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Lean Production Theory and its Application in the Construction Industry

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ABSTRACT-

Lean manufacturing is a performance-based process used in manufacturing organizations to increase competitive advantage. Initially pioneered and developed by Japanese car manufacturers, lean production was seen as the step in an historical progression of production, which took industry from the age of the craftsman through the methods of mass production and into an era that combined the best of both. A key driver of the lean project delivery approach is understanding that rewards and compensation are tied to the value of the completed project as a whole. Lean manufacturers have moved away from traditional relationships with their suppliers to partnering arrangements with a smaller number, based on good communications and open-book accounting. Lean is focused on evaluating value, more than on cost, and seeks to remove all non-value adding components and processes whilst improving those that add value. Construction is basically the design and assembly of immovable objects rooted to a place, and accordingly has, more or less, the characteristics of site production delivering an unique product by using temporary teams. The construction industry has always been under pressure to provide value for money, sustainable design and construction. Lean production presents a new approach to the construction management which has enabled production enterprises to attain very high levels of efficiency, competitiveness and flexibility in production systems. The proposed paper will highlight the lean principles that can be applied fully and effectively in construction by focusing on improving the whole process.

Index Terms— Construction, efficient, lean manufacturing, production, value.

I INTRODUCTION

The construction industry in India is the second largest industry after agriculture. The Indian construction industry is highly fragmented in which only 0.4% firms can be classified as medium to large firms based upon the number of people employed per firm. Most of the Indian contractors are not well- equipped to handle the growing demand and hence the project run-in on time and cost overruns disputes and lower quality.

On the other hand, the manufacturing industry has made significant progress in increasing productivity and product quality while lowering product lead times. The improvements in manufacturing processes have included reducing the amount of human effort, space and inventory required in the factory

and increasing the quality and variety of products and the flexibility of manufacturing operations. The application of “lean production” principles to manufacturing processes has been instrumental in achieving these results.

If manufacturing can make such vast improvements in quality and productivity, while reducing costs and lead times; the application of Lean principles to construction could work wonders.

II PRODUCTION SYSTEMS

Traditionally, US manufacturing systems of the 20th have been viewed as a mass production system focussing primarily on the process of conversions.

Batch and queue refers to the theory that for machines to achieve a high utilisation rate, they must run continually. Batch and queue theory leads to many manufacturing problems such as bottlenecking and large inventories from high work-in- progress (WIP) levels.

The concept of manufacturing a product based on forecasted sales data and then selling it is referred to as “push” production [1]. This traditional approach of manufacturing manufactures a product just to keep the production line moving which greatly differs from the idea of producing an item only when it has been ordered or purchased, which is “pull” production.

While all activities expend cost and consume time, only conversion activities add value to the material or piece of information transferred to a product.

III LEAN PHILOSOPHY

The prelude to lean philosophy is based on doing the simple things well, on gradually doing them better and, above all, on squeezing out waste in every step. Though several issues have been attributed to the Lean Philosophy, the following three issues have been considered as the key in defining the lean philosophy:

- (a) **Cognizance of Customer’s Requirements:-** Attention is paid to quality as defined by the requirements of the customer. The success of production hinges on the satisfaction of the customer. A practical approach to this is to define the customers for each stage and analyze their requirements [2].

- (b) **Elimination of Waste:** - Seven forms of wastes have been identified by Toyota, applicable in many different types of operations. They are listed as follows [3]:
- (i) Over-production - Producing more than that is immediately needed by the next process.
 - (ii) Waiting Time - Equipment efficiency and labour efficiency are two popular measures which are used to the respective efficiencies and improvement in the two helps in reducing the WIP.
 - (iii) Transport - Moving items around the operation, together with the double and triple handling of WIP, does not add value. Layout changes which bring processes closer together, improvements in transport methods and workplace organization can all reduce waste.
 - (iv) Process - The process itself may be a source of waste.
 - (v) Inventory - All inventory should be a target for elimination.
 - (vi) Motion - Simplification of work is a rich source of reduction in the waste due to motion.
 - (vii) Defects - Quality waste is often significant in operations.
- (c) **Involvement of Staff in the Operation:** - Lean philosophy is often put forward as a total system. Its aim is to provide guidelines which embrace everyone and every process in the organization [4]. The intention is to encourage a high degree of personal responsibility, engagement and 'owning' the job.

The lean philosophies can apply to design, procurement and production. The ideas developed by Lean can be conceptualised on the following three levels [5]:

- (i) Process Level - A set of tools, such as Kanban cards, poke yoke etc.
- (ii) Project Level - A production planning method, such as JIT.
- (iii) Organisation Level - General Management Theory, such as TQM.

IV LEAN MANUFACTURING

The principles of lean theory are conceptualised at the process, project and enterprise or organisation levels. Lean manufacturing is a production practice that considers the expenditure of resources for any goal other than creation of value for the end customers to be wasteful, and thus a target of elimination [6].

One of the best researched industries is car manufacturing [1]. Lean car production is characterised as using less of everything as compared to mass production: half of human effort in the factory, half the manufacturing space, half the investments in tools, half

the engineering hours to develop a new product in half the time.

V LEAN PRODUCTION TOOLS

Several Tools have been developed for implementing Lean Production, six of which have been described as follows [6]:

- (a) **Cellular Manufacturing:** - The shop floor is subdivided into cells which consist of equipment and workstations that are arranged in such an order that maintains a smooth flow of materials and components through the process. Some benefits associated with cellular manufacturing include:
- Inventory reduction.
 - Reduced transport and material handling.
 - Better space utilisation.
 - Lead time reduction.
 - Identification of causes of defects and machine problems.
 - Improved productivity.
 - Enhanced teamwork and communication.
 - Enhanced flexibility and visibility.
- (b) **Continuous Improvement:**-Continuous improvement or Kaizen includes a thorough and a systematic approach to gradual and continuous improvement, which promotes reduction of inventory as well as reduction of defective parts. one of the most effective tools of Kaizen is 5S, which consist of the Japanese words Seiri (Sort), Seiton (Straighten), Seiso (Sweep and Clean), Seiketsu (Systematise) and Shitsuke (Standardise). The underlying concept behind 5S is to look for waste and then try to eliminate it.
- (c) **Just-in-Time (JIT):**-JIT attempts to eliminate sources of manufacturing waste by producing the right part in the right place at the right time. JIT effectiveness depends heavily on having a strategic alliance between buyers and suppliers.
- (d) **Production Smoothing:**-Heijunka, the Japanese word for production smoothening, is where the manufacturers try to keep the production level as constant as possible from day-to-day. In order to decrease production cost, is necessary to balance the demand with supply and thereby not overproducing. Inability to do so lead to waste (such as work-in-progress inventory) at the workplace.
- (e) **Standardisation of Work:**-Standardized work ensures that each job is organised and is carried out in the most effective manner. A tool used to standardise work is the "takt" time, which refers to how often a part should be produced in a product family based on the actual customer demand.
- (f) **Total Productive Maintenance (TPM):**-Machine breakdown is one of the most important issues concerning the people on the shop floor. Hence it becomes necessary to effective maintenance strategies. There are three main components of TPM program, namely, preventive maintenance, corrective maintenance and maintenance prevention.

VI CONSTRUCTION AS A TYPE OF PRODUCTION

Construction and manufacturing differ significantly in the physical features of the end product. In manufacturing, the finished goods can generally be moved as a whole to retailers or end consumers. Construction on the other hand, deals with larger units that cannot be transported. Furthermore, the construction industry has three other features that distinguish it from manufacturing [7]:

- (a) On-site Production.
- (b) One-of-a-kind Projects.
- (c) Complexity.

The combined effect of the above three leads to uncertainty. The manufacturing process makes it possible to reduce uncertainty by increasing control over the process itself.

VII LEAN CONSTRUCTION

The traditional method of construction management has been followed for a long time. The main characteristics of traditional construction management are as follows [8]:

- (a) All activities are considered as value adding activities
- (b) No distinction is made between processing and flow activities.
- (c) The total cost is estimated on the basis of the Work Breakdown Structure.
- (d) Little emphasis is given to the importance of resource flows.
- (e) From the cost point of view, all activities are assumed to be independent of each other and it is assumed that reducing the cost of each activity will reduce the cost of the project.
- (f) Generally, it doesn't take into consideration the effects of poor quality output and effects of variability and uncertainty.
- (g) The work progresses linearly from one process to the other.

Another significant feature or so-called flaw of project management is the fact that all the cost and time overruns are attributed to the failure of the labourers in following the schedules and budget during the construction. No questions, however, are raised regarding the planning preceding the construction [4].

The adoption of Lean manufacturing principles to construction is an innovative approach for managing and improving construction processes by reducing cost and maximizing value considering customer needs [9]. Same as manufacturing principles, minimizing waste at early stages lead to a better quality and thus successful project in terms of time and cost. The manufacturing process has seen noticeable improvements and

development after applying lean principles to the industry. By eliminating cost-consuming flow activities, Lean approach provides potential advantages for cost reduction when successfully implemented in a construction company and can be considered as a cost leadership [10].

Lean construction thinking applied to production systems on site has increased awareness of the benefits of stable work, of pull flow of teams and materials to reduce inventories of work in progress (WIP), and of process transparency to all involved [11].

VIII APPLICATIONS

Lean has recently started penetrating the construction industry to reform the tradition construction management approach [12]. The following summarises a few of the various applications of in different trades of construction:

- (a) **Construction Supply Chain:-** Being complex, a study was conducted to show the potential improvements in applying lean concepts to construction supply chains by presenting the case of pipe supports used in power plants. It was concluded that value stream analysis, one of the lean concepts, is a reliable tool to improve supply chain performance as it helped in identifying wastes in the process. Also, several lean principles were used to improve the performance such as reducing batch size, early involvement of suppliers in design stage, standardization of process, and improve supplier selection [12].
- (b) **On-site Subcontractor Evaluation:-** A study was conducted in Chile to develop on-site evaluation method for subcontractors based on lean principles and partnering practices. This method helped in resolving many disputes, and helped the subcontractors' supervisors to monitor their workers on-site performance. It also helped the main contractor to select the suitable subcontractor based on their previous performance in future works. This supports the idea of collaborative relationship with the subcontractors that consistently perform well [14].
- (c) **Precast Concrete Fabrication:-** A study was conducted to describe the application of lean production concepts and techniques to structural precast concrete fabrication. Last Planner and Five S techniques were used to improve the performance. The results achieved included shop cycle time and lead time reduction, increased throughput rate, and improved productivity [15].

IX CONCLUSION

Construction as it is today can be said to be a project centred form of production as opposed to a process centred form of production in manufacturing. The goal of Lean construction is a further industrialization of construction. Implementation of lean production concepts and techniques in the construction industry is the way to the future, but

following that path requires letting go of traditional thinking.

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Conjectural Facet of Segmentation to Know Customer

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ABSTRACT-

Market segmentation is the process of identifying distinct groups and or subgroups of customers in the market, who have distinct needs, characteristics, preferences and/or behaviors, and require separate product and service offerings and corresponding marketing mixes. The focus of this paper is on the concept of market segmentation. The aim of investigation is to identify usefulness of segmentation. The research also discusses role of segmentation variables in consumer markets. The present research is based on secondary literature of different researchers. The study brings forth that segmentation have a key role in marketing strategy. Companies are using the segmentation method to identify their customers in consumer market. A description of different variables used in consumer markets was provided as an attempt to present research. The study also pointed out the basis of segmentation in consumer markets as well as the mistakes that companies made during segmentation. The research concludes that companies are using segmentation method to plan their marketing strategy.

Keywords- Segmentation, Market, Consumer, Target, Company

I INTRODUCTION

Segmentation is the method of dividing the complete marketplace into smaller cluster that share analogous personality. Market segmentation has appeared as a significant and commonly accepted marketing instrument. Segmentation is based upon developments on the demand side of the market and represents a logical as well as more specific adjustment of product along with marketing effort to consumer and user requirements (Smith, W. (1956); Haley, R.I. (1968)). It is the process by which people with similar needs and wants are grouped together for the purpose of serving and focusing better on the market (Mill and Morrison, 1985). Segmentation is based on the principle that there are existing groups or segments in every market which have fairly different needs and wants, that have to be satisfied in a different manner (Kotler, P. (1998)).

Market segmentation is a marketing approach that involves dividing a broad target market into subsets of consumers who have familiar desires and then scheming and implementing strategies to aim their needs and wishes using media channels and other touch-points that best allow reaching them.

In simple words, market segmentation is the method of dividing a market into different subsets of consumers with universal needs and selecting one or more segments to target with a separate marketing mix. Segmentation allows companies or firms to avoid competition in the marketplace by differentiating the products on the basis of price, packaging, promotion, distribution technique, style and superior service. Market segmentation is one of the key stages in marketing strategy. Marketer selects one or two segments to target after dividing the markets into homogeneous clusters. Marketer focuses on a specific marketing mix such as a specific product, price,

channel, and promotional appeal for each distinct segment to achieve the segmented market.

Companies want the segmentation should be viable because the complete process is based on the market research which involves cost, time and human resource. Market segmentation will become attractive marketing strategy once the key five criteria such as Measurable, Substantial, Accessible, Differentiable and Actionable are fulfilled.

II OBJECTIVE & METHODOLOGY

- (a) **Objective:-**The aim of the paper is to understand the process of segmentation, basis of market segmentation and segmentation variables in consumer markets. Moreover, highlights of marketers' common mistakes in segmentation have been included in the present research.
- (b) **Methodology:-**The present study is based on literature review of secondary information such as research papers, articles available in Emerald, EBSCO and online newspapers, blogs etc. However, the study has been carried out to understand the concept of market segmentation. The study has been conducted from the time period of November 2012 to May 2013.

III SEGMENTATION

Market segment consists of consumers who share similar needs and wants, and marketers identify the segments with respect to the characteristics. One of the most important developments in marketing is that the quantity of increased interest in market segmentation and marketers major focus has been shifted to segmentation which is used before launching any product or in building the marketing strategy. The concept of market segmentation was developed in

economic theory to show how a firm selling a homogeneous product in a market characterized by heterogeneous demand could maximize profits (Claycamp and Massy, 1968).

Segmentation process reduces the companies' time of targeting customers and focuses on getting reliable specific customers. Segmentation facilitates companies to know their actual target audience and assist the firm to identify them from the mass. In the marketing strategy segmentation has following advantages.

- It increases profitability
- It helps to have customer retention
- It helps in expansion of market
- It increases competitiveness of a firm from an overall view
- It increases the focus of a company or firm

Markets are heterogeneous. A company can't connect with all customers in huge and dissimilar markets. Consumers vary on many dimensions and often can be grouped according to one or more characteristics. A company needs to identify which market segments it can serve effectively. Different researchers have suggested different approach for segmenting. The major types of segmentation for consumer markets are mentioned below:

(a) **Geographic Segmentation:**-This is possibly the most familiar form of market segmentation wherein organizations segment the market by aiming at a particular geographical area. For example, a brand could be sold only in one city, rural or semi-urban regions of India. Regional differences in buyer's preferences occur and this often provides a basis for geographic specialization.

Geographic segmentation can take many forms such as urban versus rural, north versus south, warm areas versus cold, class 1 and class 2 cities versus metro cities and so on. These examples reveal that geographic segmentation is sometimes a substitute for other types of segmentation.

(b) **Demographic Segmentation:**-Genders, family size, age, income, housing type, occupation, SEC and education level are common demographic variables. Brands have different target consumers. Some brands are targeted only to women, others only to men. Education levels often define demographic market segments.

(c) **Psychographic or Lifestyle Segmentation:**-Psychographic (or lifestyle) segmentation is based upon multivariate analyses of consumer attitudes, values, behaviours, emotions, perceptions, beliefs, and interests. This kind of segmentation is a legal way to segment a market, if one can properly identify the segmentation variables. Qualitative research provides the insight, the conceptual knowledge, and the consumer's exact language necessary to design the segmentation questionnaire.

Usually, word for word comments from consumers are used to build basis of lifestyle statements. A large delegate's samples of consumers (generally 1,000 or more) are then asked about the degree to which they agree or disagree with each statement.

(d) **Price Segmentation:** - It is common and widely practiced market segmentation. Difference in household incomes creates an opportunity for segmenting along price aspect. If individual incomes range from low to high, then a company should offer some cheap products, some medium-priced ones, and some expensive ones. Chevrolet varied in price (and status) along a clearly defined spectrum to appeal to successively higher income groups.

(e) **Distribution Segmentation:** - A method of segmenting the market based on where (what channel of distribution) consumers purchase a product. This type of distributional segmentation is common, especially among small companies that contribute each channel a unique brand to gain distribution within that channel. An upscale line of clothing sold only in expensive department stores, or a hair shampoo sold only through upscale beauty salons are examples of this type of segmentation.

(f) **Media Segmentation:** - Different media tend to reach different audiences. If a brand uses all its funds into one particular media, it can probably lead the segment of the market that reads that particular magazine. This type of segmentation is most often practiced by companies that have some control over the media and can somehow put off competitors from using that media.

(g) **Time Segmentation:** - The time dimension can be an interesting basis for segmentation. This type of segmentation too is less common but can be very successful. For example, some stores stay open late than others or stay open on weekends. Some products are sold only at certain times of the year (e.g., Christmas cards, Olympic goodies, fireworks etc.). Markets can be segmented by hobbies, by religion, by sports team loyalties, by universities attended and several other variables.

IV BASIS OF MARKET SEGMENTATION IN CONSUMER MARKETS

It is now understood that segmentation is an approach taken up by the marketers to divide the market into small-small segments or parts based on consumers requirements which are common in nature. Overall, it is an assessment and reconsiders the strategy and its incorporation in the changes that are required. Majority of the firms do segmentation on the basis of the following categories:

- (a) **Age Group:**-The marketers divide the market on the basis of age group of the target audience. The products and marketing strategies for kids would obviously be different than grown-ups. Normally the ages of consumers are divided as under 6 years, 6-11 Years, 12-19 Years, 20-30 Years, 30-49 Years, 50-60 Years, 60+ years. Some of the examples for different products are highlighted below:

- (i) (0-4 Years) – Nappies, Baby Food etc.
- (ii) (0-12 years) –Toys, School bags etc.
- (iii) (16 years and above) – Cosmetics, magazines etc.

- (b) **Family Size:**-Companies use family size as a basis to segment the consumers in the market. Few categories of family sizes are as young and single, young and married but no children, young and married with children below 5 years age, older and married with children, older and married with children less than 15 years age, older and married but no children, older and single, others.

- (c) **Gender:**-The marketers divide the market into minor segments based on gender. Based on the gender both men and women have different interests and preferences. In general marketers do the segmentation on two categories such as male and female.

For example, a woman would not buy a product meant for males and vice versa. It is important in many industries like cosmetics, footwear, jewellery and apparel industries to do the segmentation with respect to the gender.

- (d) **Marital Status:**-Market segmentation can also be as per the marital status of the persons. In India, marketers signify marital status categories as: single, married, widow, divorcee. For example, a travel agency would have different holiday packages for bachelors and married couples.

- (e) **Income:** - Marketers divide the consumers into small segments based on their income. Persons or households are categorized into segments according to their monthly or annual earnings.

There are three categories based on income. They are:

- (i) High income group
- (ii) Mid income group
- (iii) Low income group

Pantaloon, Shopper’s stop target the high income group as compared to Vishal Retail, Reliance Retail or Big Bazaar who cater to the individuals belonging to the lower income segment. Few segments that were done with income are such as

low (upto INR 40, 000 per annum), lower middle (INR 40, 001 – INR 80,000 per annum), middle (INR 80,001 – 120,000 per annum), upper middle (INR 120,000 – 160,000 per annum) and high (above INR 160,000).

- (f) **Occupation:**- Occupation plays a major role in buying process. Marketers focus on the occupation of the consumers to segment and target for their product. Occupation such as unskilled worker, skilled worker, petty traders, shop owners, business person, professionals such as doctors, lawyer etc. Example such as office goers would have different needs as compared to school/college students.

- (g) **Education:**-Sometimes companies target the consumers on the basis of their educational qualifications. Educational qualification for consumer markets was divided as illiterate, school up to 4 years, school between 5 and 9 years, SSC/HSC, non-graduate, graduate/postgraduate general category, graduate/postgraduate professional category and so on.

- (h) **Socio-Economic Classification:**-Indian market is very complex and has encouraged the development of socioeconomic classification (SEC) as a viable method to segment the diverse markets. Consumption behaviour in India is based on the people’s education and occupation for urban markets as well as occupation and types of house for rural markets. This classifies the categories such as A1, A2, B1, B2, C, D, E1 and E2 for urban areas and categories such as R1, R2, R3, R4 for rural areas.

V MISTAKES IN MARKET SEGMENTATION

Segmentation studies tend to be large and complicated, so it’s easy for errors and mistakes to be made. Some of the most common mistakes that companies made during the segmentation process are mentioned as follows:

- (a) **Segmenting a segment.** For example, someone might want to segment the market for shampoos among 18- 24 year olds who live in Mumbai and buy brand ABC. The client is asking for a tiny part of the market that segmented. This tiny part can be segmented, but rarely are the resulting segments will be of any worth because they are just too small. For this reason, the general thumb rule will be to segment the whole market, including all age groups.

- (b) **Overlooking the “universals.”** There are cases when many attitudinal statements in the questionnaire tend to be the same across all segments. Statements that everyone agrees with, or everyone disagrees with (are said as “universals”) cannot explain much in the

multivariate analyses. Variables have to move up and down for the multivariate analysis to work. The highest rated variables, and the lowest rated, are likely to fall out of the multivariate analyses. However, marketers should always look at these universal statements. Any one of them might be the basis for a positioning.

- (c) **Creating too many segments.** There should be a control to the size of segments that companies can effectively target. If one creates more than three or four market segments, then it can be said that the resulting segments will be too small to target, at least by mass media. However this cannot be always true, but it is a good rule of thumb.
- (d) **Confusing the results.** Segmentation studies are large and complex, with enormous amounts of data.
- (e) **Targeting people instead of money.** A market segment represents a small part of the market. One should always look at the money potential of market segments and not just only the number of people in the segments.

VI CONCLUSION

Companies, agencies, institutes and organizations are using the segmentation process to divide and group their markets to target their finest customers and prospects. Segmentation clarifies customer multiplicity, abridges marketing movement, illustrates consumer lifestyle and assimilates an extensive collection of data. The research has indicated few effective segmentation criteria such as measurable, substantial, accessible, differentiable and actionable. Segmentation will become striking strategy once the effective segmentation criterions are fulfilled. The research has pointed out various characteristics of ideal market segment.

Markets are not homogeneous. It has become essential for the companies to segment the market. The research has designated some key types of segmentation for consumer markets and business markets. Consumer markets segmentations are Geographic Segmentation, Demographic Segmentation, Psychographic or Lifestyle Segmentation, Price Segmentation, Distribution Segmentation, Media Segmentation and Time Segmentation. The investigation revealed that majority of the firms do segmentation on the basis Age, Family Size, Gender, Marital Status, Income, Occupation, Education and SEC.

Segmentation studies are very huge and complicated as compared to others and it's hard for marketers to overcome the errors and mistakes. A company also makes mistakes during the segmentation process. Segmentation process works on the hypothesis that customer with similar preferences and behaviours can

be easily put together in a group to target a particular product. The behaviours can be easily measured by the companies to understand consumers. Segmentation has provided huge benefits to the companies because it helps companies to get accurate information about their consumers, constituents, or members. Finally, segmentation method aid companies to plan the marketing strategy for their product.

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Effect of insecticide malathion on weight of *Eisenia foetida* Earthworm

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ABSTRACT-

Earthworm are invertebrates and contribute to soil fertility improvement and plant growth. Malathion is widely used organophosphate insecticide in agriculture. Eisenia foetida has been suggested as a sensitive and standard species for ecotoxicological studies. Eisenia foetida were exposed to malathion via soil. Three series of different concentration 100,200 and 300 mg/kg soil were prepared. In control group soil was used with tap water. The aim of the present investigation was to assess the effect of insecticide malathion on weight of worm. Eisenia foetida are exposed to different concentration of malathion for definite period of time. It was observed that there is reduction in weight on exposure to 100mg/kg soil, but after exposure for 15 and 20 days to concentration of 300 mg/kg soil there was increase in weight. There was no loss of weight in worms of control group and they showed normal growth with increase in weight.

I INTRODUCTION

Earthworms represent a great proportion of biomass of terrestrial invertebrates. They have been selected as suitable representative of soil organisms as they are key components of soil biota. They are found almost all over the world in the temperate and tropical regions wherever there is plenty of moisture in the ground. They prefer loamy or partly sandy soil rich in humus. Annelids are of great interest because the successful groups of animal kingdom such as Arthropoda and vertebrata also have the parts metamericly repeated. Metameric segmentation of the body encountered for the first time in Annelids. Metamerism is visible in most annelids both externally and internally. Great power of regeneration is seen in earthworms. Earthworm have numerous enemies eg. Centipedes, moles, frogs, toads, lizard, hedgehog, birds and above all human. *Eisenia foetida* is the standard test organism used in ecotoxicology because it can be easily bred on a variety of organic waste within short generation times. Earthworms contribute to soil fertility, improvement, plant growth and play a key role in converting a organic matter (Reynold 1994). Earthworms are key components in natural food chain providing food source for many small mammals, birds, fishes and prawns (satchell 1967). Earthworms are one of the most important organisms responsible for mechanical mixing of soil and play a major role in maintaing physical soil characteristics, aerations, water permeability and mineral turnover (Barley and Jennings 1959). *Eisenia foetida* is bisexual having both male and female reproductive organs. Earthworms are good friends to the gardener and farmer as they are continually ploughing and manuring the soil. Malathion is an organophosphate insecticide of relatively low human toxicity. It is widely used in agriculture and residential landscaping.

II MATERIAL AND METHODS

Eisenia foetida were selected for study because it is cheap test species, easy to maintain and is readily available. Healthy, sexually matured *Eisenia foetida* approximately weighing 1 to 1.3gms length 3 to 12cms were collected from Rau (M.P.) India. *Eisenia foetida*

were kept in culture pots with moisture soil, before the commencement of the experiment. 25 earthworms were kept in each pot which were filled with 1 kg soil. They were fed with organic matter such as decaying leaves, manure etc.

Eisenia foetida were exposed to insecticide malathion via soil. Concentration series of insecticide malathion were prepared by diluting stock solution. 3 series of different concentration of malathion 100, 200 and 300 mg/kg soil were prepared. In the control group only soil was used with tap water. Worms were exposed to different concentrations for 10,15and 20 days. Effect of insecticide malathion was studied on weight, length and colour of *Eisenia foetida*. Matured worms were collected from the soil and weighed. 25 worms were treated each with different concentrations 100, 200 and 300 mg/kg soil of insecticide for 10, 15 and 20 days. After treatment change in weight and effect on length and color of *Eisenia foetida* was recorded.

III RESULTS AND DISCUSSION

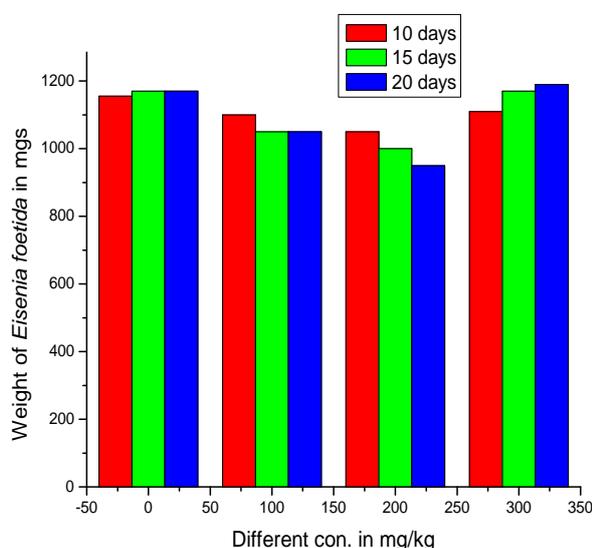
Present study was carried out to see effect of insecticide malathion on weight, length and colour of *Eisenia foetida*. *Eisenia foetida* of control group were not exposed to insecticide and only tap water was used. *Eisenia foetida* of experimental group were exposed to 100,200 and 300 mg/kg soil of insecticide malathion. Result was recorded after exposure to malathion for 10, 15 and 20 days. It was observed in *Eisenia foetida* of control group there was increase in weight from 1155mg to 1170mg after 15 and 20 days but in *Eisenia foetida* exposed to 100mg/kg soil malathion there was decrease in weight to 1100, 1050 after exposure for 10 and 20 days. On exposure to 200 mg/kg soil there was decrease in weight to 950 mg after exposure for 20 days. But it was observed that on exposure to 300ml/kg soil it was observed that there was increase in weight to 1170mg and 1190mg after exposure for 15 and 20 days. Slight increase in weight may be due to degradation and deposit of pesticide residues. Insecticide malathion has a high use in agriculture and garden. It has a lethal effect on many living systems. Chooand Baker (1998) found endosulfan significantly reduce the weight of juvenile *Aporrectodea trapezoids*. Booth and Halloran (2002) found growth to be

significantly reduced in *A. caliginosa* on exposure to two organophosphate pesticides, diazinon and chlorpyrifos at 60 and 28 mg/kg doses. Bustos-obreg and Goicochea (2002) explored the effect of exposure to commercial parathion on *Eisenia foetida* and observed decrease in body weight of treated worm. Singh *et al* (2003) reported the significant contribution of soil microorganisms to the degradation of organophosphate Insecticides in natural soil. Khan *et al* (2007) reported a significant reduction in earthworm biomass after exposure to different concentration of copper chloride and concluded abnormal functioning of major physiological systems such as digestion and absorption. Effect of pesticides on growth and reproduction of earthworm was studied by shahla *et. al* (2010). Correia and Moreira (2010) studied effect of glyphosphate on earthworm *Eisenia foetida*. Insecticide malathion has a high use in agriculture and gardens but it has lethal effects on many living systems. Espinoza-Navarro and Bustos-Obreg(2003) treated *Eisenia foetida* with organophosphate insecticide malathion. Zhou *et al* (2006) reported that weight of the earthworms was a more sensitive index compared to the mortality in indicating toxic effect. Observation were made on length and colour of worm. There were no changes in length and colour of worms exposed to insecticides.

Table1: Changes in weight of *Eisenia foetida* (earthworm) after exposure for 13,15 and 20 days to insecticide malathion

S.No.	No. of Earthworms	Different doses of malathion in (mg/kg)	Weight in mg (after 13 days exposure)	Weight in mg (after 15 days exposure)	Weight in mg (after 20 days exposure)
1.	25	Control	1155	1170	1170
2.	25	100	1000	1050	1050
3.	25	200	1050	1000	950
4.	25	300	1100	1170	1190

Fig.1 Weight change in *Eisenia foetida* exposed to malathion



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Yield Variation in Mustard Crop Due To Sewage Irrigation

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ABSTRACT-

A higher total yield was recorded from sewage irrigated field than the control field. The increase in infection on pods correspondingly decreased with its progress of the pod length, number of seeds per pod, 1000 seed weight and the percent oil contents of the seeds. The diseases were also responsible for losses in yield production. Both the fields showed only two diseases of fungal pathogens i.e. *Alternaria* blight and white rust of mustard. Both the diseases were found to cause a great loss in total production of the crop. The correlation coefficient was negatively significant, showing inverse association of two characters indicating that increase in per cent incidence of disease the yield decreased. Leaf and pod infection also represented a negative correlation with the seed yield. The regression study revealed that due to one per cent leaf infection the yield decreased 24.56 Kg per hectare. The losses in yield were estimated upto 74.92 per cent with 46.06 per cent disease incidence in tubewell irrigated field and 70.52 per cent with 43.86 per cent disease in sewage irrigated field. A highly significant variation in per cent disease index due to crop growth stages and due to field types was proved statistically. An assessment of yield loss by comparative determination revealed that with the increase of infection on pods, the pod length, number of seeds per pod, seed weight and oil per cent decreased progressively and the number of infected seeds increased with the increase on infection. In comparison to healthy seeds taken from healthy pods from sewage irrigated field, the seeds taken from diseased pods showed 16.16 percent loss in oil content. From tube well irrigated fields also 14.22 per cent loss in oil content was estimated from diseased pods. Due to infection the seed weight was also reduced upto 9.97 per cent in sewage irrigated and 11.27 per cent in tube well irrigated field. The diseases not only reduced the seed output and pod length but also reduced the total oil contents of the seeds.

Keywords: Sewage, Yield, Disease, Mustard

I INTRODUCTION

Sewage can be utilized as a source of fertilizer to the agrochemical fields. It provides water and nutrients and has potentiality in terms of nutrients for the plants especially for N, P, and K enrichment which regulate the plant growth. Sewage irrigation for agriculture purpose has a lot of implications and serious threat to soil agroecosystem. Sewage irrigation is also responsible altering the physico-chemical characteristics of the soil, influencing soil microflora leading to severe plant and animal diseases and in turn affecting yield of the crop qualitatively and quantitatively both (Vimal and Talashikar, 1983; Giusquiani *et al.*, 1992) Asano (1994) viewed that waste water reuse as an alternative and reliable water resource against the specter of growing demands of water. Soil microflora has the direct markable effect on plant growth regulating substances. Abdel-Mallek *et al.* (1988) and Chitra and Vittal (1989) has found a significant increase in fungal population of soil treated with sewage sludge. Gangawane and Kulkarni (1985) recorded rhizosphere microflora is altered with sewage sludge treatment and opined that the change was due to direct effect of present constituents of sewage or indirectly due to changes in the root exudates pattern of plants. Lewis *et al.* (1981) observed that the treatment of sewage sludge compost to the soil will be appreciable to decrease the activity of certain diseases.

