firstly, all the circumstances, including the objective circumstances constituting the accident, from which the inference of guilt is to be drawn, must be firmly established. Secondly, those circumstances must be of a determinative tendency pointing unerringly towards the guilt of the accused. Thirdly, the

circumstances should make a chain so complete that they cannot reasonably raise any other hypothesis save that of the accused's guilt. That is to say, they should be incompatible with his innocence, and inferentially exclude all reasonable doubt about his guilt⁴.

Sarabjit Singh's case was also one which is against all standard medical ethics and procedure. The vital body parts like heart, kidney and stomach were missing when Sarabjit Singh's body was received. A doctor owes certain duties to his patient and a breach of any of these duties gives a cause of action for negligence against the doctor. These types of conducts by the doctors may attract not only an action for negligence but also criminal liability. For fixing criminal liability for medical malpractices very high degree of gross recklessness is required to be proved and not negligence. We believe life is God given and doctors help in preserving life who, figures in the scheme of God as he stands to carry out his command. It is very difficult to comprehend when a person who is in a fiduciary relationship commits torture.

There are many recent instances of torture and malpractices done by doctors. Stents, the scaffolding devices inserted into blood vessels to keep them open, are used if the patient has more than 70% block of an artery. But many doctors confide that stents are used even when the block is less than 30%. This not only inflates the bill, but increases the risk of a heart attack, according to cardiologists. Lured by freebies and kickbacks from stent manufacturers, an increasing number of doctors are using the device even on heart patients who don't need them. Dr Sai Satish, an interventional cardiologist at Apollo Hospitals, calls the trend "criminal." So blatant became this practice that in Hyderabad, eminent cardiologist Dr D Seshagiri Rao, head, department of cardiology, Nizam's Institute of Medicine (Nims), was caught red-handed Jan 30, 2013, while accepting a bribe of Rs 1.6 lakh from a stent supplier⁵. These incidents involve a contribution from more than one person. The tendency to blame the last identifiable element in the claim of causation – the person holding the 'smoking gun' is natural. A more comprehensive approach would identify the relative contributions of the other failures in the system, including failures in the conduct of all members involved in medical field⁶.

The hospital is in a better position to disclose what care was taken or what medicine was administered to the patient. It is the duty of the hospital to satisfy that there was no lack of care or diligence. The people expect better and efficient service when approaching hospitals. If the hospital fails to discharge their duties through their doctors, it is the hospital which has to justify the negligence of the doctors. Impleading a particular doctor may not absolve the hospital of its responsibilities⁷.

Tackling medical expenses is a major problem faced by many Indians. Health economists have pointed out that only 15 % of the Rs 1500 billion spent in the health sector in India comes from the government. 4% comes from social insurance and 1% from private insurance companies. The remaining percentage is spending by the individuals using private services and without insurance⁸. Although traveling abroad to receive medical treatment dates back

to ancient Greece, the emerging world of medical tourism has garnered public attention as one that must be tapped into by successful travel agents. These days it seems like every country in the world promotes itself as a haven for medical tourism. The reality is that in most cases they offer sub-standard facilities and limited skills/qualifications. This lower cost includes significantly longer post-operative care in the hospital itself. The costs are usually a lot lower than even the deductible most insurance companies levy on a patient. While wealthy foreign patients have traditionally come to the US for perceived higher quality treatment or procedures and technology, patients from the U.S. are increasingly traveling to Mexico, India, and China for cheaper treatment. Popular cross-border services include cardiac surgery, hip and knee replacement, cosmetic surgery, and stem cell therapy. A standard knee replacement, which costs an average of \$45,000 in the U.S., can be performed for \$6,500-\$13,000 in India.

Rapid developments in the medical field in the last century have revolutionized the field of medical practice. It is now possible to diagnose diseases faster and more accurately using advanced diagnostic techniques. Medical management has become more effective with refined medications having more specific actions and fewer side effects. Surgical treatment has moved towards less invasive modes of management with lesser morbidity and faster recovery. Among all these developments, the medical profession in India is at crossroads facing many ethical and legal challenges in the practice of the profession. The medical fraternity is becoming more and more dependent on technology and market forces tend to influence decision making by the doctors. The fundamental values of medicine insist that the doctor's obligation is to keep the patient's interest above everything else.

