PRESENT AND FUTURE SCOPE OF OPPORTUNITY FORENTREPRENEURSHIP DEVELOPMENT IN SOLAR ENERGY SECTOR

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ABSTRACT

This study discusses the present scope and future prospects of opportunities for entrepreneurship development in solar energy sector. Solar energy is becoming a promising and viable source of alternative energy not only from the generation of power point of view but also with regards to the protection of environment due to its abundant availability and cleanness. Its importance is also increasing day by day because of decreasing price in solar panel, enhanced usage in various sectors and a sustainable source of energy. Therefore, in the rising industry of solar power generation, job prospects would rise through entrepreneurship development.

Keywords: *cucumber, boron, yield, quality, konkan*

Introduction

In the rising industry of solar power generation, job prospects are on the rise too. Toaccomplish the 20000 MW installed capacity targets under Jawaharlal Nehru National SolarMission (JNNSM), solar energy business will need a projected requirement of about 4, 00,000 people by 2022. There are options in production and development implementation andNNNSM is a real prospect for start-ups. Once the Government steps up the scope of thedomestic solar manufacturing business, we will see an increase in the industrial sector. Thereis possibility of undertaking various field works for the growth of the sector. It has more to do with linking systems like solar panels, batteries, charge controllers, inverters and theconsignment in fixing up power plants. In the absence of universal electricity access across the country, the dream of digital India, e-commerce, e-governance, smart cities and developedeconomy shall remain a farce and impossible to realize. Government of India has thereforerecognized the importance of solar energy as one of the sustainable sources of energy under National Action Plan for Climate Change (NAPCC). NAPCC aims to derive 15% of its energy requirements from renewable energy sources by the year 2020. Various policy measures, such as preferential tariff or fixed tariff or feed-in tariff, excise duty exemption, and soft loan, have been implemented to achieve the above-mentioned target. The growth in the solar powergenerating industry represents many new opportunities for the entrepreneurs. One does not have to obtain an engineering degree or some other technical background to seize upon these opportunities in this industry. They can spread the entire value chain from PV cell production manufacturing to management of the national energy grid system. The opportunities include original equipment manufacturing, PV manufacturing, PV product testing and delivery, PV cell installation and servicing, new energy storage devices, mobile solar energy askedappliances, management of the solar energy supply to the national grid system, development of alternative materials to produce wafers or semiconductors, energy usage monitoring devices, development of heating and cooling systems, development of new hot fluids for cogeneration or electrical turbines systems, and many others. All of the opportunities can be categorized into three major categories associated with the energy generation value chain such as to reduce the cost of power generation, improve the speed and reliability of power generation, and expandthe opportunities to apply renewable, sustainable energy technology to new applications across the value chain. Some general examples of these opportunities are shown in Table 1.

Table 1: Opportunity areas for entrepreneurial activities in solar sector

Equipment to Manufacture PV cells	**PV Cell Manufacture**	**PV Cell Installation**	**Energy Generation**	**Energy Capture and Storage**	**National Grid Management**	**Regenerative Technology Development**	**Cross Value Chain Opportunities**
Source or manufacture equipment	Semiconductor materials improvement	Cell installation commercial, residential	Conversion from traditional technology to solar energy	Storage systems	Monitor energy flows	Improve collection efficiency	Training of customers, employees, etc.
Product testing	Reduce cell size -Thin wafers -Nanotechnology	New applications -HVAC -Home appliances	Scale-up opportunities for existing systems	Improve capture efficiency	Energy trading and arbitrage opportunities	Value chain cost efficiency	Operating procedures, manuals development
Manufacturing operations improvement	Lower Manufacturing costs	Support services Maintenance and repair Warranty			Transmission Network Management	New materials technology	Value chain integration and consulting service

Each area of the value chain offers business venture opportunities that can create value using one or more of the three major categories and enhance universal electricity access for all as electricity is essential for human comfort, efficiency and basic needs like lighting, cooking food, coolinghomes, earning a living and utilizing health and educationservices etc. Due to the continuous increment in electricitydemand day-by-day, Indian power sector is interfacing some challenges to maintain the balance between the power generation and demand with suffering from supply constraints and shortages in power. For maintaining the ratio of generation and demand of power, moving from conventional sources to non-conventional sources is not only an option, it is a necessity. The importance of using solar as energy source in India's perspectives in not only to increase power generation, but also to expand energy reliability with considering the environmental, social, independent and financial benefits properties.

Entrepreneurship opportunities

Entrepreneurship is one of the principal mechanisms for the mitigation of unemployment and under-employment amongst educated youth. For success, the prospective engineerentrepreneur must coordinate knowledge and skills and keep abreast of the technologies, business market, skill requirement and fiscal policy issues related to the solar energy business. In addition, the engineer entrepreneur needs to do lots of homework for site selection, check proximity of the enterprise to transport facilities and power evacuation for establishing a micro-grid enterprise. Attention must be paid on the cost, durability, effectiveness and the design of the important components, such as the solar inverter, transmission and distribution equipmentand supporting switchgear and equipment which ought to be geared up as per demand and the local market. The entrepreneur should vigorously survey the human resource requirement and keep a database of the organizations willing to provide financial and technological assistance to the prospective entrepreneurs on convenient terms. The prospective entrepreneur must try to be partner with reputed companies and institutions to develop mechanisms and maintain profitability and human resource development for entrepreneurial operations. Suggestion for the solar - based enterprises is made, especially due to the availability of solar energy in abundance all over the country by virtue of its advantageous geographical location. India lies on the equatorial belt of the earth bestowing

250 to 300 clear sunny days in a year with annual global solar radiation from 1600 to 2200 kWh/$m^2$and equivalent energy potential of about 6, 000 million GWh per year. Energy from the sun can alone suffice more than the electricity needs of this country. Solar energy is a clean, emission free, renewable and environment friendly energy resource, abundantly available in India. The more it is harnessed to produce electricity, the better it shall be for larger electricity access on a countrywidescale. The country must gradually prepare itself to bid a good bye to the use of fossil fuels for electricity due to escalating costs of the imported fuel and the environmental degradation caused by the GHG and NOx emission generated by the fuels which has become a burning issue for the country's climate and sustainability. Optimal harnessing of solar energy for electricity can make this country the world leader in energy and bring this nation on the map of developed economies which all Indians should continuously strive for.