II MATERIALS AND METHODS

- (a) **Selection of crop and sites for experimental study:** To evaluate the effect of sewage irrigation on disease development with consequent loss, two fields were selected for studies which were situated at Jaderuwa Dam near Morar in Gwalior. One selected field was irrigated with sewage water (treated field) and the other neighbouring field was irrigated with tubewell water (control field). Mustard crop was selected for the present study, because in this particular area in more than seventy per cent fields only mustard crop is grown in Rabi season. This crop is also economically important for this particular area. The Chambal Division which includes Gwalior, Bhind and Morena districts are well known as "Mustard growing zone" of Madhya Pradesh. Hence, the area is reach for the production of mustard.
- (b) **Per cent Incidence of Disease:** A Survey of crop for mustard diseases was conducted at four stages of crop growth to compute per cent incidence of disease by using quadrat method.

Percent incidence of disease= number of diseased plants in one meter square area/Total number of plants present in one meter square area*100

Four stages of Crop growth taken in account are as follows:

1. Pre-flowering stage
2. Flowering Stage
3. Podding stage

4. Harvesting stage

(C) Crop loss estimation: Yield loss was estimated in the field by taking different parameters in consideration. Average loss of yield per plant and loss of seed weight was recorded to find out per cent loss of yield. Loss in oil content was recorded by ether extraction method using Soxhlet's apparatus (Iswaran, 1980).

Correlation coefficient between percentage infection and yield regression equation was also worked out.

Regression equation (y) = 1510-24.56x
 Where y = Yield after loss in Kg/Hectare
 1510 = Kg normal yield of mustard/Hectare
 24.56 = Kg/Hectare loss at 1 per cent infection
 X=per cent infection

Table: 1 Per cent incidence of disease on mustard crop at various growth intervals and consequently yield after loss.

Stages of crop growth	Per cent disease		Yield after loss Kg/H (Regression Equation =Y)	
	Sewage Irrigated	Tubewell Irrigated	Sewage Irrigated	Tubewell Irrigated
Pre flowering stage	1.55	2.08	1471.94	1458.92
Flowering stage	12.44	13.90	1204.37	1168.62
Podding stage	34.85	38.32	654.08	568.86
Harvesting stage	43.86	46.06	455.08	338.77

C.D. at 5% level
 Field A X Field B = 0.744 H.S
 Between seasons = 1.051 H.S
 Field Type X Seasons = 1.487 H.S

Table : 2 Assessment of yield loss per plant in sewage irrigated and tubewell irrigated fields.

Type of Field	Yield per plant (g)		Yield loss per plant (Per cent)
	Healthy	Diseased	
Sewage Irrigated	15.45	8.58	44.66
Tubewell Irrigated	15.02	7.46	50.33

Table : 3 Assessment of yield loss due to diseases in mustard crop

Category of infection on pods	Pod length (cm)		No. of seed/pod		No. of infested seed/pod		100 seed weight		Percent oil content	
	Sewage Irrigated	Tubewell Irrigated	Sewage Irrigated	Tubewell Irrigated	Sewage Irrigated	Tubewell Irrigated	Sewage Irrigated	Tubewell Irrigated	Sewage Irrigated	Tubewell Irrigated
Healthy Pods	7.60	7.50	19.00	19.00	1.00	0.00	8.26	8.16	46.40	44.30
Superficial Lesion/pod	7.40	7.60	19.00	16.00	1.00	0.00	8.10	8.06	46.40	43.70
1-3 day Lesion/pod	7.60	7.20	16.00	12.00	1.72	1.66	8.08	7.84	46.00	42.30
3-5 day Lesion/pod	7.30	7.10	12.00	16.00	2.30	2.73	7.63	7.60	41.20	40.30
More than 5 Lesion/pod	7.10	6.90	14.00	17.00	4.27	4.93	7.40	7.20	38.50	36.00

III DISCUSSION

The increase in yield of mustard crop in sewage field in comparison to tubewell irrigated field may be due to lower incidence of disease and/or due to application of sewage water to the field which in turn improve the physico-chemical characteristics of soil and make available the nutrients to growing plants. Allievi *et al.*, (1993) concluded that the use of compost can lead to improve soil fertility, even after several years, which in turn results both in quantitative as well as in qualitative improvement in yield. Bevaqua & Mellano (1993) also reported the benefits in yields from compost application. Certain studies are available (Vimal and Talashikar, 1983 & Giusquiani *et al.* 1992) which point out towards the utility of wastes for crops as fertilizers and for their certain agronomic reasons

Chahal and Kang (1978) & Kaushik *et al.* (1984) reported shriveling of seeds and reduction in quantity of oil content to be the major effect due to severe infections of diseases. A correlation of disease intensity on foliage and/or silique with components of yield losses of rapeseed mustard has been estimated and interpreted by Saharan (1991). Ansari *et al.* (1985) reported the loss of oil content of seeds from diseased plants of rapeseed over the seeds from healthy plants to be ranging between 14.6 to 30 per cent . Saharan (1992) has also reported 10-78 per cent loss from oil yielding crops due to *Alternaria* blight in India. Reduction in pod length, number of seeds per pod, seed weight and per cent oil contents due to infection on pods have been assessed during present study and

showed negative correlation with the infection category on pods. Increase of deep lesions on silique increased the percentage of seed infection and decreased pod length, seeds per pod, seed weight and per cent oil content which has also been reported by many workers (Bandhyopadhyay *et al.*, 1974; Chahal and Kang 1979; Kolte *et al.* 1987).

Narwal *et al.* (1983) found that application of sewage sludge despite adequate nutrient supply also the dry matter of fodder rape as compared with soil without sludge was increased. The wheat grain and straw increased when crop residue was applied (Dev and Bhardwaj, 1991). The grain yield of wheat and soyabean increased by the application of poultry or piggery manures and did not need any supplementary dose of fertilizer (Gupta *et al.* 1992). Cimino and Toscano (1993) found that the application of sludge provided good growth of pea and broad bean species, increased germination and better yield in comparison of use of inorganic fertilizer. Bevaqua and Melano, (1993) observed that the application of compost favoured early stand development and for onion, turf and spinach were upto 5 per cent level and snapdragon yield were also increased. Allievi *et al.* (1993) reported that use compost have a constant improvement in both quantity and quantity of production.

Application of sewage sludge is beneficial and it supplies nutritional agents to the soil and ultimately leads in improvement of production. However, phytotoxic levels of heavy metals could be enhanced by sludge application and therefore, this is problematic and ultimately is concerned with human health. Toxic effects due to high concentration of manganese by sewage application have also been observed by Chapman (1978) and Gupta and Macleod (1973).

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Economic Development through Information Technology in India

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I INTRODUCTION

What contribution can information technology (IT) make to India's overall economic development? This paper offers some perspectives that can help answer of this question as using concepts and analysis from economic theory. It examines the theory and evidence for comparative advantage, complementarities, and a special role in the innovation process as factors that make IT special. The paper also considering opportunities for future growth in India's IT sector, existing and potential constraints and possible policy responses that can help IT contribute to broader economic development. In this paper, I assume a basic familiarity with the general structure and performance of the Indian economy and the economic reform process that has been taking place through the last decade or more. However, I provide a brief review of the industry in this introduction.

The era of 21st century is often regarded as an era of technology. Today, Technology plays a very important role in our life. It is being seen as a basis of growth of an economy. IT has connected the world globally and is now changing our life style and social consciousness dynamically.

We are living in an age of remarkable technological change that is forcing us to think very hard about the linkages between technology and economic development. The harder we think about it and we more realize that technological innovation is almost certainly the key driver of long-term economic growth.

We are living in an age of remarkable technological change that is forcing us to think very hard about the linkages between technology and economic development. The harder we think about it, the more we realize that technological innovation is almost certainly the key driver of long-term economic growth. We further realize that the innovation process must be supported by a complex set of social institutions. Although markets have a great deal to do with innovation, innovation is not purely a market-driven phenomenon. Innovating economies require an interconnected set of market and nonmarket institutions to make the innovation process work effectively, and for this reason, governments need an innovation strategy if they wish to foster highly innovative economic systems.

II ECONOMIC GROWTH THEORY AND THE ROLE OF TECHNOLOGY

Economic theory offers a series of textbook approaches to understanding economic change. One of the first was initiated in 1776 by Adam Smith (Smith 1981), who emphasized the role of the division of labor in promoting rising output per person. He stressed that increasing specialization, mediated mainly by market forces, would lead to rising efficiency in production, and therefore to rising living standards. Smith focused on the role of market institutions, efficiency in transactions, and effective property rights in promoting high levels of economic well-being. Understandably, Smith's model of the division of labor did not draw primary attention to innovation since he was living at the time when the Industrial Revolution was just gaining force. The full import of sustained innovations across many economic sectors could still not be seen.

Understanding long-term economic growth requires understanding technological innovation. But the economics profession is somewhat odd. The technically challenging part of the Solow growth models lies in solving a differential equation for how fast the capital stock grows rather than in interpreting the mysterious process of technological change. And so, for the many years following Solow's initial contributions, economists studied the role of savings and investment as the central feature of economic growth, rather than focusing on the sources of long-term technological change. This began to change only in the 1980s.

III MAJOR ROLE OF INFORMATION TECHNOLOGY IN AGRICULTURE SECTOR FOR ECONOMIC GROWTH

Information Technology (IT) has long been viewed as having great potential for improving decision making in agriculture. In all phases of the agricultural industry, information technologies are vital to the management and success of a business. Information Technology is rapidly becoming more and more visible in society and agriculture.

Information Technologies represent a way for developing world nations to foster economic development, improve levels of Agriculture, Education

and Training as well as address gender issues within society. Infrastructure technology development is also vital for entrepreneurship and small business development. In many emerging nations, it is a major challenge to gain access to capital and market information. Developing nations specifically do not have functioning infrastructure or much in the way of financial resources.

The Indian economy has undergone a structural change over the last decade with shares of agriculture, manufacturing and services in the gross domestic product (GDP). Science and Technology has played an important role in bringing about this transformation in Indian economy which is showing a shift from a predominantly agriculture based economy to manufacturing and services based economy and is now increasingly integrating with the world economy to become globally competitive as demonstrated by its increasing share in world exports.

Development and growth of agriculture that can also benefit the cultivators are limited. Many solutions, mostly related to technology inputs and infrastructure implemented earlier are loosing to deliver incremental benefits in present circumstances.

There is now an urgent need to convert agriculture into agri-businesses, which are economically viable and sustainable in future. In this situation the Information Technology offers new hopes.

Many sectors of economy have benefited by the use of Information Technology. The same can also happen with agriculture sector. Both Government as well as Private Sector organizations are working to develop new models for Information Technology applications in agriculture.

Today with the opening of global economy both physical and time distance between production and consumption is required to be reduced. This requires very-very efficient management of Agri-business Value Chain.

IV COMPARATIVE ANALYSIS OF INFORMATION TECHNOLOGY IN AGRICULTURE SECTOR

With help of information technology Farmer benefited National Agriculture Insurance Scheme. With help of graph we can show comparison National level ,State level and division level. There are huge differences in size of states. Land and Agriculture scheme are the most important factors of production in any agrarian economy. In spite of having larger average size of holding the food grain productivity in Jabalpur division. Eight district and many block in Jabalpur division. There are different types of soil and irrigation facility. Because of regional disparities very difficult to implement National agriculture insurance scheme. But with the help if information Technology Farmer benefited National Agriculture Insurance Scheme and

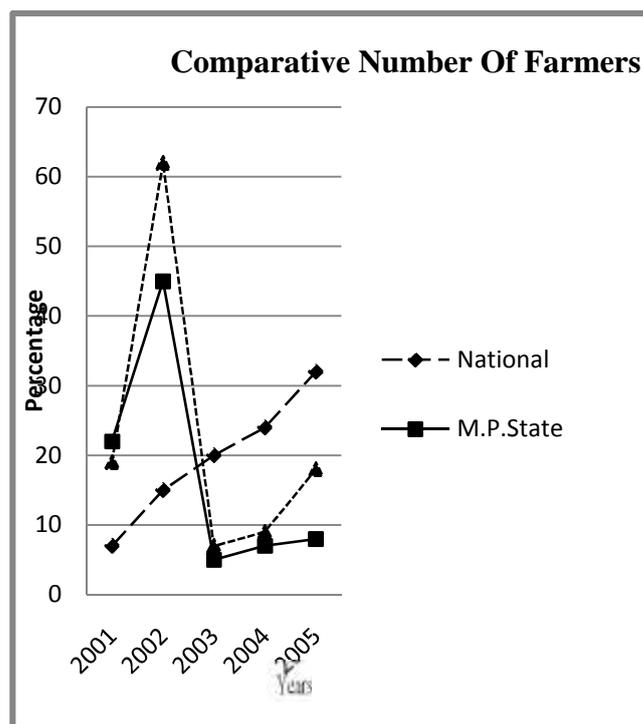
other agriculture related area like fertilizer, raining, Crops protection etc.

Beneficiary Farmer %

Season-Ravi

No	Year	No. of Farmers			Percentage of No. of Farmers		
		National	M.P.	Jabalpur Division	National	M.P.	Jabalpur Division
1	2001	453325	138818	5513	7.5	22.3	18.6
2	2002	926392	282007	18393	15.4	45.2	62.2
3	2003	1210288	37441	1181	20.1	6.0	4.0
4	2004	1526462	57114	2071	25.3	9.2	7.0
5	2005	1916554	108352	2418	31.8	17.4	8.2
Total		6033021	623732	29576	100	100	100

Source % & Economics Survey and National Agriculture Insurance Scheme-Bhopal

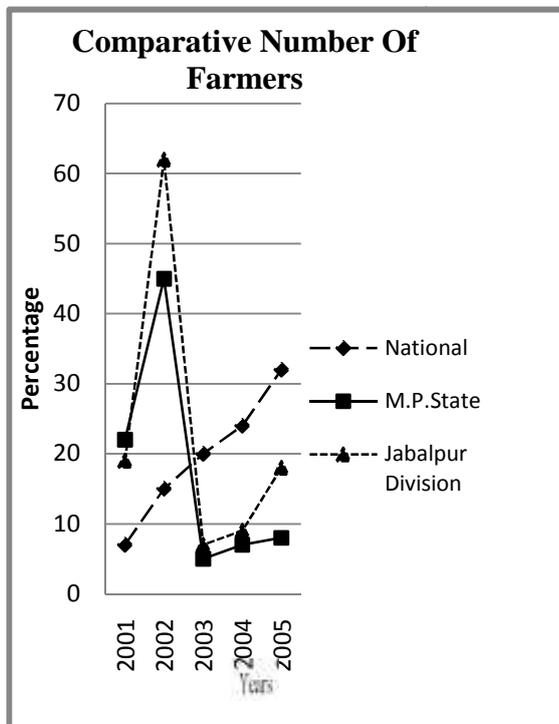


Beneficiary Farmer %

Season-Kharif

No.	Year	No. of Farmers			Percentage of No. of Farmers		
		National	M.P.	Jabalpur Division	National	M.P.	Jabalpur Division
1	2001	3145776	259141	4580	23.8	23.3	3.6
2	2002	4337041	617594	59705	32.8	55.6	47.1
3	2003	1617802	12307	445	12.3	1.1	0.4
4	2004	2280276	202187	61860	17.3	18.2	48.8
5	2005	1823556	19887	201	13.8	1.8	0.2
Total		13204451	1111116	126791	100.0	100.0	100.0

Source % & Economics Survey and National Agriculture Insurance Scheme-Bhopal



V CONCLUSION

A central finding of economics over the past fifty years has been that technological advancement is critical to long-term economic growth. More recent research distinguishes between the crucial roles for technological diffusion in the catch-up phase of economic development and innovation once economies reach a fairly high level of development. India's great challenge in this regard is to move from adoption to innovation as the engine of technological advancement. Yet the social systems that best foster technological innovation do not come into existence without an explicit effort to create them. Creating a successful innovation system is a challenge that requires focus, attention, and institutional creativity. There is no doubt

that India has everything that it needs to become a central site of science-based innovation in the twenty-first century world economy. This chapter has highlighted some of the issues it must face in achieving this aim. As the region progresses, we predict that one of twenty-first-century's biggest transitions will occur when both China and India begin to make dramatic contributions to global science and technology and thereby dramatic contributions to the welfare of the world. When this happens, the structure of the world economy will change in new and promising ways.

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Academic Integrity as an Educational Planning in the Kurdistan Region of Iraq

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ABSTRACT

Educational planning in Kurdistan has been an issue of importance for those who shape the future of the citizens in this region of Iraq. It is about determining the factors which are going to influence the future development of the people of Kurdistan and their culture. Thus, complying with the rest of the academic policies around the world, the foundations of the Kurdish education is expected to be based upon important values and principles which reinforce quality academic learning. Academic integrity among students, lecturers and administrators becomes a significant attribute and, without any doubt, it is involved in the educational planning process. This research paper points out the different aspects of academic integrity, focuses on the necessity of including the issue of academic integrity in educational planning and shows through a field research project how educators in the Region perceive the concept of academic integrity and its practice.

I INTRODUCTION

Academic integrity is the set of the significant values and principles which offer meaning to the overall mission of any institution of higher learning. It is the value system which determines the scientific, individual as well as professional attitude and behaviour of everyone involved in education, primarily faculty members and students; alongside its formal application, academic integrity is about the informal "contract" between faculty and students who both agree to behave in a professional and ethical manner and, of course, share common standards and common perception about excellence.

In the Kurdistan Region of Iraq, the issue of academic integrity among universities has been questioned a lot and most research studies show that there is limited focus on the issue; related with a general absence of social integrity and corruption, academic integrity remains a fundamental priority for educational institutions which are determined to lead education in this area of the world through effective planning.

Academic integrity is connected with other important issues such as academic fraud or academic dishonesty and for years it is a key topic for academic research. Most well-known universities in the world have institutionalized their success by applying strong academic ethics and codes of conduct. Academic integrity and ethics is a fundamental issue concerning the operation and the value system of the colleges and universities around the world for the last ten years at least. Most major well-known institutions of higher learning around the world -such as Georgetown University, Howard University, Cornell University, University of Utah, MIT publicize their philosophy and practice of academic integrity on their websites. Selected of approaches as they are presented on the web are listed below.

Ethical Standards & Code of Conduct is a major issue of the University of Utah: "The University of Utah is an institution with a remarkable history of world-class achievements brought about by the shared vision of many talented individuals. Our successes are well known and acknowledged, providing a solid foundation for future

growth as we build on our potential. As the flagship institution of the Utah State System of Higher Education,

we are committed to the highest professional standards in teaching, research, and community service. It is our collective efforts and stewardship that will allow us to move the University forward. As we move forward, the values and standards embedded in our organizational missions will be subject to scrutiny and challenge. If we are to effectively meet the challenges that await us, it is essential we individually, and collectively, understand the responsibilities each of us has in making a positive contribution to the success of the University of Utah."

Howard University in Washington DC places an emphasis on the issue through the statement by its Board of trustees and the powerful statement of purpose: "It is the policy of the University to conduct itself with the highest degree of integrity and honesty in all of its dealings. This is a responsibility that we share as a University Community. Each Trustee, student, Faculty member, and administrative employee must be bound by this common duty in the pursuit of his or her individual responsibility to the educational objectives of the University

Georgetown University states on the issues of honesty and integrity; "Honesty and integrity are fundamental bonds in a community of people who strive for "serious and sustained discourse" Georgetown University faculty and staff are expected to provide truth, accuracy and objectivity in their work and interactions"

Cornell University (New York) refers to the following clear policy: "Cornell University expects all executive officers, trustees, faculty, staff student employees, and others, when acting on behalf of the university, to maintain the highest standard of ethical conduct"

MIT (Massachusetts Institute of Technology, USA) mentions the following; "Honesty is the foundation of good academic work. Whether you are working on a problem set, lab report, project or paper, avoid engaging in plagiarism, unauthorized collaboration, cheating, or facilitating academic dishonesty"

II HISTORICAL OVERVIEW

In antiquity, books were published by hand-copying. Scholars freely made digests or commentaries on other works, which could contain as much or as little original material as the author desired. There was no standard

system of citation and scholars were a small group who knew and generally trusted each other. This system continued through the middle ages in Europe. Education was in Latin and Greek. Many scholars were monks who lived in monasteries. Since they spent their time in monasteries, they used much of their time copying manuscripts. Other scholars were in urban universities connected to the Roman Catholic Church. Academic dishonesty dates back to the first tests. Scholars note that cheating was prevalent on the Chinese civil service exams thousands of years ago, even when cheating carried the penalty of death for both examinee and examiner. Until the end of the 19th century, there were no specific rules on how to properly cite quotations from others' writings, which may have caused many cases of plagiarism out of ignorance." (W.Cross, Wiley Online library, 2003)

The same practice occurred in the Islamic schools. Islamic students and scholars were also staying at rooms attached to mosques and studied Islamic religion, Islamic Sharia, Arabic language and grammar along with other sciences. Obviously there were no rules regarding hand copying of those materials (Mohammad, 1987, "The Place of Pre-school Education in the Iraqi Educational System" Unpublished Thesis.

During the early 20th century, cheating was a common phenomenon at college campuses in the United States, and was not considered a dishonourable act. It has been estimated that as many as two-thirds of students cheated at some point of their college careers at the turn of the 20th century (enc.wikimedia.com')

The first scholarly studies in the 1960s of academic dishonesty in higher education found that nationally in the U.S., somewhere between 50%-70% of college students had cheated at least once. While nationally, these rates of cheating in the U.S. remain stable today, there are large disparities between different schools, depending on the size, selectivity, and anti-cheating policies of the school. Generally, the smaller and more selective the college, the less cheating occurs there. For instance, the number of students who have engaged in academic dishonesty at small elite liberal arts colleges can be as low as 15%-20%, while cheating at large public universities can be as high as 75%. Moreover, researchers have found that students who attend a school with an honour code are less likely to cheat than students at schools with other ways of enforcing academic integrity.1- As for graduate education, a recent study found that 56% of MBA students admitted cheating, along with 54% of graduate students in engineering, 48% in education, and 45% in law. There is no doubt that there is a serious concern on the rise of academic dishonesty among students in the United States. Justin Pope, an expert on this issue expresses the seriousness of the matter of cheating (Pope, 2007)

A typology of academic misconduct has been devised by Perry (2010). Perry's typology presents a two dimensional model of academic misconduct with one dimension measuring the degree to which rules are understood and the other dimension measuring how closely these rules are followed. According to the typology only those students

who understand the rules but fail to adhere to the rules are classified as 'cheats'

(www.openleft.com/diary 15589/Perry's Typology)

III ACADEMIC MISCONDUCT

There are various types of academic misconduct. Among them, plagiarism and cheating on tests are the most common ones. The following is a brief reference to the different forms of academic dishonesty:

(a) **Plagiarism-** Plagiarism, as defined in the 1995 Random House Compact Unabridged Dictionary, is the "use or close imitation of the language and thoughts of another author and the representation of them as one's own original work." In academia, it is seen more broadly as the adoption or reproduction of original intellectual creations (such as ideas, concepts, pieces of information or expressions, etc.) of another author (person, collective, organization, community or other type of author, including anonymous authors) without acknowledgment, in contexts where originality is acknowledged and rewarded. This can range from borrowing without attribution a particularly apt phrase, to paraphrasing someone else's original idea without citation, to wholesale contract cheating. The modern concept of plagiarism as immoral and originality as an ideal emerged in Europe only in the 18th century, while earlier in centuries, authors and artists were encouraged to "copy the masters as closely as possible" and avoid "unnecessary invention". The 18th century new morals have been institutionalized and enforced prominently in the sectors of academia (including academic science, education, engineering etc.) and journalism, where plagiarism is now considered academic dishonesty and a breach of journalistic ethics, subject to sanctions like expulsion and other severe career damages. Not so in the arts, which have resisted in their long-established tradition of copying as a fundamental practice of the creative process. with plagiarism being still hugely tolerated by 21st century artists. Law making is a professional field which is not structured around the concept of originality and for which plagiarism is less relevant. Plagiarism is not a crime but is disapproved more on the grounds of moral offence It may be a case for civil law if it is so substantial to constitute copyright infringement (Edit lib INDEX, 2012)

During the last ten years, discussions on the subjects of student plagiarism have increased with a major focus of this discussion on the issue of how university students can avoid plagiarism.

(b) **Fabrication-** Fabrication is the falsification of data, information, or citations in any formal academic exercise. This includes making up citations to back up arguments or inventing quotations. Fabrication is very common in the natural sciences, where students sometimes falsify data to make experiments "work". It includes data falsification, in which false claims are made about research performed, including selective submitting of results to exclude inconvenient data to generating bogus data.

Bibliographical references are often fabricated, especially when a certain minimum number of references is required

or considered sufficient for the particular kind of paper. This type of fabrication can range from referring to works whose titles look relevant but which the student did not read, to making up bogus titles and authors.

(c) **Deception**—Deception is providing false information to a teacher/instructor concerning a formal academic exercise. Examples of this include taking more time on a take-home test than is allowed, giving a dishonest excuse when asking for a deadline extension, or falsely claiming to have submitted work. This type of academic misconduct is often considered softer than the more obvious forms of cheating, and otherwise-honest students sometimes engage in this type of dishonesty without considering themselves cheaters. It is also sometimes done by students who have failed to complete an assignment, to avoid responsibility for doing so.

(d) **Sabotage**—It occurs when a student prevents others from completing their work. It includes cutting pages out of library books or disrupting the experiments of others. Sabotage is usually only found in highly competitive environments, where class rankings are highly prized. Poor behaviour and the low level disruption of other students' learning, however, is extremely common in all educational settings. Some medical school librarians have noted that important articles—required reading for specific courses—are frequently missing from bound journals—sliced out with razor blades (Wikipedia)

(e) **Cheating**—The use of crib notes during an examination is typically viewed as cheating. Cheating can take the form of crib notes, looking over someone's shoulder during an exam, or any forbidden sharing of information between students regarding an exam or exercise. Many elaborate methods of cheating have been developed over the years. For instance, students have been documented hiding notes in the bathroom toilet tank, in the brims of their baseball caps, or up their sleeves (Reader's Digest, 2006).

Also, the storing of information in graphing calculators, pagers, cell phones, and other electronic devices has cropped up since the information revolution began. While students have long surreptitiously scanned the tests of those seated near them, some students actively try to aid those who are trying to cheat. Methods of secretly signalling the right answer to friends are quite varied, ranging from coded sneezes or pencil tapping to high-pitched noises beyond the hearing range of most teachers. Some students have been known to use more elaborate means, such as using a system of repetitive body signals like hand movements or foot jerking to distribute answers (i.e. where a tap of the foot could correspond to answer "A", two taps for answer "B", and so on). Cheating differs from most other forms of academic dishonesty, in that people can engage in it without benefiting themselves academically at all. For example, a student who illicitly telegraphed answers to a friend during a test would be cheating, even though the student's own work is in no way affected. Another example of academic dishonesty is a dialogue between students in the same class but in two different time periods, both of which a test is scheduled for that day (Callahan, 2004).

IV PROFESSORIAL MISCONDUCT

Professorial misconduct includes improper grading of students' papers and oral exams, grade fraud, deliberate negligence towards cheating or assistance in cheating. This can be done for reasons of personal bias towards students (favouritism) or a particular viewpoint (intellectual dishonesty), for a bribe, or to improve the teacher's own perceived performance by increasing the passing rate. It is still occasionally done for matters of ego or to procure sexual favours (sexual harassment).

(a) **Impersonation**— Impersonation is a form of cheating whereby a different person than the student assigned an assignment or exam completes it. Unlike in cheating the academic work is totally 'outsourced' to another person or organization, often for money (Bushway, 1977)

(b) **Causes of academic misconduct**— There are a variety of causes of academic misconduct. Researchers have studied the correlation of cheating to personal characteristics, demographics, contextual factors, and methods of punishing misconduct, even stages of moral development.

(c) **Incentives to cheat**—Some scholars believe that there are students who have a pathological urge to cheat. The writer Thomas Mallon noted that many scholars had found plagiarism in Literature to often be perpetrated in a way similar to kleptomania. That is, a psychological disease associated with uncontrollable stealing, even when it is against the interests of the thief. On the other hand, Mallon concludes it is probable that most "cheaters" make a rational choice to commit academic misconduct.

Other experts on the issue, such as Richard Fass put forward the possibility that business scandals in the real world make students believe dishonesty is an acceptable method for achieving success in contemporary society. Academic dishonesty, in this case, would be practice for the real world. For some students, there would be a dichotomy between success and honesty, and their decision is that: "It is not that we love honesty less, but that we love success more." Conversely, other scholars consider that with the recent rise in corporate ethics related dismissals in the business world, this approach to cheating may be losing its appeal, if it ever really had any. Recent studies have indicated that there is no clear link between academic dishonesty and academic success. (Fass, 1986).

Studies show that in the USA, on average one third of grade A students have cheated. And asserts that academic dishonesty acts as a shortcut, so even grade 'A' students might be tempted to cheat. He contends that even if a plagiarized paper receives a relatively low grade, that grade is actually high, given how much time and effort went into the paper. In the study mentioned above (in which students were allowed to bring crib sheets to a test but did not improve their scores), the researcher concluded that the students used the crib notes as alternatives to studying, rather than as complements to studying, and thus spent less time preparing for the exam.

(d) **Teachers-** The federal government of the United States has mandated high-stakes testing as part of the “No Child Left Behind Act”, signed into law in 2002. Schools and teachers are held accountable for the results. According to Steven Levitt and Stephen Dubner, teachers are known to “teach to the test”: while not teaching the actual answers, they teach the questions and similar ones, and they neglect any topic that will not be tested on. Levitt also states that teachers may inflate the results of tests given in their classroom (D. Levitt,2003). Teachers and librarians can have a significant proactive impact on doing honest work. Faculty issues in deterring academic dishonesty. There are limitations to relying on the faculty to police academic dishonesty. One study found that up to 21% of professors have ignored at least one clear cut case of cheating (McCabe,2003). Another study revealed that 40% of professors “never” report cheating, 54% “seldom” report cheating, and that a mere 6% act on all cases of academic misconduct that confront them. A third survey of professors found that while 79% had observed cheating, only 9% had penalized the student (L. McCabe, 2003)

(e) **Demographic and personal causes-** Research has identified a number of demographic characteristics that appear to be important influences on cheating, including age, gender and grade point average Older students, females, and students with higher academic achievement are less likely to cheat, whereas students involved with many extra-curricular activities are more likely to do so. Students involved in extra-curricular activities may be less committed to their studies, or may have more demands on their time, that interfere with their studies, creating a greater incentive to cheat. It has been found that younger students are somewhat more likely to cheat: one study finding the highest incidence of cheating occurs during Sophomore year at college. Although, cheating might be expected to decline with greater moral development, one experiment found that there was no relationship between how a student performed on a morality test and his likelihood of cheating (that is, students at a pre-conventional stage of morality are as likely to cheat as those at a post-conventional stage).

Race, nationality, and class all show little correlation with academic misconduct. There is also no correlation between how religious someone is and the likelihood that that person will cheat. A comparison between students of different religions yielded similar results, although the study did show that Jews tend to cheat less than members of other religions. One of the strongest demographic correlations with academic misconduct in the United States is with language. Students who speak English as a second language have been shown to commit academic dishonesty more and are more likely to be caught than native speakers, since they will often not want to rewrite sources in their own words, fearing that the meaning of the sentence will be lost through poor paraphrasing skills.

(f) **Contextual causes-**Academic misconduct is more easily traced to the academic and social environment of the student than to his or her background. These contextual factors can be as broad as the social milieu at school to as narrow as what instructions a teacher gives before an exam.

Contextual factors that individual teachers can affect often makes the least difference on cheating behavior. A study found that increasing the distance between students taking an exam has little effect on academic misconduct, and that threatening students before an exam with expulsion if they cheat actually promotes cheating behavior. Indeed, increased exam proctoring and other methods of detecting cheating in the classroom are largely ineffective. According to one survey of American college students, while 50% had cheated at least once in the previous six months, and 7% had cheated more than five times in that period, only 2.5% of the cheaters had been caught. As teachers invent more elaborate methods of deterring cheating, students invent even more elaborate methods of cheating (sometimes even treating it as a game), leading to what some teachers call a costly and unwinnable arms race Increased punishment for academic misconduct also has little correlation with cheating behavior. It has been found that students with markedly different perceptions of what the severity of the punishment for cheating were all equally likely to cheat, probably indicating that they thought that increased penalties were immaterial since their cheating would never be discovered. However, if a professor makes clear that he disapproves of cheating, either in the syllabus, in the first class, or at the beginning of a test, academic dishonesty can drop by 12%.Some professors may have little incentive to reduce cheating in their classes below a point that would otherwise be obvious to outside observers, as they are rated by how many research papers they publish and research grants they win for the college, and not by how well they teach

Teachers can, however, accidentally promote cheating behavior. A study found a correlation between how harsh or unfair a professor is perceived as and academic misconduct, since students see cheating as a way of getting back at the teacher. Also, students who see themselves in a competition, such as when the teacher is using a grade curve, are more likely to cheat.

Research has also shown a correlation between goal orientation and the occurrence of academic cheating. Students who perceive their classroom to have high mastery goals are less likely to engage in cheating than those who perceive their classroom to emphasize performance goals. In other words, students who are encouraged to learn for the sake of learning and who exhibit an intrinsic value of education are less likely to cheat than those who are encouraged primarily by grades and other extrinsic rewards.

The most important contextual causes of academic misconduct are often out of individual teachers' hands. One very important factor is time management. One survey reported two- thirds of teachers believed that poor time management was the principal cause of cheating. Often social engagements are to blame. It has been found that there is a strong correlation between extracurricular activities and cheating, especially among athletes, even those on intramural teams. It has also been found that student cheating rates rise significantly the more time students spend playing cards, watching television, or having a few drinks with friends. Relatedly, fraternity or sorority membership is also strongly correlated with academic misconduct(Bernardi, 2004).