A physician may stick on to their moral values obligations and duties when facing an ethical problem, because upholding one's duty is ethically correct according to Kantian duty-based deontological theory. Bentham's utilitarian principle provides a choice to the physicians to consider that an action which brings greatest benefit to the most people is the choice that is ethically correct. The Aristotelian virtue ethical theory judges a person by his character rather than by an action that may deviate from his normal behavior. It takes the person's morals, reputation and motivation into account when rating an unusual and irregular behavior to consider as unethical⁹. The important issues of autonomy, confidentiality, justice, beneficence, and non maleficence are key factors that guide the doctors for daily decision making¹⁰.

Ethics is an intellectual approach to moral issues, a philosophical framework which critically evaluates the choices and actions people take to deal with various aspects of daily living¹¹. Health care workers are constantly faced with ethical dilemmas on an individual as well as a societal level. Ethics is a term very far from reality. There are many standards and principles that provide a firm basis to the ethical concerns. This paper intends to discuss certain moral, ethical and legal issues and questions which arise in relation to 'treatments' of disease, through analyzing case laws.

The principle of justice

The principle of justice assumes impartiality and equality. It means that a clinician will treat all clients equally and give everyone their due portion of services. This principle applies to the individual client as well as on the larger societal level. Common to the human nature, it is not really possible to treat everyone justifiably and equally? It may not be honestly said that a clinician does not have “favorite” clients? There are certain clients with whom a physician wants to limit contact and with some they really want to extend their relations. While it is normal to have bias, it is important to know when and how it affects one’s ability to practice within the principle of justice, so that no client is discriminated against or denied access to treatment that other clients have. This requires an understanding of one’s conscious and unconscious reactions to what the client may present in treatment. It also requires knowing when to ask for consultation with a supervisor, so that personal issues do not stand in the way of working with clients.

The principle of autonomy

The principle of autonomy yet another ethical standard helps individuals to have the right to decide how to live their own lives, as long as their actions do not interfere with the welfare of others. A physician plays a key role in determining if the client is competent to make his own decisions. *The consent which a patient gives after understanding the pros and cons of the treatment which the doctor is going to conduct, which is known as informed consent principle, follows from the principle of patient autonomy. Autonomy principle also protects the doctor from unnecessary interference*¹².

Isaiah Berlin describes autonomy as follows: “I wish my life and decisions to depend on myself, not on external forces of whatever kind. I wish to be the instrument of my own, not of other men’s acts of will. I wish to be a subject, not an object; to be moved by reasons, by conscious purposes, which are my own, not by causes which affect me, as it were, from outside. I wish to be somebody, not nobody: a doer—deciding, not being decided for, self-directed and not acted upon by external nature or by other men as if I were a thing or an animal, or a slave. I wish, above all, to be conscious of myself as a thinking, willing, active being, bearing responsibility for my choices and able to explain them by reference to my own ideas and purposes”¹³. This principle respects the unconditional worth of the individual and promotes the concepts of self-governance, self-determination, and self-rule. These rights can be exercised much effectively with the help of a doctor as he can understand better whether or not the client has the information needed to make a personal choice.

The principle of beneficence

The principle of beneficence another ethical principle assumes a responsibility on the physician to improve and enhance the welfare of patients, or to “do good” for others. The fiduciary relationship of a doctor with a pregnant woman extends to her fetus. A physician who has a doctor-patient relationship with a pregnant woman who intends to carry her fetus

to term and deliver a healthy baby also has a doctor-patient relationship with the fetus. As a matter of law, a pregnant woman is entitled to be informed if medical test results reveal that she has a communicable disease that can be transmitted to her baby during labor and delivery. That's what in essence principle of beneficence or doing good really means. If material facts or risk involved, which forms vital for the treatment are not disclosed it may result in negligence. Negligence is the breach of a duty caused by the omission to do something which a reasonable man, guided by those considerations which ordinarily regulate the conduct of human affairs would do, or doing something which a prudent and reasonable man would not do¹⁴

Law of Torts, Ratanlal & Dhirajlal Twenty-fourth Edition 2002, at p.441-442

“The decision what degree of disclosure of risks is best calculated to assist a particular patient to make a rational choice as to whether or not to undergo a particular treatment must primarily be a matter of clinical judgment. An issue whether non-disclosure of a particular risk or cluster of risks in a particular case should be condemned as a breach of the doctor's duty of care is an issue to be decided primarily on the basis of expert medical evidence. In the event of a conflict of evidence the judge will have to decide whether a responsible body of medical opinion would have approved of non-disclosure in the case before him. A judge might in certain circumstances come to the conclusion that disclosure of a particular risk was so obviously necessary to an informed choice on the part of the patient that no reasonably prudent medical man would fail to make it, even in a case where no expert witness in the relevant medical field condemned the non-disclosure as being in conflict with accepted and responsible medical practice¹⁵.”