Rebates and concessions to prospective entrepreneurs under the national solar mission

A lot of opportunities exist for young engineer entrepreneursto avail special incentives, subsidies and tax benefits from the Government side as MSMEs and Energy entrepreneurs to make them active partners in developing country's economy by enhancing electricity access in rural areas. The Jawaharlal Nehru National Solar Mission (JNNSM), offers a 10-year tax holiday for photovoltaic (PV) and thermal solar plants getting completed before 2020, reduced customs duty and zero excise duty on specific capital equipments, critical materials and project imports in addition to the grant of loans at cheap interest rates. These concessions and subsidies are meant to meet the challenges of ecologically sustainable growth, energy security and for fulfilment of the target of solar energy in villages and grid connected power by the National Thermal Power Corporation fixed at 1,00,000 MW and 15, 000 MW respectively by the year 2022. The young engineer entrepreneurs must carefully understand the perspective, policies and incentives and its implications for deriving optimum benefits in order to make their ventures business oriented and profitable.

Existing skill gaps in solar PV and thermal systems

Solar PV and Solar Thermal based renewable energy generation in India currently contributessignificantly to the employment opportunities in the renewable energy sector. Considering the JNNSM targets, there would be a multi-fold increase in employment opportunities in this sector. Employment opportunities in solar PV and solar thermalbased RE systems require qualified mechanical and electrical engineers, semi-skilled and non-skilled workers for installation and commissioning, technical staff for the operation and maintenance, project managers, etc., The following skill gaps (Table 2) in solar system need to be fulfilled to strengthen the solar sector in the coming days. Entrepreneurs are to take challenge to a bridgethe gaps in creating avenues to become a part to the growth of solar industry.

Table 2: Function-wise Skill Gaps in Solar PV and Solar Thermal Systems

Solar (PV & Thermal)		
Solar	Research and Development	Knowledge and exposure in advanced areas like wafer technology, semi-conductor technology. Design skills in installing building integrated PV (BIPV) in buildings
	Project Development and Consultancy	Lack of awareness and experience in handling concentrated solar collectors (CSP).
	Manufacturing	Low skills in module assembly System integration in solar PV.
	Construction and Installation	Installation and commissioning of solar thermal systems (SWH). Third-party installers are not skilled in erection. Grid integration of megawatt scale solar PV power projects.
	Operation and Maintenance	Shortage of skills in trouble shooting of circuitry of solar PV lanterns and home lighting systems.
	Marketing	After sales service, customer care. Techno-commercial analysis of mega projects in on-grid solar PV.

Conclusion

The solar PV on-grid sub-sector is now at the growing stagein India. With the Jawaharlal Nehru National Solar Mission (JNNSM), a scheme of the Government of India, the installedcapacity is estimated to reach 20 GW by the year 2022. This would create enormous employment opportunities in the country. During last five to ten years, India is facing a big problem with the shortage of electricity. Government of India predicted that the total power demand will expand to 400,000 MW at the end of 2020. It needs enormous additions in capacity of electrical generation to meet the demand and to maintain the progress in the electricity market economy of the country. Considering the large potential, easy availability and other inherent characteristics of solar power, Government of India has given more emphasis on promotion of solar power in Indian power scenario. Currently India is in the top ten ranked countries in the world for investment, capacities addition and creation of job opportunities in solar power. Solar power can also provide a better economic scenarioafter successful implementation of solar mission for all states of India, especially for some underdeveloped states, where the potential of solar power generation is very good but not utilized till date. From the above discussion, it is concluding that the solar power takes an important role in the future power development in India due to the major initiatives and dedication at Government level.

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IMPACT OF HUMAN DEVELOPMENT ON ECONOMIC PROGRESS

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ABSTRACT

According to Dr. Amartya Sen in the any countries labour development are fixed with the labour in the countries with its education, training, health and service. In the undeveloped countries if the human labour power plan is failed various kinds of unemployment problem creates. Human labour is being a resource and if the labour is provided much it has negative impact. Amartya Sen said reasons of poverty in the undeveloped countries and suggested that welfare instruments should be taken as a developed instruments. According to P. R. Brahmananda. The reputed Indian economist, human development index is taken in consideration of various aspects of human life development. During these days modern and welfare scientists made statement that economic development and social development are the two sides of one coin.

***Keywords** : Human Development, Economic Progress Poverty Social interest, Agriculture*

Introduction

Today in the world some undeveloped countries in the process of development comparing with developing countries. Today in Indian economy population explosion, poverty, unemployment instability are the basic problems. While leading in 21st century India would be at the top in the field of growth. Even though the planning of human labour is succeeded, the problem of poverty will be reduced and India would become the powerful nation. We come to know that human resource development means real economic development.

Like Victor and Mac Canold Western economist says that in order to develop the human development index, social development program should be maintained. In such programs or activities, the emphasize should be laid on novelty, productivity and inspiration. Therefore the undeveloping countries should keep aside the traditional education and follow the modern education methodology. In the modern education methods the institutions like research centre, Universities, technical education and training centres should lay emphasize on the social orientation and job orientation research and pay attention and how the men's power is used from the scientific approach.

According to Dr. Amartya Sen (Noble award winner) in the any countries labour development are fixed with the labour in the countries with its education, training, health and service and how they are made available. In the sense it depends on poverty. Hence in the countries where poverty is more human development index is seen less.

In the undeveloped countries if the human labour power plan is failed various kinds of unemployment problem creates. Hence from this point of view in such countries training and education should be given importance.

Human labour is being a resource and if the labour is provided much it has negative impact. The orthodox like Malthus has created excitement, but the new orthodoxies says that if the power plan is succeeded that will help to the economic development process. International fame scientist Vasant Govarikar and population scientist in shikago university say that in the undeveloped countries extra labour not harmful but proves to be useful. But for the human development index should be increased and attitude towards labour. The orthodox scientist give importance to capital and labour and ingored to labour development and social interest and as a result the undeveloped countries left remains undeveloped.

Amartya Sen said reasons of poverty in the undeveloped countries and suggested that welfare instruments should be taken as developed instruments. Perhaps with the help of his statements or opinions institutor of international human development has developed the humanb development index by his statement. According to him education,

health and eradication of poverty, the elements which are accepted by which human development index should be taken into consideration.

According to P. R. Brahumananda, the reputed Indian economist, human development index is taken in consideration of various aspects of human life development ans in that good long age and good health, writing and improvement in reading capacity and improvements in various opportunities and in the growth of income and save spending and various aspects of life improvements should be taken into consideration. In their opinion to think of international index of human development following elements should be taken into consideration.

a) Average lifespan.
b) Literate rate of men above the 15 years.
c) The rate of child attending to school of below 15 years.
d) Working power in order to fulfill the primary needs of people.
e) General standard of education.
f) Availability in case of cloth, food, shelter and facility of health.
g) Internal instability, war condition, natural and environmental calamity should be removed and the peace to live life and other elements of international index of human development should be taken into consideration.