One of the most important causes of academic misconduct is the contextual factor of an environment of peer disapproval of cheating, that is, peer pressure. Psychologists note that all people tend to follow the norms of their peer group, which would include norms about academic dishonesty. Thus, students who believe that their peers disapprove of cheating are less likely to cheat. Indeed, multiple studies show that the most decisive factor in a student's decision to cheat is his perception of his peers' relationship with academic dishonesty. For instance, on average 69% of students cheat at colleges with low community disapproval of academic misconduct, whereas only about 23% of students cheat at colleges with strong community disapproval of academic misconduct. Peer pressure works both ways, as a study found that there is a 41% increase in the probability of a student cheating if he or she has seen someone else cheat. However, even if most students strongly disapprove of cheating, there has to be a community in order for those norms to be enforced via peer pressure. For instance, larger schools, which usually have much higher cheating rates than small schools, tend to have a weaker community, being more split up into different peer groups that exert little social pressure on each other. Another measure of a college community, how many students live on campus, further shows a significant relation with a school's cheating rate. Relatedly, many professors argue that smaller classes reduce cheating habits.

- (g) **Ethical causes-** No matter what the demographic or contextual influences are on a student who decides to engage in cheating behaviour, before they can cheat they must overcome their own conscience. This depends both on how strongly someone disapproves of academic dishonesty and what types of justifications the student uses to escape a sense of guilt.

Students who personally do not have a moral problem with academic misconduct can cheat without feeling guilty (Bernardi, 2004).

However, while many students have been taught and have internalized that academic dishonesty is wrong, it has been shown that about a third of students who strongly disapprove of cheating have in fact cheated. People who cheat despite personal disapproval of cheating engage in something called "neutralization", in which a student rationalizes the cheating as being acceptable due to certain circumstances (enc.wikipedia.com).

- (h) **Negative effects of cheating-** Cheating in academia has negative effects on students, on teachers, on individual schools, and on the educational system itself. For instance, students who engage in neutralization to justify cheating, even once, are more likely to engage in cheating in the future, potentially putting them on a road to a life of dishonesty. Studies show that students who are dishonest in class are more likely to engage in fraud and theft on the job when they enter the workplace. Students are also negatively affected by academic dishonesty after graduation. A university diploma is an important document in the labor market. Potential employers use a degree as a representation of a graduate's knowledge and ability. However, due to academic dishonesty, not all

graduates with the same grades actually did the same work or have the same skills. The more students who cheat, getting by without achieving the required skills or learning, the lower the quality of the average graduate of a school, and thus the less employers are willing to pay a new hire from that school. Because of this reason, all students, even those that do not cheat themselves, are negatively affected by academic misconduct.

Academic dishonesty also creates problems for teachers. In economic terms, cheating causes an underproduction of knowledge, where the professor's job is to produce knowledge. Moreover, a case of cheating often will cause emotional distress to faculty members, many considering it to be a personal slight against them or a violation of their trust. Dealing with academic misconduct is often one of the worst parts of a career in education, one survey claiming that 77% of academics agreed with the statement "dealing with a cheating student is one of the most onerous aspects of the job. A professor's job is about producing known.

Academic misconduct usually has a negative effect on a college's reputation, one of the most important assets of any school. An institution plagued by cheating scandals may become less attractive to potential donors and students and especially prospective employers. Alternatively, schools with low levels of academic dishonesty can use their reputation to attract students and employers.

Academic dishonesty undermines the academic world. It interferes with the basic mission of education, the transfer of knowledge, by allowing students to get by without having to master the knowledge. Furthermore, academic dishonesty creates an atmosphere that is not conducive to the learning process, which affects honest students as well. When honest students see cheaters escape detection, it can discourage student morale, as they see the rewards for their work cheapened (Pope, 2007).

V PUNISHING DISHONESTY

Punishments for academic dishonesty vary according to the age of the party involved and the nature of the infraction. In high school, a standard penalty for cheating is a failing grade; in college, it can result in expulsion or dismissal (At the University of Virginia for instance, there are no lesser penalties than dismissal for breaches of the honor code). In rare instances, college professors have been fired when it was discovered that they plagiarized during college or graduate school. All parties involved in the dishonesty—not just the individual whose grade is increased by it—can be punished.

Historically the job of preventing cheating has been given to the teacher. It used to be that in college the professor acted in loco parentis and was able to regulate student behavior as a parent. Thus, professors who discovered cheating could assign essentially any punishment they deemed appropriate. This system often had no recourse by which students could appeal judgments. Generally, proctors were hired to patrol exams. If a case was particularly serious, a dean or other top-level administrator might have been involved. Against this inconsistent and paternalistic system, students at some schools rebelled and

demanded to be treated as adults. Stephen Davis (1992) describes various techniques and determinants on student punishment.

(a) **Judicial boards-** However, many people doubted the advisability of relying on an abstract notion of honor to prevent academic dishonesty. This doubt has perhaps led to the reality that no more than a quarter of American universities have adopted honor codes. Moreover, many professors could not envisage a student run trial process that treated faculty accusers fairly. In response to these concerns, in the middle of the twentieth century, many schools devised mixed judicial panels composed of both students and faculty. This type of academic integrity system was similar to the traditional faculty control system in that it relied on professors to detect cheating, except in this system cheaters were brought before centralized boards of students and faculty for punishment. By the 1960s over a quarter of American universities had adopted this system of mixed judicial boards. Still, though, over half of American universities continued to use faculty-centred control systems (Bowers, 1964).

(b) **Student due process rights-** Starting in the 1960s, the U.S. Supreme Court began giving college students more civil liberties such as the right of due process in disciplinary proceedings (Dixon v. Alabama Board of Education, 1961). In Cooper v. Blair (1973), specifically academic misconduct was ruled to require due process, being a disciplinary matter and not an educational matter. The due process-rights of students in academic misconduct cases are not to the same degree as in a court of law. For instance, the student has no right to representation and the burden of proof is not necessarily stringent. In the "General Order on Judicial Standards of Procedure and Substance in Review of Student Discipline in Tax Supported Institutions of Higher Education", (1968) student due process rights were laid out as follows:

- (i) The student should be given adequate notice in writing of the specific ground or grounds and the nature of the evidence on which the discipline proceedings are based.
- (ii) The student should be given an opportunity for a hearing in which the disciplinary authority provides a fair opportunity for hearing of the student's position, explanations, or evidence.
- (iii) No disciplinary action may be taken on grounds which are not supported by any substantial evidence.

These new rules put an end to the old faculty based system of policing academic dishonesty, now students were entitled to an impartial hearing. While schools using the old honour code method or the mixed judicial system were not affected by these decisions, schools using the faculty based system generally instituted systems that relied on a committee of faculty and administrators or a dean to run the academic misconduct hearings.

(c) **Honour codes-** Donald L. McCabe and Linda Klebe Trevino, two experts in the field of academic dishonesty, have proposed a new way of deterring cheating that has

been implemented in schools such as the University of Maryland. Modified honor codes put students in charge of the judicial hearing process, making it clear that it is the students' responsibility to stop cheating amongst themselves, but at the same time students still have proctored exams and are not allowed to take pledges of good conduct in place of professor oversight. The researchers who advocate this type of code seem to think that the normal honor code is something of a special case that is not applicable to many schools. According to supporters of this system, schools with a large student body, a weak college community, or no history of student self-governance will not be able to support a full honor code. However, while modified honor codes seem to be more effective than faculty or administration run integrity codes of conduct, research shows that schools with modified codes still have higher rates of cheating than schools with full honor codes. Studies show that honor codes are not applicable to all schools (McCabe, Trevino and Butterfield, "Modified Honor Code" 357). Gary Pavele has presented a model of a Model Code in 1997 providing the guidelines of a code which could be applied in educational institutions.

(d) **Different systems of enforcement-** Research has shown that there is a strong correlation between forms of academic integrity system and levels of cheating at a school. Several studies have found students who attend schools with honour codes are less likely to cheat than students at schools with traditional integrity codes (McCabe and Trevino, "Multi campus investigation", 384). Another study found that only 28% of schools with honour codes have high levels of cheating, whereas 81% of schools with mixed judicial boards have high rates of cheating. Whereas faculty or administration run codes of conduct tend to rely on policing and punishment to deter students from cheating, honour codes tend to rely on and cultivate student senses of honour and group peer pressure to deter academic misconduct. As mentioned above in the section on causes of cheating, increased enforcement or punishment is rarely effective at discouraging cheating, whereas there is a high correlation between peer pressure and academic honesty. The modified honour code attempts to cultivate peer disapproval of cheating while maintaining the traditional proctor system, although critics argue that the proctor system undermines the creation of an atmosphere of student self-policing, reducing the effectiveness of the honour code, possibly explaining why modified honour codes have not been as effective as the original version (McCabe and Trevino, "Multi campus investigation", 1997, p384)..

(e) **Guarding academic dishonesty-**Historically the job of guarding and preventing cheating has been given to the teacher. It used to be that in college the professor acted as a parent ("Richard Hardy and David Burch, "What Political Science Professors Should Know in Dealing with Academic Dishonesty", Teaching Political Science 9, no. 2 (Fall 1981). It is true that here are limitations to relying on the faculty members of an institution to guard and control academic dishonesty and fraud. Studies show that teachers often either ignore cases of student cheating in examinations or do not report cheating. The reasons for this lack of action focus on the unwillingness to spend time and energy to such cases, reluctance to experience

emotional confrontation, and fear of retaliation by the student; in many cases, faculty members act like that because they are afraid of losing students, of being accused for harassment. There are other reasons as well. Some professors are reluctant to report violations to the appropriate authorities because they believe the punishment to be too harsh.

Some professors may have little incentive to reduce cheating in their classes below a point that would otherwise be obvious to outside observers, as they are rated by how many research papers they publish and research grants they win for the college, and not by how well they teach.

Others do not report academic misconduct because of postmodernist views on cheating. Postmodernism calls into question the very concepts of "authorship" and "originality." From the perspective of cultural studies and historicism, authors themselves are simply constructs of their social surroundings, and thus they simply rewrite already written cultural stories. Moreover, in the field of composition studies, students are being encouraged more and more to do group work and participate in ongoing collective revision. The postmodernist view is that "the concept of intellectual malpractice is of limited epistemological value. Under the ironic gaze of postmodernism, the distinctions between guilt and innocence, integrity and deceit permeating the scandal debates appear irrelevant." However, there is an argument that postmodernism is just moral relativism, therefore cheating is condoned as a valid academic method, even if it is morally and legally wrong. One professor wrote in an article in *The English Journal* that when he peeked in on an unproctored class taking a test and saw several students up and consulting with one another, he decided that they were not cheating, but were using non-traditional techniques and collaborative learning to surmount the obstacles teachers had put in their way. Issues of cultural relativism also affect professors' views on cheating; the standard objection being that "students from certain Middle Eastern, Asian, and African cultures are baffled by the notion that one can 'own' ideas, since their cultures regard words and ideas as the property of all rather than as individual property." Culture and psychology play a significant role in understanding and practicing academic cheating (E. Auderman et al., 2007)

Another issue teachers may have with deterring cheating is that they may decide that it is not their job. The argument that "they are professors, not policemen" is often heard in academic environments. In economic terms, some professors believe they are being paid to provide knowledge and learning and, if the student loses that learning through cheating, he/she is only cheating him/herself out of the money they paid (www.professorbee.com)

VI UNDERSTANDING THE ESSENCE OF INTEGRITY

During a recent training course of university faculty members, run by the researchers, the initial question was "how do you define integrity?" Surprisingly, the given definitions varied among the participants, lecturers in

different departments. It was obvious that educators perceived the issue of integrity in different ways: some views related integrity solely to plagiarism or cheating in examinations, others to the lack of professional attitude within the classroom and others related integrity to teacher-student interpersonal miscommunication. Only few definitions "touched" the issue of integration of values. The difficulty in understanding academic integrity has to do with the realization of the combination of values which determine its texture.

- (a) **Field Research-** The perception of academic integrity among educators

It is known that according to the Code of Ethics for Educators professional educators act with conscientious effort to exemplify the highest ethical standards

The researcher Dr Mohammad Sadik, an academic advisor at Cihan University, a major private university located in North Iraq, run

A field study on academic integrity among professional faculty members. The study focused on how faculty members perceive academic integrity. Prior to this research project, the researcher checked more than fifteen university websites to identify written official policies on academic integrity: none of the institutions had a clear policy on academic ethics and conduct. The questionnaire focused on respondents' perceptions. Among other questions, participants were asked to identify the core values underlying academic integrity, identify the causes of academic dishonesty and suggest methods to strengthen academic integrity within their institution. Interpreting the answers of the questionnaires, the following were determined:

- (i) Faculty members defined academic integrity as a set of significant values which offer meaning to the mission of an academic institution
- (ii) The phenomenon of cheating is not more often appearing in Middle Eastern universities
- (iii) Weak and lazy students have a stronger tendency for cheating Ethics is a fundamental ingredient in defining academic integrity
- (iv) Academic integrity considers mostly educators in higher learning
- (v) Academic integrity appears to be a kind of "contract" between faculty and students who both agree to behave in a professional and ethical manner
- (vi) Lack of specific policies on the matter permit academic dishonesty and fraud to grow
- (vii) The formalization of policies on academic integrity as well as the proper training of faculty and students helps in strengthening academic honesty
- (viii) The majority of institutions lack the application of a specific policy on academic integrity

Analyzing the questions on the "sources" of academic dishonesty and the proposed actions to minimize it, respondents referred to the following:

Sources of the lack of academic integrity include the lack of specific and clear policies and regulations on the matter,

cultural influence which permits academic cheating, lack of training on the importance of integrity among teachers, administrators and students, along with the fact that underpaid faculty is many times apathetic in chasing student cheating.

The proposed solutions to minimize academic dishonesty included the declaration of specific rules and regulations, proper training on the issue, rigid punishment measures for cheaters, more interaction with foreign universities which are more sensitive on this matter, rewarding policies for students who do not cheat, employment of faculty who acquire high professional standards. A quantitative analysis is attached in Appendix 1

This research focuses on determining the perception of academic integrity among faculty members so to understand how an academic code of conduct will be initialized in the near future. There is no doubt that no university in will grow and develop without having a firm policy with commitment towards academic and scientific integrity

It is evident that after the end of the socio-political turbulence and the end of dictatorship in Iraq, a lot of changes have occurred and social values have been influenced. In Middle East, the social integrity is expected to influence the academic one and that is a significant element in most past research projects regarding academic integrity.

The outcome of this research will eventually help academic institutions in the Middle East to accept the value and the benefit of applying academic integrity in all aspects of academic life. Surely, by emphasizing on ethical academic codes, students will add value to their degrees and the sad phenomena of cheating, plagiarism; disciplinary misconduct and dishonesty will eventually diminish. It is noticeable that the researchers found very little reference on academic integrity in the websites of universities operating in Kurdistan, Iraq, Out of 20 universities in the region, only 3 appear to have a policy on academic dishonesty: the American University of Iraq and Ishik University (table 1).

University	Website	Type of university
Hawler Medical University	www.hawlermu.org	Public
University of Duhok	www.uod.ac	Public
University of Kurdistan Erbil	www.ukh.ac	Public
University of Salahaddin	www.suh-edu.com	Public
University of Koya	www.koyauniv.ac	Public
University of Soran	www.sorani.com	Public
University of Garmian	www.gannianuniv.com	Public
University of Sulimania	www.univsu1.org	Public
University of Zakho	www.uoz-krq.org	Public
Komar University -KUST	www.komar.edu	Public
Cihan University	www.cihanuniversity.edu.iq	Private
Lebanese-French University	mvw.lfo-bmu.net	Private
SABIS University	mvw.sabisuniversity.net	Private
University of Human Resources	www.hduuniv.com	Private
Nawroz University	mvw.nawrozuniversity.com	Private
British Royal University Erbil	www.broyalu.net	Private
American University of Iraq	www.auiis.edu	Private
Ishik University -Erbil	www.iu.ac	Private

Table: 1

Ishik University, the American University of Iraq (AUIS) and Komar University are the only universities whose websites include specific information on academic integrity.

AUIS refers to an Honour Code which “...embodies the honesty and integrity on which academic success is based” We read: "The Honour Code was written by AUIS students, representing the Academic Preparatory Program and the Undergraduate Program, in February 2011. All students entering AUIS sign the Honour Code. In order to create and sustain a healthy educational environment, students are encouraged to follow the guidelines offered here. These guidelines will be considered as the Honour Code of the University. Any act that violates them will be considered dishonourable.

- (i) Each student's work will be the result of his or her own honest academic efforts.
- (ii) Students will use English during all educational pursuits at A UIS; no other languages should be used during class discussions and examinations.
- (iii) Students will not give or receive aid from their classmates during examinations, home works, assignments ... etc, unless permitted by the professor.
- (iv) Students will not lie, plagiarize, or steal.
- (v) Students will respect one another and University property and personnel.

”On my honour, I will follow the above guidelines about academic ethics and codes of conduct”. (www.auiis.edu. iq) Ishik University in Erbil refers to specific regulations for student discipline. We read; “Chapter I: General Provisions. Article 1- These regulations are in place to arrange the consequences for actions, such as, non-compliance issues, unethical conduct, plagiarism, and other alleged misconducts and actions that require penalties determined by university disciplinary committee. ” Chapter II-Disciplinary Cases and Resulting Sanctions

Article 4: General Student Obligations to Avoid Disciplinary Actions

Each Ishik University student is expected to demonstrate respect for every other human being. Each student must in particular: Behave in an honest and responsible way. Comply with all legal provisions that apply to students, (www.iu.ac).

Komar University refers to its statement on Values and Moral Standards. We read: “The moral norm which guides conduct and informs policy at Komar University of Science and Technology is responsible freedom. ” Freedom is an important experience that the university, one of the freest of institutions, provides for its entire community member (faculty, students, administrators, and staff). Freedom is responsibly exercised when it is guided by ethical standards.Truthfulness in one's claims and representations and honesty in one's activities are essential in life and vocation, and the realization of truthfulness and honesty is an intrinsic part of the educational process. Guided by these principles, this Academic Honor Policy outlines the university ’s expectations for students " academic work, the procedures for resolving alleged

violations of those expectations, and the rights and responsibilities of students and faculty throughout the process.

Academic Honor Pledge

I affirm my commitment to the concept of responsible freedom. I will be honest and truthful and will strive for personal and institutional integrity at Komar University of Science and Technology. I will abide by the Academic Honor Policy at all times.” (www.komar.edu)

VII ACADEMIC DISHONESTY TODAY

Academic dishonesty unfortunately exists in all levels of education and in all societies. Studies show that students start cheating in the first grade, while high school is the most common level where cheating is blooming. Of course, not only students but teachers as well do cheat. Cheating among colleagues appears to happen often; such cheating occurs in the form of using each other’s notes and tests or inflating grades. Nowadays the phenomenon of buying research papers through the internet has become a serious problem. There are online services that offer to prepare any kind of homework of high school and college level and take online tests for students.

In the Kurdistan Region there is much to happen and be applied on this matter; academic integrity remains a significant issue and academic institutions are moving towards the formulation of policies to empower the benefits of academic honesty. Above all, however, academic authorities in such region are required to pass legislation that protect copyright. Unfortunately, until now, in some countries, textbooks which are used by colleges and universities are copied without permission and sold without any kind of control. Of course, this practice passes the wrong messages to students and academics degrading fundamental values of academic integrity.

Unfortunately, the focus on academic dishonesty in many areas of the world is limited; cheating is a common phenomenon which academics will have to face for years. Students will keep on striving for good grades, discover new ways to cheat and teachers will eventually still be faced with academic dishonesty issues. It is obvious that academic dishonesty is not a problem whose solution can be ordered. Societal values and pressures for success will be always behind the phenomena of academic dishonesty with universities. The mission of contemporary academic organizations, realistically, is to establish and apply sound policies on academic integrity, keep on training everyone involved in the academic community and relate their reputation to the degree they believe in academic integrity.

The researchers' suggestion is that the focus of academic authorities should be the policies which could prevent academic deceit rather than policies focusing on declaring punishments against dishonesty. Thus, proper faculty and student training on the issue, primarily on the benefits of integrity, will eventually eliminate academic malpractice at all levels. Our focus as educators becomes quite clear: to educate everyone involved in academia about the value of academic integrity and its role and influence on professional success.

VIII CONCLUSION

In general, in only a few years the personal computer, the CD-ROM encyclopedia and the Internet have changed the way students do academic research. Unfortunately, technology helps the phenomena of academic dishonesty within universities and academic honesty must be more emphasized. Academic integrity and its application among academic institutions in the Kurdistan Region remains a fundamental issue. Further research should be conducted and more actions should be taken to control academic fraud. This research reveals the importance of passing copyright laws and setting up rigid measures to protect academic integrity. Training faculty and students on the matter and the benefits which derive from its application remains a priority. The researchers plan to repeat their research after a period of two years to identify possible improvement among the perceptions of faculty members on this issue.

Academic integrity is an issue which does not really apply to certain forms or types of academic institutions, regardless if they belong to the public or private sector. Thus, educational planning focusing on academic integrity is absolutely necessary for both the public and private educational institutions in the Kurdistan Region.

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QUESTIONNAIRE & RESULT OF SURVEY

Question				
Read the following 3 statements on “academic integrity” and mark the one that YOU THINK is the most accurate one (please tick or circle your selection')	Academic integrity is the set of significant values and principles which offer meaning to the overall mission of any academic institution 66%	Academic integrity is related with the absence of corruption emphasizing the fair treatment of students within an academic environment 26%	Although not a priority, academic integrity contributes positively to the success of an academic institution, diminishing cheating among students 8%	
Q2	Do you think that student cheating is mostly attempted by	Weak and lazy students 66%	All students regardless studying and learning abilities 44%	Smart students 6%
Q3	Do you think academic dishonesty incidents is a phenomenon appearing more often in Middle Eastern institutions rather than the western ones?	Yes 18%	No 50%	Not sure 32%
Q4	Which set of values you think is closer to the determination of academic integrity ?	ethics, professionalism, justice, achievement of excellence 58%	professional manners, truthfulness, mutual understanding 30%	progress, honesty, inspiration, awareness 12%
Q5	Academic integrity considers mostly educators in institutions of higher learning	True 44%	False 26%	Possibly true 34%
Q6	“Academic integrity appears as an informal “contract” between faculty and students who both agree to behave in a professional and ethical manner and share common standards and common perceptions about excellence”. Do you agree with such view?"	Yes I agree 68	No, I do not agree 14	Not sure 18%
Q7	Do you have a specific policy of academic integrity in the institution you are employed at the present time?	Yes 36%	No 64%	

<p>Q8 Please indicate or list the major reason(s) permitting academic dishonesty and academic fraud to grow in an academic institution</p>	<p>Lack of policies and regulations Lack of training on academic integrity</p>
<p>Q9 Please propose a method of strengthening academic integrity in an educational institution</p>	<p>Faculty training Formalization of punishment rules on academic dishonesty and fraud Student training</p>

Demographics

Total sample: 50 (Males 41 Females 9)

Years of experience in education: Less than 10 years: 25 10-20 years: 9 over 20 years: 16

Respondents are employed at the following institutions: Cihan University Cihan College, Salahaddin University

Entrepreneurship A New Avenue for Indian Women

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I INTRODUCTION

Being the second most populous country of the world, India has both in abundance, the challenges and perspectives in entrepreneurship. There are two wheels of society which run the whole economy of a nation, male fraternity and female fraternity. Entrepreneurship is a major contributor of economic growth. Its impact is manifold on the development of a nation.

Women being the better halves in a society, play an important role in entrepreneurship development. It is a fact that a woman constitutes the family, which leads to society and to Nation. Social and economic development of women is necessary for gross economic development of any society or a country. Entrepreneurship is the state of mind which every woman has in her as an additional quality/ trait in a recessive form. Due to drastic change in environment, now people are more prone to accept leading role of women in patriarchal society.

The increasing dependency of mankind on service sector has created many entrepreneurial opportunities especially for women where they can excel their skills with maintaining balance in their life.

This research paper would explore and explain the possibilities of participation of women to strengthen entrepreneurship in India. It also includes the success stories of few Indian women who had set examples for the world to show how one can survive and flourish in even in adverse circumstances.

Essentially it focuses on "Women Entrepreneur", with special reference to Indian women that how they manage efficiently in between their work life and their family life by satisfying the requirements of both. This paper also illustrates the past challenges and present hurdles affecting entrepreneurship in Indian scenario followed by curative suggestions.

Purpose of this paper presentation is to share various motivating factors of role of Indian women in entrepreneurship development and success stories of women entrepreneurs. It will also suggest the ways of eliminating and reducing hurdles of the women entrepreneurship development in Indian Context in order to achieve grand success in entrepreneurship with special reference to those exceptional examples where women have taken initiative to set up a functional and successful Enterprise.

(a) Women Entrepreneurship: When we speak specifically about the term "Women Entrepreneurship" we mean, an act of business creation and ownership that not only empowers women economically but also increases their financial strength as well as position in society. Hence women-entrepreneurs have been making a considerable impact in all most each segment of the economy which is more than twenty five of all kinds of business.

The need to run and manage the vast emerging developments occurring globally in general and in India particular requires a lot of entrepreneurs. Women fraternity, constituting the half of the literate youth power, plays a crucial role in entrepreneurship development.

(b) Women Entrepreneur: The women of current era represent a modern, educated, working woman who has a family to run, children to raise, while doing the job. These women wish to achieve academic and professional excellence without risking their career and or money on it. The factors responsible for women to be Entrepreneurs include, Financial compulsions, Change in life style, Rapidly disappearing secured jobs, increased Inflation, International market forces, Populist moves of the Governments, Forcing to enhance family income, Multiple sets of the same commodity, Each commodity very expensive, Escalating costs of education, Peer pressure for outing, life style expenses etc.

I would like to discuss here what major limitations an educated woman faces being an Indian woman. Some of the major challenges an Indian working woman faces:

- (i) Work – family balance
- (ii) Be fully traditional or modern?
- (iii) How to say no to the traditional expectations, loading work at will?
- (iv) The increasing influence of technology has brought about a major shift in how we work, relax, entertain, travel, learn and so on

Entrepreneur is a recent concept that means having entrepreneurship qualities and using them to develop the same organization you are employed with. It is defined as "A manager within a company who promotes innovative product development and marketing."

II CHANGING ENVIRONMENT & ENCOURAGING POLICIES

As per general Budget 2013, it is clearly indicated by the Government of India that women as entrepreneurs are required in bulk hence a major portion of it is concerned with the same this year.

First women's bank to be set up in public sector with capital of Rs 1,000cr. It will lend to businesses that are run by women, employ women, and support women's SHGs (Self Help Groups) and livelihoods.

Rs. 200 crores to end "gender discrimination" to help "vulnerable groups" like single women and widows. Rs. 1,000 Crores "Nirbhaya Fund" for the dignity and safety of women.

This year's budget has focused on women like never before. I would also like to discuss the series which focuses on women who are mixing enterprise with social good to bridge the gap between yesterday's and tomorrow's India. These evangelists are building start-ups, crowd funding businesses, honing new skills, and launching second careers. Whether it is the case of Girl's Gram Panchayat in Gujarat, the Chennai-based Flexi Careers, Bangalore's nonprofit financier Rang De, they are all devoted to a single passion: empowering women.

Crowd funding is a small example where microfinance is mixed with crowd funding. Rang De is a web platform that is adding colour to women's lives. Whether it is Humeera Kuji, a tailor from Jhabua, MP, looking to double her output with a second sewing machine, or Sonali Das, twenty years old from Kashimpur, West Bengal, who breeds and sells birds, a loan of a few thousand rupees can be a big relief. Such loans are provided to people logging on to Rang De's website and pledging amounts as low as rs 100. Smita Ramakrishnan, co-Founder and co-CEO proudly says that they have around Rs 10 Crore to more than 25,000 women across 15 states.

Another exceptional example is of "Sangini Mahila Seva Cooperative Society".

It is about lighting up the lives of sex workers. What began as a movement to teach Mumbai's sex workers the importance of safe sex has now become one of the first cooperative societies for such workers. According to Shilpa Merchant, a pro bono worker with the Sangini Mahila Seva Cooperative Society, sex workers find it difficult to open bank accounts; some banks deter them from entering their branches. Sangini has changed all that providing thousands of women access to banking. For 60 years old Pannabai, her Rs. 18,000 saving is a matter of pride and security. It is like a new life for a sex worker.

Another important example is of Female Flexibility. Sundarya Rajesh, 43, the founder president of Chennai based FLEXI Careers India, is a match maker. She is always scouting for flexible jobs for women taking a

break after marriage, childbirth or relocation. Generally companies lose talented pool of qualified professionals when they do not provide openings for women who seek a formal but flexible work environment. Convincing employers about the efficacy of flexi work was tough until Saundarya proved it could be cost-effective. Starting with a registry of 200, her firm now boasts of 26,000 professionals.

Although we have a lot of encouraging examples yet awareness at mass level at both rural and urban level is still required to get maximum participation from women. I would like to quote here 5 Indian women entrepreneurs, their inspiring works and the lesson they teach us...

As a nation, we have long idolized male business icons like RATAN TATA and DHIRUBHAI AMBANI, for their entrepreneurial spirit and business Bravado, as in the age of economic creativity, we need successful role models to fuel our generation's business imagination, and teach them how to succeed despite of the missing infrastructure and convoluted laws of our land.

Yet, I am often shocked by the lack of discussion about "Women Entrepreneurs as Role Models"

"It's not as if India doesn't have successful women entrepreneurs. There are plenty, and the number is only growing faster with time. Yet, despite the material success and social change that Indian women entrepreneurs have earned, their names are far from becoming everyday household discussion topics.

To reverse this trend, and acknowledge Indian women's business success, I trace some of these leaders' life stories and the useful lessons they teach all entrepreneurs whether male or female.

Ela Bhatt: India's microfinance success story owes much to ELA BHATT'S grit and social consciousness. Bhatt is the founder of the Self-Employed Women's Association (SEWA) which provides microfinance funding and entrepreneurial training to thousands of women across India.

Bhatt, a noted Gandhian, started SEWA in 1972, to support the large number of women working in India's unorganized labour sector. From traditional garments and textiles to solar-power bulbs and lighting products, SEWA women have found entrepreneurial success through a diverse line of ventures. SEWA supports more than 9,00,000 women in their business journey through financing, publicity, legal help and other social and justice based issues.

Ela Bhatt has been awarded the Padmashri, the Padmabhushan and the Magsaysay award, in recognition of her contribution to women's economic and social empowerment in India. Her story is the best example of "small things making a huge difference". SEWA began by giving out small loans to women to start their entrepreneurial journeys. Today, it has led a revolution in micro financing and even impacted India's regulations

within the unorganized sector, in favor of the countless self employed women. Most importantly, SEWA has taught women that anything and everything is possible: it is possible to be a woman and succeed in a patriarchal, it is possible to grow large enterprises even if you start small, it is possible to do good while doing well for yourself, and it is possible (and very beneficial) for women to support and strengthen each other in their journey towards economic freedom and social well-being.

Kalpana Saroj: Kalpana Saroj was bullied and discriminated in school for being an “untouchable” Dalit. At the age of 12 she was forced into a violent marriage with a man 10 years older than her. However, this resilient entrepreneur didn’t let either India’s archaic cast system or the illegal practice of child marriage get in her way.

She escaped her marriage and learnt tailoring to support herself, moving to Mumbai at the age of 16 , working nearly 18 hours a day, she expanded her business as a seamstress, building a reputation as smart business women .This eventually led to her being asked to take over Kamani tubes, a metal engineering company that was in deep debt.

Saraj turned the company around into a giant profit making business worth more than \$100 million. She runs a sovereign company that employs people from all castes and background.

Her courage of conviction and battle against deeply-ingrained social evils give hope to aspiring entrepreneurs within India’s many underrepresented minorities, that in the business world, all that matters is determination. Her spirit of relentless enterprise make Kalpana Saroj one of India’s most inspiring entrepreneurs, who stands as factual evidence of an India changing for the better.

KIRAN MAJUMDAR SHAW: One of the most famous women entrepreneurs of India, Kiran is often heralded as the pinup women for the women entrepreneurs of India. This recognition is well deserved: as the founder of the hugely successful biocon , a biotech firm in India, she has led the movement of innovation and growth within India’s biotechnology sector. Biocon’s strong manufacturing capabilities and its global scale have helped it become one of the world’s leading biotech companies. Much of its \$ 900 million worth can be attributed to Ms. Shaw’s vision of affordable, yet innovative healthcare products.

While her success in her business venture is constantly honoured by the business fraternity, her prominent role in encouraging young entrepreneurs is worth of even greater applause. Ms. Shaw regularly doles out business advice and encouragement to young start ups and is one of the most accessible business leaders because of her social media savvy.

Chetna Gala Sinha also has set an example in the field of banking. Ekta Kapoor is a renowned name on small screen and likewise the no of women increases in the field of entrepreneurship development.

III CONCLUSION

The study tried to find out the difference among various set of people of the crucial factors which are concerned with the women Entrepreneurial opportunities at large. Issues have been identified through various review of literature. It is cross checked with few real entrepreneurs/Entrepreneurs. These factors may vary from place to place business to business but women Entrepreneurship is necessary for the growth of any economy weather it is large or small.

For all you Women Entrepreneurs out there or Women who aspire to be Entrepreneurs, I would like to conclude with a quote of Mary Kay Ash, founder of Mary Kay Cosmetics. “Don’t limit yourself. Many people limit themselves to what they think they can do. You can go as far as your mind lets you. What you believe, remember, you can achieve.”