Negligence is never presumed and may not be inferred merely from a lack of success or an adverse result from treatment. The plaintiff in a medical malpractice case bears the burden of showing not only the defendant's negligence, but that the negligence caused the plaintiff's injury. In order to recover damages in a medical malpractice case, a plaintiff is required to prove the following elements: (1) The defendant owed plaintiff a duty of care and was required to meet or exceed a certain standard of care to protect plaintiff from injury; (2) the defendant breached this duty or deviated from the applicable standard of care; and (3) plaintiff was injured and that injury proximately resulted from the defendant's breach of the standard of care. The standard of medical or hospital care that is to be applied in any given case is not a rule of law, but a matter to be established by the testimony of competent medical experts¹⁶. The doctor must take the patient's point of view and cultural context into account before determining what “doing good” truly means. Something good in the eyes of the doctor may be seen as doing harm in the eyes of the patient. The doctor needs to consider whether the proposed treatment is for the benefit of the patient or for his own agenda.

The Principle of nonmaleficence

Similar to beneficence, nonmaleficence another ethical principle means “to do no harm” has been highlighted when discussing patient exploitation of any form. The principle of fidelity an ethical requirement requires telling the truth and keeping promises. Fidelity is a fairly simple concept that can be violated easily. William Frankena has outlined several ways of expressing beneficence & nonmaleficence. In theory this principle is simple; one ought always to do good and never to do harm. They are different in that beneficence requires positive action while the principle of nonmaleficence usually involves omissions. These ideas, which are listed in descending order of priority. One ought not to inflict evil or harm, One ought to prevent evil or harm, One ought to remove evil or harm, and One ought to do or promote good. The principles of beneficence and nonmaleficence are based in the relationships with others; the more tightly we are in relationship, the greater the demands of these principles. Nonmaleficence is owed to all. This is the bedrock of morality¹⁷.

The duty to treat

The duty to treat a patient in need is an ethical requirement. A patient approaching a doctor expects medical treatment with all the knowledge and skill that the doctor possesses to bring relief to his medical problem. The relationship takes the shape of a contract retaining the essential elements of tort. “The classical formulation of the claim in this sort of case as ‘damages for negligence and breach of professional duty’ tends to be a mesmeric phrase. It concentrates attention on the implied obligation to devote to the client’s business that reasonable care and skill as if that obligation were not only a compendious, but also an exhaustive, definition of all the duties assumed under the contract created by the retainer and its acceptance. But, of course, it is not. A contract gives rise to a complex of rights and duties of which the duty to exercise reasonable care and skill is but one¹⁸”

Oliver J. observed:

Midland Bank Trust Co. v Hett, Stubbs and Kemp

[1979] Ch. 384 at 434.

.” A doctor owes certain duties to his patient and a breach of any of these duties gives a cause of action for negligence against the doctor.

When a doctor is consulted by a patient, the doctor owes to his patient certain duties which are: (a) duty of care in deciding whether to undertake the case, (b) duty of care in deciding what treatment to give, and (c) duty of care in the administration of that treatment. A breach of any of the above duties may give a cause of action for negligence and the patient may on that basis recover damages from his doctor. Negligence has many manifestations – it may be active negligence, collateral negligence, comparative negligence, concurrent negligence, continued negligence, criminal negligence, gross negligence, hazardous negligence, active and passive negligence, willful or reckless negligence, or negligence per se¹⁹. Negligence means “either subjectively a careless state of mind, or objectively careless conduct. It is not an absolute term but is a relative one; is rather a

comparative term. In determining whether negligence exist in a particular case, all the attending and surrounding facts and circumstance have to be taken into account²⁰.”

The jurisprudential concept of negligence differs in civil and criminal law. To prosecute a medical professional for negligence under criminal law it must be shown that the accused did something or failed to do something which in the given facts and circumstances no medical professional in his ordinary senses and prudence would have done or failed to do. What may be negligence in civil law may not necessarily be negligence in criminal law because of the lack of intention. For negligence to amount to an offence the element of mens rea must be shown to exist consisting of desire, knowledge and the aspect of forceability with certainty towards the consequences. For an act to amount to criminal negligence, the degree of negligence should be of much high degree. A negligence which is not of such a high degree may provide a ground for action in civil law but cannot form the basis for prosecution²¹.