During these days, modern and welfare scientists made statement that economic development and social development are the two sides of one coin and importance of human development is same in all the countries. Recently in the undeveloped countries in their developing process, human resource and in their involvement the importance is being made. And the new approach of new economic development is seen.

Human development and developing countries:-

Today in the world some undeveloped countries in the process of development comparing with developing countries. In such countries Devis Ken, Richardsan Walsh expressed the importance of human resource development. In the sense in undeveloped countries for the economic development allround development of human resource should be done before and no one can deny it. Hence, from this point of view in the process, economic development of undeveloped developing countries modern approach should be accepted and the effective plan of human power and giving inspiration to that get accelerated and increase the efficiency in it and should make the overall development. Hence, human power development will be done and with the human resource economic development will be increase otherwise not.

Today in Indian economy population explosion, poverty, unemployment, instability are the basic problems. Hence, the standard of the commons has come down. As a result the rate of Indian development is beyond the grasp. There is a relation between human resource and economic development. According noble prize winner economist Dr. Amrtya Sen, developing countries like India in the developing process preference should be given to human resource development and make investment in training, education, medical and health. Therefore the human power will enhance for the betterment of nation.

21st Century and Human development:-

While leading in 21st century, India would be at the top in the field of growth. Even though the planning of human labour is succeeded, the problem of poverty will be reduced and India would become the powerful nation. For that India should accept the effective and realistic way to develop the human development index.

Human development means real economic developments :-

The commentary of the statement published in the programs of united nations of organization, we come to know that human resource development means real economic development.

Development without gender discrimination:-

In the world various developed and undeveloped countries. Gender discrimination is man and women are considered subordinate. In various countries still women are given secondary place in some fields they are ignored about their wages and other facilities. In some

countries women are kept away from jobs. For example, Africa and some countries in Asian.
Keeping this attitude in mind the concept of development without gender discrimination come into affect.

Commentary of the statement of human development:-

Today various countries in the world are being made improvement in the process of economic development and making growth in the welfare of citizen of their nations. Because in the process of welfare, real modern development is seen.

New technology is an effective weapon for human development and poverty eradication:-

Making the historical imitation in the developed countries, it is seen that new technology is the effective weapon for the development. We feel that growth in the technology has produced developing resources and they have helped for the development. It helped for the search of new things, after the time there take place some change in education, health and so on and it helped for the development in the technology.
Due to the technical growth in the countries like Africa, Asia and Latin America the birthrate has come down after 1930. After 1930 in the most of countries the lifespan goes up.

Revolution in Agriculture:-

New kinds of crops and seeds are developed through the new technology and they have helped in average of production in the per acre of land. The improvement is done in pesticides and fertilizer. Even new techniques are found for the use of rice and cotton from 15% to 30%.
It is found that, there is an impact of Economic progress has great impact on Human development. Poverty, unemployment, instability and population explosion are the basic problems. There is a relationship between human development and economic development. Therefore we come to kow that human resource development we are real economic development.

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GENDER DISCRIMINATION IN INDIA

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Introduction

After independence in India one of the issues which has attractive the attention of the policy makers was gender issues and concerns. Gender issues have become central policy arena. The issues of gender equality and justice assumed added significance in the context of the interface between new economic policy perceptions and gender relations. The gender equity became part of country's strategy for eradicating poverty and human misery. The policy makers are strongly believed that a positive commitment to gender equality and equity will strengthen every area of action to reduce poverty because women can bring new energy and new insights. A lot of debate is going on women and development since last few decades. Several interventions had taken place both at national and international level leading to passing of several loss including loss against physical violence IPC Section 498 (a) and Section 125 for maintenance. The importance of feminism has been steadily growing and gaining intellectual legitimacy.

Developments at Global Level:

There has been global effort with a strong support from U.N., since 1975 to understand the discrimination and restore status of women through equality, development and peace. The year 1975 was declared as the international year of the women by the United Nations. It organized 4 world conferences on at Mexico in 1975, one at Copan Hagen in 1980, one at Nairobi in 1985 and one at Beijing in 1995. The World Summit for Children 1990, set goals for health, education and nutrition for women and their children. The international conference on nutrition in 1992 held at Rome, emphasized the elimination of malnutrition among women and children. The international conference on population and development in 1994 brought out a link between demographic issues and advancement of women through education, health and nutrition. The 1994 international conference on population and development placed issues of gender at the center of discussion. Thus, several international organizations are trying to promote the advancement of women and their full participation in developmental process and trying to eliminate all forms of discrimination against women.

Developments in India:

The most deep-rooted forms of gender inequality had been built into the structure of traditional Indian society. Through gender inequality exists a large measure in the society under different dimensions for long time, its importance has grown in the recent times only. In the traditional society the inequality between males and females existed to a large extent. Women were looked down socially, economically and politically. Women became scape goats of many traditions and customs. She was brutally killed in the name of Sathi. The practice of child marriage, Kanyasulkam, Prostitution was taken it granted by society and women have no voice what so ever for centuries together. Women's role was restricted to domestic life especially kitchen work and bearing and rearing of children. She has no place in economic and political activities. Girl children were discriminated in terms of basic necessities of life such as food, clothing and shelter. Woman is the last person in the family to eat. She is the person who does all types of menial jobs. There is no respect for her work. Most of the women's work outside the domestic front is restricted to agricultural labour activity (in agriculture) and unorganized activities in urban sector. The census of India did not consider their work while counting the number of economically active persons in the country for quite a long time.

The Government of India has taken several measures and also making endeavourer to hoist the status of women in the society in order to promote equality of men and women. The different plans, programmes, and policies have

laid emphasis on women empowerment and raising the economic, educational, health and political participation of women to match with that of men. The draft national policy on empowerment of women envisages 1) to setup councils at the national and State levels to review the implementation of the recommendations of the national and State Commissions for women. 2) The center and State to draw up time bound action plans to translate this –policy into concrete action in consultation with the Central and State Commissions for women. (3) Every ministry at the Center and the State is obliged ensure equal flow of benefits in physical and financial terms to Article 15 of the constitution prohibits any discrimination on grounds of sex. The directive principles of State policy also urges that the State shall direct this policy towards securing an adequate means of livelihood for women and ensuring equal pay for equal work for both men and women. Since seventy's the objectives of raising the status of women and also been included in different five years plans. In the sixth five year plan emphasis was laid on raising the employment status of women. The seventh plan emphasized the need for human resource development in women. The eighth plan aims at enabling women to function as equal partners and implement social legislation for women effectively. The ninth plan has identified empowerment of women as an objective. The tenth plan also emphasis on women development.