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Women Empowerment through Entrepreneurship in India

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ABSTRACT-

Woman constitutes the family, which leads to society and Nation. Social and economic development of women is necessary for overall economic development of any society or country. Entrepreneurship is the state of mind which every woman has in her but has not been capitalized in India in way in which it should be. Due to change in environment, now people are more comfortable to accept leading role of women in our society, though there are some exceptions. Women entrepreneurship development is an essential part of human resource development. Any strategy aimed at economic development will be lop-sided without involving women who constitute half of the world population. Evidence has unequivocally established that entrepreneurial spirit is not a male prerogative. Women owned businesses are highly increasing in the economies of almost all countries. The hidden entrepreneurial potentials of women have gradually been changing with the growing sensitivity to the role and economic status in the society. Skill, knowledge and adaptability in business are the main reasons for women to emerge into business ventures. Major objectives of the study are to ascertain the factors in the emergence of women entrepreneurs. Further study highlights the major constraints and challenges faced by women entrepreneur and opportunities available to them. At the end the paper makes some suggestions for increase or promotion of women entrepreneurs and healthy growth of women entrepreneurs in India.

I INTRODUCTION

Generally, an entrepreneur is a person who combines capital and labour for production. According to Cantillion “entrepreneur is the agent who buys means of production at certain prices, in order to sell at prices that are certain at the moment at which he commits himself to his cost”. According to P.F Drucker “he is one who always searches for change: responds to it & exploits it as an opportunity”. Hence, Entrepreneurship refers to the act of setting up a new business or reviving an existing business so as to take advantages from new opportunities. The term “Entrepreneur” is used in various ways and various views. These views are broadly classified into two groups namely: - Risk-Bearer Organizer. Thus, entrepreneurs shape the economy by creating new wealth and new jobs and by inventing new products and services. Entrepreneurship is a state of mind, which develops naturally, based on his/ her surrounding and experiences, which makes him/ her think about life and career in a given way. The women have achieved immense development in their state of mind. With increase in dependency on service sector, many entrepreneurial opportunities especially for women have been created where they can excel their skills with maintaining balance in their life. Accordingly, increasing number of Indian women has entered the field of entrepreneurship and also they are gradually changing the face of business of today, both literally and figuratively. But still they have not capitalized their potential in India the way it should be. When we speak about the term “Women Entrepreneurship” we mean, an act of business ownership and business creation that empowers women economically, increases their economic strength as well as position in society. Hence women-entrepreneurs have been making a considerable impact in all most all the segments of the economy which is more than 25

percent of all kinds of business. In India “Entrepreneurship” is very limited amongst women especially in the formal sector, which is less than 5 percent of all the business.

II GROWTH OF WOMEN ENTREPRENEURSHIP AND EMPOWERMENT IN INDIA

Last five decades have seen phenomenal changes in the status and work place diversity of women in India. Empowering women entrepreneurs is essential for achieving the goals of sustainable development. The bottlenecks hindering their growth must be eradicated to entitle full participation in the business. Women entrepreneurs can be guided by women as pioneers and mavericks. They have ventured to build enterprises, to discover their relevance and meaning of life in themselves. But still in relation to the women population the trend has not been spectacular. As per 1991 census, only 185900 women accounting for only 4.5 percent of the total self employed persons in the country were recorded. Majority of them were engaged in the unorganized sector like agriculture, agro based industries, handicrafts, handlooms, and cottage based industries. There were more than 295680 women entrepreneurs claiming 11.2 percent of the total 2.64 million entrepreneurs in India during 1995-96. This is almost double the percent of women (5.2 percent) among the total population of self employed during 1981; The Indian economy has been witnessing a drastic change since mid -1991, with new policies of economic liberalization, globalization and privatization initiated by the Indian government. India has great entrepreneurial potential in order to mobilize women entrepreneurs. A number of activities such as motivational drive; preparation of information material;

conducting training; creation of women industrial estates/areas/sheds; creation of common marketing exposition centers, training of trainers/ promoters; use of mass media, etc are required. Combined effect of all these is bound to accelerate the process of women entrepreneurship development.

(a) **Progress of Indian Women:** A significant chunk (58 percent) of entrepreneurs surveyed had started their businesses between the ages of 20 & 30; interestingly, 25 percent had started up even before turning 25. Some women started their business right after their education, most were either graduates or post-graduates.

(b) **Top 10 Women Entrepreneurs of India**

- (i) Dr. Kiran Mazumdar Shaw, Chairperson & Managing Director of Biocon Ltd., who became India's richest woman in 2004, was educated at the Bishop Cotton Girls School and Mount Carmel College in Bangalore. She founded Biocon India with a capital of Rs.10,000 in her garage in 1978 – the initial operation was to extract an enzyme from papaya. Her application for loans were turned down by banks then – on three counts – biotechnology was then a new word, the company lacked assets, women entrepreneurs were still a rarity. Today, her company is the biggest biopharmaceutical firm in the country.
- (ii) Ekta Kapoor, creative head of Balaji Telefilms, has been synonymous with the rage of soap operas in Indian TV, after her most famous venture 'Kyunki Saas Bhi Kabhi Bahu Thi' which was aired in 2000 on Star plus. Ekta dominates Indian Television. At the 6th Indian Telly Awards 2006, she bagged the Hall of Fame award for her contributions.
- (iii) Neelam Dhawan, Managing Director, Microsoft India, leads Microsoft India. She is a graduate from St. Stephens College in 1980, and also passed out from Delhi's Faculty Of Management studies in 1982. Then she was keen on joining FMCG (Fast Moving Consumer Goods) majors like Hindustan Lever and Asian Paints, both companies rejected Dhawan, as they were not interested to appoint women for marketing and sale.
- (iv) Naina Lal Kidwai was the first Indian woman to graduate from Harvard Business School. Fortune magazine listed Kidwai among the world's top 50 Corporate Women from 2000 to 2003. According to the Economic Times, she is the first woman to head the operations of a foreign bank in India HSBC (Hongkong & Shanghai Banking Corporation)
- (v) Indu Jain, the multi-faceted lady used to be the Chairperson of the Times Group-the most powerful and largest media house in India. Indu Jain is known by many different identities such as that of spiritualist, humanist, entrepreneur, and educationalist but most

prominently she played the role of the Chairperson of Times Group. Indu Jain is the perfect picture of the successful Indian woman entrepreneur.

- (vi) Priya Paul, she has a bachelor's degree specializing in Economics from Wellesley College, USA. She entered her family business and is currently the Chairperson of Park Hotel.
- (vii) Simone Tata has been instrumental in changing a small subsidiary of Tata Oil Mills into the largest cosmetic brand in India – LAKME, synonymous today with Indian fashion. She became a part of Lakme during 1961 and has been responsible for turning the company into one of the biggest brands of fashion in India. At present she is the Chairperson of Trent Limited, a subsidiary of Tata Group.
- (viii) Mallika Srinivasan, currently the Director of TAFE- Tractors and Farm Equipment, India, was honoured with the title of Businesswoman of the Year during 2006 by the Economic Times. She joined the company in 1986 and has since been responsible for accelerating turnover from 85 crores to 2900 crores within a span of 2 decades.
- (ix) Preetha Reddy, Managing Director of Apollo Hospitals, Chennai, one of the largest healthcare conglomerates of India, is one of the pioneer businesswomen of India in the segment of Health Care Industry.
- (x) Ranjana Kumar, currently Vigilance Commissioner in Central Vigilance Commission, after her retirement as the Chairperson of NABARD- National Bank For Agricultural and Rural Development, is a prominent Indian Banker. When the Government of India appointed her as the Chairperson and Managing Director of The Indian Bank, she became the first woman to become head of a public sector bank in India. At the time of her appointment, The Indian Bank was saddled with huge losses but during her tenure she ensured the turnaround of The Indian Bank.

III REASONS FOR WOMEN OPTING FOR ENTREPRENEURSHIP

The women were asked why they started a business in the first place. The most common reasons were financial in nature. Self determination, expectation for recognition, self esteem and career goal are the key drivers for taking up entrepreneurship by women (Moore & Buttner, 1997). Sometimes, women chose such career path for discovering their inner potential & caliber in order to achieve self satisfaction. It can also provide a means to make best use of their leisure hours. However, dismal economic conditions of the women arising out of unemployment in the family and divorce can compel women into entrepreneurial activities. The importance of promoting women to engage in

economic activities is now being increasingly realized by all developing countries. The need is twofold - (i) to empower women by bringing them into main stream of development and by improving their economic status; and (ii) to provide new employment opportunities by self-employment and entrepreneurship development among them. Several women were motivated by their interest in a particular craft and having time on their hands to pursue their interests. For these women, the business often started as a hobby; then, as their friends and relatives started purchasing some of their products, the hobby slowly grew into a full-fledged business operation. A final motivator seems to be the urge to do something for other people for example, providing employment to others, to be good role models to their children or just the need to do something worthwhile. While these can be called "pull" factors, the focus here seems to be on factors outside of themselves or their personal success. Studies from other countries- especially from developed nations- indicate that individual "push" factors such as dissatisfaction with jobs is a significant motivating factor in the case of women entrepreneurs. It is interesting that the "push" factors here were primarily related with their jobs or facing the "glass ceiling"..

Entrepreneurship development among women is one activity that promises encouraging results. By motivating, training and assisting women towards independent business ventures, it may be possible to bring beneficial results in the development of a region. Women's entrepreneurial activities are not only a means for economic survival but also to empower them economically and enable them to contribute more to overall development.

IV CONSTRAINTS FOR WOMEN ENTREPRENEURS

Women entrepreneurs face a series of problems right from the beginning till the enterprise functions. Being a woman itself poses various problems to a woman entrepreneur. The problems of Indian women pertain to her responsibility towards family, society and lion work. The traditions, customs, socio cultural values, ethics, motherhood, hard work areas, feeling of insecurity etc are some peculiar problems that the Indian women are coming across while they jump into entrepreneurship. Women in rural areas have to suffer still further. They face tough resistance from men. They are considered as helpers. The attitude of society towards her and constraints in which she has to live and work are not very conducive.

Besides the above basic problems the other problems faced by women entrepreneurs are as follows:-

- (a) Socio-cultural barriers – Women's family and personal obligations are sometimes a great barrier for succeeding in business career. Only few women are able to manage both home and business efficiently, devoting enough time to family.

- (b) Market-oriented risks – Stiff competition in the market and lack of mobility of women make the dependence of women entrepreneurs on middleman indispensable. Many business women find it difficult to capture the market and make their products popular. They are not fully aware of the changing market conditions and hence can effectively utilize the services of media and internet.
- (c) Motivational factors – Self motivation can be realized through a mind set for a successful business, attitude to take up risk and behavior towards the business society by shouldering the social responsibilities. Other factors are family support, Government policies, financial assistance from public and private institutions and also the environment suitable for women to establish business units.
- (d) Lack of Knowledge in Business Administration – Women must be educated and trained constantly to acquire the skills and knowledge in all the functional areas of business management. This can facilitate women to excel in decision making process and develop a good business network.
- (e) Awareness about the Financial Assistance – Various institutions in the financial sector extend their maximum support in the form of incentives, loans, schemes etc. Even then every woman entrepreneur may not be aware of all the assistance provided by the institutions. So the sincere efforts should be taken towards creating awareness among them.
- (f) Exposed to the Training Programs - Training programs and workshops for every type of entrepreneur is available through the social and welfare women entrepreneurs which may not reach the entrepreneurs in rural and backward areas. There are associations based on duration, skill and training program. Such programs are really useful to new, rural and young entrepreneurs who want to set up a small and medium scale unit on their own.
- (g) Identifying the Available Resources – Women are hesitant to find out the access to cater their needs in the financial and marketing areas. In spite of the mushrooming growth of associations, institutions, and the schemes from the government side, women are not enterprising and dynamic to optimize the resources in the form of reserves, assets mankind or business volunteers.
- (h) Male Dominated Society - Even though our constitution speaks of equality between sexes, male chauvinism is still the order of the day. Women are not treated equal to men. Their entry to business requires the approval of the head of the family. Entrepreneurship has traditionally been seen as a male preserve. All this puts a break in the growth of women entrepreneurs.

- (i) Lack of Education - Women in India are lagging far behind in the field of education. Most of the women (around sixty per cent of total women) are illiterate. Those who are educated are provided either less or inadequate education than their male counterpart partly due to early marriage, partly due to son's higher education and partly due to poverty. Due to lack of proper education, women entrepreneurs remain in dark about the development of new technology, new methods of production, marketing and other governmental support which will encourage them to flourish. Women like these are an inspiration for all other women who strive to achieve great heights in their lives. Taking them as our role models each one of us can be there where they are right now. All we need have is faith in ourselves, confidence and above all a fixed aim.

V SUGGESTIONS FOR THE GROWTH OF WOMEN ENTREPRENEURS

Right efforts from all areas are required in the development of women entrepreneurs and their greater participation in the entrepreneurial activities. Entrepreneurship basically implies being in control of one's life and activities and women entrepreneurs need to be given confidence, independence, and mobility to come out of their paradoxes. The following measures are suggested to empower the women to seize various opportunities and face challenges in business.

There should be a continuous attempt to inspire, encourage, motivate and cooperate women entrepreneurs.

An awareness programme should be conducted on a mass scale with the intention of creating awareness among women about the various areas of business.

Attempts should be there to enhance the standards of education for women in general as well making effective provisions for their training, practical experience and personality development programmes, to improve their over-all personality standards.

Organize training programmes to develop professional competencies in managerial, leadership, marketing, financial, production process, profit planning, maintaining books of accounts and other skills. This will encourage women to undertake business.

Vocational training to be extended to women community that enables them to understand the production process and production management.

Skill development to be done in women's polytechnics and industrial training institutes. Skills are put to work in training-cum-production workshops.

Educational institutes should tie up with various government and non-government agencies to assist in entrepreneurship development mainly to plan business projects.

International, National, Local trade fairs, Industrial exhibitions, seminars and conferences should be organized to help women to facilitate interaction with other women entrepreneurs.

Women in business should be offered soft loans & subsidies for encouraging them into industrial activities.

The financial institutions should provide more working capital assistance both for small scale venture and large scale ventures.

Making provision of micro credit system and enterprise credit system to the women entrepreneurs at local level.

The women of weaker section could raise funds through various schemes and incentives provided by the government to develop entrepreneurs in the state. E.g. the Prime ministers Rozgar Yojana, The Khadi and Rural village industries scheme, etc. In the initial stages women entrepreneurs may face problems but they must persevere, believe in themselves and not give up mid way.

NGO's and government organizations should made certain attempts to spread information about policies, plans and strategies on the development of women in the field of industry, trade and commerce.

Women entrepreneurs should utilize the various schemes provided by the Government.

Women should try to upgrade themselves in the changing times by adapting the latest technology benefits.

Women must be educated and trained constantly to acquire the skills and knowledge in all the functional areas of business management. This can facilitate women to excel in decision making process and develop a good business network.

Self help groups of women entrepreneurs to mobilize resources and pooling capital funds, in order to help the women in the field of industry, trade and commerce can also play a positive role to solve this problem.

Women's entrepreneurship must be examined both at the individual level (i.e. the choice of becoming self-employed) and at the firm level (the performance of women owned and managed firms) in order to fully understand the differences between men's and women's entrepreneurship.

To establish all India forums to discuss the problems, grievances, issues, and filing complaints against constraints or shortcomings towards the economic progress of women entrepreneurs and giving suitable decisions in the favor of women entrepreneurs and taking strict stand against the policies or strategies that obstruct the path of economic development of such group of women entrepreneurs. Thus, by adopting the following aforesaid measures in letter and spirit the problems associated with women can be solved.

VI INITIATIVES BY THE GOVERNMENT OF INDIA

Development of women has been a policy objective of the government since independence. Until the 1970s the concept of women's development was mainly welfare oriented. In 1970s, there was a shift from welfare approach to development approach that recognized the mutually reinforcing nature of the process of development. The 80s adopted a multi-disciplinary approach with emphasis on three core areas of health, education and employment. Women were given priorities in all the sectors including SSI sector. Government and non government bodies have paid increasing attention to women's economic contribution through self employment and industrial ventures.

The First Five-Year Plan (1951-56) envisaged a number of welfare measures for women. Establishment of the Central Social Welfare Board, organization of Mahila Mandals and the Community Development Programmes were a few steps in this direction. In the second Five-Year Plan (1956-61), the empowerment of women was closely linked with the overall approach of intensive agricultural development programmes. The Third and Fourth Five-Year Plans (1961-66 and 1969-74) supported female education as a major welfare measure. The Fifth Five-Year Plan (1974-79) emphasized training of women, who were in need of income and protection. This plan coincided with International Women's Decade and the submission of Report of the Committee on the Status of Women in India. In 1976, Women's Welfare and Development Bureau was set up under the Ministry of Social Welfare.

The Sixth Five-Year Plan (1980-85) saw a definite shift from welfare to development. It recognized women's lack of access to resources as a critical factor impeding their growth.

The Seventh Five-Year Plan (1985-90) emphasized the need for gender equality and empowerment. For the first time, emphasis was placed upon qualitative aspects such as inculcation of confidence, generation of awareness with regards to rights and training in skills for better employment.

The Eight Five-Year Plan (1992-97) focused on empowering women, especially at the grass roots level, through Panchayati Raj Institutions.

The Ninth Five-Year Plan (1997-2002) adopted a strategy of Women's Component Plan, under which not less than 30 percent of funds/ benefits were earmarked for women related sectors.

The Tenth Five-Year Plan (2002-07) aims at empowering women through translating the recently adopted National Policy for Empowerment of Women (2001) into action and ensuring Survival, Protection and Development of women and children through rights based approach.

The Eleventh Five-Year Plan (2007-2012) aims at empowering women politically, educationally, economically, legally.

The Twelfth Five Year Plan (2012-2017) is to ensure dignity & equality of all women, in a manner that enables them to gain control over their choices, resources, societal perceptions & attitudes, through enhancement of their economic, social & political freedom by engendering all national Policies, schemes & programmes. These plans are committed to ensure empowered lives for women who comprise 48 percent of the country's population. At present, the Government of India has over 27 schemes for women operated by different departments and ministries. Some of important schemes are:-

- (a) Integrated Rural Development Programme (IRDP),
- (b) Khadi and Village Industries Commission (KVIC),
- (c) Training of Rural Youth for Self-Employment (TRYSEM),
- (d) Prime Minister's Rojgar Yojana (PMRY),
- (e) Entrepreneurial Development Programme (EDPs),
- (f) Management Development Programmes (MDPs),
- (g) Women's Development Corporations (WDCs),
- (h) Marketing of Non-Farm Products of Rural Women (MAHIMA),
- (i) Assistance to Rural Women in Non-Farm Development (ARWIND) schemes, Trade
- (j) Related Entrepreneurship Assistance and Development (TREAD),
- (k) Indira Mahila Yojana ,
- (l) Indira Mahila Kendra,
- (m) Mahila Samiti Yojana,
- (n) Mahila Vikas Nidhi,
- (o) Micro Credit Scheme,
- (p) Rashtriya Mahila Kosh ,
- (q) SIDBI's Mahila Udyam Nidhi ,
- (r) Mahila Vikas Nidhi,
- (s) SBI's Stree Shakti Scheme ,
- (t) NGO's Credit Schemes,

- (u) Micro & Small Enterprises Cluster Development Programmes (MSE-CDP),
- (v) National Banks for Agriculture and Rural Development's Schemes ,
- (w) Rajiv Gandhi Mahila Vikas Pariyojana (RGMVP),
- (x) Priyadarshini Project- A programme for Rural Women Empowerment and Livelihood in Mid Gangetic Plains,
- (y) NABARD- KFW-SEWA (Support to Training & Employment Programme) Bank Project,
- (z) Exhibitions for women, Promotional package for Micro & Small enterprises approved by CCEA(Cabinet Committee on Economic Affairs) under marketing support.

VII CONCLUSION

The efforts of government and its different agencies are ably supplemented by NGOs that are playing an equally important role in facilitating women empowerment. Despite concerted efforts of government and NGOs there are certain gaps. Of course we have come a long way in empowering women yet the future journey is difficult and demanding .It can be said that today we are in a better position wherein women participation in the field of entrepreneurship is increasing at a considerable rate. Efforts are being taken at the economy as brought promise of equality of opportunity in all spheres of the Indian women.

Laws guaranteed equal rights of participation in political process and equal opportunities and rights in education and employment were enacted. But unfortunately, the government sponsored development activities have benefited only a small section of women i.e. the urban middle class women. Women sector occupies nearly 45 percent of the Indian population. At this juncture, effective steps are needed to provide entrepreneurial awareness, orientation and skill development programs to women. The role of women entrepreneur in economic development is also being recognized and steps are being taken to promote women entrepreneurship. Resurgence of entrepreneurship is the need of the hour emphasizing on educating women strata of population, spreading awareness and consciousness amongst women to outshine in the enterprise field, making them realize their strengths, and important position in the society. Highly educated, technically sound and professionally qualified women should be encouraged for managing their own business, rather than dependent on wage employment outlets. The unexplored talents of young women can be identified, trained and used for various types of industries to increase the productivity in the industrial sector.

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How to Contain Ethical Misdeeds and Corruption

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ABSTRACT

In this fast changing world, people are becoming power-centric. Their insatiable lust for power of all sorts and unending desires make them focus on short-run to acquire power by whatever means. Such people with limited rationality often forget to do what would be best for them and for others in the long-run. This article elaborates on factors, such as individual, organizational and environmental factors collectively responsible for the growing phenomenon of ethical misdeeds and corruption which is detrimental to peace equity, freedom and justice. It is firmly believed that there is need to launch frontal attack on corruption by initiating measures as suggested in this article to contain corruption thus enabling formation of an ethical society which is necessary for sustainability.

I INTRODUCTION

India is a multi-cultural, multi-lingual and multi-religious society. Each such group believe in certain value system e.g. "Glory to God Service to All", 'Musallam Iman', 'Nishkam Karma', "Ahimsa", universal love and equity' etc. These values are instilled in the young minds since early childhood and at later stage these are also imbibed by the young and the elders which impact their emotion, knowledge, thoughts, perception and have great influence on their behavior pattern, choice of responses and the process of choice making. People are exhorted to practice these values assiduously and in some cases their belief in rebirth often motivates them to practice these values as it would enable them to improve not only their this 'Lok' but also 'Parlok' by attaining salvation. These values are infact the basis for human morality, mores and ethical standards. Many socio-cultural, religious groups have provided certain code of conducts for practicing these values either voluntarily or aided by certain guidance such as Ten Commandments, four fold task and eight fold path etc. and are disseminated through sermons, religious discourse and various religious practices and in certain cases sanctions are imposed on those who fail to follow ethical standards and laws dictate. Thus these values by and large are considered by the people, as good for themselves and also for the entire mankind and constitute the basis for peaceful co-existence, freedom, equity, justice, mutual respect and act as deterrent to dishonesty, impropriety, subjugation, violence, human suffering and tendencies to encroach upon the rights and properties of others.

In India, various religious groups or sects broadly agree to the said ethical aspects and they differ from each other only in ceremonial aspects. Hence, the said values are considered as core values to all in Indian Society and there is general belief that since the Indian value sky.

The emergence of technological society or changing pattern of life often tries to put these core values into melting pot and seek to create new values which is far from being values at all and has only aided to the growing inanity of the world.

However, even after providing due emphasis at home, school, socio-religious gatherings etc. on importance of cultivating moral and ethical standard, there are innumerable examples of its violation and India is no exception even after having a very strong cultural heritage. Patricia Werhane (2005) in her article, "Why do good people do bad things" has put forwarded certain important reasons for good and ethical people doing wrong things:-

- (a) No one is perfect and tend to make moral mistakes and even some people will repeat their mistakes if not checked for at least some of the time.
- (b) It is believed that very often people are primarily motivated by self-interest. People often exercise moral judgments mostly by focusing on their own personal gain as the object of their self interest. Some people with weak morality because of fear, greed and for other interest willy-nilly become capable to corrupt designs of others.
- (c) Some people primarily in total disregard to social, moral and legal networks of relationship are least bothered about the untoward consequences either to themselves or their organization. They often perceive that their misdeeds could be covered up, suppressed or forgotten in due course."
- (d) People tend to deal with moral issues differently- some more naively than others, some primarily out of self interest, some depending on loop holes in laws and conventions, others seeking ideal or universal principles on which to ground and evaluate moral decisions.
- (e) There are several instances of misdeeds occurring in a firm within a complex network of professional, managerial and legal relationship. It is sometimes said that conflict of interest between professional and institutional commitments, conflict of roles and responsibilities or the identification of moral responsibility with role responsibility may lead to the subsequence abdication of individual moral responsibility to client's demand.

- (f) Many organization and their managers are either unaware of the moral dimensions of their activities or lack skill in moral reasoning.
- (g) Human relationship play central role in morality, moral decision making and moral evaluation. People are affected by human relationship of a variety of kind and these relationships are part of what is defined as moral or immoral.
- (h) Lack of moral theory, mechanism to locate moral culprits and absence of system of moral education for improvement in stage of moral development.

II THERE ARE SOME OTHER REASONS FOR MORAL MISTAKES AND MISDEEDS SUCH AS

- Sometimes people adopt contradictory roles without perceiving conflict of interest.
- Mafia mentality is popularly explained as ability of some people to function in contradictory roles/immoral activities simultaneously.
- Confusion over means and ends. Gandhi an theory of right means to achieve right ends is often ignored.
- Individual perception that social responsibility of their work place is different from moral responsibility thus trying to dilate the sustainability issue for short-term gains.

From above discussions it appears that there are two principal factors (I) Individual factors and (II) organizational factors which generally influence ethical decision making.

(a) Individual Factors in Ethical Decisions: O.C. Ferrell (2005) has observed that although organization ethics involves the role of individual and their values because primary responsibility of decisions rest with individuals and in a work place integrity of an individual's personal moral philosophy and stages of moral development is obviously important but equally important is the primacy of organizational factors in determining ethics at workplace.

Further, (Ferrell and Gresham 1985)- described elaborately, the moral philosophy- the principles, rules, code of conduct etc. learnt through socialization at home, school, social groups, religious group etc. that individual use these to decide "what is right" and "What is wrong" and accordingly justify their decision and explain behavior. However, researchers suggest that individual may apply different moral philosophies in different situations (Fracdrich and Farell 1992) and depending on the situation people even change their value structure or moral philosophy.

(b) Stages in Development of Moral Reasoning: One more reason that people may change their moral philosophy has

been explained by Lawrance Koliberg (1969). He contended that different people make different decisions when confronted with similar ethical situation. The question arises as why ? when ethical codes or codes of morality is common for all, Why do all the people do not conform in the same way to these codes of conduct? The answer lays in the fact that all people are at different stages of cognitive development and all people gradually pass through these broad stages of cognitive development.

Principle stage Focus on upholding basic rights, values and social rules

Conventional stage Focus on group-entered values and conforming to expectations

Pre-conventional individual focus on their own needs and desire

(c) Stages of cognitive Moral development: However the complexity of human nature and unpredictable responses make the above shapes of moral development complex. According to Koliberg (1969) moral development should probably be viewed as a continuum rather than a series of discrete stages. It is generally believed that the moral beliefs and behavior of people change as they gain education and experience, however, there is no credible evidences in this regard.

(d) Organizational Factors: Organizational factors at workplace involve principally three factors such as- (I) organizational culture (II) co-workers and superiors and (III) opportunity which collectively influence whether a person will make an unethical decision at work (Ferral and Gresham 1985, Farrel, Grasham and Fraedrich 1989, Hunt and Vitell 1986, Jones 1991, Trevino 1986). Organization draws people from across section of Society with multi-cultural background having a set of values, beliefs, norms and behavioural pattern. It is said that a strong organizational culture enables it to successfully face uncertainties and contribute in its sustainability. The ethical climate of an organization is significant for organizational culture which helps to guide a wide range of individual behaviour specially on issues of right and wrong, code of conduct, ethical policies of top management and action on ethical issues.

(e) Co-workers & Superior:The variety of interaction of co-workers among them-selves or with supervisor creates informal culture within an organization. Studies conducted by (Ferall and Gresham 1985) confirm that co-workers and supervisors have more impact on an employee's daily decisions than any other factor. Co-worker peers can even change a person's original value system. It has further been noticed that value change if temporary or permanent is likely to be greater when co-worker is a supervisor. Employee may resolve workplace issued following a supervisor's instructions even when such instructions are in conflict with the employees personal value.

(f) Opportunity: As said above the organizational culture, influence of co-worker and to extent individual factors creates condition to limit the practice of misdeeds. However, when the conditions provide rewards/opportunities of financial gains a keenly contended position to be given to favorites in a variety of workplace, recognition, promotion position of authority

etc., the chances of misconduct is rather high which has to be curbed by policy at workplace for punishment of employees who violate a rule such as acceptance of gifts/cash/valuable from the client. At organization level the following kind of misconduct/unethical behavior is generally noticeable which must be prevented by organization for building up ethical climate.

III ORGANIZATIONAL OPPORTUNITIES FOR UNETHICAL BEHAVIOR

- (a) A conflict of interest exists when individual must choose whether to advance their own interest, the interest of an organization or interest of some other group or individual, collusion of self-interest for personal gains which leads to systematically subversion of all norms of morality and ethical standards.
- (b) While employees are prevented in developed countries from accepting bribes gift, special favors etc. but these companies generally offer bribes and other personal favors to clients in developing world, where bribery is an accepted way of doing business, to influence their decision in favor of their firm.
- (c) In workplace, when individual deceptive practices to advance their own interest over that of their organization or some select group by committing fraud.
- (d) Organization ethical issues sometimes seriously undermine equity and restrict opportunity and such discriminatory focus based on caste, creed, place of origin, color, gender, nationality etc. should be done away with for the sake of building up healthy ethical climate within the organization.
- (e) Some firms engaged in business sometimes argue that there is nothing like business ethics. Exploitation, selfishness and greed is justified to survive in an environment of cut-throat competition.
- (f) Lack of understanding that inducing ethical behavior is necessary for sustainability.

IV ENVIRONMENTAL FACTORS

From above discussion, it is amply clear that ethics is connected with human conduct with an emphasis on determining right and wrong. However, high ethical standard calls for a strong positive response and commitment from both individual and organization to moral principles and ethical codes. However, there are several factors which adversely affect the intensity of ethical issues such as increasing value of money, urges to grow rich soon at whatever cost, personal greed, luxurious life style etc. and these often cause havoc with individuals morality and ethical standards specially in an environment where morality enforcing institutions, are dwindling and are gradually being rendered useless because of growing hypocrisy. Ethical misdeeds is no more confined to an individual or an organization but has sect oral dimensions because of collusion among various sets of functionaries

and decisions makers. Similarly in market economy organization practices and policies often create pressure which may sway employees to mark unethical decision. In public life the daily summons of leaders on probity and zero-tolerance for corruption etc. and their brazen attempt to cover up corruption has seriously undermined the intensity of ethical issues among masses and gradually they are forgetting the names of role models like Gandhi, Nehru, Lal Bahadur shastri, Gulzari lal Nanda etc. who are being replaced by a new set of role models famous for all wrong reasons. Politicians have come to realize that corruption is a non-issue as generally it does not affect election results (It is said that charges of corruption in 2G scam led to the defeat of DMK Govt. in 2011 assembly election in Tamilnadu). It has been proved beyond doubt that it is money that plays a significant role for success in the election. The result is that corruption and non-ethical behavior has entered and has established a firm grip over all walks of life. There is growing feeling among people that corruption has come to stay in Indian Society and Public life because the Governments of the day not only try to play it down but also support and worse even connive with the perpetrators.

It is beyond the scope of this article to apportion the extent and magnitude of corruption in the Indian polity. However, there is an indicator i.e. Corruption Perception Index (with certain limitations) compiled by Transparency International in 2010 based on public perception of corruption has ranked India at 87th position among 178 selected countries (In 2006, India occupied 70 place). Every day expose on new scam clearly indicate that there is no abatement of corruption and things are going from bad to worse.

It now seems that in Indian Society, corruption has become a low risk and high-paying activities and we learn every day as to how a government of the day increases allocation over poverty alleviation programmes and how it is being siphoned off with impunity. The late Sri Jay Prakash Narain often referred to new Delhi as "Gangotri" of corruption. Obviously, the government of the day and parties in power and opposition has to take concrete steps to minimize corruption.

Under this situation, corruption is gradually becoming a way of life being contributed by all the factors such as individual factors, organizational factors and patronage to corruption by environmental (political, social and Economic) factors. To contain corruption which is a threat to development, a holistic approach would be needed covering all the causative factors of corruption as discussed below:

V INSTITUTION OF LOK PAL AS EFFECTIVE SYSTEM

- (i) Shri Arvind Kejriwa, a RTI activist, in his article, "How to root out corruption" (published in TOI dated 2nd Nov, 2010) has maintained as under:

There is plethora of anti-corruption agencies. The government has deliberately left some critical loop holes so as to make it ineffective". He cites the example of CVC

which is an independent body but does not have power to take action and has no jurisdiction over politician. The CBI has power but does not seem independent. The proposed institution of Lok Pal an advisory body has jurisdiction over politicians but not over bureaucrats. He suggested that a strong anti-corruption system is needed by merging all the institutions in single agency of Lok Pal having comprehensive power to investigate and prosecute the guilty either bureaucrats or politicians and both without needing any permission from the authority. Lok pal members should be appointed through transparent participatory process, lest it becomes a tool in the hands of some political party.

VI INSTITUTION OF LOK AYUKT

- (i) The institution of Lok Ayukt should be implemented across the states on the line of Lok pal. This three member body consisting of a retired Supreme Court judge/High Court- Chief Justice, State vigilance Commissioner and a Jurist or an eminent administrator should be further enlarged as per the need by men of known integrity and abilities. Lok Pal should have supervisory jurisdiction and appellate jurisdiction over Lok Ayukta lest the government of the day is allowed to weaken such body as we recently saw in Karnataka. Lok Pal and Lok Ayukt should have power to prescribe a time limit for any

Investigation and they may constitute investigation team of their choice. The massive popular response received by the movement of Anna Hazare against corruption and the Central Govt. agreeing for joint drafting committee and placing the Lok Pal in the Lok Sabha in the winter session of the Parliament is a significant development in fight against corruption.