“The test as to whether there has been negligent or not in situations which involves the use of some special skill or competence, is not the test of the man on the top of a Clapham omnibus, because he has not got this special skill. The test is the standard of the ordinary skilled man exercising and profession to have that special skill. A man need not possess the highest expert skill. It is well-established law that it is sufficient if he exercises the ordinary skill of an ordinary competent man exercising that particular art.²²”

Gross medical mistake will always result in a finding of negligence. Use of wrong drug or wrong gas during the course of anaesthetic will frequently lead to the imposition of liability and in some situations even the principle of res ipsa loquitur can be applied. Even delegation of responsibility to another may amount to negligence in certain circumstances. A consultant could be negligent where he delegates the responsibility to his junior with the knowledge that the junior was incapable of performing of his duties properly²³.

A doctor cannot be held negligent in following one of the existing medical opinions, even if the opinion is in minority. But this minority opinion must be acceptable to the science of medicine. There are certain parameters of the standard of care that is expected from a doctor by law. In India, all aspects of medical practice are governed by Bolams Law or Bolams Test. Knowing the standard of care that law expects from every doctor can help in perfecting practice that will be acceptable in law²⁴. Michael Jones is of the opinion that, inherent danger in Bolam test is that if the Courts defer too readily to expert evidence medical standards would obviously decline. The Bolam test may be restricted to those cases where an adverse result follows a course of treatment which has been intentional and has been shown to benefit other patients previously. This may not be extended to certain types of medical accident merely on the basis of how common they are. Relaying more on this principle may put doctors on the slippery slope of excusing carelessness when it happens often enough²⁵.

A judge before accepting a body of opinion relating to a medical negligence case as being responsible, reasonable and respectable, may need to be satisfied that, in forming their views, the experts have directed their minds to the question of comparative risks and benefits and have reached a defensible conclusion on the matter²⁶. Many scholars are of the opinion that, bolam test is inconsistent with the right to life unless the domestic courts construe that the requirement to take reasonable care is equivalent with the requirement of making adequate provision for medical care²⁷.

The doctor, in private and government hospitals, has 'total, absolute and paramount.' duty to attend emergency patients. Even though a doctor has an absolute duty they cannot be unnecessarily harassed in courts when they appear as witnesses in medico-legal cases. Doctors may not be unnecessarily summoned to give evidence. Doctors may be given preference in court and it is not proper to keep them waiting. Unnecessary harassment of adjournments or cross-examination may be avoided²⁸.

If the patient was admitted in a particular hospital and evidence is produced to satisfy that he died because of lack of proper care and negligence, then the burden lies on the hospital to justify that there was no negligence on the part of the treating doctor or hospital. The hospital is in a better position to disclose what care was taken or what medicine was administered to the patient. It is the duty of the hospital to satisfy that there was no lack of care or diligence. The hospitals are institutions, people expect better and efficient service, if the hospital fails to discharge their duties through their doctors, being employed on job basis or employed on contract basis, it is the hospital which has to justify and not impleading a particular doctor will not absolve the hospital of its responsibilities²⁹.

Professionals may have to take on an advocacy role within their community to educate and campaign for care. There are many situations in which doctors act against accepted ethical standards. It may not be easy to find a dentist willing to work with an HIV-infected patient, a situation against the duty of a doctor to treat the patients. In addition, it is important for doctors to remember that when taking the ethically or morally correct action in a duty-to-treat situation they do not inadvertently create situations where they themselves may be held legally culpable. Awareness of those circumstances which creates legal culpabilities when taking the ethically or moral action in a duty-to-warn situation is essential.

Through its judgments Indian judiciary has given much protection to doctors. As a result the police will not proceed against a doctor accused of medical negligence without obtaining a suitable medical opinion preferably from a doctor in government service. The criminal courts also will have to follow the exercise of getting a medical opinion before entertaining a private complaint against a doctor. The police cannot arrest a doctor accused of negligence in a routine manner³⁰.

The law, like medicine, is an inexact science. "When applying the situation of the doctor to the employment of a professional man, the law does not usually imply a warranty that he will achieve the desired result, but only a term that he will use reasonable care and

skill. The surgeon does not warrant that he will cure the patient. Nor does the solicitor warrant that he will win the case. But when a dentist agrees to make a set of false teeth for a patient, there is an implied warranty that they will fit his gums³¹. "One cannot predict with certainty an outcome of many cases. It depends on the particular facts and circumstances of the case, and also the personal notions of the Judge concerned who is hearing the case.