The formulation of the national commission for women (N.C.M.) and the idea of setting of a national council for empowerment of women are encouraging steps in this direction. Also different state governments are also implementing several development measures for women's health in general and re-productive health in particular. The lack of sex education among adult girls and re-productive health education among the married women are also cause of many preventable diseases. Empowering women regarding the own re-productive health care and effecting accountability of men towards women's re-productive health are important for promoting women health status in the society.

Now with the efforts of national and international organizations several laws were passed and some laws were changed. But still women continue to suffer from many social and economic and political disadvantages, since the attitudes did not change as fast as the change in laws. Gender issues are ideologically motivated and need a change in mindset in terms of attitudes and behavior of both men and women of all dimensions.

Objective and Data Base

The main objective of the present paper is to examine the gender discrimination in India in demographic social, economic and political context. The data required for the present paper was collected from secondary sources.

The women discrimination can be visualized on various angles. In a male dominated society like ours one has to accept that women are at the receiving end. The sex ratio is unfavorable to women and it has declined overtime. The literacy rates are low among women. The expectation of life is low for women in India up to the recent times. The opportunities and access to decision-making institutions are not equal to both men and women. There is clear division of labour among men and women, designating certain tasks exclusively to each and another. Mostly activities, which have low market value, are attached to women. Women mostly spend their time in household maintenance. There were also gender differences access and control over resources, which were important elements to consider in development, programmes especially where interventions may change the value of resource and reduce women's access.

Gender Ratio:

Sex is an easily identifiable characteristic and its dichotomous nature presents few problems of classification. The sex structure of any population can be measured through the percentage of males in the population or masculinity proportion or the sex ratio. The sex ratio of the population thus may either be expressed as the number of males per thousand females or as the number of females per thousand males. The former definition is followed all over the world but the Indian census followed the later definition. The sex ratio above thousand indicates a high sex ratio while that below thousand indicates a low sex

ratio.

Sex and age are the basic characteristics or the biological attribute, of any demographic group and affect not only its demographic but also its social economic and political structure, for the influence birth and death rate, internal and international migration, marital status composition, man power, the gross national product, planning, regarding educational and medical services and housing, etc. The attitude of society towards children, the youth and elderly people is affected by sex-age distribution of population. Sex and age are also very important because, they are visible, indisputable and convenient indicators of social status. Each individual is ascribed a certain status in society on the basis of sex and age. Similarly her/his expected role in the family and society is associated with sex and age. These are culturally determined and vary from one culture to another. Even with in the same culture, they may undergo changes overtime. In the traditional Hindu family status is accorded on the basis of sex and age. Men are more important than women and older persons are more important than younger persons.

The sex ratio is very low in India as compared to many developing countries and most of the advanced countries. The high maternal mortality, infant mortality, child mortality foeticide, infanticide, abortion, low age of marriage social stigma associated with marriage, son preference are responsible for low sex ratio in India. Also under counting of women associated with many social factors is one of the main reasons for low sex ratio in the country.

The Social factors, such as, illiteracy, ignorance, the economic factors such as low wage, unemployment under employment and political factors such as, low participation of women in the elections and other elected bodies are also equally responsible for gender inequality in the country. So, there is every need to bring about changes in social, economic, and political structure in order to reduce gender inequality in India and empower women in its true term.

The term empowerment of women is an important popular concept among political spectrum. Empowerment through the expansion of the civil, political and social rights of citizenship is a laborious and unexciting process. Empowerment is only effective answer to oppression, exploitation, injustice, and other melodies of society. The idea of empowerment contains exciting possibilities. It is a wide term with no specific meaning. The term is very vogue and is more a context driven rather than theory driven. It is about social transformation. It is about the people rather than politicians. It is about power, although the concept of power contained in it is generally left unspecified.

Empowerment is both a means to an end and an end in itself. The focus on empowerment has given a new emphasis to the building of economic and social capabilities among individuals, classes and communities. It is theories of social change in particular, a change from a hierarchical to and egalitarian type of society. It is based on democratic society, which is based on recognition of equal rights to all individuals in its place. Empowerment appears to be an alternative path for dismantling the old structure and putting new one in this place. Empowerment is to change the society through re-arrangement of the power. So there is a need for empowerment through civic, political and social rights of citizens.

Gender empowerment measure is a measure for women development. It measures gender inequality in a society. India ranks 86 out of 175 countries in the world, as far as gender empowerment is concerned. The measure indicates whether women are able to actively participate in economic and political life. It measures the gender inequality in basic capabilities of women. It focuses on gender inequality in the key areas of social economic political scenario. The lack of access to land, to credit, better employment opportunities, handicaps women's ability to free from poverty. Poverty is more among women as compared to men. When women are disproportionately poor, they are dis-empowered and bounded by strains of productive work, the birth of children and other household and community responsibilities.

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A REVIEW ONUSE OF COMPUTER TECHNOLOGY IN INDIAN AGRICULTURE

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ABSTRACT

Computer technology playing important role in Indian agriculture to increase crop yield. An Optimization of agricultural practices for enhanced crop yield is considered to be essential phenomena for the countries like India. Image processing techniques helpful to identify crop diseases accurately and also suggest right pesticide to control the disease . In India, weather and geographical conditions are highly variable and were thought to be the major bottleneck of agricultural practices to achieve improved crop yield. Agricultural practices in India are facing many challenges such as change in climatic conditions, different geographical environment, conventional agricultural practices. Economic loss due to the lack of information on crop yield productivity is another major concern in the country. These hurdles can be overcome by the implementation of advanced technology in agriculture. Some of the trends observed are smart farming, digital agriculture and Big Data Analytics which provide useful information regarding various crop yields influencing factors and predicting the accurate amounts of crop yield. The exact prediction of crop yield helps formers to develop a suitable cultivation plan, crop health monitoring system, management of crop yield efficiently and also to establish the business strategy in order to decrease economic losses. This also makes the agricultural practices as one of the highly profitable ventures. This paper presents insights on the various applications of technology advancements in agriculture such as Digital Agriculture, Smart Farming , Crop Management, Weed and Pest control, Crop protection and Big data analytics.