VIII RTI ACT

- (i) There is further need to strength RTI by curtailing the list where information could be refused. Punitive action should also include suspension from service for deliberating distorting, suppressing the information or delaying the information beyond the prescribed period. Again necessary arrangement has to be made that RTI commission and its members are appointed through transparent participatory process. It would be good idea that Lok Ayukta is given some supervisory power over RTI Commission at the state level by making suitable amendment in the Act.
- (a) **Whistle Blowers:** They could play a significant role in war against corruption. There is need for framing a law to provide necessary protection and support to the Whistle Blowers. The government of India may create anti-corruption police and courts at all level to investigate and prosecute corruption under the overall authority of Lok Pal and Lok Ayukt.
- (b) **Manifesto of Political Parties:** In the manifesto of political parties there should be mention of their resolve to fight corruption and what steps the individual political party proposes to reduce corruption when it would come to power and percentage reduction in corruption if it comes to power Election Commission should insist that political parties in power should give details of corruption/scam happening during its period of governance and tangible actions taken against the corrupts.
 - (i) The TV Channels/News magazines should annually publish the integrating ratings of ministers and other personalities holding high position for information to general public.
- (c) **Use of Technology:**
 - (i) For reducing chances of corruption at lower level, the other states in India should follow Karnataka's computerization programme like "Bhoomi" software mechanism to check changes in lands registry through corrupt practices, smart card for vehicle registration and licenses to Drivers and enforcement automation of traffic violation by Bangalore Traffic Police.
 - (ii) I.T. professionals should develop a website like Men of Integrity. com in all prominent Indian/Regional languages based on parameter, supporting their record of unquestionable integrity and propriety. It should remain in public domain and all people would be entitled to put the names of rich men of integrity at local level, district level, state level and national level from all walks of life. The said data would remain in public domain so that it could be questioned in case of doubt by anybody. Moreover people should be encouraged to provide specific and relevant information of misdeeds/ corruption/ impropriety on any name entered in the said website. Necessary measure would have to be taken to ensure the reliability and sanctity of the said website. This data must be used by the cabinet or the government of the day while recommending names/persons for high places in public life without any deviation.
 - (iii) Unique Identity Card which is being prepared should also contain information about the sources of income and present status of their assets based on which a projection for next 10 years be made on average growth rate of income/assets in the century. In case of any transaction above 05 lacs by an individual use of said UID may be made mandatory and details of transaction be recorded in UID. I.T. professionals could work on the details and feasibility of the said concept. It would be a master stroke against corruption.
 - (iv) Channels like "Times Now" having a clear record of waging relentless war against scams, scandals and corruption should be encouraged to open channels in regional languages all over the country. When men and women in the lanes of villages would come to know about the misdeeds of their leaders in public life, surely, it would gradually start affecting the outcome of elections.
- (d) **Private Sector Initiative:** Private sector initiative as given in Wikipedia is worth quoting. It mention about new initiatives that have come from private sector to raise

awareness about corruption related issues and build anti-corruption platforms. <http://5thpillar.org> is one such organization that is promoting the use of zero Rupee notes to fight corruption by shaming the officials who ask for bribe. Another popular initiative “Jaggo Re! One Billion Votes” from Tata Tea which has changed its focus from voter registration to fighting corruption. “no bribe.org” is another platform for corruption free India.

(e) Corporate Governance:

- (i) Corporate governance should be strictly applied to prevent corporate level corruption.
- (ii) Corporate governance is a formal system of accountability and control for ethical and socially responsible organizational decisions and use of resources. Accountability relates to how well the content of workplace decision is aligned with a firm’s stated strategic decision. Control involves the process of auditing and improving organizational decisions and action. Werharne, H. Patricia, 1999, maintained “The corporate must understand that adherence to the provisions of corporate governance would facilitate their long term survival and sustainability.
- (iii) Corporate sector will do well to promote ethical leaders who could frame actions in ethical terms, articulates and embodies the purpose and value of the organization and could connect the basic value proposition to stakeholders support and societal legitimacy (Frecmen, R. Edward 1984)
- (iv) Due emphasis should be given on ethical training of the employees for cultivating values such as honesty, trustworthiness, equity and human dignity and an yearly system of corporate ethical audit should be introduced by the Company Law Board.

(f) Professional Ethics and Education value:

- (i) The curriculum of education must include lessons in ethical and moral subjects and should try to instill in the young minds the importance of integrity dedication, magnanimity, openness, creativity etc. Such values if practiced in the days to come would surely improve the quality of life and would contribute towards freedom, peace and prosperity. Management students in addition to focusing on best practices should also focus on ethical decision making skills.

The major challenge today is to develop an ethical society and all institutions irrespective of its role should frame rules for ethical behavior so that it functions with integrity and probity which is the best way to serve itself and the community as well.

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T Shape Eccentric Slot Stacked Microstrip Antenna for UMTS

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ABSTRACT

T shape eccentric microstrip antenna with circular polarization radiation for UMTS(universal mobile telecommunication system). The antenna have a thick air substrate of 5mm and stacked microstrip radiating patch, Where the return loss is less than -10 db. The results show that the dual band antenna, is able to achieve VSWR less than 2 and the return loss above the -10db.

Keyword –Microstrip antenna, stacked , dual band

I INTRODUCTION

Antennas are a very important component of communication systems. by definition, an antenna is a device used to transform an RF signal, traveling on a conductor, in to an electromagnetic wave in free space the broadband circularly polarized microstrip antennas play a vital role in wireless communication due to its low-profile, small-size and light weight. In spite of numerous advantages, microstrip antenna, suffers from disadvantages like low gain and narrow impedance bandwidth [1 2]. Substrate with low dielectric constants, multilayer structures and utilizing air gaps between the dielectric layers can enhance the impedance [2], through coupling cross-slot to excite the radiating patch [3], The distance between the radiating patch and the ground plane is (1.6+ .0012 mm).

II ANTENNA DESIGN

Fig. 1 shows the geometry of the proposed broadband microstrip antenna, The radiating T shape patch , printed on a substrate of thickness 8.2 mm and relative permittivity ϵ_r , has the dielectric material thickness is 1.6mm the length of both side, $L=29$ mm ,and $W = 29$ mm and the ground plate consist of $L_g = 38.6$ and $W_g =38.6$ mm is excited by the distance of feed point is (19.5, 30.2)mm.

Rectangular patch antennas can be designed by using a cavity model [5] suitable for moderate bandwidth antennas. The lowest-order mode, TM_{10} , resonates when the effective length across the patch is a half-wavelength. “Fig.1”, demonstrates the patch fed below from a coaxial along the resonant length. Radiation occurs due to the fringing fields. These fields extend the effective open circuit (magnetic wall) beyond the edge.

III ANALYSIS

- (a) **Resonance frequency of antenna:-** The resonance frequency f_{mn} depends on the patch size, cavity dimension, and the filling dielectric constant, as

follows:

$$f_{mn} = \frac{k_{mn} c}{2f \sqrt{\epsilon_r}} \tag{1}$$

where $m = 0, 1, 2,$ and $n = 0, 1, 2, \dots,$

k_{mn} = wave number at m, n mode, c is the velocity of light, ϵ_r is the dielectric constant of substrate, and

$$k_{mn} = \sqrt{\left(\frac{mf}{W}\right)^2 + \left(\frac{nf}{L}\right)^2} \tag{2}$$

For TM_{01} mode, the length of non-radiating rectangular patch’s edge at a certain resonance frequency and dielectric constant according to equation (1) becomes

$$L = \frac{c}{2f_r \sqrt{\epsilon_r}} \tag{3}$$

$$W = \frac{c}{f_r} \sqrt{\frac{2}{\epsilon_r + 1}} \tag{4}$$

Where f_r = resonance frequency at which the rectangular microstrip antennas are to be designed. The radiating edge W , patch width, is usually chosen such that it lies within the range $L < W < 2L$, for efficient radiation. The ratio $W/L = 1.5$ gives good performance according to the side lobe appearances.

In practice the fringing effect causes the effective distance between the radiating edges of the patch to be slightly greater than L . Therefore, the actual value of the resonant frequency is slightly less than f_r . Taking into account the effect of fringing field, the effective dielectric constant for TM_{01} mode is derived using [6,7]

By using above equation we can find the value of actual length of the patch as,

$$L = \frac{c}{2f_r \sqrt{\epsilon_{eff}}} - 2\Delta l \tag{5}$$

Fig. 1: Geometry of Proposed antenna on IE3-D

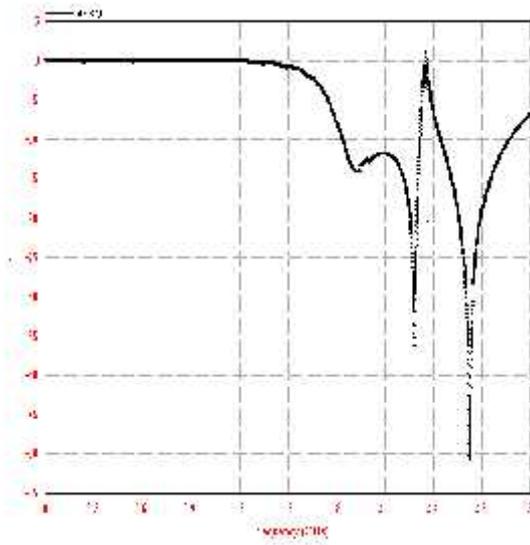


Fig. 2 : return loss Vs frequency.

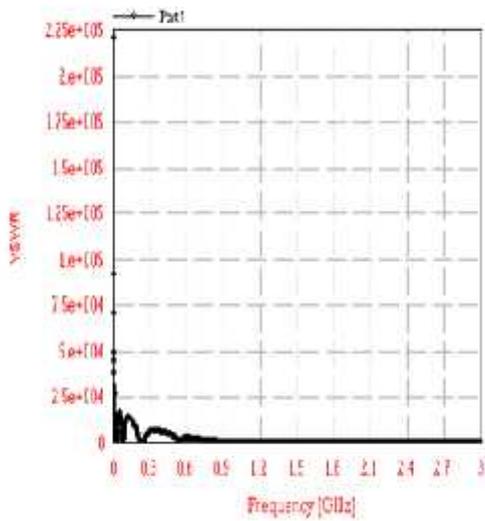


Fig. 3 VSWR versus frequency

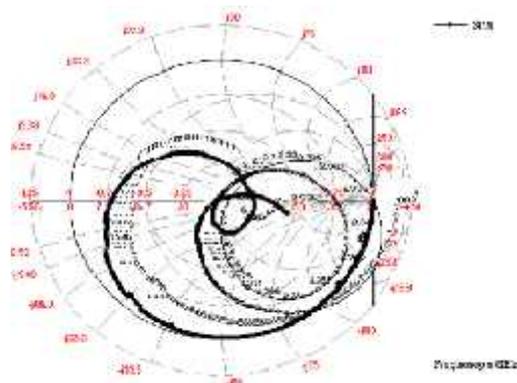


Fig. 4: smith chart of impedance

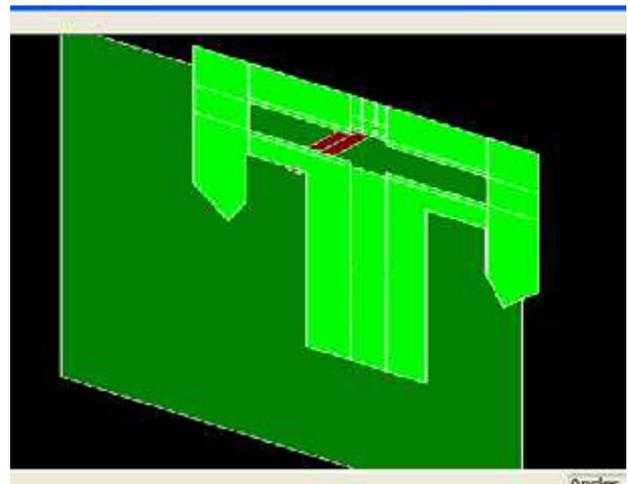


Fig. 5: 3D View of T shape Geometry

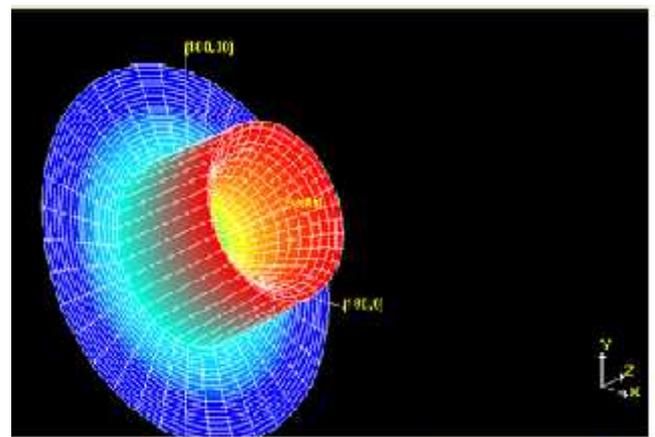


Fig. 6 : Direction of maximum radiation pattern 3D

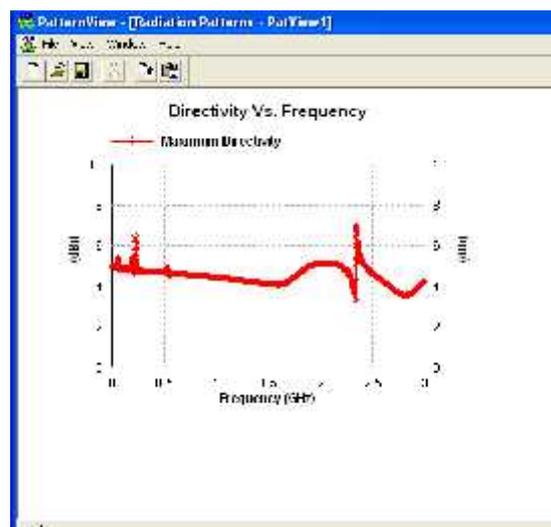


Fig. 7: Directivity of antenna in dB

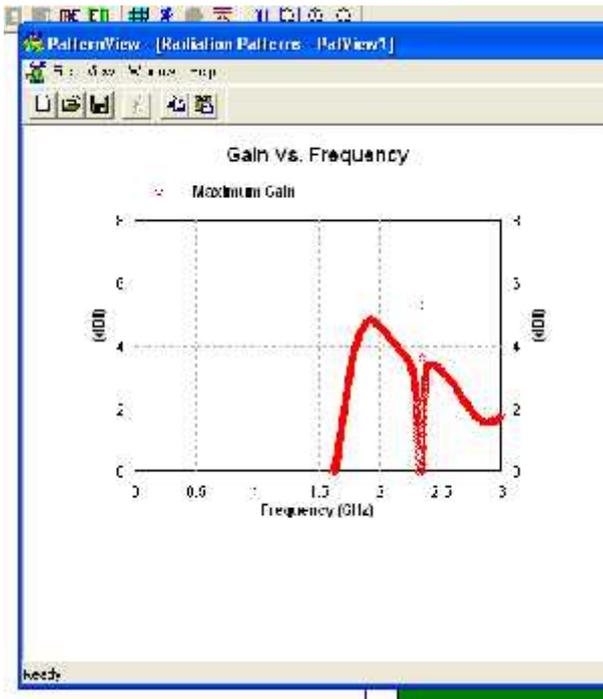


Fig. 8: Gain of antenna in dBi

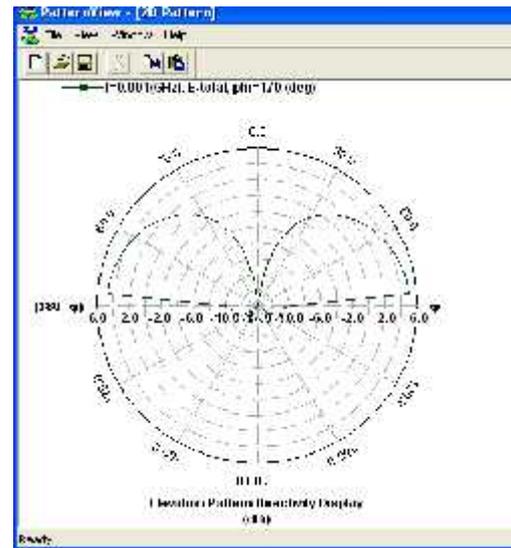


Fig. 11: 2D radiation pattern (polar plot)

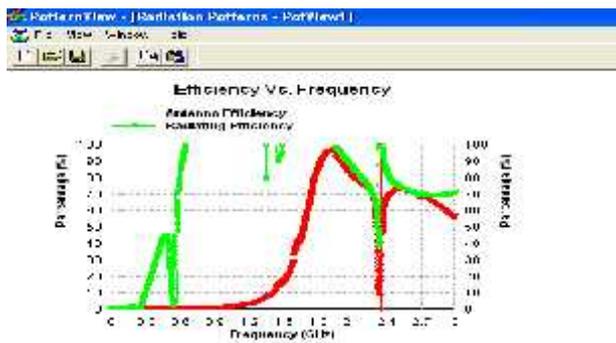


Fig. 9: Antenna efficiency and radiation efficiency



Fig. 12: 2-D radiation pattern

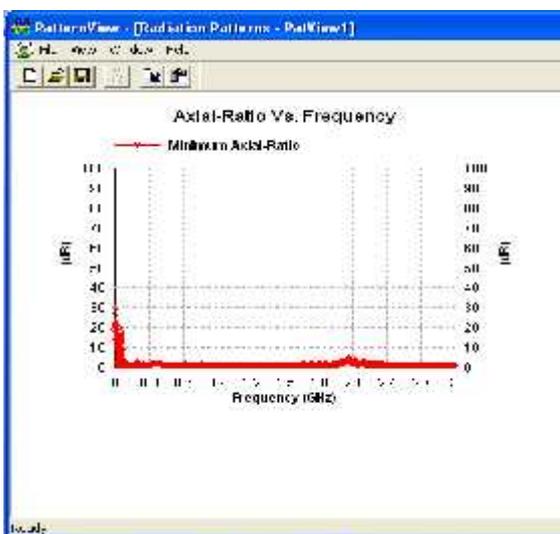


Fig. 10: Axial ratio of antenna <1, or = 1

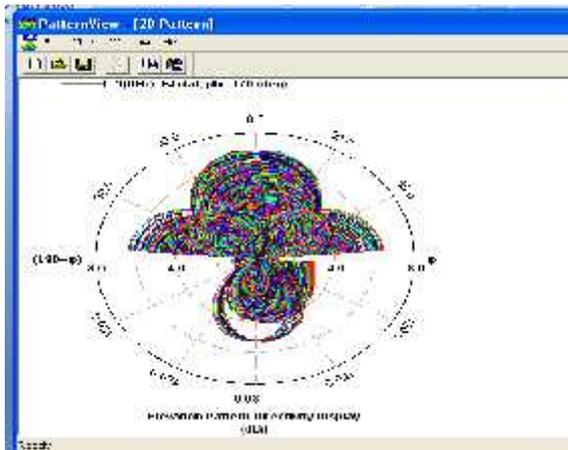


Fig. 13: 2-D radiation pattern (max. point)

Since the feed point connected with the coaxial connector, have good equal amplitude and 90° phase shift, dual band CP radiation can be achieved [5]. Furthermore, by using the thick air substrate, much wider CP bandwidth can thus be obtained. The impedance matching of the antenna can be achieved by fine adjusting the feed position, the distance between the radiating patch and the ground plane (1.6+.006mm).

In this paper, we have designed dual and stacked microstrip antenna with 2.5 ghz . The antenna has an output by using IE3D. A thick air substrate of 5 mm is used in the present proposed design, and impedance matching is obtained through the square radiating patch. The results show that the proposed antenna is able to achieve VSWR less than 2 and the return loss above the -10.db.

IV CONCLUSION

Characteristics of a design of broadband C P square microstrip antenna has been analysed. The proposed antenna is most suitable for universal mobile telecommunication systems (UMTS) which has the transmitter frequency of 1920-1980 Mhz ,and receiver frequency between 2110-2170 Mhz.

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Significance of Biomass in Reduction of Global Warming

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ABSTRACT

Our over dependency on fossil fuel creates so many environment problems. Ozone layer depletion and global warming is the major environmental problem due to excess use of non renewable energy. In present scenario pressures on the global environment have led to use of renewable sources of energy. Renewable energy is also clean energy, which would mean its usage would not be damaging to the quality of the environment. Biomass is one potential source of renewable energy. Biomass is a sustainable fuel that can deliver a significant reduction in net carbon emissions when compared with fossil fuels. There are many biomass conversion technologies into useful energy include anaerobic digestion, Pyrolysis, gasification, Trans-esterification, fermentation and combustion. The gasification of biomass is a thermo-chemical process by which solid fuel can be converted into gaseous fuel. The gaseous products can be burned to generate heat or electricity. In present paper we will discuss the method of electricity generation from agricultural waste and significance of this technology in respect of decrease in CO₂ emission.

Keywords: Biomass, Gasification, Global warming, CO₂ emission, Fossil fuels.

I INTRODUCTION

Biomass is any organic matter that can be used as energy source. The term biomass encompasses a large variety of materials, including wood from various sources, agricultural residues, and animal and human waste. Biomass is biological material derived from living, or recently living organisms, such as wood, waste, hydrogen gas, and alcohol fuels [5]. Biomass gets its energy through photosynthesis. With sunlight, water and oxygen plants make carbohydrates, which is good source of energy. Biomass is renewable source of energy because we can grow more plants in short time. Biomass is used for facility heating, electric power generation, and combined heat and power. According to Annual report of World Bank (2010) India is the second-largest contributor to the increase in global energy demand to 2035. In the next 25 years, India's electricity demand is expected to grow at an average annual rate of 7.4 percent. The use of biomass to provide energy has been fundamental to the development of civilization. The availability of biomass in India is estimated at about 500 million tons per year including residues from agriculture, agricultural industries, and forest products. A survey by the Ministry of New and Renewable Energy indicated that 15-20 percent of total agricultural wastes could be used for power generation, without altering their present uses. This implies availability of 120 to 150 million tons of surplus agro-industrial and agricultural residues per year that could be made available for power generation. Biomass materials used for power generation include bagasse, rice husk, straw, cotton stalks, coconut shells, soy husk, oilseed cakes, coffee waste, jute wastes, peanut shells, and sawdust [1].

Biomass is one potential source of renewable energy and the conversion of plant material into a suitable form of energy, usually electricity or as a fuel for an internal combustion engine can be achieved using a number of different conversion routes [7]. Biomass energy conversion technologies include anaerobic digestion, pyrolysis,

gasification, trans-esterification, fermentation and combustion [6]. Gasification produces a synthesis gas with usable energy content by heating the biomass with less oxygen than needed for complete combustion. Pyrolysis yields bio-oil by rapidly heating the biomass in the absence of oxygen. Anaerobic digestion produces a renewable natural gas when organic matter is decomposed by bacteria in the absence of oxygen [2]. Gasification as well as anaerobic digestion processes seems to be most attractive in Indian scenario [10]. The average gas composition was found to be 21.6% CO, 36.08% H₂, 14.49% CO₂, 1.4% CH₄ and 26.46% N₂. These gases do, however, not present similar energy significance, because some of them are combustible, whilst some (CO₂ and N₂) are waste gases. Combustible gases are CH₄, H₂ and CO [8]. Gasification is the thermo-chemical conversion of Solid Carbonaceous fuel into combustible gas (mainly by CO & H₂) by partial combustion i.e. combustion in the presence of limited air. The mixture of combustible gases thus produced is termed "Producer Gas". It is also called as Low Btu Gas or Low Calorie Gas, because of its low energy content. This gas is good enough for use in S.I. Engine or C.I. Engine. Since it is a low calorie gas. It is not possible to run C.I. Engine on 100% gas. A pilot jet is necessary for ignition. However an S.I. Engine can run on 100% gas because of presence of an ignition source namely sparkplug.

II EXPERIMENTAL

- (a) **Availability of agricultural waste:** The availability of biomass in India is estimated at about 500 million tons per year including residues from agriculture, agricultural industries, and forest products. A survey by the Ministry of New and Renewable Energy indicated that 15-20 percent of total crop residues could be used for power generation, without altering their present uses. This implies availability of 120 to 150 million tons of surplus agro-industrial and agricultural residues per year that could be made available for power generation. Biomass materials used for power generation include bagasse, rice husk, straw, cotton stalks,

coconut shells, soy husk, oilseed cakes, coffee waste, jute wastes, peanut shells, and sawdust (MNRE). There is a large variability in agricultural wastes generation and their use depending on the cropping intensity, productivity and crops grown in different states of India. Residue generation is highest in Uttar Pradesh (60 Mt) followed by Punjab (51 Mt) and Maharashtra (46 Mt).

- (b) **Collection of agricultural waste from farmers field:** The agricultural wastes are normally collected manually and transported to farm yard. The tractor operated bailers are used for mechanized collections. The available bailers can collect biomass in the form of densified bails of 800 to 900 kg in one hour. The biomass assessment was made and found that 100 kW power plants would require 400 tonnes of agricultural waste and with 20% collection efficiency 3.2 km radius catchment area is required on single crop basis. The cost of biomass collection is about Rs 400 per tonne. The cost of transportation is also Rs 300-400 per tonne for lead distance 10 km.



Fig.1 Manual collection of biomass



Fig.2 Transportation of biomass

- (c) **Densification of agricultural wastes:** A major disadvantage of agricultural residues as a fuel is their low bulk density, which makes handling difficult, transport and storage expensive, and gives rise to poor combustion properties. However, these problems can be overcome by compacting the loose biomass to form briquettes. The opportunity to utilise more efficiently agricultural residues, with a reduction in pollution levels, has in recent years aroused the interest of developing countries, as well as some industrialised ones, in briquetting. Briquetting is a relatively new technology for developing countries [4]. There are different types of briquetting plants available for densification of biomass.

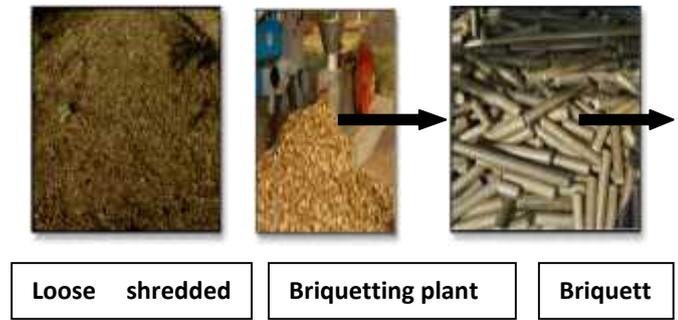


Fig.3 Showing densification of loose biomass

- (d) **Gasification:** Gasification is a thermochemical conversion of biomass which takes place in limited supply of oxygen in close container called gasifier. Gasification occurs by heating biomass to high temperature (1200 – 1400°C) in an oxygen deprived environment, therefore limiting combustion. The process takes place in four stages: drying, pyrolysis, gasification (oxidation) and finally combustion. The first phase of heating and drying is unproductive in terms of energy output, as energy is used to evaporate remaining moisture from the biomass. In the pyrolysis phase volatile components of the biomass are removed. The temperature range in this stage is 450 – 600°C. Pyrolysis vapour is comprised of water, carbon monoxide, hydrogen, methane, volatile tars and carbon dioxide. The remaining biomass is a carbonized solid fuel – charcoal, with 10 - 25 % of the original fuel mass. The final stage at temperatures between 700°C - 1200°C involves the conversion of char into producer gas that constitutes about 16% CO, 20% H₂, 50% N₂, 12% CO₂ and 2% CH₄ and products such as ash and powder slag. Different zones of gasifier according to temperature is described below:

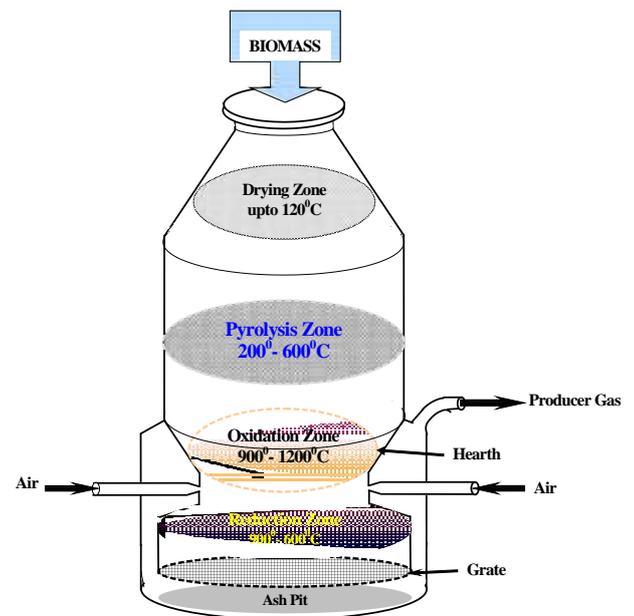
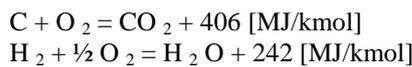


Fig. 4 Schematic diagram of downdraft gasifier showing different zones

- (i) **Drying:** Biomass fuels consist of moisture ranging from 5 to 35%. At the temperature above 100°C, the water is removed and converted into steam. In the drying, fuels do not experience any kind of decomposition.
- (ii) **Pyrolysis:** Pyrolysis is thermal decomposition of biomass fuels in the absence of oxygen. Pyrolysis involves release of three kinds of products: solid, liquid and gases. The ratio of products is influenced by the chemical composition of biomass fuels and the operating conditions. The heating value of gas produced during the pyrolysis process is low (3.5 - 8.9 MJ/m³).
- (iii) **Oxidation:** Introduced air in the oxidation zone contains, besides oxygen and water vapours, inert gases such as nitrogen and argon. These inert gases are considered to be non-reactive with fuel constituents. The oxidation takes place at the temperature of 700-2000 ° C. Heterogeneous reaction takes place between oxygen in the air and solid carbonized fuel, producing carbon monoxide. Plus and minus sign indicate the release and supply of heat energy during the process respectively.



- (iv) **Reduction:** In reduction zone, a number of high temperature chemical reactions take place in the absence of oxygen. The principal reactions that take place in reduction are mentioned below.

1. $CO_2 + C = 2CO - 172.6 \text{ [MJ/kmol]}$ -----
- Boudouard reaction
2. $C + H_2O = CO + H_2 - 131.4 \text{ [MJ/kmol]}$ -----
---- Water-gas reaction
3. $CO_2 + H_2 = CO + H_2O + 41.2 \text{ [MJ/kmol]}$ -----
----- Water shift reaction
4. $C + 2H_2 = CH_4 + 75 \text{ [MJ/kmol]}$ -----
----- Methane production reaction

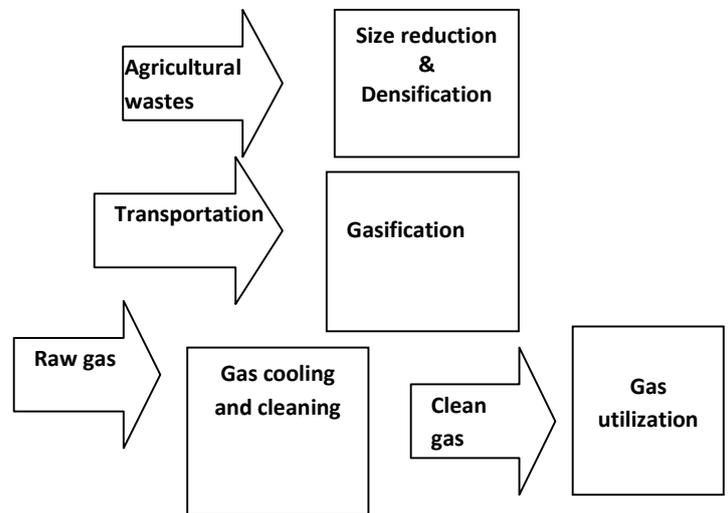
Main reactions show that heat is required during the reduction process. Hence, the temperature of gas goes down during this stage. If complete gasification takes place, all the carbon is burned or reduced to carbon monoxide, a combustible gas and some other mineral matter is vaporized. The remains are ash and some char (unburned carbon)

III COOLING AND CLEANING OF GAS

The temperature of gas coming out of generator is generally in between 300°C -500 °C. This gas has to be cooled in order to raise its energy density. Various types of cooling equipment have been used to achieve this end. Most coolers are gas to air heat exchangers where the cooling is done by

free convection of air on the outside surface of heat exchanger. Since the gas also contains moisture and tar, some heat exchangers provide partial scrubbing of gas. Thus ideally the gas going to an internal combustion engine should be cooled to nearly ambient temperature.

Cleaning of the gas is trickier and is very critical. Normally three types of filters are used in this process. They are classified as dry, moist and wet. In the dry category are cyclone filters. They are designed according to the rate of gas production and its dust content. The cyclone filters are useful for particle size of 5 µm and greater 26. Since 60-65% of the producer gas contains particles above 60 µm in size the cyclone filter is an excellent cleaning device. After passing through cyclone filter still the gas contains fine dust, particles and tar. It is further cleaned by passing through either a wet scrubber or dry cloth filter. In the wet scrubber the gas is washed by water in counter current mode. The scrubber also acts like a cooler, from where the gas goes to cloth or cork filter for final cleaning.[9]



- Shredder
- Thresher
- Hammer mill
- Briquetting Plant

- Updraft
- Downdraft
- Fluidized bed
- Entertained

- Cyclone
- Tar cracker
- Gas cooler
- Gas scrubber
- ESP

- Boiler
- Gas engine
- Gas turbine
- Fuel cell

IV ENVIRONMENTAL & SOCIAL BENEFITS

- i. Biomass is renewable source of energy. Electricity produced by biomass reduces the threat of global climate change. The environment could also be saved by avoiding the burning of these residues in the field. It has been estimated that 20 kW power plant could replace 125 t CO₂ per year as compared to electricity generating unit through grid.
- ii. The raw material which is being burnt in the field could be used & farmers may get benefit by selling these residues to the power plant. This will support the rural upliftment by providing assured electricity supply along with additional income generation to rural mass.
- iii. 20 kW power plant could generate employment opportunity of about 600-700 man-days for various activities of power plant. The system also reduces environmental degradation caused by petrochemicals. At the firm level, less pollution would be released into the environment. This small power plant could generate employment opportunity of about 600-700 man-days for various activities of power plant.