Two principles have to be kept in mind while dealing with medico- legal cases: (1) Judges are not experts in medical science, rather they are lay men. This it self often makes it somewhat difficult for them to decide cases relating to medical negligence. Moreover, Judges have usually to rely on testimonies of other doctors which may not necessarily in all cases be objective, since like in all professions and services, doctors too sometimes have a tendency to support their own colleagues who are charged with medical negligence. The testimony may also be difficult to understand, particularly in complicated medical matters, for a layman in medical matters like a Judge; and (2) A balance has to be struck in such cases. While doctors who cause death or agony due to medical negligence should certainly be penalized, it must also be remembered that like all professionals doctors too can make errors of judgment but if they are punished for this no doctor can practice his vocation with equanimity. Indiscriminate proceedings and decisions against doctors are counter productive and serve society no good. They inhibit the free exercise of judgment by a professional in a particular situation³². Too much suspicion about the negligence of attending doctors and frequent interference by courts would be a very dangerous proposition as it would prevent doctors from taking decisions which could result in complications and in this situation the patient would be the ultimate sufferer³³.

Even under the law of tort a medical practitioner can only be held liable in respect of an erroneous diagnosis if his error is so palpably wrong as to prove by itself that it was negligently arrived at or it was the product of absence of reasonable skill and care on his part regard being held to the ordinary level of skill in the profession. For fastening criminal liability very high degree of such negligence is required to be proved. Death is the ultimate result of all serious ailments and the doctors are there to save the victims from such ailments. Experience and expertise of a doctor are utilized for the recovery. But it is not expected that in case of all ailments the doctor can give guarantee of cure³⁴.

If doctors were frequently called upon to answer charges having criminal and civil consequences, it would frustrate and render ineffective the functioning of the medical profession as a whole and if the medical profession was hemmed by threat of action, criminal and civil, the consequence will be a loss to the patients and no doctor would take a risk, a justifiable risk in the circumstances of a given case, and try to save his patient from a complicated disease or in the face of an unexpected problem that confronts him during the treatment or the surgery³⁵.

The doctor has a duty to obtain prior informed consent from the patient before carrying out diagnostic tests and therapeutic management. In cases in which the patients are competent

adult, there was no question of someone else giving consent on their behalf. The consent given for diagnostic and operative laparoscopy and “laporotomy if needed” does not amount to consent for a total hysterectomy. Situations of temporarily unconscious under anesthesia, is not emergency. It is appropriate to wait until the patient regained consciousness and gives proper consent. The question of taking the patient’s mother’s consent does not arise in the absence of emergency. Consent given by her mother is not a valid or real consent. The failure to obtain consent for removal of the reproductive organs as performance of surgery without taking consent amounts to an unauthorized invasion and interference³⁶. Lord Goff observed, The additional or further treatment which can be given (outside the consented procedure) should be confined to only such treatment as is necessary to meet the emergency, and as such needs to be carried out at once and before the patient is likely to be in a position to make a decision for himself. Cases in which the surgeon performs an operation without his consent on a patient temporarily rendered unconscious the doctor may do no more than is reasonably required, in the best interests of the patient, before he recovers consciousness³⁷.

The services of the doctors are covered under the provisions of the Consumer Protection Act, 1986 and a patient can seek redressal of grievances from the Consumer Courts^{38,39}

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and

Shobha Pandit

Medical negligence: Coverage of the profession, duties, ethics, case law, and enlightened defense - A legal perspective Indian J Urol. 2009 Jul-Sep; 25(3): 372–378. Corporate Advocates, D- 29, 5th Floor, Mantri Kishore Park, Bhosale Nagar, Pune 411 007, India whenever a complaint is received against a doctor or hospital by the Consumer Forum (whether District, State or national) or by the Criminal Court then before issuing notice to the doctor or hospital against whom the complaint was made the Consumer Forum or Criminal Court should first refer the matter to a competent doctor or committee of doctors, specialized in the field relating to which the medical negligence is attributed, and only after that doctor or committee reports that there is a prima facie case of medical negligence notice may be issued to the concerned doctor/hospital. This is necessary to avoid harassment to doctors who may not be ultimately found to be negligent³⁹.