Keywords: *Technology, smart farming, agriculture, digital, data mining*

1. Introduction

Agriculture is the basis for food security and survival. Mankind living on the globe depends majorly on the agriculture based crops for their survival. India is an agricultural dependent country and the fact that the majority of the populations are vegetarians and solely depends on the agricultural products for their survival. Being an agricultural based nation, country's economy is principally influenced by annual crop yields of agricultural practices. Recent survey indicates that more than
70 % of the population is in to agriculture and the majority among the rest is connected to the other aspects of agricultural practices. The other facets of agricultural practices include agricultural machinery companies, fertilizer companies, crop yield marketing and sales companies etc. Agriculture activities help humans to raise the most principle food crops with ideal animal population to achieve environmental balance. In the country like India, farmers cultivate major food crops such as rice, wheat, cereals, pulses, different vegetables known as onions, potatoes, sugarcane, oil seeds, mango, orange, red chilli, soyabean and also various commercial crops such as coconut, coffee, tea, cotton, rubber and jute.

2. Use Of Technology In Agriculture

2.1. Image Processing in Digital agriculture

Image processing tools used to identify crop diseases.Digital agriculture is the use of new and advanced technologies, integrated into one system, to enable farmers and other stakeholders within the agriculture value chain to improve food production. In comparison with conventional and sensor based approaches, an advanced approach termed as digital agriculture can help the farmers to understand their agricultural practices in a much better and effective way in a real time manner. Thus, digital agriculture holds profound impact on the crop yield enhancements, by empowering the formers with required scientific knowledge to implement good agriculturalpractices . It also provides an opportunity to review the historical information in understanding the various situations and difficulties to gain an essential knowledge in taking the right decisions. The composite agricultural practices combined with rigorous and enhanced crop yield require an implementation of robust automated systems with less development time at low cost. Agricultural safety is a big concern in current scenario which can be implemented by controlling the various contaminants that

promote crop damage. Agricultural automation systems including field machinery, irrigation systems, greenhouse automation, animal automation systems, and automation of fruit production systems helps in achieving enhanced crop yields [3,4].

2.2. Smart farming

Smart Farming is a development that emphasizes the use of information and communication technology in the cyber-physical farm management cycle [5]. Smart Farming represents the application of modern Information and Communication Technologies (ICT) into agriculture, leading to what can be called a Third Green Revolution. Agricultural based practices in India needs indefinite transition from the conventional methods to the smart farming approaches in order to achieve sustainable and profitable agricultural practices. Smart forming also termed as Internet of Agriculture Technology (IoAT)**,** employs Information and Communication Technologies (ICT) in understanding the various aspects of the farming practices and help the farmers to maintain the optimum conditions with least effort and higher cost benefits to achieve more proficient, highly productive, cost effective and profitable farming enterprises. Smart farming models are found to be more generic, easy to understand and easy to adapt by the farmers as shown in Figure 1.

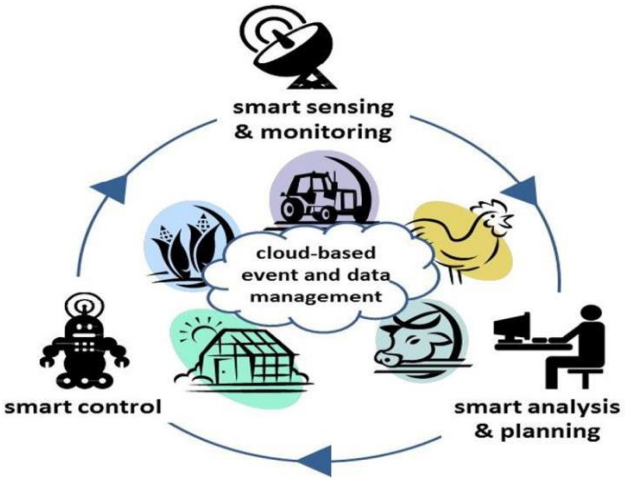

Figure 1. The concept of smart farming representing the cyber-physical system based management cycle [6]

As per the recent survey, the world population is going to reach close to 8 billion by the year 2040. Providing the food for these mammoth populations is considered to be a big challenge for the governments, and it is highly impossible with less cultivable land available and conventional agricultural approaches. The only way to deal this ample task is the implantation of smart agricultural practices and the application of IoT technology in agriculture to overcome the crop limiting hurdles such as biotic and abiotic stress, crop failure, crop damage, loss of productitivity and wastage to achieve progression in the agricultural practices. IoAT refer to the application of various sensors to monitor the different conditions such as light intensity, humidity percent, temperature measures, soil moisture content etc. in real-time situation and also helps in the automation of irrigation system to reduce water wastage. The benefits provided by the IoAT is ample and some of the most important benefits are listed to be sensor based field monitoring, effective resource mapping, remote crop monitoring, climate monitoring & forecasting, controlled usage of fertilizers and pesticides and finally the accurate prediction of crop yield [7, 8].

2.3. Big data techniques

One of the greatest challenges for agriculture is climate change and its impact on human life. In contrary to other fields like e-commerce and advertising where Big Data has played big role in their success, there is little impact on advanced understanding of the environment. This inconsistency curtails the climate data with complex nature. Big data analytics has been in use to mine large datasets of climate with more focus of differences between the traditional big data and mining climate data approaches [15]. In India the impact of climate change effects plant growth development and subsequently crop yield. Due to the increase in the temperatures, there is a drastic reduction in the duration of the crop. Increase in crop respiration rate had resulted in pattern change of pest attack. Most of the crops have adjusted to the growing season, day lengths of the middle and lower latitudes and with poor response to the much longer days of the summer. Increased temperature accelerates the rate of release of CO2 during warmer seasons resulting in reduced crop yield. By collecting

the data of rainfall and temperature of last 5 years one can analyze the data by using different big data analytics tools to get the exact change in the Indian agricultural climate [16]. Sensors play a vital role in predicting the effectiveness of the certain seeds, fertilizer in different section of the farm as shown in Figure 5. To achieve an optimum crop yield, software guides the farmers to sow the hybrid varieties seeds at one corner and different variety at another corner [17].

2.4. Agriculture/ crop management

Various seasonal, economic and biological factors influence the crop production but unpredictable changes in these factors lead to a great loss to farmers [19]. Crop protection & weed control solutions need to be developed to reduce the crop damage and in turn increase the overall yield of the crop. The existing models consist of three major elements: (i) Data Capture & Storing. (ii) Data Analysis and (iii) Recommendations based on analytics. This unified solution need concurrent advances in the domains of agricultural science, collaboration between supply chain partners and in ICT. New techniques are required touse the historical data for prediction of the occurrence of pests, weeds and other diseases [20,21].