V CONCLUSION

Biomass based power plant is an alternative source of electricity generation. This source decreases the dependency of human being on non-renewable sources of energy, resulting in the decrease in pollution level as well as global warming. 20 kW power plants could replace 125 t CO₂ per year as compared to grid electricity which is the main source of global warming. Different stages of electricity generation from biomass through power plant generate employment as well.

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Waste Water Management and Treatment

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ABSTRACT

The paper describes the type of wastewater from domestic usage and reflects on the quantity generated. Depending upon the use, the wastewater has to be treated at different levels with increasing order of the treatment. These levels are explained. As regards application of treated sludge on land, the major problem is the economical marketing of the product, but agricultural reuse has been established in many countries. The natural ecosystem, external inputs to primary food production, recycling of nutrients, system of wastewater utilization and project evaluation are explained. The environmental and health aspects are extremely important in the soil and crop system of any land application of treated wastewater. The potential for infection to human, animal and plants from land application can be mainly attributed to the presence of pathogenic organisms. We have reviewed available data on wastewater and agriculture in India. India is rich in water resources and endowed with a network of rivers and alluvial basins to hold ground water. However natural variability is of much importance. The demand for water for domestic use, irrigation, energy, industry and others has been calculated. Municipal sewage is the main source of water pollution in India especially in and around urban areas. The total wastewater generated at present from 299 class 1 cities, comprising of 63% of total population, is around 17000 MLD. Out of this 60% is generated from 23 metro cities. Around 11 municipal corporations and 10 municipalities have sewage farms organized through public authorities. It is, however, observed that not much data is available, and a lot more work is needed. It is felt that the use of treated municipal wastewater for Agriculture in India will gain many direct benefits in the country. Suggestions for further Investigations in India are made.

I INTRODUCTION

Wastewater can be divided into two categories - industrial wastewater and domestic (municipal) wastewater. The industrial wastewater results from various industrial operations and processes, and generally undergoes in-plant pretreatment and reuse before being discharged into a public water body or the natural hydrologic cycle, in many metro cities the industrial waste water is also used for cultivation in small farms. The domestic wastewater consists of human waste, ablution water, kitchen wastewater and other wastes of household activities in urban areas. In rural or suburban areas, the wastewater may be collected and disposed through the use of septic tanks.

II WASTEWATER QUALITY AND EFFECTS

Most of the wastewater contains organic compounds, ammonia, iron or other oxidizable compounds and is a significant source of biological oxygen demand. The discharge of industrial and domestic wastewater with oxygen demand interferes with desirable water uses. The impact of low dissolved oxygen concentrations or anaerobic conditions is reflected in an unbalanced ecosystem, fish mortality, odour and other nuisances. Some types of industrial wastewater may be toxic and pose substantial health hazard to biological lives in the environment. Some organic chemicals discharged into the aquatic environment result in aquatic effects of mortality and / or chronic effects on ecosystem. In extreme cases, heavy metals such as mercury, cadmium, lead etc. and organic chemicals which are

bio accumulated in the aqueous food chain, may cause odour and nuisance problems. A large amount of nutrients such as nitrogen and phosphorous compounds present in domestic wastewater and certain industrial wastewater may cause eutrophication of receiving water bodies.

III WASTEWATER TREATMENT

The wastewater treatment generally consists of a number of unit operations and processes to achieve the desired level of treatment. According to the degree of treatment, the unit operations and processes are classified into three treatment types. These are known as primary, secondary and tertiary treatment. The term secondary refers to chemical and biological unit processes. The biological treatment is employed to remove colloidal and soluble organic material in the wastewater through metabolism. The biological treatment is also useful to remove nitrogen compounds in wastewater in some cases. The tertiary treatment processes have been developed for the treatment of wastewater, which contains chemicals difficult to treat with biological treatment or toxic substances. Nitrogen, phosphorous and soluble organic and inorganic compounds are removed to meet stringent, water quality standards. The most commonly used tertiary treatment processes are activated carbon adsorption, ion exchange, reverse osmosis etc.

IV WASTEWATER REUSE

Increased water reuse is inevitable in the world today. Existing water supplies are simply incapable of meeting the future demands. Conservation via

recycling will be one means to augment conventional sources. Municipal wastewater reclamation and reuse for beneficial community should be a viable planning alternative. The potentially applicable effluent reuse methods can be grouped into the following general categories.

- (a) **Agricultural Irrigation:** This category includes irrigation for edible and non-edible crops, pasture irrigation and livestock watering.
- (b) **Cooling Water:** Many industries, including power generating plants use large quantities of water for cooling purposes.
- (c) **Landscape, Irrigation and Recreational Uses:** includes irrigation of turf and ornamental planting in golf courses, parks, storm water retention basins or other areas; also use of the reclaimed wastewater to fill artificial lakes for recreational or aesthetic purposes may also be included in this category.
- (d) **Industrial Process Water:** Many industries use significant amount of water in their manufacturing process and thus can utilize recycled wastewater.
- (e) **Non-Potable Water Reuse:** Includes uses of the reclaimed water for toilet flushing, fire protection and air conditioning.
- (f) **Groundwater Recharge:** Wastewater is used to replenish groundwater supplies, either by infiltration through the ground surface or direct injection into aquifers.

The potential reuse alternatives described above have varying requirements regarding the quality of the wastewater effluent.

V METHODS AND MATERIAL FOR AGRICULTURAL USE

- (a) **Linkages and project evaluation for agricultural system:** In natural ecosystem external inputs to primary food production are important. Natural ecosystem productivity is sustained through the recycling of nutrients from plants and made available again in the process of organic mineralization.
- (b) **Environmental and health considerations:** Along with soil and crop considerations, in the case of land application of treated municipal wastewater, environmental and health considerations are of much importance. The land application of treated wastewater provides water and nutrients for crop growth and avoids nutrient overloading and eutrophication of natural water body. The land application of provides nutrients for crop growth and organic matter for soil conditioning, and avoids potential water pollution problems. The inorganic contaminants such as cadmium, zinc, nickel, molybdenum, etc. and their permissible levels in wastewater can be studied and good literature including manuals can be referred to. This is also the case for organic chemical contaminants. The potential infection to

human, animal and plants from land application of treated wastewater is attributed to the presence of pathogenic organism in the wastewater

- (c) **Indian scenario on wastewater and agriculture:** India is rich in water resources, being endowed with a network of rivers and vast alluvial basins to hold groundwater. However, its natural variability in the existence and availability are of much greater concern. Out of the total annual precipitation of about 400 M. ha m (million hectare metres) in India, 188 M. ha m flows as runoff. Of this, it is estimated that only about 70-75 M. ha m is usable after providing for requisite storage (and without major inter-basin transfer). Depending upon population projections, the projected demand for water in cu km is given in Table 1.

Table 1 Projected Demand for Water (cu km)

Purpose	Year2010	Year 2025
Domestic Use	33	52
Irrigation	630	770
Energy	27	71
Industry	30	120
Others	30	37
Total	750	1050

- (d) **Quality of water:** Municipal sewage is the main source of water pollution in India, especially in and around large urban centres. Fertilizers and pesticide residues from agriculture run-off are said to be the potential threat to potable water quality. Nitrate level becomes a cause for concern when it exceeds the maximum limit permissible in the water.
- (e) **Urbanization in India:** A study of the process of urbanization in India since the beginning of this century reveals a steady increase in the size of its urban population, number of urban centers, and level of urbanization since 1911 and a rapid rise after 1951. From a modest base of 25.8 million persons in 1901, the number of urban dwellers has risen to 217.6 million, signaling a phenomenal eightfold increase in urban population over the period 1901 - 1991.
- (f) **Status of water supply in India:** About 88% of total municipal population of class - 1 cities have been covered under organised water supply. Out of 299 class - 1 cities, 77 cities have cent percent water supply coverage. In 158 cities, there is 75% and above, and in 43 cities 50% and above coverage. In 10 cities the water supply is below 50%. Per capita water supply ranges from 9 lpcd to 584 lpcd. National average per capita water supply for class- cities is 183 lpcd. As compared to 1988 status, the average per capita water supply has increased from 147 lpcd to 183 lpcd at national level.

Table 2

Sr. No	Major river basins territories	Number of class-1 cities	Number of Class-1 cities with various mode of disposal				
			Agriculture	River	Both river and agriculture	Agriculture and others	Other (sea/land/drain etc.
1	Beah mani	1	-	1	-	-	-
2	Brahm aputra	7	-	3	-	-	4
3	Cauva ry	16	3	3	-	1	7
4	Ganga	103	29	16	23	8	25
5	Godav ari	25	3	1	4	4	13
6	Indus	15	6	2	-	1	6
7	Krishn a	27	4	3	2	3	15
8	Maha nadi	9	-	1	2	2	4
9	Mahi	3	-	1	2	3	4
10	Narma da	4	1	1	-	2	-
11	Prnnar	6	-	-	-	-	6
12	Sabar mati	7	-	2	2	-	-
13	Subar nrekha	2	-	-	2	1	-
14	Tapi	8	-	1	1	3	3

facilities.

- (i) **Mode of disposal of wastewater in India:** Treated or partially treated wastewater is disposed into natural drains joining rivers or lakes or sea or is used for irrigation / fodder cultivation or combination of these by the municipalities.

The basin-wise mode of disposal adopted by various class-1 cities is given in Table 3. The mode of disposal in 118 cities is indirectly into rivers / lakes / ponds / creeks, while in 63 cities on to agricultural land. On the other hand, in 41 cities it is dispersed directly into rivers, and in 44 cities it is discharged both into rivers and on to agriculture land.

- (j) **Irrigation water utility in India:** The use of treated municipal wastewater for irrigated agriculture offers an opportunity to conserve water resources. Wastewater reclamation can also provide an alternative to disposal in areas where surface waters have limited capacity to assimilate the contaminants, such as the nitrogen and phosphorous that remains in most treated wastewater effluent discharges. Land application of municipal wastewater has been practised for its beneficial effects. Not surprisingly, public response to the practice has been mixed. Raw municipal wastewater contains human pathogens and toxic chemicals. When treated to acceptable levels, the wastewater is referred to as “reclaimed water” Reclaimed water contributes a very small amount of water to agricultural irrigation, mainly because the extent of the practice is limited both by regional demands and the proximity of suitable agricultural land to many municipal wastewater treatment plants. Irrigation of residential lawns and / or gardens with reclaimed water should become increasingly popular.

VI RECOMMENDATIONS AND CONCLUSIONS FOR INDIAN CONDITIONS

(g) **Status of wastewater in India:** The total wastewater generated by 299 class-1 cities is 16,652.5 MLD. Out of this, about 59% is generated by 23 metro cities. The state of Maharashtra alone contributes about 23%, while the Ganga river basin contributes about 31% of the total wastewater generated in class-1 cities. Only 72% of the total treated wastewater generated is collected. Out of 299 class-1 cities, 160 cities have sewerage system for more than 75 percent of population and 92 cities have more than 50 percent of population coverage. On the whole 70% of total population of class-1 cities is provided with sewerage facility, compared to 48% in 1988. The type of sewerage system is either open or closed or piped.

(h) **Wastewater treatment in India:** Out of 16,662.5 mld of wastewater generated, only 4037.2 mld (24 %) is treated before release, the rest (i.e. 12,626.30 mld) is disposed off untreated. Twenty-seven cities have only primary treatment facilities and only forty-nine have primary and secondary treatment

- (a) Surface water, which is a source of drinking water is polluted. Therefore, an action plan to arrest the pollution of surface water should be prepared and implemented.
- (b) Application of treated municipal wastewater for irrigation and fodder cultivation should be encouraged by the local authorities.
- (c) Irrigation of food crops with treated municipal wastewater has been practised on a limited scale. The public needs to receive explanation about the concept of wastewater irrigation as a part of larger and more comprehensive water conservation programmes, and the use of reclaimed wastewater for a variety of non-potable uses.
- (d) Municipal wastewater contains a variety of pathogenic (infectious) agents. When reclaimed water is used on fields producing food crops, public health must be protected.

- (e) The methods of testing salmonella are of questionable sensitivity. Until more precise methods are developed and accepted, the present test for salmonella should not be used as substitute for fecal coliform results. This test is less precise because of the relatively low numbers of salmonella present compared to fecal coliform.
- (f) A comprehensive and consistent survey of municipal wastewater treatment plants is needed to show whether or not toxic organic compounds are present at concentrations that pose a risk to human and animal health and to the environment.
- (g) Those who irrigate crops with treated municipal wastewater should be aware of the concentration of nutrients (nitrogen and phosphorous) in the reclaimed water and should adjust fertilizer practices accordingly, in order to avoid vegetable growth or potential contamination of ground water.
- (h) While determining fertilizer application rates, an analysis of the rates of organic nitrogen mineralization should be performed in order to avoid build-up of excess nitrate-nitrogen. Nitrate-nitrogen that is not taken up by plants may contribute to excess fertilization and leach ate.
- (i) The programmers designed to promote agricultural use of treated effluents or treated should be carefully structured to avoid the creation of incentives to apply reclaimed water at rates in excess of agronomic rates, and to avoid undermining farm management practices needed to protect public and occupational health and the Environment.
- (j) Municipalities that wish to implement a beneficial-use program me need to address public concerns and provide assurance that the wastewater do not endanger health or the environment in application areas. The public and local officials should be involved in the decision-making process at an early stage.
- (k) The operators of municipal wastewater treatment facilities and the parties using wastewater should implement management and self-regulation measures that are visible and stringent, including monitoring and reliable reporting by farmers, and should support vigilant enforcement of appropriate regulations by local or state agencies.

Implementation of these measures will be a credible means of preventing nuisance risks and harm to people, property, and highly valued nearby resources.

- (l) The municipal utility should carry out demonstration programmes for public education, and for verification of the effectiveness of management and self-regulatory systems. In addition, the utility should be prepared to indemnify farmers against potential liabilities when farmers' financing by banks or other lenders may hinge on this assurance.
- (m) Regulators should clearly assign authority to local governments for responding to any reports of adverse consequences related to beneficial, such as ground water contamination, odour, attraction of vermin, or illnesses.

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Estimation of Air Quality: A Case Study

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ABSTRACT-

An investigation was undertaken to study the pollution levels in the villages in Korba district. The Presence of number of power plants & various industries in Korba district gave a support for the existence of Environmental problem in this area. Many industrial emissions from existing Thermal power plants, coal & Bauxite mines were being continuously released in to the atmosphere. This paper presents ambient air quality of villages in Korba district. Four different villages (Tiwarta, Chainpur, Burganihapara and Renki) were selected for the study and compared. The parameters studied were Particulate matter (PM10, PM2.5), Sulphur Dioxide, Nitrogen Oxides and Ammonia. The results were compared with National Ambient air Quality Standards-NAAQS-2009, (Environment (Protection) seventh amendment rules - 2009), A Gazette notification released by Ministry of Environment and Forests, Government of India. From overall analysis, it was observed that the concentration of all the above parameters is within the prescribed limit of Central Pollution control Board.

Keyword: Emissions, Particulate matter, parameters, Pollution, Ambient.

I INTRODUCTION

Air pollution may be described as contamination of the atmosphere by gaseous, liquid, or solid wastes or by-products that can endanger human health and welfare of plants and animals, attack materials, reduce visibility, or produce undesirable odors. Although some pollutants are released by natural sources like volcanoes, coniferous forests, and hot springs, the effect of this pollution is very small when compared to that caused by emissions from industrial sources, power and heat generation, waste disposal, and the operation of internal combustion engines. Fuel combustion is the largest contributor to air pollutant emissions, caused by man, with stationary and mobile sources equally responsible.

The Presence of number of power plants & various industries in Korba district gave a support for the existence of Environmental problem in this area. Many industrial emissions from existing Thermal power plants, coal & Bauxite mines were being continuously released in to the atmosphere.

So the Ambient air analysis has been carried out in the villages of Korba district at various Sampling points for various Air Pollutants like Particulate matter (PM10, PM2.5), Sulphur Dioxide, Nitrogen oxides and Ammonia.

(a) **Study Area:-** Korba industrial area is part of Korba Dist. situated at 22- 22' N and 82-42'E latitude with the 304.8 meter above sea level. The ambient air quality of Korba surrounding villages is continuously degrading due to industrial activities. Therefore, we have decided to analyze the ambient air quality of the study area, so that some remedies for the improvement could be possible.

II SAMPLE COLLECTION

Ambient air samples were collected from four different villages Korba district during the pre monsoon season (March-April 2013) using standard methods of Indian standard and CPCB guidelines and analyzed in laboratory for different pollutants. The various parameters were analyzed are reported given below.

Particulate matter (PM10, PM2.5) in ambient air were sampled and analyzed as per IS 5182, (Part IV) and followed Central Pollution Control Board guide lines (Gravimetric method), Sampling and analysis of Sulphur dioxide were done by following the method IS:5182, (part-II, West & Gaeke method), Sampling and analysis of Nitrogen Oxides were done by following the method IS:5182 (Part-VI, Sodium Arsenite method) and Sampling and analysis of Ammonia were done by following the method EPA ISC Part-II method-401 (Indophenol blue method).

III RESULTS AND DISCUSSION

In this study we selected four villages in Korba district, those are Tiwarta, Chainpur, Burganihapara and Renki, and these villages are nearer to many Coal based thermal Power plants.

In the above said villages we collected air samples by following standard methods.

Collected samples were analyzed for different pollutants like Particulate matter (PM10, PM2.5), Sulphur Dioxide, Nitrogen Oxides and Ammonia.

The concentration levels of different pollutants were compared with National Ambient air Quality Standards-

NAAQS-2009,(Environment(Protection)seventh amendment Environment and Forests, Government of India and the rules - 2009),A Gazette notification released by Ministry of results and observations were given below.

Table 1 – Concentration of PM10

S. No	Name of the village	Unit	Concentration of PM10	CPCB Standard Limit
1	Tiwarta	µg/m ³	63.8	100
2	Chainpur	µg/m ³	61.2	100
3	Burganihapara	µg/m ³	63.6	100
4	Renki	µg/m ³	62.2	100

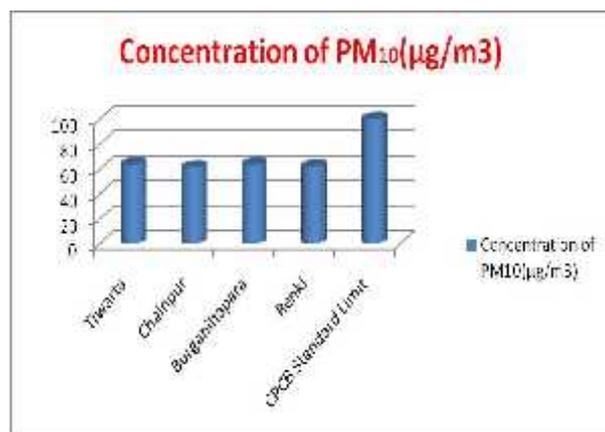


Table 2 – Concentration of PM 2.5

S. No	Name of the village	Unit	Concentration of PM2.5	CPCB Standard Limit
1	Tiwarta	µg/m ³	41.2	60
2	Chainpur	µg/m ³	40.8	60
3	Burganihapara	µg/m ³	42.3	60
4	Renki	µg/m ³	40.1	60

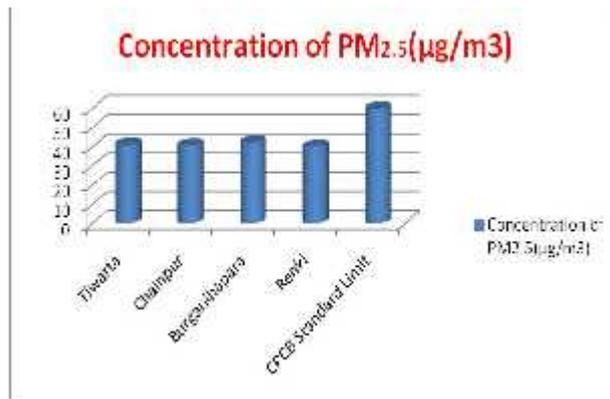


Table 3 – Concentration of Sulphur dioxide:

S. No	Name of the village	Unit	Concentration of SO2	CPCB Standard Limit
1	Tiwarta	µg/m ³	51.9	80
2	Chainpur	µg/m ³	58.2	80
3	Burganihapara	µg/m ³	54.6	80
4	Renki	µg/m ³	56.9	80

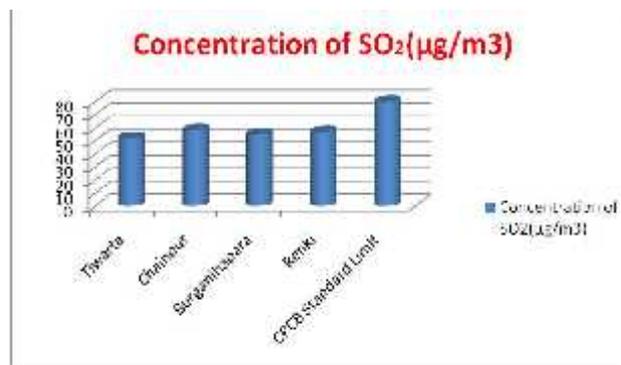


Table 4 – Concentration of Nitrogen Oxides

S. No	Name of the village	Unit	Concentration of NOx	CPCB Standard Limit
1	Tiwarta	µg/m ³	49.6	80
2	Chainpur	µg/m ³	42.5	80
3	Burganihapara	µg/m ³	43.6	80
4	Renki	µg/m ³	44.9	80

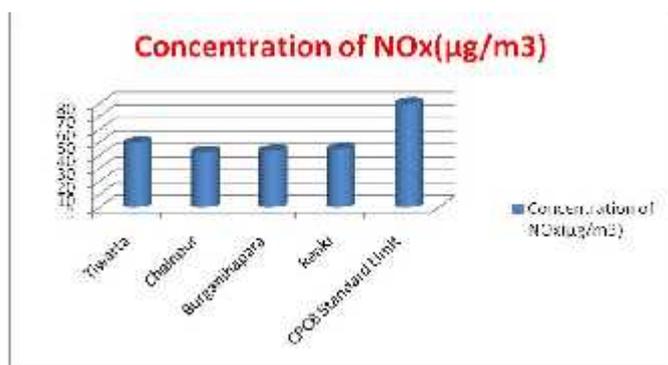
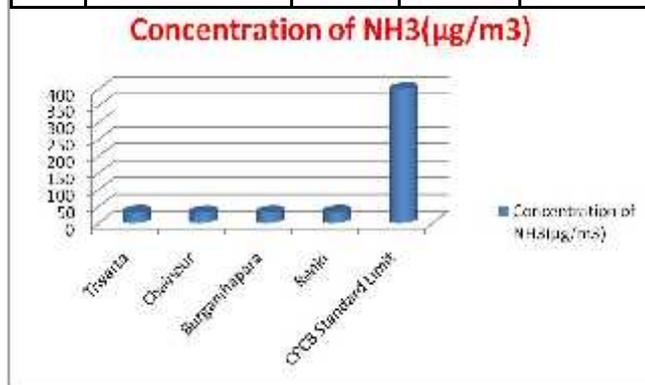


Table 5– Concentration of Ammonia

S. No	Name of the village	Unit	Concentration of NH ₃	CPCB Standard Limit
1	Tiwarta	µg/m ³	32.9	400
2	Chainpur	µg/m ³	31.5	400
3	Burganihapara	µg/m ³	32.1	400
4	Renki	µg/m ³	33.2	400



Ammonia:

IV CONCLUSION

By observing the above results, it can easily be concluded that concentration of estimated pollutants are within the prescribed limit of Central Pollution control Board Except for Ammonia rest of the pollutants (i.e. Particulate matter

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Optimum Design of Wind and Solar Hybrid System Power Generation for Stand Alone and Remote Areas

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ABSTRACT-

Standalone wind with Solar Photovoltaic is known as the best hybrid combination of all renewable energy systems and suitable for most of the applications taking care of seasonal changes. They also complement each other during lean periods, example additional energy production by wind during monsoon months compensate less output generated by solar. Similarly, post winter months when wind is dull, SPV takes over. The hybrid system provides more consistent year-round renewable energy production. These systems are modular and can be expanded easily. A hybrid renewable energy system utilizes two or more energy production methods, usually solar and wind power. Hybrid wind & solar systems provide more consistent year-round performance and reduce the need for back-up generation. The major advantage of solar / wind hybrid system is that when solar and wind power production is used together, the reliability of the system is enhanced. Additionally, the size of battery storage can be reduced as there is less reliance on one method of power production. Often, when there is no sun, there is plenty of wind. The packaged systems are ideally suited to remote homes, schools, clinics and other off-grid applications. They can also be retrofitted to existing diesel - generator systems to save on high fuel costs, minimize noise and provide up to 24-hour power. The standard hybrid systems available to meet power needs. We can also tailor a system to suit should you have a smaller or larger power requirement.

Keywords: Solar Photovoltaic cell, wind blade, Battery, Hybrid Power Conditioning Unit.

I INTRODUCTION

Present day energy scenario; for meeting the ever-increasing energy demand, efforts has come into focus with a view to develop new generation technologies. The major goals of these approaches are to have reduced environmental damages, conservation of energy, exhaustible sources and increased safety. In this context during the past few years renewable energy sources have received greater attention and considerable inputs have been given to develop efficient energy conversion and utilization techniques. Majority of the population in our country is located in the village and a large number of the villages are still not served by National Grid due to cost involved for laying of the Transmission line, in relation to their power consumption, is prohibition in some cases because of the distance involved, quantity of life, availability of cold storage for Medicine, TV coverage and other aspects are adversely affected in such cases.

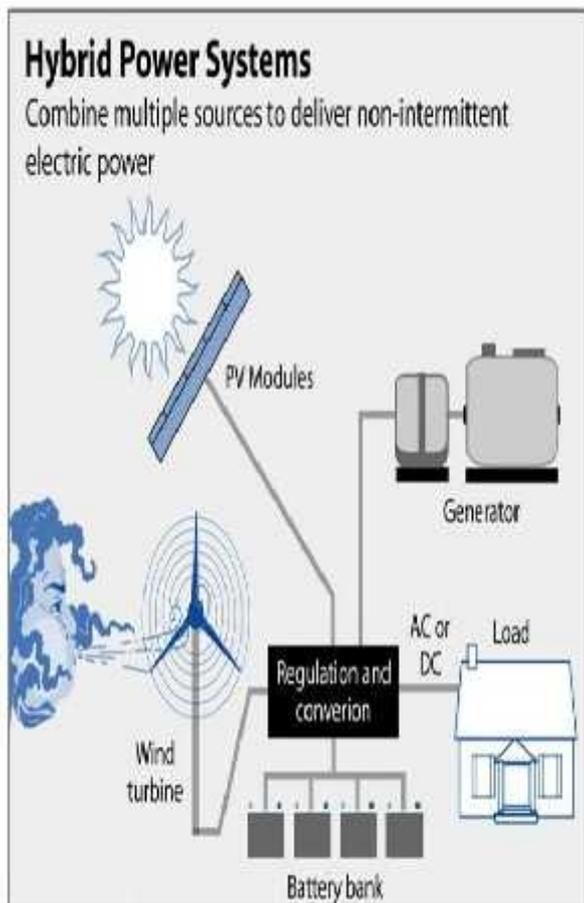
Conventional sources of energy have a long generation period, draw heavily on exhaustible deposits and adversely affect ecological balance. New and Renewable sources of energy are not only economically viable but do not suffer from any of the above disadvantages.

II TO DEVELOP NEW GENERATION TECHNOLOGIES & RENEWABLE ENERGY SOURCES

- (a) Ever-increasing energy demand
- (b) Reduced environmental damages and increased safety
- (c) Conversion of energy and inexhaustible sources
- (d) Received greater attention to develop efficient energy conversion and utilization Techniques.
- (e) The realization of enormous need to electrify and energies remote rural areas.
- (f) Adequately available, least impact on environment and ecology
- (g) Ideally suited for decentralized variety of applications.
- (h) The future of fossil fuels has a limited time for their availability i.e. estimated that it could be around 70 to 100 years.
- (i) Inaccessible areas and hilly terrain's, renewable energy becomes very handy.
- (j) The cost of generation goes on decreasing as time passes.
- (k) Environmental friendly projects

III HYBRID SYSTEMS (WIND - SOLAR)

A Hybrid plant combines Wind, Solar, and hybrid power conditioning unit with a battery as shown in schematic diagram figure-1. to supply electricity to remote areas, locations that have relied on conventional fuel may now take advantage of natural energy.



Standalone wind with Solar Photovoltaic is known as the best hybrid combination of all renewable energy systems and suitable for most of the applications taking care of seasonal changes. They also complement each other during lean periods, example additional energy production by wind during monsoon months compensate less output generated by solar. Similarly, post winter months when wind is dull, SPV takes over. The ground space required for wind generator is hardly 5 x 5 Sq ft. It can be easily erected on towers of 9 mts up to 18 mts with fold over mechanism on the ground or / it can also be mounted on roof-top of tall buildings. The low inertia comes in handy to start generating wind speeds as low as 2.5 mts per second. The energy generated can be easily combined with that of Solar PV through an integrated controller which will ensure continuity of energy transfer into battery bank system. This DC stored energy can be converted by power conditioning unit to AC Single phase 230V/50Hz, Power which can be used for Lighting load.

IV SOLAR AND SOLAR PHOTOVOLTAIC MODULES

Solar energy is a very large, inexhaustible source. The power from the Sun intercepted by the Earth is approximately 2.9×10^{15} MW, which is many thousands of times larger than the present consumption rate on the earth of all commercial energy source. Thus in principal, solar energy could supply all the present and future energy needs of the world as a continuous basis. This makes it one of the most promising of the unconventional energy sources.



The solar modules generate DC electricity whenever sunlight shines on the solar cells. The solar modules should be tilted at the optimum angle for that particular location, face due south and should not be shaded at any time of the day

V ADVANTAGES / DISADVANTAGES OF PHOTOVOLTAIC SYSTEM

(a) **Advantages:**

- (i) Direct room temperature conversion of light to electricity through simple solid state devices.
- (ii) Absence of moving parts
- (iii) Maintenance cost is low, as they are easy to operate.
- (iv) They do not create pollution.
- (v) They are highly reliable
- (vi) They consume no fuel to operate, as the Sun's energy is free.
- (vii) Wider power handling capabilities.
- (viii) Easy to fabricate
- (ix) Amenable to onsite installation
- (x) It is an environmentally clean source of energy.
- (xi) Free and available in adequate quantities in almost all parts of the world where people live.
- (xii) Non-availability of conventional source of energy.

(b) Disadvantages:

- (i) The solar radian flux availability is a low value 1 kW / m² for technological utilization.
- (ii) Large collecting area required, and Cost is more.
- (iii) Availability varies with time.
- (iv) In many applications, energy storage is required because of insolation at night.
- (v) The relatively poor conversion efficiency.

VI AERO WIND GENERATOR

Wind energy is a clean renewable energy source cheaper to maintain, saves fuel and can give decentralized energy. This is one of the main components in this system and converts kinetic energy of wind into electrical energy in the wind into mechanical energy. An electric generator is coupled to the propeller shaft directly, this propeller in turn rotates rotor of the electric generator and in turn generates DC electricity. The output from the wind generator varies as per the wind speed. Wind electricity for decentralized system or hybrid generation of electricity using other energy sources as complementary to wind energy has now been given some attention and this could be suitable in low wind regimes for localized small grid systems or battery charging for low wind speed, wind pumps could also be a viable option. This needs creation of necessary data and manpower base, setting up some demonstration plants at appropriate locations and carrying out research and studies for indigenisation of technology. The ground space required for wind generator is hardly 4x4 sq ft, it can be easily erected on towers of 9 mts upto 18 mts with fold over mechanism on the ground or / it can also be mounted on roof-top of tall buildings. The low inertia comes in handy to start generating wind speeds as low as 2.5 mts per second. The energy generated can be easily combined with that of solar pv through an integrated controller which will ensure continuity of energy transfer into battery bank system. This dc stored energy can be converted by power conditioning unit to ac single phase 230v/,50hz, power which can be used for lighting load.



VII FEATURES OF AERO WIND GENERATOR

- (a) 20 years life of the equipment
- (b) Simple rooftop installation - no tower necessary
- (c) Microprocessor-based smart internal regulator with peak power tracking safety protection electronics controls voltage and rotor rpm.
- (d) Maintenance-free - only two moving parts exclusive auto-brake-feature that slows the system to a silent spin when the batteries are charged thus extending bearing life and reducing noise.
- (e) Sophisticated internal charge controller - externally adjustable for any type of battery.
- (f) Low cost, low maintenance cost, no fuel cost
- (g) No pollution , easy installation
- (h) Designed to be used in combination with photovoltaic modules to balance system energy output during times of seasonal fluctuations.

VIII ADVANTAGES / SAILENT FEATURES OF HYBRID SYSTEMS

- (a) Eliminates expensive mains cable installation costs;
- (b) Eliminates any associated electricity bills;
- (c) Increases public safety aids in providing a safe working environment in areas where mains power is difficult to access;
- (d) Fully automatic operation; Easy to operate and maintain.
- (e) High quality construction and components;
- (f) .Designed for easy to operate, servicing and maintenance where required;
- (g) Most eco-friendly & clean source of power;
- (h) No pollution and no recurring fuel costs;

IX HYBRID SYSTEM MAJOR COMPONENTS

- (a) Solar Photovoltaic modules
- (b) Wind Generator

- (c) Hybrid Power Conditioning Unit
(Inverter and charge controller)
- (d) Battery

- (e) Street lighting.
- (f) Transmissions & communication Tower and many more applications.
- (g) High output make ideal for virtually any remote battery charging application.