One of the main objects of the Consumer Protection Act, 1986 is to provide speedy and simple redressal to consumer disputes and for that a quasi-judicial machinery is sought to be set up at the district, State and Central level. These quasi-judicial bodies are required to observe the principles of natural justice and have been empowered to give relief of a specific nature and to award, wherever appropriate, compensation to consumers. Penalties for non-compliance with the orders given by the quasi-judicial bodies have also been provided. Prior to the Act, consumers were required to approach the civil court for securing justice for the wrong done to them and it is a known fact that decision in a suit takes years. Under the

Act, consumers are provided with an alternative, efficacious and speedy remedy. As such, the Consumer Forum is an alternative forum established under the Act to discharge the functions of a civil court. Therefore, delay in disposal of the complaint would not be a ground for rejecting the complaint and directing the complainant to approach the civil court⁴⁰.

In the case of the Indian Medical Association vs. V.P. Shanta and Ors, Supreme Court finally decided on the issue of coverage of medical profession within the ambit of the Consumer Protection Act, 1986 so that all ambiguity on the subject was cleared. With this epoch making decision, doctors and hospitals became aware of the fact that as long as they have paid patients, all patients are consumers even if treatment is given free of charge. While the above mentioned apex court decision recognizes that a small percentage of patients may not respond to treatment, medical literature speaks of such failures despite all the proper care and proper treatment given by doctors and hospitals⁴¹.

Confidentiality

The number of individuals asking about the procedure and the nature of the treatment through which they have to undergo is increasing and at the same time they want confidentiality to those information which they provide. The concept of confidentiality is the connecting factor between the doctor and the patient in their fiduciary relationship which forms the cornerstone of a therapeutic procedure. Ethically the doctor is responsible to the provider to be honest with the client about what data need to be reported to funding sources such as insurance companies, and to other individuals.

A physician, who orders an HIV test for a patient, has a duty to take reasonable measures to notify that patient the results of the test. This duty is made even more paramount when the test results indicate that the patient is positive for HIV, because: such a patient may be in immediate need of medical treatment; and from a public health perspective, such patient must also be advised on how to prevent the transmission of the virus to others. A doctor who violates this duty becomes civilly liable to not only the patient, but to all reasonably foreseeable individuals who contract the virus from the HIV positive patient. Hospital and doctor have duty to third party to inform patient of positive HIV test⁴².

In order to move to a more rational level of decision making, the doctor has to first identify the clinical, legal, cultural, ethical and policy issues for making an ethical decision. After identifying these factors he may review what principles are at stake. After identifying the possible options and reviewing pros and cons of each option the doctor may act accordingly. The doctor may also evaluate the outcomes of his decision⁴³.

When an ethical argument emanates, analyzing the concern is the first step. There may be therapeutic exigencies to be solved. It is important to evaluate how does the ethical difficulty relate to the problem which the patient is facing presently. It is valuable to delineate the actual problems of ailment so that appropriate data may not be missed. There may be pertinent legal issues to acknowledge and solve. States have a duty under national as well as international human rights law to protect people's health. Nonetheless, while some health-

related policies and laws protect basic human rights, others violate fundamental rights when they criminalize, prohibit, and restrict access to necessary health services. For example, laws and regulations related to protection of life from conception, contraception, actions of pregnant women, and abortion can harm women and place women and health care providers in jeopardy of legal penalization. Advocates, civil society groups, human rights groups, and government institutions must work together to promote, protect, and fulfill women's fundamental reproductive rights⁴⁴. It is essential for the doctor to study the laws regarding the problem in hand.

An inquiry into the appropriate therapeutic procedures to be followed with reference to the ethical question is essential. Knowledge of the cultural background of the patient is significant for understanding the patient's attitude and whether or not the patient will act according to the recommended treatment plan.

Conclusion

Ethical issues are often divulged when there is a basic impulse that something is not right. Disorientation, distress, or dubiousness about what to do next with the patient denotes that an ethical issue is at stake. If basic ethical standards seem to be sacrificed, the doctors may stop and assess the problem in the background of the ethical principles. So much can be occurring with the patient that it is difficult to see the real issue. It is difficult to understand whether the issue is significant or is there any peril to the client's confidentiality. These are some of the concerns relating to basic ethical principles. It is useful to simply list all of the possible options and then pursue them. Listing out the risk and benefits of each possible option, and identifying the aftermath of the options for the welfare of the patient is an appropriate action based on ethical standards. After going through all these ethical standards the doctor should be ready to make a decision. Sometimes the decision may not be one that everyone is agreeable with, but it may be the least abhorrent one. Subjecting a decision taken based on ethical background to proper evaluation and watching the effect of the treatment on the patient carefully may relieve the doctor from the ethical dilemmas generally and their actions will certainly result in justice⁴⁵.