2.5. Data mining and analytics

Decision support system (DSS) in the field of agriculture is ably supported by data mining tools. The main aim of the processes involved in data mining is to extract the information from the currently available data sets and then transform the same using specific tools to a unique format that is easily understandable and can be used for advanced purposes as shown in Figure 4. Data mining helps in soil fertility studies and empowers the farmers in making a decision to sow specific variety of the crop that results in a better yield. The main aim of soil classification is to predict the engineering properties and fertilizer of soil there by order the choices for use. The currently available statistical techniques and the laboratory test consume lot of time, energy and money. It is possible to develop more efficient techniques for solving complex and large data sets of soil with improved accuracy and effectiveness. Data mining techniques based on GPS, k-means approach, SVMs, K-nearest fertilize method are useful to study the soil characteristics, pollution in atmosphere, the factors that influence the crop yield.

Soil tests are normally conducted to study the fertility of the soil, impurity and other deficiencies if any in soil that to be removed. Most of the Soil testing laboratories that are owned by either government or private sector offer different protocols for analysis of the soil and the literature pertaining to the soil characteristics. Suitable fertilizers are recommended based on the data available with reference to the soil composition. This helps the formers to apply a suitable fertilizer for specific crops during that seasons .

3. Conclusion

Many AI tools and digital image processing tools used to identify crop diseases. From theabove survey of technology usage in agriculture, it can be observed that there are numerous computer approaches that can be used for improving the quality and quantity of crops. In contrast to other developed countries, in India it is a big challenge to achieve the anticipated growth due to non-maintenance of resources on which the production systems depend. Various elements influence the successful use of quality farming.

The usage of technology in agriculture domain has resulted in digital agriculture, precision agriculture, analytics for crop yield etc. In India, large numbers of people are engaged in agriculture and there is a gap between the farmers and technology. Governments have introduced various methods into agriculture to help the farmers to take the advantage of technology. In spite of this, there is a scope for user friendly easily understandable agro advisory systems to help farmers to take decision on crops to be sown. Also at different levels of crops growth, these technological inventions should help farmers to extract best yield with reduced expenses. There exists a scope for research to increase accuracy to identify different diseases of crop.

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RURALAND AGRICULTURE DEVELOPMENT - A DIGITAL VILLAGE

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Introduction

The Rural development is the process of improving the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas. A Digital Village is a space where a community expresses their identity though ICT and Digital Media. This may be from an artistic, heritage, or economic perspective or a mixture of all three.

The Rural development is the process of improving the quality of life and economic well-being of people living in relatively isolated and sparsely populated areas. Rural development has traditionally centered on the exploitation of land-intensive natural resources such as agriculture and forestry. However, changes in global production networks and increased urbanization have changed the character of rural areas. Increasingly tourism, niche manufacturers, and recreation have replaced resource extraction and agriculture as dominant economic drivers. The need for rural communities to approach development from a wider perspective has created more focus on a broad range of development goals rather than merely creating incentive for agricultural or resource based businesses. Education, entrepreneurship, physical infrastructure, and social infrastructure all play an important role in developing rural regions. Rural development is also characterized by its emphasis on locally produced economic development strategies. In contrast to urban regions, which have many similarities, rural areas are highly distinctive from one another.

Rural Development & Digital Village:-

A Digital Village is a space where a community expresses their identity though ICT and Digital Media. This may be from an artistic, heritage, or economic perspective or a mixture of all three.This can be done through poetry, digital stories, community newspapers online, image collections (old and new), audio (Internet radio, oral history), animations, video, and text. To engage in the activities the participants need to learn new skills and so the Digital Village also becomes a learning community.At it's simplest a Digital Village is a community website. The term "village" need not apply to an actual village (although in many cases it does) but to a cluster of villages, a geographical area or a group of participants in a town. On Teesside there is even an example of a Digital Cemetery.A Digital Village becomes a vehicle for participant led learning where the interests of the learning community set the agenda for what they learn. This is done using Community Media and innovative use of ICT, particularly open source software and web2 applications. The activity is informal and workshop based. Some technical support is required but the process becomes "flexible replication". Assistance from ICT animator's is needed for these workshops but we have also observed peer learning taking place in these informal workshops.

It is also possible to introduce an element of e-learning into the Digital Village concept. There is currently a great deal of interest in Virtual Learning Environments (VLE's) and e-portfolios. It is also very simple to consider the Digital Village as both VLE and e-portfolio. Whatever the participants want to learn e.g. digital images, creative writing, family or local history etc… can be supported on the Digital Village website VLE style and it is also presented on the DV website e-portfolio style.

Digital Village Programme is about to launched by Government

Digital Village is the next big plan likely to be announced by the central government under its Digital Indiainitiative. The plan was revealed by Ravi Shankar Prasad, the Minister for Electronics & Information Technology and Law & Justice while speaking at the Digital India Awards ceremony in New Delhi. However, he did not give out any further

details.It is also not known if the project will be spearheaded by the Ministry of IT or Ministry of Rural Development. Smart cities have been completely handled by the Ministry of Urban Development.

What is Digital Village Programme –

Digital village Programme is a part of Digital Indian Scheme.This is another move towards digital inclusion of India's hinterland, the National Democratic Alliance government plans to unveil a programme, Digital Villages, with an initial outlay of Rs.500 crore.

Objectives of Digital Village Scheme-

- Minimum of 100 villages will be shortlisted under this scheme.
- Government will offer services including e-medicine, e-education, Internet connectivity services and light-emitting diode lights to those selected villages.

Expenditure for Digital Village Scheme-

The government has trained its focus to digitally connect rural areas of the country and spend **around Rs.10,000**crore from the Universal Service Obligation Fund (USOF) in the current financial year in building rural digital infrastructure.The Indian government maintains USOF to fund capital costs required to provide telecom services in rural areas, where not only the cost of projects are high but return on investment is also low.

Official Speak on Digital Village Scheme –

"We will create a framework and empanel private players who can come in to offer services in the Digital village scheme. States can work with empanelled set of private players to take forward this project," Sundararajan said.The first official quoted above added that Common Service Centres (CSCs), also known as Digital SevaKendras, will also be included in the plan for offering last-mile connectivity through Wi-Fi services in these villages.

For this concept of rural development and digital India to be successfully implemented, certain conditions need to be met:

• First the telecom infrastructure for broadband facilities have to be available to a critical mass of consumers – a few islands of connectivity will not add significant economic value

• A wide range of applications and content relevant for rural consumers must be accessible on mobile devices and the operators must provide service packages affordable to the target user. Broad based availability of broadband services, through handheld devices, is a pre-requisite for the achievement of the goals of 'Digital India'.