X HYBRID POWER CONDITIONING UNIT

Hybrid power conditioning unit is used to combine the Solar PV Array & wind generator. This unit prevent the overcharging and the deep discharging of the battery bank. It is the brain of the whole set up. When batteries are fully charged then it stops the further charging of the batteries and when the batteries are deep discharged then it disconnects the load and allows the battery to charge. The output from Batteries is in DC form. To supply power to the loads sch as compact fluorescent lamps (CFL's), Street Lights, Television, this DC power needs to be converted to AC. Power conditioning is an electronic device which inbuilt Inverter, converts the DC power to AC with the help of IGBTs. The advantage of using AC is that we can use energy efficient lights such as CFLs. (e.g. 11W CFL gives same lumen output as that of 60W ordinary bulb) & we can optimise the overall system size, thereby saving in the initial higher investment.

XI BATTERY

Once the power output from solar and wind is converted to DC, it is supplied to batteries and the batteries get charged. Depending upon the load requirement and the number of hours of operation of loads the adequate battery size is calculated. Battery banks are typically sized to supply the electric load for one to three days.



XII APPLICATIONS

- (a) Ideal for cell phone recipient stations.
- (b) Farm houses, guesthouses, Hospitals, Hotels, Laboratories and R&D centres
- (c) Remote and Rural village Electrification.
- (d) Residential colonies & Apartments General lighting.

XIII MNRE GUIDELINES

These guidelines are to select new projects and provide the necessary policy framework for development of projects under the scheme of JAWAHARLAL NEHRU NATIONAL SOLAR MISSION (JNNSM).

- (a) The objectives of these guidelines are:
 - (i) To facilitate a quick start up of the JNNSM,
 - (ii) To ensure serious participation for projects to be selected under JNNSM,
 - (iii) To facilitate speedier implementation of the new projects to be selected to meet the Phase I target of JNNSM;
 - (iv) To enhance confidence in the Project Developers and
 - (v) To promote manufacturing in the solar sector, in India

XIV MNRE SUBSIDY

As part of this mission the Government has initiated a subsidy scheme to help individuals and organizations procure these Solar Energy Systems at reduced capital costs. The scheme is being implemented by IREDA (Indian Renewable Energy Development Agency Ltd.) through NABARD (National Bank for Agriculture and Rural Development). The scheme that was last modified on 15th March 2012 provides **40% subsidy** on capital costs of Solar PV Systems for units located in both urban and rural areas in India.

Models	Photovoltaic modules/ Panels (Vp)	Battery capacity	Maximum Recommended Load And Duty Cycle	Benchmark cost (Rs)	Maximum capital subsidy eligible (Rs)
I	13	12V,7AH(SMF)	5-7 Watt Load For 3-4 Hrs(20 Watt Hrs/Day)	2700	1080
II	18-20	12V,20AH(Tubular L.M.Gel VRLA)	10 Watt Load For 4 Hrs (40 Watt Hrs/Day)	4800-5400	2160
III	37-40	12V,40AH(Tubular L.M.Gel VRLA)	20 Watt Load For 4 Hrs (80 Watt Hrs/Day)	9900-10800	4320
IV	53	12V,50AH(Tubular L.M.Gel VRLA)	30 Watt Load For 4 Hrs (120 Watt Hrs/Day)	13500	5400
V	73-80	12V,80AH(Tubular L.M.Gel VRLA)	45 Watt Load For 4 Hrs (180 Watt Hrs/Day)	18300-21600	8640
VI	130	12V,80AH(Tubular L.M.Gel VRLA)	60 Watt Load For 4 Hrs (240 Watt Hrs/Day)	27300	10800
VII	125	12V,150AH(Tubular L.M.Gel VRLA)	75 Watt Load For 4 Hrs (300 Watt Hrs/Day)	33750	13500
VIII	150-190	24V,75/80AH(Tubular L.M.Gel VRLA)	60 Watt Load For 4 Hrs (360 Watt Hrs/Day)	40500-43200	17280
IX	230-240	24V,110/120AH(Tubular L.M.Gel VRLA)	120 Watt Load For 4 Hrs (480 Watt Hrs/Day)	54300-56700	22680

XVII CONCLUSION

- (a) Standalone wind with Solar Photovoltaic is known as the best hybrid combination of all renewable energy systems and suitable for most of the applications taking care of seasonal changes.
- (b) Hybrid wind & solar systems provide more consistent year-round performance and reduce the need for back-up generation.
- (c) The major advantage of solar / wind hybrid system is that when solar and wind power production is used together, the reliability of the system is enhanced. Additionally, the size of battery storage can be reduced as there is less reliance on one method of power production.
- (d) The packaged systems are ideally suited to remote homes, schools, clinics and other off-grid applications.
- (e) Remote and Rural village Electrification & domestic lighting applications.

XV EXPECTED ENERGY GENERATION DETAILS

- (a) The energy generated from the wind aero generator is considered 1kwh/day.
- (b) The energy generated from the solar module by considering 7hrs/day. For 75W x 7hrs = 525WHrs and For 150W x 7hrs = 1050WHrs
- (c) Energy generation

SI No	Hybrid System	Generation Per Day Kwh	Generation Per Month Kwh	Generation Per Annum Kwh
1	600W = 400W WIND + 200W SOLAR	2.05	61	738

XVI SIZING OF EQUIPMENT

SI No	Name of the Equipment	Units	475	550
a	Wind Aero Generator	W	400	400
b	Solar PV module	W	75	150
c	12 V Battery	Ah	200	400
d	Solar PV module - Charger	A	10	15
e.	Hybrid Power Conditioning -Unit (Inverter and charge controller Systems).	VA	500	500

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What will The Universities of India in 2020 look like?

The future is a difficult thing to predict. Still, we are trying to visualise what the future might hold for Indian Universities.

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ABSTRACT-

In recent years India's place in the world has changed; a new India is emerging. Indians are carving out their futures, confident that they have something unique to offer the world. To thrive in challenging times, India's must be not only academically and technically equipped, but also creative, innovative and connected. When we look back, we realize that many things have changed remarkably, but others seem not to have changed at all. In this Paper researches have studied two things: First, Many issues that have been with us for the past few years include: how to make the Teaching year more exciting; how to communicate what students actually do; how to improve the overall education system, and how to give students a basic understanding education; But for the most part, things have changed in astounding ways. Secondly: Strategies we should follow to improve the university system and to become global university. In the 21st century we aspire once again to serve and lead as the 'engine' of this new India.

Keywords: Universities, Enrolment Ratio, Higher Education, 21st century, Research

I INTRODUCTION

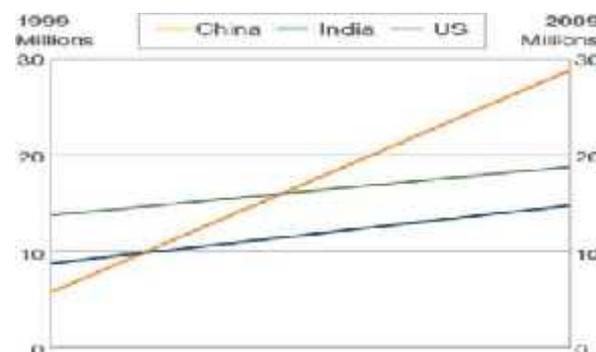
Former President and missile man APJ Abdul Kalam met the students IIM- I. Sharing his vision of a 21st century university, Kalam said such a university should have a global outlook, a scientific temper, close interaction between technology and public welfare, virtual classrooms and a stress on collaborative research. He said research is the backbone for any university and it empowers students. On his vision for the country for 2020, Kalam said that there are still many challenges before it and there are only seven years left. So, we also need to think about the universities of 2020 in India. It is designed to be the 'light on the hill':

India has now come up with new aims. Yes! It is now in a plan to increase its **Gross Enrolment Ratio (GRE)** from 18.1% to 25.2% by 2017 and around 30% increase in enrollment by the year 2020. It wants to expand its university system to meet the aspirations of a growing middle class, to widen access, and become a "knowledge powerhouse".

It will mean increasing the country's student population from 12 million to over 30 million, and will put it on course to becoming one of the world's largest education systems.

"We will very likely be number two if not number one in terms of numbers," says Pawan Agarwal a former civil servant and author of Indian Higher Education: Envisioning the Future.

The amount of money in the central budget for higher education in the current five year plan (2012-2017) is nine times the amount of the previous five years. But there is a steep hill to climb. India's National Growth in university enrolment Knowledge Commission estimated the country needs 1,500 universities compared to around 656 now.



Source: Unesco. US Education Dept.

India's private university sector is also growing rapidly, particularly in professional education in information technology, engineering, medicine and management where there is huge demand from the burgeoning middle classes. But that will not be enough. To bridge the gap, the government last year tabled legislation to invite foreign universities to set up branch campuses. The Foreign Providers Bill is currently making its way through parliament.

Imagine where we might be in 2020, The Pew Research Center 2011 study found survey (1,021 experts and stakeholders respondents) says that by 2020, University will be different by mass adoption of

teleconferencing and distance learning to leverage expert resources. Significant numbers of learning activities will move to individualized, just-in-time learning approaches. There will be a transition to "hybrid" classes that combine online learning components with less-frequent on-campus, in-person class meetings. Most universities' assessment of learning will take into account more individually-oriented outcomes and capacities that are relevant to subject mastery. Requirements for graduation will be significantly shifted to customized outcomes.

The Indian Institute of Science, Bangalore (IISc) has taken the number one position in a new ranking of the top 10 Indian higher education institutions based on their global academic prestige. Specialist institutes occupy the top five places in the Times Higher Education India Reputation Rankings, published for the first time this year alongside the full Times Higher Education World Reputation Rankings.

IISc - which was conceived by the Indian industrialist J. N. Tata and founded in 1909 - takes first position. Just below it are the Indian Institute of Technology Bombay in second, the All India Institute of Medical Sciences in third, the Indian Institute of Technology Kanpur in fourth and the Indian Institute of Technology Delhi in fifth.

Of the so-called "Bric" countries with rapidly expanding economies (Brazil, Russia, India and China), India is the only nation lacking a single representative in the overall world top 100. Times Higher Education, said: "As a country with a rapidly growing economy and a fine tradition of scholarship, it is a cause for concern that India does not have any institutions that are sufficiently highly regarded by international scholars that they feature among the global top 100 of our World Reputation Rankings.

"But it is clear that there is a need to benchmark the country's performance using recognized global performance indicators such as those employed by Times Higher Education, especially as the country's higher education system is going through such dramatic development and expansion. So we are glad to release this inaugural India Reputation Ranking, which not only gives a sense of the pecking order within India but also shows how far its top institutions must travel to join the elite top 100."

Times Higher Education revealed that if the The World Reputation Rankings were to list more than just the top 100, India's top-ranked institution, IISc Bangalore, would be 130th. IIT Bombay would sit in 192nd place, but all other Indian institutions would fall outside a global top 200.

Referring to global university rankings that use a range of indicators beyond reputation alone, he said: "It is a sobering thought that not one Indian university today figures in the top 200 universities of the world today."

India 's Prime Minister, ManMohan Singh, told a conference in February: "Too many of our higher education institutions are simply not up to the mark. Too many of them have simply not kept abreast with changes that have taken place in the world around us...[and are] still producing graduates in subjects that the job market no longer requires..."

II BY 2020, WE WILL BE

Last year there were reports of up to 50 foreign universities interested in setting up in India. The hype reached fever pitch in November during the visit of US President Barack Obama and a large group of US University Presidents. They were enthusiastically talking of university partnerships.

We need to create truly global university, both physically and intellectually. We need to start wide network of research and teaching collaborations, but they are not enough. Joint planning and resource allocation in strategic areas will give us a head start over all other universities. This will result in attractiveness to elite students, new research and research funding opportunities and global partnerships with industry and governments.

Some foreign universities are already in place. The UK's Leeds Metropolitan University provides management degrees on a 36-acre campus in Bhopal in central India. Lancaster University runs courses at the GD Goenka World Institute - a 69-acre site near Delhi.

China is also ready to set up first university campuses abroad. "The Chinese government and its universities have been very ambitious in the reform and internationalization of Chinese higher education," said, director of the Center of Chinese Studies at University of Michigan. "China's global influence and prestige in higher education is best served by strengthening its universities at home and offering a 'world class' education to Chinese students and expanded numbers of overseas students."

"It is not yet clear how we will develop our presence in India. It is a complicated reform bill."

Plan to become among the strongest research universities in the world. We will create critical mass in areas where we are or will become world- renowned and in areas Relevant to the grand challenges the world faces, particularly areas at the intersections of disciplines. We will focus on research that has a high impact on the world, engaging with local communities and industry to ensure we are meeting the challenges they face.

University should promote the highest standards of research and scholarship and be a world leader in research areas of specialization.

III CONCLUSION

(a) **What strategies we should follow:**

Embracing the distinct identities of each of our campuses and developing the competitive advantages that diversity offers. We must turn our identity as a globally networked university with multiple campuses and academies into a major strategic advantage. For this to happen, we need to work together. Our structures need to ensure both that leaders retain the autonomy necessary to effectively deliver outcomes and that there is a clear strategic framework for them to operate in.

(b) **Increasing our focus on Asia.**

With the ever-accelerating rise of Asia, we are now equipoise geographically and culturally between the old and the new at a tipping point in history. What opportunity! In the past, India has punched above its weight because we have lateral thinkers who challenge accepted norms. This is no longer enough. We must access larger talent pools for outstanding staff and students. The development of our joint academy will build up to increase students in science and engineering. Our new joint school and research academy with other international University is arguably the most exciting university project in all of China and offers unique masters, PhD and research opportunities. It is crucial that they are taken up.

(c) **Revolutionizing student learning:**

We will be a leader in providing education that is appropriate for the new era. Amongst other things, we will ensure that students have the ability to locate and use good quality information in a highly complex and overloaded information environment. The environment we teach in will draw on the best information, including open ware, and encompass state-of-the-art learning spaces and blended approaches, conscious development of character and soft skills, and opening students' minds to international opportunities. We will resource necessary investment in educational infrastructure, in part through partnerships.

(d) **Continuing to strengthen academically:**

We will continue the academic strengthening program embraced by the university community, where all research-active academics are required to meet minimum research criteria and are aware of stretch criteria relevant in career building. We need to clear advantages to attract high quality recruits new talent and continue to grow our own. One such advantage is our long-nurtured 'can do'

reputation. Initiatives such as the Warwick partnership and our new research developments in India and China also provide appeal. We must be entrepreneurial in engaging with industry and developing new income sources, and efficient in managing core operations so we can support ambitious research planning.

(e) **Giving optimal attention to each campus:**

Most of academic mass is centered in India. It is these campuses from which our charge to become one of the world's top research universities will be led. Yet much if not most management attention over the last decade has gone to the diasporas rather than the home base. Going ahead, we must pay appropriate attention to both in our management structures.

(f) **Continually improving our systems:**

Resource is tight and people's time precious. We must continue to eliminate red tape. In some areas we may have become uncharacteristically risk averse and adopted unduly tight management protocols. We cannot afford inefficient or suboptimal support processes. Considerable progress has been made under University by consolidating our operations where appropriate and we must keep looking for sensible efficiencies. A state-of-the-art IT system will be essential to delivering the ambitions outlined in this paper, so we must continually improve the management and delivery of IT solutions. We will create systems and structures that draw the best out of our professional staff and engage them in delivering on our institutional goals.

(g) **Establishing of various research centers:**

Universities should establish various research centers to make the standardized curriculum as per advanced technologies and ever growing demand for higher education. Our University has taken initiative to meet out this requirement and Research Centers are putting their efforts in their concern fields by using advanced technology. Our future dream is to establish a Research Hub at global level.

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Vignan University - A Case Study

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I INTRODUCTION

The Indian higher education system, although the second largest in the world, has been facing three fundamental challenges - access, equity, and quality - as evidenced by the relatively low Gross Enrollment Ratio (GER), wide geographical, community and gender disparity, and unemployability of graduates. There has been wide disparity in higher education GER across states, urban and rural areas, gender, and social groups. Further, it has been plagued with faculty shortage, poor academic standards, outdated curricula and ill-equipped libraries. Against this backdrop, the Vignan group of educational institutions evolved to address these challenges effectively and provide credible option to those students who were not satisfied/able to access quality education.

II TRANSFORMATION AND GROWTH OF VIGNAN UNIVERSITY

Vignan University is an institute, which has been set up to provide quality education in a diverse and intellectually stimulating environment and impart value addition training to students to make them competent and inspired engineers. The Institute cultivates vision and encourages new ideas, besides aiming to inculcate human values and build awareness about the self and society around. The Institute has dedicated faculty, state-of-the-art infrastructure and good Placement Record.

As a University, it is in the process of improving its standards to the level of a global technical institution. The latest curriculum has been prepared after consulting the institute's illustrious alumni working across the world, veterans from industry and distinguished academics possessing a rich teaching and research background.

VIGNAN GROUP is a group of institutions in the country, which has established a good foothold at all levels of education by catering to the needs of various sections of student community. Starting from schools to junior colleges (+2), Science, Engineering, Pharmacy and Postgraduate institutions with a student base of about 40,000, VIGNAN has today branched across all important geographical areas of A.P, like Guntur, Vijayawada, Eluru, Rajahmundry, Charla, Vishakapatnam and Hyderabad. Thus VIGNAN is playing a significant role in promoting higher education sector and thereby bringing about a dramatic

change in the socio-economic dynamics of the region. Empowered by education, many families from the lowest rungs of the society have been uplifted to the higher income levels. As a result A.P has become a rich pool of talent and the favorite hunting grounds for global companies.

III ENTRY PARAMETERS

The Vignan group has identified educational needs and designed academic courses ranging from kinder garden to post doctoral studies to fulfill the unmet the needs of various segments of student population spreading across rural, semi-urban, and urban areas, income, occupational, and social groups. It focused on identifying and stimulating latent talent among students with rural background.

The founder Chairman, Vignan Group envisioned in the early 1980's the exponential growth in the demand for exceptionally good quality education in the fields of engineering and medicine on the one side and the inelastic supply of the public educational system. He further observed that in the fierce competition for very limited seats available with public educational system, the 10 + 2 students from rural areas, particularly girl students, were not able to move to urban areas due to concerns such as affordability and security for girls to explore their chances in the competitive exams. Thus, they were always on a lookout to affordable, quality education within their reach. The Vignan Group has come up with the residential pattern of education at the +2 level to suit this unmet demand.

With the brand Vignan becoming credible and most sought after, the group started focusing on expansion. Gradually the junior colleges were spread across the state. Soon the management discovered that in order to unfold the full potential among students, they should be provided quality education right at the elementary level and accordingly built a network of very good primary education. By 1990s Vignan has become the state's leading player in the field of education at primary and secondary levels of education. These initiatives turned out to be timely as it was co terminus with the nationwide educational reforms aimed at building a huge pool of human talent to take advantage of the job opportunities thrown open by the advent of ICT and internet. At this juncture, the Vignan group forayed into the field of engineering education with the establishing of Vignan's Engineering College with focus on students with rural background.

The tremendous student response vindicated the Vignan's vision was right. Soon, Vignan has become synonymous with the quality engineering education.

On its vertical growth, it has built credible institutional space to meet the demand for pharmaceutical education. With the great deal of experience and proven track record, the Vignan group started horizontal expansion at the graduation level in engineering and pharmacy. Eventually, about 37 high quality educational institutions were put in place throughout the state of Andhra Pradesh.

IV TARGET AUDIENCE AND POSITIONING

Unlike several institutions that mushroomed in no time to meet the demand for quality higher education, the Vignan group has evolved itself to set benchmark standards leaving its competitors far behind. The successes in academic results, and placements made it a premier brand in the education field. The students who join these institutes are sound in their academic background and strong in their commitment towards becoming professionals. With the offer of quality education at benchmark standards, constant motivation, career guidance, placement and excellent hostel infrastructure that provided good nutritious food and comfortable ambiance it emerged as the most preferred choice of parents in their search for holistic education towards building all round personality and character of their children.

The growing student response unfolded the space for a full-fledged university with focus on engineering. The Vignan Engineering College at Vadlamudi transformed itself into Vignan's University in 2009.

The country is looking forward for innovation, employment, entrepreneurship and growth which all require autonomy to mould the institute to meet the challenges. This could be possible through a university which encourages innovation and promotes research. Vignan made its right entry by becoming a University. It expanded array of programs offered and entered into new segments. A reputation for quality, a consistently strong track record, and a well-known brand are the key drivers of its growth.

V CRITICAL SUCCESS FACTORS

Pro-active management, Student-centric pedagogy, high degree of academic rigour and excellence and mentoring by quality faculty, industry driven course curriculum, well equipped library, focus on soft skills and placement oriented education have been the factors responsible for Vignan's success.

VI THREATS AND CHALLENGES

- (a) Maintaining current strength is a major problem due to large number of branded universities in neighboring states.
- (b) Large number of neighboring engineering colleges offering the same course at low price.
- (c) Compared to the students of branded universities, vignan student projects, participation in outside competitions, seminars, conferences and workshops is low.
- (d) Machinery required need to be procured in each discipline. There is lack of Labs in many departments.
- (e) Lack of core faculty in all branches is a major issue.
- (f) Maintain appropriate Teacher /student ratio is the biggest challenge. At present ratio is 40:1, far below the statutory norms.

VII CONCLUSION

The unprecedented growth in higher Educational during the past two decades has to a large extent been due to the participation of private sector. Their presence in the higher education sector is manifesting in many different forms of colleges and universities. As rightly expressed by Prof. M. Anandkrishnan, former chairman, FICCI Higher Education Committee, private sector investment in higher education has considerably supplemented the public investments and helped to enhance the enrollment capacity in selected disciplines as well as employment potential. Vignan group of institutions as one of the private sector players is making significant strides in the field of education and community development.

Renewable Energy System Designs for Solar Cooker/Oven and Silicon (Si) Module Heater

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ABSTRACT –

A renewable energy system design for solar cooker/oven with different detachable reflectors and a design for Si module heater for cooking purposes are presented here. The solar cooker design is based on the principle of hot box type cooker with different detachable reflectors. The reflectors used can be mirror, stainless steel, aluminum or brass sheet/foil. Performance of cooker can be tested with different reflectors. They can be tested at different insulations in different seasons. These cookers/ovens may prove to be efficient, reliable and trouble free. The selective absorber coating used will be textured black copper coating. Different type of food can be cooked for a family of 4-5 between 9 am to 5 pm at different insolation falling on this cooker/oven. Second design is a Silicon (Si) module exposed to sun during different days. Which can be used for cooking and baking purposes. Both renewable solar systems designs can be used for making nutritious food. The solar cooker can boil, cook, roast and bake depending on insolation falling on it and the temperature obtained within cooker/oven while photovoltaic heater (oven) can boil, cook, fry and also bake. Both the cooking systems proposed are sustainable and stand alone systems respectively. They are also ecofriendly.

Keywords- Black copper selective coating, chemical conversion, high absorptance, low emittance, operating temperature, renewable energy system, reflectors, sustainable, stand alone system. Solar cooker/oven, (Si) module heater,

I INTRODUCTION

Harnessing solar energy is essential since solar energy is limitless, inexhaustable, cheap, valuable, nonpolluting, source of energy available to mankind during the day. Hence efficient utilization of solar radiation is required. It can solve our energy crises and energy shortage problems.

For this purpose selective absorber surface had been investigated by number of researches [1,2]. Black copper are most commonly investigated selective surfaces [1-4] Textured black copper selective coating had been developed [1,2] which possess high solar absorptance (α) \sim 0.97-0.98 and low thermal emittance $\epsilon_{(100)}$ \sim 0.15-0.2 is used in this solar cooker/oven.[1,4] Here another design of solar cooker/oven which can be made using texture black copper selective coating has been proposed. Which may prove to be reliable viable, ecofriendly, efficient and trouble free. Different type of food can be cooked for a small and medium family during different days at different insulations.

Secondly a Silicon (Si) module heater for cooking purpose which can operate at different insolation is proposed. Both green renewable solar (thermal and photo voltaic) systems can be used for cooking and baking purposes depending upon insolation falling on these systems. These solar systems are sustainable to environment and are also standalone systems. They are ecofriendly and easy to make and use. They can be shifted to any desired place when ever necessary.

II EXPERIMENT TECHNIQUES

The textured black copper selective surface had been developed by chemical conversion which can be used as industrial technique for fabrication of absorber coating [1-4]

Air annealing is carried out in a laboratory oven with accuracy $\pm 10^0$ c for 24 hour. Solar insolation had been recorded using pyranometer. Temperature of absorber plate and glass cover had been recorded using a thermo couple [1-4].

The total reflectance had been recorded by Hitachi 330 double beam spectrophotometer between 0.3-2.5 μ m the integrated solar absorptance (α) has been computed. The thermal emittance had been measured using an emissometer [1-4].

III RESULT AND DISCUSSIONS

Textured black copper selective coating possessing solar absorptance (α) \sim 0.97-0.98 and emittance (ϵ_{100}) \sim 0.15-0.2 can be used to develop textured black copper solar cooker/oven.[3] And a silicon module which can be used to operate a heater are given here. Both device systems can be used for boiling, cooking and baking purposes.

Both these system are being described here in brief.

Experiment and design (Stand alone systems)

- (a) **Design of renewable energy solar cooker/oven:-** Design of solar cooker/oven (Stand alone) box type solar cooker with reflector is simple to use and is presented here. Such cookers have been found to be maximum in use. Here a designs of textured black copper solar cooker/oven is shown in fig. 1.

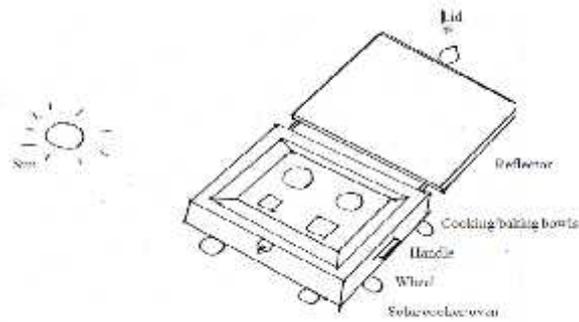


Fig. 1 Shows a design of textured black copper solar/oven.

Table 1 Characterization Of Texture Black Copper Selective Coating Ref [1-3]

1	as deposited textured selective coating	(τ) ~0.97-0.98 ϵ_{100} ~0.15-0.2
2.	exposed to 250 ⁰ C in electric oven (air annealed)	(τ) ~0.95 ϵ_{100} ~0.2
3.	textured black copper coating is stable and appears black and velvety textured black copper sample was made during (1984-86)	τ high, ϵ_{100} low and stable

The cooker/oven consist of textured black copper absorber coating. Which possess initial solar absorptance (τ) ~0.97-0.98 and emittance (ϵ_{100}) ~ 0.15-0.2 [1,2] which is stable upto 250⁰C (Table 1) Reflector is attached to the box type cooker Reflector is attached to obtain the maximum sun rays falling on the cooker/oven Reflectors such as

- (i) Mirror,
- (ii) Stainless steel,
- (iii) Aluminum,
- (iv) Brass

can be tested in this cooker/oven. These reflectors may increase the temperature by 15-25⁰C higher by optimizing the angle of reflector which may reduce boiling, cooking, baking time. The rays seen by the reflectors are shown in fig 2.

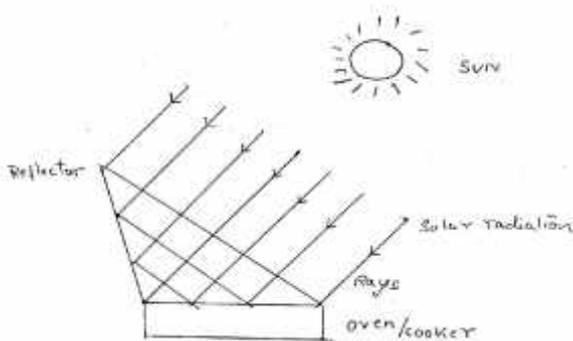


Fig. 2 Indicates solar rays falling on a reflector of cooker/oven.

The top glass cover can be single glass cover or double glass cover or Single glass cover with antireflecting coating or double glass cover with the top glass cover with antireflecting coating.

This will depend on the optimization to obtain best reflector to be used in the proposed solar cooker/oven. The cooker can be used for 250-330 days during sunshine days and semi cloud days. These are stand alone system.

- (b) **Human engineering considerations:** - The food to be cooked or baked can be kept in the solar cooker to which wheels are attached to shift the cooker so that the person who is cooking/baking does not stand in sun for a longer time or the solar cooker can be shifted under covered area during rainy seasons.

The cost of such cooker will increase with increase of glass cover and anti-reflecting film/coating on it. However, the payback period may not be more than 3-4 years if used regularly for cooking/baking purposes. The longevity of such textured black copper solar cooker/oven may be more than 15-20 years as evident by a samples of the textured black copper coating developed during 1984-86 [1-4] [Table 1]. Thus textured black copper selective coating cooker can be fabricated using the design given is fig. 1.

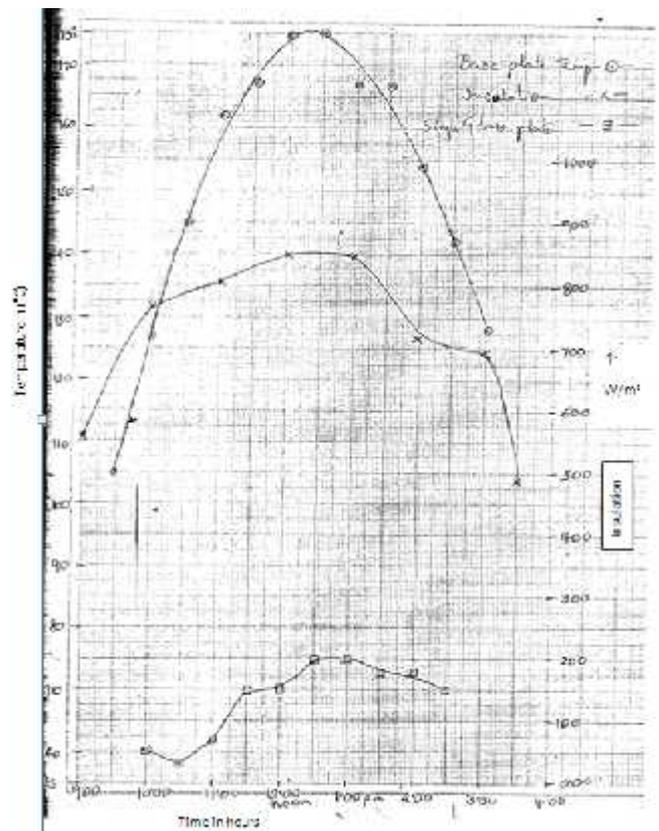


Fig. 3 Depicts the performance of solar oven/cooker on clear day (cloudy during end of the experiment).

Fig. 3 shows performance of one such cooker/oven developed using textured black copper coatings performance on a clear day. The day had become semi cloudy during later hours of the experiment [4]

The conditions during experiment had been

- (i) No load
- (ii) Single glass cover and mirror as reflector
- (iii) Maximum insolation 850w/m²
- (iv) Maximum base plate temperature was 175⁰C
- (v) Maximum ambient temperature 45⁰C
- (vi) Maximum glass cover temperature was 75⁰C
- (vii) The time was between 9 am to 4pm

This textured black copper cooker can be used for 250-300 days in sunshine and semi cloudy days and in rainy days when sun shine is present.

B. Design of Silicon (Si) solar module system (Stand alone system)

In a solar cell conversion system the solar radiation falls on solar silicon (Si) module which converts sun light directly into electricity which gets stored in a battery. Battery is connected to the heater this can be used inside the house during the day and at night. These electric appliances (heater) can be utilized for cooking, boiling and baking purposes. [Table 2] Table 2 given the operating ranges of Si module heater (oven).

Table 2 Range Of Operating Temperatures Of Appliances Of [Solar Thermal Solar Cooker And Photovoltaic Heater]

Appliances	Operating ranges
1. solar cooker	80-120 ⁰ C-150 ⁰ C
2. solar oven	120 ⁰ C-250 ⁰ C-300 ⁰ C
3. solar food heater/warmer	50-80 ⁰ C-100 ⁰ C
4. photovoltaic heater high watt (waltage)	50-100 ⁰ C
5. photovoltage oven (high watt (waltage))	150-250 ⁰ C-300 ⁰ C

The main advantage of such Silicon (Si) solar cell module device is that it can be moved to sun [if wheels are attached to a trolley on which module can be kept]. It can work quite satisfactory in sun, shade and under diffuse radiation. This is shown in fig. 4.

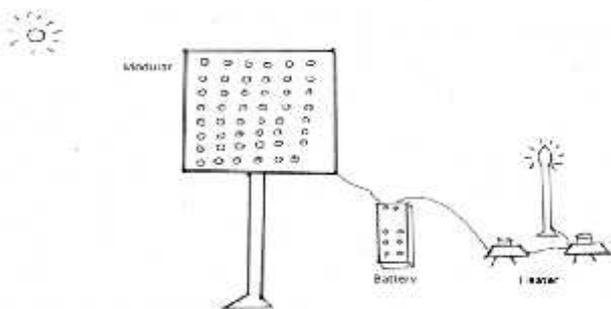


Fig. 4 Show a Silicon Si module with appliances [heaters and lamp] working using the Si module.

This may prove economical and can be used in energy crisis and light shortage days for cooking and baking purpose. Baking can also be done on such heater (oven) system.

In a solar module a solar cell may cost about Rs. 60-100. Hence depending on size of the module (wattages (watts) of module) such system can be installed and/or such Si module assembly made. Both such system can be tested, Solar cooker/oven and Si heater can be used for boiling, cooking and baking purpose in light shortage days. These can be used in sunshine days, semicloudy day and when sun is present in rainy days.

While Si module heater can be used in sunshine day, semicloudy days, cloudy days and under diffuse radiations. And by using Solar battery at nights which gets charged during the day.

Table 3 Price of Solar Cooker/Solar Cell And Utility

<ul style="list-style-type: none"> • solar cooker costs ~Rs 1000-1500-2000 • cooker can be used for 250-300-330 days • life ~ 15-20 years. • solar cooker/oven can be used under solar radiation and also semi cloudy days.
<ul style="list-style-type: none"> • Si Solar cell ~ 1-1.5W • cost ~ 60-100 Rs • solar module – (many watts (3-100 watts)) • life - long • Si module can also be used under diffuse radiation

IV CONCLUSION

Here two cooking appliances design have been presented.

- (a) First is a solar cooker/oven made of textured black copper selective coating possessing solar absorptance (α) ~ 0.97-0.98 and emittance (ϵ_{100}) ~ 0.15-0.12 which can be used for cooking purpose.
- (b) Second is a Si module heater (oven) design for cooking boiling, and baking purposes.

In short both these solar devices can cook boil, roast, warm food and bake at appropriate temperatures under solar radiation. They are sustainable and ecofriendly and can be easily used. Solar cooker can prove efficient under solar radiation and semicloudy days. However, the silicon (Si) module heaters can be used in both sun and diffuse radiations and at night by using rechargeable battery which gets charged during the day under sun.

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A Critical Examination of Challenges and Opportunities for Entrepreneurs in India

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ABSTRACT-

Entrepreneurs are driven to achieve success in their business along with the qualities of a Leader, Manager, Dreamer, Innovator, risk taker, continues learner, decision maker & most important is to implement all these qualities into the work. There are a lot of examples of the entrepreneurs in India who are now called synonymous of 'Success'. They saw the bigger picture but wisely started their business as a very small unit. Entrepreneurs set the example of turning their dream into reality. And the story behind to achieve the dreams into reality is to set massive goals for themselves and stay committed to achieving them regardless of the obstacles they get in the way, with the ambition and the unmatched passion towards achieving the goal. It looks fascinating, attractive and motivating after listening stories of the entrepreneurs, but success is not as easy as it looks always. There are some obstacles which we call the challenges to overcome by looking forward the prospects to be a successful entrepreneur. This research paper focuses on the challenges available in the Indian market by en-cashing the possibilities and prospects of the same to be a successful entrepreneur.

I INTRODUCTION

An entrepreneur is a person who operates a new venture and also inherits some risks and is able to look at the environment, The great ones are ready to be laughed at and criticized in the beginning because they can see their path ahead and are too busy working towards their dream, True entrepreneurs are resourceful, passionate and driven to succeed and improve

The term “entrepreneurship” comes from the French verb “entrepreneurs” and the German word “entrepreneurs”, both means to “undertake”. By grave and Hofer in 1891 defined the entrepreneurial process as „involving all the functions, activities, and actions associated with perceiving of opportunities and creation of organizations to pursue them.

Entrepreneurs play an important role in developing and contributing to the economy of a nation. It is all the more in a developing world where are ample opportunities for innovations to exploit the available resources and initiate entrepreneurial ventures.

Entrepreneurship has gained greater significance at global level under changing economic scenario. Global economy in general and Indian economy in particular is poised for accelerated growth driven by entrepreneurship. Admits environment of super mall culture we find plenty of scope for entrepreneurship in trading and manufacturing.

Entrepreneurship as a stabilizing force limits entrepreneurship to reading markets disequilibria, while entrepreneurship defined as owning and operating a business, denies the possibility of entrepreneurial behavior by non-owners, employees and managers who have no equity stake in the business. Therefore, the most appropriate definition of entrepreneurship that would fit into the rural development context, argued here, is the broader one, the one which defines entrepreneurship as:

"a force that mobilizes other resources to meet unmet market demand", "the ability to create and build something from practically nothing", "the process of creating value by pulling together a unique package of resources to exploit an opportunity".

The entrepreneurship is very a old concept according to which anyone who runs business is called an entrepreneur. The more precise meaning of entrepreneur is; one who perceives a need and then brings together manpower, material and capital required to meet that need. Entrepreneur is one who understands the market dynamics and searches for change respond to it and exploit it as an opportunity.

II THE NATURE OF ENTREPRENEURSHIP & CURRENT SCENARIO

In recent years the subject of entrepreneurship has become quite popular, though very few people thoroughly understand the concept. Most researchers agree that the term refers to entrepreneurial activities that receive organizational sanction and resource commitments for the purpose of innovative results. 36 The major thrust of entrepreneuring is to develop the entrepreneurial spirit within organizational boundaries, thus allowing an atmosphere of innovation to prosper.

According to the Global Entrepreneurship Monitor report, India's High Growth Expectation Early-Stage Entrepreneurship (HEA) rate is only one-fifth of that of China. Further, among medium and low income countries, while China's nascent and new entrepreneurs appear to be the most growth-oriented, with more than 10 per cent of them anticipating high growth. Early-stage entrepreneurial activity in India is marked by low levels of growth expectation. This is despite the extremely high levels of potential entrepreneurial activity as perceived by the non-entrepreneurially active population in the country.

While data on entrepreneurship is hard to come by, the following numbers are telling. According to the NSS 62nd round, in rural India, almost 50 per cent of all workers are self-employed – 57 per cent among males and nearly 62 per cent among females, while the corresponding figures in urban India are 42 for males and 44 for females. The NSSO defines a self-employed person as one who has worked in household enterprises as own-account worker; worked in household enterprises as an employer or worked in household enterprises as helper. The essential feature of the self-employed is that they have autonomy (decide how, where and when to produce) and economic independence (in respect of choice of market, scale of operation and finance) for carrying out their operation. According to the 5th Economic Census conducted by the Central Statistical Organization (CSO), there are 41.83 million establishments in the country engaged in different economic activities other than crop production and plantation. Five states viz. Tamil Nadu (10.60 per cent), Maharashtra (10.10 per cent), West Bengal (10.05 per cent), Uttar Pradesh (9.61 per cent) and Andhra Pradesh (9.56 per cent) together account for about 50 percent of the total establishments in the country. The same five states also have the combined share of about 50 per cent of total employment.

Issues in the current framework can be put under two categories:-

- (a) **Finance:** Starting Business on credit is one of the key problems faced by the early stage entrepreneurs in India. Getting financed by the Banks is still tough, after a lot of practices of the governments. There are some more ways of funding like venture capital, angel funding, and private equity which are becoming popular these days, But still institutional finance is not able to meet the entrepreneurial demands.
- (b) **Regulation and governance:** Government regulations are definitely established for a cause, but as far as setting up a business or becoming an entrepreneur is as tough as to deal with the government. An entrepreneur has to deal with regulatory & compliance issues, which includes, registering the business, obtaining government clearance and license of that particular business, high taxes, and complying the labor regulations. Difficult paper works, and a long delay on every issue, creates unnecessary burden to the entrepreneurs, which surely affect the ability & productivity of the business

III INDIA SPECIFIC ENTREPRENEURSHIP CHALLENGES

- (a) **Family Challenges:** The topmost challenge for an entrepreneur is to convince his family for the risk of his choice of business. The Indian Family is still consider Jobs easy & Risk free, as it does not require funding , risks, & more time to get successful. Or either they have options of joining their own old business. Most of the family tries to choose the most easy & safest way for their child regarding earning money. The worst problem is the high involvement of the family in once decision-making, which affect a lot of people mind to think about starting a business.

(b) **Social Challenges:** Social challenges come from the society and the social environment a person belongs to. Generally it involves a comparison between an entrepreneur and a nearby person friend or relative who is successfully doing job in an MNC or Govt. Job. A job holder person can easily obtain luxury of life like Car, Home, Air conditions and an urban lifestyle in a very short time. But for an entrepreneur it takes time to get successful and also has to compromise with the luxury because of funding and increasing his business and requires the patience as well. These type of social challenges sometimes demotivates the early stage entrepreneurs.

(c) **Technological Challenges:** Indian educational system is convincingly not making aware of current technological revolution & its importance to the students. An entrepreneur equipped with the latest technology can grow multiple than an ordinary entrepreneur. These technological unawareness keeping far behind Indian entrepreneurs to the Other countries like China, Japan & US.

(d) **Financial Challenges:** (Difficulty in borrowing fund): It is always a big issue for the entrepreneurs to finance a new business. It is because of the high poverty and middle class ratio in the country. Most of the people does not have financial support from the family. Also Very high interest rates of the non-banker firms make it more difficult to start a business.

The Government has some policies for SME's for funding through nationalized banks, but the ratio of passing the loan is very low almost 20%.

(e) **Policy Challenges:** Now and then there is lot of changes in the policies with change in the government. *i.e.*

- (i) Problems of raising equity capital
- (ii) Problems of availing raw-materials.
- (iii) Problems of obsolescence of indigenious technology
- (iv) Increased pollutions Ecological imbalanced.
- (v) Exploitation of small and poor countries, etc.

IV OPPORTUNITIES OF ENTREPRENEURSHIP IN VARIOUS SECTORS

(a) **Tourism:** Tourism is a booming industry in India. With the number of domestic and international tourists rising every year, this is one hot sector entrepreneurs must focus on. India with its diverse culture and rich heritage has a lot to offer to foreign tourists. Beaches, hill stations, heritage sites, wildlife and rural life, India has everything tourists are looking for.

But this sector is not well organized. India lacks trained professionals in the tourism and hospitality sectors. Any business in this sector will thrive in the long run as the demand contuses to grow every year. Foreign tourist

arrivals during January-March were 15.63 lakh with a growth rate of 12.8 percent, compared to 13.86 lakh during the first three months last year.

(b) Automobile: India is now a hot spot for automobiles and auto-components. A cost-effective hub for auto components sourcing for global auto makers, the automotive sector is potential sector for entrepreneurs. The automobile industry recorded a 26 per cent growth in domestic sales in 2009-10.

The strong sales have made India the second fastest growing market after China. India being one of the world's largest manufacturers of small cars with a strong engineering base and expertise, there are many segments that entrepreneurs can focus on in India's automobile and auto components sector.

(c) Textiles: India is famous for its textiles. Each state has its unique style in terms of apparels. India can grow as a preferred location for manufacturing textiles taking into account the huge demand for garments. Places like Tirupur and Ludhiana are now export hubs for textiles. A better understanding of the markets and customers' needs can boost growth in this sector.

(d) Social ventures: Many entrepreneurs are taking up social entrepreneurship. Helping the less privileged get into employment and make a viable business is quite a challenge. There are many who have succeeded in setting up social ventures. With a growing young population in rural areas who have the drive and enthusiasm to work, entrepreneurs can focus on this segment.

(e) Software: India's software and services exports are likely to rise with export revenue growth projected at 13 to 15 percent to hit about \$57 billion by March 2011.

With one of the largest pool of software engineers, Indian entrepreneurs can set higher targets in hardware and software development.

The information technology enabled services have contributed substantially to the economy. With more companies outsourcing contracts to India, business to business solutions and services would be required. Entrepreneurs can cash in on the rise in demand for these services with innovative and cost effective solutions.

(f) Engineering goods: India continues to be one of the fastest growing exporters of engineering goods, growing at a rate of 30.1 per cent. The government has set a target of \$110 billion by 2014 for total engineering exports. Entrepreneurs must capitalize on the booming demand for products from the engineering industry.

(g) Franchising: India is well connected with the world. Hence, franchising with leading brands who wants to spread across the country could also offer ample opportunities for young entrepreneurs. With many small towns developing at a fast pace in India, the franchising model is bound to succeed.

(h) Education and Training: There is a good demand for education and online tutorial services. With good facilities at competitive rates, India can attract more students from abroad. Unique teaching methods, educational portals and tools can be used effectively to make the sector useful and interesting.

(i) Food Processing: India's mainstay is agriculture. Entrepreneurs can explore many options in the food grain cultivation and marketing segments. Inefficient management, lack of infrastructure, proper storage facilities leads to huge losses of food grains and fresh produce in India.

Entrepreneurs can add value with proper management and marketing initiatives. The processed food market opens a great potential for entrepreneurs be it fast food, packaged food or organic food. Fresh fruits and vegetables too have a good demand abroad. A good network of food processing units can help potential exporters build a good business.

(j) Corporate demands: There will be a good demand for formal attire with more companies opening their offices in India. People who can meet this demand in a cost effective way can make a good business. With corporate gifting getting very popular, this is also a unique business to explore.

(k) Ayurveda and traditional medicine: India is well known for its herbal and ayurvedic products. With increasing awareness about the ill-effects allopathic medicines, there will be a huge demand for cosmetics, natural medicines and remedies.

(l) Organic farming: Organic farming has been in India since a long time. The importance of organic farming will grow at a fast pace, especially with many foreigners preferring only organic products. Entrepreneurs can focus on business opportunities in this sector. There are many small-time farmers who have adopted organic farming but the demand is still unmet, offering many opportunities for those who can promote organic farming on a large scale.

(m) Media: The media industry has huge opportunities to offer young entrepreneurs. With the huge growth of this segment, any business in this field will help entrepreneurs reap huge benefits. Television, advertising, print and digital media have seen a boom in business.

Digitization, regionalization, competition, innovation, process, marketing and distribution will drive the growth of India's media and entertainment sector, according to Ficci.

(n) Packaging: With China invading the markets with cheap plastic goods and packaging materials, there is a good opportunity to develop good packaging materials to meet domestic and foreign demand. There is a huge demand various sectors like agriculture, automotive, consumer goods, healthcare infrastructure and packaging sectors for plastics.

(o) Floriculture: India's floriculture segment is small and unorganized. There is a lot to be done in this lucrative sector. The global trade in floriculture products is worth \$9.4 billion. With a 8 per cent growth, it is expected to grow to \$16 billion by 2010. India's share in world trade is just 0.18 per cent.

This is a huge market to be tapped considering the rising demand for fresh flowers. More awareness and better farming and infrastructure can boost exports.

(p) Toys: Another evergreen industry is toy manufacturing. India has potential to manufacture cost effective and safe toys for the world. With Chinese toys being pulled up for toxins, the market for safe and good quality toys beckons Indian entrepreneurs.

(q) Healthcare sector: India's healthcare sector is dismal. The private sector can play a vital role in developing this sector. With medical tourism also gaining momentum, the sector can attract foreigners who are looking for cost effective treatment in countries like India.

(r) Biotechnology: After the software sector, biotechnology opens a huge potential. Entrepreneurs can look at a plethora of options with the application of biotechnology in agriculture, horticulture, sericulture, poultry, dairy and production of fruits and vegetables.

(s) Energy solutions: In a power starved nation, the need to develop cost effective and power saving devices is gaining more significance. There is a huge demand for low-cost sustainable energy saving devices as well.

The government has already unveiled the National Solar Mission which has set a target of 20,000 MW of solar generating capacity by the end of the 13th Five Year Plan.

Prime Minister Manmohan Singh had urged the industry to see the huge business opportunity and set up 'Solar Valleys' on the lines of the Silicon Valleys. These solar valleys can become hubs for solar science, solar engineering and solar research, fabrication and manufacturing. So there is a big opportunity for entrepreneurs in this sector as well.

(t) Recycling business: E-waste will rise to alarming proportions in the developing world within a decade, with computer waste in India alone to grow by 500 per cent from 2007 levels by 2020, according to a UN study. This sector opens a viable business opportunity for entrepreneurs in terms of e-waste management and disposal.

V CONCLUSION

Entrepreneurship has been on the rise as a global phenomenon much before India began becoming sensitive to the development of entrepreneurship. However the awareness towards the path of entrepreneurship is now

picking up a quick pace in our own country, and as a matter of fact is seen as one of the countries that is par excellence with the rest of the Asian countries as far as growing entrepreneurship is concerned. There are ample opportunities in small businesses in India and such opportunities will transform India in the coming future. For such transformation to happen there needs to be support both at the governmental and societal level. For the government it is important to realize that the goal of small business owners will be to remain self-employed. Such people may not need financial assistance but they will need marketing and legal assistance in order to sustain themselves. Practical and cost effective programs need to be developed to address their needs because self-employed people will represent an important segment in economic revitalization.

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Influence of Infra Red Radiation on Germination Efficiency, Seedling Growth, Vigour Index and Biochemical Constituents in Summer Mungbean (*Vigna radiate* L.).

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ABSTRACT-

A pot/lab experiment was conducted during summer season of 2011 at the research farm of Directorate of Seed Research, Kushmaur, Mau with mungbean variety Samrat (PDM 139) to find out the effect of varying doses of IR radiation (30, 60, 90, 120, and 150 sec.) exposure on germination, seedling growth, seedling dry weight, vigour index and Nitrate assimilation enzymes. Result obtained revealed that there was differential response of IR-radiation on different seed quality parameters. Out of Radiation doses exposed, 30 sec. of exposure enhanced root length, shoot length, seedling dry weight & vigour index I up to 18.28%, 29.47%, 24.83%, &14.1% respectively. Activities of Nitrate assimilation enzymes showed differential response against the exposure of IR- Radiation, the maximum activity of Nitrate reductase was noted with 60 sec. whereas the Nitrite reductase activity was maximum with 90 sec. Conclusively exposure of IR-Radiation for 30 sec. favors only the seed quality parameters but the Nitrate assimilation enzymes showed their maximum activity in the range of 60 to 90 sec.

I INTRODUCTION

Pulses constitute an integral part of Indian agriculture because of their vital role in enriching the human diet as well as soil fertility. Besides their higher nutritional value, pulse crops have a unique characteristic of maintaining and restoring soil fertility through biological nitrogen fixation and thus play a vital role in sustainable agriculture (Asthana, 1998). India is the largest producer and consumer of pulses in the world accounting for 33% of world's area and 22% of world's production of pulse. In India mungbean is grown on an area of 3.44 million ha. with production of 1.40 million ton with a productivity of 406 kg/ha (Agropedia, 2011). There are number of problems with germination in mungbean seeds causing relatively less germination, deformed seedlings or have no growing tips or leaves, seedlings and plants stunted when they are emerged. Therefore, to overcome from these problems of germination many techniques have been tested in the past by researchers including Infra red exposure. Infra- Red exposure is one of technique which can be used to enhance the germination and vigour ability in Mungbean crops.

In national and foreign bibliography there are many paper providing the favorable effects of infra-red on size of yield and some time also on quality (Prodleoeny *et al.* 2001). The present experiment is aimed to understand the influence of infra-red exposures of varying doses on seedling germination, growth of root and shoot and its development in terms of dry weight gain and activities of assimilatory enzymes of nitrate metabolism in mungbean plant.

II MATERIAL AND METHODS

One year old farmer saved seed mungbean variety samrat was collected from Mau district of U.P. The collected seeds were initially treated with IR radiation at the distance of 30 cm with varying exposure time including 30 Seconds, 60Seconds, 90Seconds,

120Seconds & 150Seconds and seeds that have not given any treatment was taken as control. The treated mungbean seeds were used for germination test as per the ISTA procedure under lab condition and the percentage was recorded on the basis of final count (Anonymous 1999). The same sets of treatments were sown in cemented pots @05seeds/pot filled with 15 kg well pulverized moist soil and added with recommended dose of NPK (25:50:40 kg/ha). After sowing, the germination count was started just after one day and counted up to 14th day and the emergence was recorded by counting total number of seeds germinated and survived up to 14th day in each treatment (Fehr *et al.*1977) Other seed quality parameters including seedling length, seedling dry weight and vigour (I & II) were also recorded according to method suggested by (Abdul-baki & Anderson 1973). The nitrate and nitrite reductase activities were assayed following the method of (Jaworkjski 1971) and (Ferari and Varner 1971) after 20 days of sowing.

III RESULT

- (a) **Germination percentage:** - The data depicted in the table 1 clearly revealed that the one year old seed of mungbean variety Samrat when treated with increasing doses of IR radiation the germination percentage was increased with increasing doses up to 120 sec. but beyond the 120 sec. the doses showed the deleterious effect on germination percentage of mungbean seed.
- (b) **Speed of germination:**-The data depicted in table 1 clearly revealed that the speed of germination was increased with increasing doses of IR radiation up to 150 sec. Maximum speed of germination was obtained on 150 sec. The magnitude of increase was in increasing order with each of doses applied.
- (c) **Root length:** - The data observed in the table 1 clearly revealed that the root length in mungbean seedling was much with the treatment of IR 30 sec. and it was followed by 60 and 90sec. The doses beyond 90 sec.

showed deleterious effect and as the result the length of root was decreased over control.

- (d) **Shoot length:**-The data recorded in the table 1 clearly revealed that the maximum shoot length was obtained on 30 sec followed by 60 and 90 sec. but beyond this limit the doses become deleterious and as a result the length of shoot was decreased over control.
- (e) **Seedling dry weight:**-The data collected on dry weight of seedling is depicted in table 1 clearly indicated that the seed treatment up to 120sec. enhance the dry weight of seedling over control. The maximum seedling dry weight was recorded on 30 sec. followed by 60, 90 and 120 sec. The treatment of 150 sec. was deleterious and seed dry weight was badly affected.
- (f) **Vigour index I:** - Vigour index I is the product of germination percentage x seedling length. The data presented in the table 1 clearly indicated that the maximum vigour index I was observed when the seed were treated with 30 sec. followed by 90, 60and and 120 sec. over untreated control.
- (g) **Vigour index II:** - Vigour index II is the product of germination percentage x seedling dry weight. The data presented in the table 1 clearly revealed that the maximum vigour index II was obtained with 120 sec followed by 150, 90, and 60sec.
- (h) **Nitrate reductase assay:** - Nitrate reductase activity is the indicator of nitrate assimilation in the growing seedling. The data depicted in table 1 clearly revealed that when seed of mungbean treated with IR radiation, nitrate reductase enzyme activity was increased with the increasing doses of IR radiation and the maximum enzyme activity was recorded at 60 sec followed by 90, 120, 150 and 30 sec.
- (i) **Nitrite reductase assay:** - Nitrite reductase activity is the indicator of nitrite assimilation in growing seedling. The data depicted in table 1 clearly revealed that when seeds of mungbean treated with IR radiation, nitrite reductase activity (NIR), was increased with the increasing doses of IR radiation. Maximum enzyme activity was recorded at 90 sec. followed by 60, 120, 150and 30sec.

Table 1: Effect of various doses of IR-Radiation on seed quality parameters and enzymes activity in mungbean crops.

Treatments	Germination %	Speed of germination	Seedling length (cm.)		Seedling dry weight (mg)	Vigour index I	Vigour index II	Nitrate Reductase	Nitrite Reductase
			Shoot Length	Root length					
Control	90	4.570	33.74	11.23	145.0	4471.20	13.15	0.4540	0.3374
IR-30 Sec.	90	4.510	43.63	13.51	181.0	5097.60	16.29	0.4934	0.3463
IR-60 Sec.	93	4.770	39.30	11.21	178.0	4697.43	16.55	0.5994	0.4214
IR-90 Sec.	96	4.830	38.67	10.71	162.0	4740.38	11.18	0.5870	0.4244
IR-120 Sec.	100	4.810	35.17	5.63	147.0	4464.00	14.70	0.5640	0.4014
IR-150 Sec.	95.65	4.850	30.17	3.17	130.0	3408.81	11.16	0.5460	0.3863

IV DISCUSSION

In the past, numbers of scientist have studied the response of different classes of radiation on germination, growth and vigour & various enzymes

activity in different species. The response of IR-radiation differs with dose, time of exposure and type of species. Effect of IR-Radiations on different crop species reported by number of researchers (Oladiran Fasina, *et. al* 2001, Podlesny J., 2002, Wilczek M. 2004, Podlesny J. and Podlesna A. 2004, Abdelghafar Abu-ElsaoudE, *et.al* 2008, Hernandez-Vizuet M .and Michtchenko. A., 2010, Michtchenko and M. Hernández, 2010, Floarea Burnichi, 2011).

In the present investigation proper doses (30, 60, 90, 120, and 150 sec.) of IR radiation have been applied to the seed of mungbean at the 30 cm distance. The responses on germination, seedling growth, seedling dry weight, vigour index and nitrate assimilatory enzyme have been studied. The doses of IR radiation have their differential response on different parameter. The IR radiation enhanced the germination percentage (11.1%), speed of germination (7.78 %), root length (18.27%), shoot length (29.47%), seedling dry weight (24.83%), vigour index-I (14.1%), vigour index-II (38.69 %), nitrate reductase activity (31.94%) and nitrite reductase activity (25.93%) in mungbean crops.

Our findings are supported by many researchers (Oladiran Fasina, *et. al* 2001, T G Pereira and A. Oliva-Teles 2002, Podlesny J. and Podlesna A., 2004, Abdelghafar Abu-ElsaoudE, *et.al* 2008, Hernandez-Vizuet M .and Michtchenko. A.,2010) who reported that there was a positive response of IR-Radiation on germination, seedling growth , seedling dry weight, vigour index and nitrate assimilatory enzymes activities.

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Station Wagons: Time for a Comeback?

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ABSTRACT-

With the advent of nuclear families in metros, everything seems to be getting small. From houses to flats, laptops to tablets, sedans to hatches small seems to be the mantra. In the given scenario, the possibility of launching a station wagon seems pretty slim as they are big, do not look as smart as their counterparts and need bigger parking space. Hatchbacks seem to be the perfect choice. They are more practical, easy to maneuver in bumper to bumper traffic and return a good fuel economy. But what happens when a family decides to take a road trip to Manali, Goa or Kerala. Extremely compact boot space of hatchbacks, lack of safety features and less room makes it nearly impossible to take it out on Indian highways. That is where station wagons come into picture. Smaller station wagons like Indigo Marina can fill this void of adventurous nuclear families who like to go out on weekends and enjoy a perfect sunset away from the concrete jungles of an urban city. Then there are compact SUV's giving fierce competitions to sedans. This paper is a humble effort to analyze the possibility of product differentiation by finding a niche in the ever-growing automotive sector for a station wagon to make a successful comeback.

Keywords: cars, station wagon, hatchbacks, suv, sedans

I INTRODUCTION

A station wagon, also called an estate car or an estate, is an automotive body-style variant of a sedan/saloon with its roof extended rearward and does not have a trunk lid. The access to the boot is via a fifth gate. The body style transforms a standard three-box design into a two-box design — to include an A, B, and C-pillar, as well as a D-pillar. A Station wagon can flexibly reconfigure its interior volume via fold-down rear seats to prioritize either passenger or cargo volume which makes it a very practical vehicle for city as well as long hauls. The first station wagons were a product of the age of train travel. They were originally called "depot hacks" because they worked around train depots as hacks (short for hackney carriage, an old name for taxis).

Before the 1930s, manufacturers assembled the framing of passenger compartments of passenger vehicles in hardwood. In automobiles, the framing was sheathed in steel and coated with colored lacquer for protection. Eventually, all-steel bodies were adopted because of their strength, cost, and durability. The first factory-built all-steel station wagon in North America was the 1946 Jeep Station Wagon, based on the Jeep produced by Willys-Overland during World War II. Willys offered a trim level, evoking earlier wood bodywork, rendered instead in paint and trim work.

Early station wagons evolved from trucks and were viewed as commercial vehicles (along with vans and pickup trucks), not consumer automobiles—with the framing of the early station wagons left unsheathed because of the commercial

nature of the vehicles. Early station wagons were fixed roof vehicles, but lacked the glass that would normally enclose the passenger compartment, and had only bench seats. In lieu of glass, side curtains of canvas could be unrolled. More rigid curtains could be snapped in place to protect passengers from the elements outside.

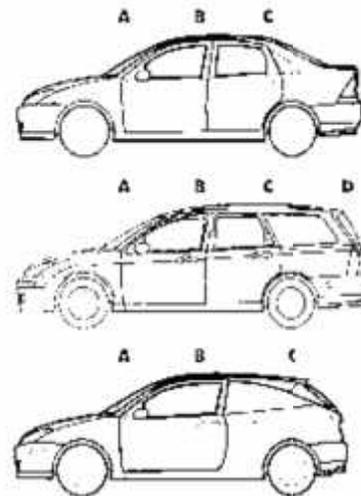


Fig 1 Typical pillar configurations of a sedan(three box), station wagon (two box) and hatchback (two box) from the same model range.

II ANALYSIS

For a comparative analysis, a hatchback (Maruti Suzuki Swift), a station wagon (Tata Indigo Marina), a compact SUV (Ford Ecosport), an entry level sedan (Maruti Suzuki Swift Dzire) and a SUV (Chevrolet Enjoy) have been taken into consideration as these cars enjoy a decent market share in their segment. Only Tata Indigo Marina has been discontinued out of the above mentioned cars. The comparison below has been made on the basis of dimensions as it will give a clear picture as to whether a niche segment can be found in this overlapping market scenario. The parameters in question are length, width, height, wheelbase and boot space.

TABLE 1 EXTERIOR DIMENSION

	SWIFT	MARINA	ECOSPORT	SWIFT DZIRE	ENJOY
Overall (Length)	3850 mm	4158 mm	3999 mm	3995 mm	4305 mm
Overall (Width)	1695 mm	1625 mm	1765 mm	1695 mm	1680 mm
Overall (Height)	1530 mm	1575 mm	1708 mm	1555 mm	1750 mm
Wheel Base	2430 mm	2450 mm	2520 mm	2430 mm	2720 mm
Boot Space	210 liters	670 liters	362 liters	316 liters	190 liters

Having a look at the above table, it becomes clear that Indigo Marina scores heavily on the boot space and overall length. Additionally, the rear seats of Marina when folded give it 1340 liters of boot space which is humungous whereas even a bigger SUV like Enjoy manages only 630 liters with its rear seat folded. The main problem with Marina is its width which is smaller by 70 mm even to that of a hatchback. The height and wheelbase of Marina is more than a sedan but lesser than a compact SUV. The above specifications are a clear indicator that a spacious entry level station wagon can be clearly positioned in between a hatch and a compact SUV which has the length of a sedan, a boot of a station wagon and the width of a compact SUV. Having established that, a comparative analysis of power delivery becomes mandatory.

TABLE 2 ENGINE SPECIFICATIONS

	SWIFT	MARINA	ECOSPORT	SWIFT DZIRE	ENJOY
Engine Type	DDIS Diesel Engine	Turbocharged with intercooler diesel	EV5 Diesel engine	DDIS Diesel Engine	Smarach Turbocharged Diesel engine
Displacement	1248	1405	1500	1248	1248
Power	74hp @ 4000rpm	70ps @ 4500rpm	55.8hp @ 3750rpm	74hp @ 4000rpm	76.4hp @ 4000rpm
Torque	190Nm @ 2500rpm	140Nm @ 1800-3000rpm	2.40c @ 2000-2750rpm	190Nm @ 3000rpm	183Nm @ 1750rpm

It becomes clear that the torque of Indigo Marina is quite poor in comparison to other cars it is pitted against. Maruti Swift is a clear winner as it is a hatch and hence has lesser weight and maximum acceleration. Station wagons are supposed to carry heavy weights both in the form of luggage and passengers; hence, it is very important to have a decent torque for the initial acceleration. Marina also lacks in the power department. With a mere 70 ps of power, overtaking at highways can be a bit of a problem. The specifications of Ford Ecosport emerge as the perfect choice for a highway drive. Maybe the engine specification of Marina was the prime reason for its failure as a station wagon.

III CONCLUSION

There is a small but important gap in the entry level segment for compact station wagons. Today’s nuclear families crave to venture out on highways on weekends. They might find it difficult to do so in a hatchback or a sedan or in a compact SUV (entry level sedans and compact SUV’S have very little boot space as compared to entry level station wagon, see table 1), SUV’s charge a hefty sum and there is always a problem of “fishtailing” with bigger SUV’s which makes them difficult to maneuver at high speeds. An entry level station wagon provides the perfect solution to the above mentioned problems. By using the theory of product differentiation, car companies can launch the station wagons of their successful models. Also, it is easy to drive in city traffic as compared to a SUV, has decent fuel economy and provides excellent handling on both city roads and highways. Maybe Marina was launched ahead of its time when the concept of nuclear families just started and no upgrades or cosmetic changes were made in the car over the years causing it to die a slow death. But now is the perfect time to make a comeback, as change is the keyword amongst automotive giants, be it cosmetic or design change or an introduction of a new model, things are moving very fast in the entry level segment and if priced right and positioned correctly, introduction of a compact station wagon can change the game for the company which introduces it.

IV SUGGESTIONS AND RECOMMENDATIONS

- (a) The engine on Marina needs to be refined extensively. The DDIS diesel engine by Fiat which powers cars like Swift, Vista, Dzire, Grande Punto etc. can be the perfect choice for a compact Station Wagon.
- (b) The car should be priced between 5.5-7.5 lacs. (ex-showroom)
- (c) The length of the wagon should not exceed 4000mm so as to take the excise benefit which will keep the price of the car very competitive. Boot space will be compromised a wee bit (about 40-50 liters) but still would be much more than its counterparts (about 600 liters)

- (d) The width of the car should not be less than 1690mm so as to provide superb handling and greater room inside the car, thus serving its purpose as a highway tourer also.
- (e) The quality of plastic and its fit and finish has to be of the highest order as today's customer is very picky on these points.
- (f) The tire size should not be less than R15 to provide better traction and handling on high speeds.
- (g) GPS (Global Positioning System) should come as standard as the station wagon should excite adventure seekers and GPS is a must for that.
- (h) Lots of cup holders and rear AC vents is a must as long hours of highway driving takes a toll on not only the driver but the passengers in rear seats as well.
- (i) Safety feature like ABS and Airbags should come standard.

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