The greatest challenge in providing such affordable broadband coverage is the wireless "last-mile" link. Typically, carriers will extend data coverage to rural areas after a well-developed network of telecom towers is established, with optic fiber/microwave back haul.

Unfortunately, telecom infrastructure providers find rural towers quite uneconomic. In most countries, towers are built in rural areas with government subsidy and support. These Governments make land, rights of way and infrastructure available for rural mobile networks at low or no cost. The 'Digital India' plan will not deliver the desired results unless NOFN is linked to telecom towers, which provide critical 'last mile' wireless broadband services to rural households.In this context, rural telecom towers are, and will remain, a key component in taking broadband down to the village level.

Inida's first digital &Cashless village

Akodara, India's first 'digital village' is located in Gujarat's Sabarkantha district. Situated 90 km from Ahmedabad, the village has been functioning normally despite the chaos demonetisation has brought to the rest of the country, as neither shops nor citizens of the village deal in cash.

Residents of Akodara have been using e-banking for everything. From buying milk and groceries to paying bills and drawing salaries, everyone here uses mobile phones for their payments. "We have got used to e-banking and hardly deal in cash and therefore the note scarcity has not hit us," Pankil Patel, a grocer living in Akodara told the Hindustan Times.

Maharashtra Gets Its First 'Cashless Village'

MUMBAI: Amid the Centre's push for digital transaction, Dhasai village in Thane district has become the first "cashless village" in Maharashtra, state Finance Minister SudhirMungantiwar said today.

From today, all payments in the village are being done through plastic money. Traders, vegetable and fruit vendors and others providing goods and services in Dhasai are using swipe machines for cashless transactions. "Prime Minister NarendraModi has taken a revolutionary step to check corruption and terror funding by banning old Rs. 500 and Rs. 1,000 notes. He has shown us a dream and has taken steps in that direction. "In this journey, Dhasai has emerged as the first cashless village in the state. Maharashtra, too, will soon become a cashless state," he said. Nearby small villages depend on Dhasai for trade and their daily needs.

Translating Digital India vision for rural development:

The vision for Digital India unveiled by the Prime Minister is path breaking and has the potential to create a transformational change in various sections of the society with rural India poised for being the biggest beneficiary of this change. The plan to provide universal phone connectivity and access to broadband in 2.5 lakh villages by 2019 is the clarion call for entrepreneurs and policy planners to take advantage of the opportunity to build new solutions for rural markets. Mobile telephony is expected to play the lead role in delivering the advantages of information access and digital empowerment to the rural population. India has close to 960 million mobile subscribers as of end March 2015 as per Telecom Regulatory Authority of India (Trai) and now service providers are turning their attention to rural India for their expansion. Urban mobile subscriber share stands at 58% as compared 42% of rural subscribers. Rural mobile subscriber base is growing twice as faster compared to urban subscriber base. While the national teledensity stands at 79% as of March 2015, rural teledensity is 46.5% thus indicating a yawning gap to be addressed.

Rural development agencies

Apart from this a lot of agencies make effort to make Digital & Cash less India which includes rural development. And that agencies are :-

- Agricultural Development & Training Society, India
- Tipperary Institute, Ireland
- Azerbaijan Rural Investment Project in Azerbaijan
- Nimbkar Agricultural Research Institute, India&Etc
- USDA Rural Development, an agency of the United States Department of Agriculture
- European Network for Rural Development{Amaram M. C., FaithGem.
- England Rural Development Programme by DEFRA

Conclusion

Every household has a savings account that can be accessed through mobile phones via SMS. Most local financial transactions happen through mobile banking, debit cards and internet banking. Payment for agricultural produce at the local market or milk at the co-operative society is made through online transactions. The bank accounts are linked to Aadhar cards and government benefits are transferred directly into accounts.The unlocking of the potential for rural transformation on the strength of digital platform calls for innovation and pragmatic approach along with diligent implementation.

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ISSUES AND CHALLENGES IN SUSTAINABLE CONSERVATION OF BIODIVERSITY IN DEVELOPING COUNTRIES: A REVIEW

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ABSTRACT

Conservation of biodiversity refers to the effort of protecting and preserving the variety of life on earth. It encompasses the conservation of genetic, species, and ecosystem diversity. Biodiversity is essential for the functioning of ecosystems, providing us with valuable ecosystem services, including food, medicine, and clean water. In this paper, authors have reviewed several research articles from journals, books, magazines, and newspapers to explain the need for sustainable conservation of biodiversity and itssignificance for the survival of species, the well-being of humans, and the healthy functioning of ecosystems, and it is a key element in achieving sustainable development goals. The loss of biodiversity is a global issue that is caused by human activities such as deforestation, pollution, climate change, and overexploitation of natural resources. The conservation of biodiversity requires collaborative efforts from individuals, organizations, and governments at local, national, and international levels. Strategies for conserving biodiversity include habitat protection, restoration, and management, ex-situ conservation, and sustainable use of natural resources. Effective conservation measures can help to mitigate the loss of biodiversity and maintain the healthy functioning of ecosystems, ensuring the survival of species and the well-being of humans.

***Keywords**: Biodiversity Conservation Ecosystem Species Sustainable*

Introduction

The term "biodiversity" refers to the broad catch-all phrase for the degree of natural variety or variation within the natural system; both in terms of number and frequency. It generally refers to the diversity of all types of life on earth. Various types of plants, animals, and microorganisms, as well as the genes they carry and the ecosystems they create. Species diversity, genetic diversity, and ecological diversity are the three basic levels that are taken into account. In relation to the variety of habitats, biotic communities, and ecological processes in the biosphere, biodiversity is essential in a number of ways, including enhancing the aesthetic value of the natural environment, contributing to our material well-being through utilitarian values, sustaining the integrity of the environment through; preserving CO2/O2 balance, regulation of biochemical cycles, absorption and breakdown of pollutants and waste materials through decomposition. Despite the advantages of biodiversity, the threats to species and ecosystems today are the greatest ever recorded. Virtually all of these threats are the result of human mismanagement of biological resources, which is frequently stoked by poor economic policies, pollution, and flawed institutions in addition to changing the climate. Biodiversity conservation is crucial for the health of our planet and its inhabitants, and we must take action to protect it. Loss of biodiversity is a global issue, but it is particularly acute in developing nations. There are a number of factors that contribute to this problem, including habitat destruction, climate change, pollution, over-harvesting of resources, and invasive species. Developing countries often struggle to allocate sufficient funds for conservation programs, resulting in limited resources for monitoring, research, and protection of biodiversity.Another issue is the competing demands on land use, including agriculture, mining, and urbanization. This has led to the destruction of natural habitats, fragmentation of ecosystems, and loss of biodiversity. Additionally, poaching, illegal

wildlife trade, and habitat destruction due to human-wildlife conflict pose significant threats to biodiversity conservation. Biodiversity conservation is essential for sustainable development in developing countries. Biodiversity is the foundation of many critical ecosystem services, including clean air and water, nutrient cycling, and soil formation.

Literature Review

India has a wide range of climates (including tropical, subtropical, temperate, alpine, etc.) because of the huge fluctuations in temperature and precipitation. The country is a "mega biodiversity country" in the world due to the richness of its flora and fauna brought about by climatic changes. Physically, India makes up around 2.4% of the planet's surface area, but it is home to about 8% of all species. Due to the nation's abundant biodiversity, ecologists and environmentalists have crucial work ahead of them: critically assessing the country's biodiversity and developing conservation measures (Tripathi, S. K et al, 2016). India also has a wide variety of forest types and is home to three hotspots for terrestrial biodiversity due to its variable temperature and topography, which are defined by at least ten unique biogeographical areas. Due to the loss of other terrestrial habitats' natural states, the forest today contains the majority of the terrestrial biodiversity. 96 national parks, 509 animal sanctuaries, and several holy groves preserved by indigenous tribes make up the outstanding protected area network. Nonetheless, despite a favorable forest policy and a robust regulatory framework, forest degradation and biodiversity loss persist due to the rising demands of the expanding human population, changing land uses, and the spread of exotic alien forms of life (Singh, J. S et al; 2008).In particular, there is a need for research on biodiversity in buffer zones, long-term monitoring plans, and an analysis of the financial and conservation benefits of tourism. The creation of monitoring plans for "eco-sensitive zones" surrounding protected areas, along with a strong emphasis on maintaining existing protected areas, should be the two key objectives for policymakers (Ghosh-Harihar et al, 2019). Biological Diversity assesses the status and trends of biodiversity and the progress made toward the Aichi Biodiversity Targets. It highlights the need for urgent action to address biodiversity loss, which is threatening the functioning of ecosystems and the services they provide (Outlook, G. B; 2010).

Climate change and severe weather are already having an influence on agricultural production, disproportionately harming vulnerable groups of the population through higher food prices, lost possibilities for employment, negative effects on health, and relocation. Together with ensuring food security, it is difficult to reduce malnutrition, especially among women and children. Increased greenhouse gas (GHG) emissions, habitat loss, soil fertility decline, groundwater depletion, and contamination of soil, air, and water are only a few of the negative environmental effects of agricultural intensification. Globally, the primary cause of ecological change has been land conversion for agriculture (Aditya, V et al; 2020). The major threat to the species, which results in population isolation and decrease, is caused by human activities that alter and disrupt natural habitats. The occurrence of the species has been found to be adversely connected with human population density, even if it may occur in locations where there is some degree of human activity and habitat destruction (Rheingantz, M. L et al; 2021). Among the biggest dangers to biodiversity is urbanization. Although they can potentially support high biodiversity, urban grasslands offer a significant number of ecosystem services in the areas of social, economic, recreational, and environmental ecosystems. Urban grasslands are significant for (local) biodiversity, and it is advised to intensify efforts to optimize these unique ecosystems for conservation by conducting restoration ecological research (Klaus, V. H et al; 2013).

Conflicts between people and wild animals frequently occur on the margins of protected areas where these encounters are prevalent. Conflicts between animals and people compromise their mutual well-being all around the world and endanger the survival of many of the implicated animal species. It has been demonstrated that conflict-exposed species are also more vulnerable to extinction. Human-caused harm and death are to blame for the species' susceptibility to extinction. These

harms and deaths might be unintentional, as in the case of car accidents and train wrecks, or intentional, as in the case of retaliatory shooting, poisoning, or capturing (Matseketsa, G et al; 2019).The current mass extinction event is driven by human activities such as habitat destruction, climate change, and overexploitation of natural resources. There is an urgent need for conservation efforts to protect biodiversity and the ecosystems that support it (Kolbert, E; 2014). To achieve transformational change in order to meet the world's sustainability objectives, transformative governance is required. The management of biodiversity has historically depended on tools from the natural sciences, such as indicator frameworks, integrated assessment models, or techniques to calculate the economic worth of nature, to assess the status of species, ecosystems, and causes of change (Visseren-Hamakers, I. J et al ; 2021). The purpose of the United Nations Convention on Biological Diversity is to guarantee the preservation of biodiversity, its responsible use, and the equitable distribution of the benefits from the exploitation of genetic resources. With it, the Strategy Plan for Biodiversity 2011-2020 was developed to advance the goal of humanity "Living in Harmony with Nature" by 2050.The Sustainable Development Goals (SDGs), a comprehensive plan for people, the planet, and prosperity developed in 2015 by the UN, include living in harmony with the environment as one of its many objectives (Locke, H et al; 2019).

Biodiversity

Biodiversity refers to the variety of life on Earth, encompassing the diversity of species, genes, and ecosystems. It is the result of millions of years of evolution and the interactions between different organisms and their environments. Biodiversity is essential to maintain the health and resilience of ecosystems, and the services they provide to humans, such as food, clean water, and medicine. The loss of biodiversity can have far-reaching consequences, including the collapse of entire ecosystems, the extinction of species, and the disruption of essential ecological processes. Biodiversity can be measured at different levels, including the genetic, species, and ecosystem levels. Genetic diversity refers to the variety of genes within a species, while species diversity refers to the number of different species in an ecosystem. Ecosystem diversity refers to the variety of ecosystems within a region or on the planet.

Biodiversity conservation

Biodiversity conservation refers to the protection, preservation, and management of all the different forms of life on Earth, including plants, animals, and microorganisms. The goal of biodiversity conservation is to maintain and promote the natural diversity of life, which is essential for the healthy functioning of ecosystems and the sustainability of human societies. Biodiversity conservation is important for many reasons. First, biodiversity is essential for the functioning of ecosystems, which provide important services such as clean air and water, soil fertility, and climate regulation. Second, biodiversity has important economic value, providing resources such as food, medicine, and building materials. Third, biodiversity has an aesthetic, cultural, and spiritual value, contributing to the beauty and diversity of the natural world and the cultural heritage of different societies. Biodiversity conservation involves a range of activities, including habitat protection and restoration, species management and reintroduction, sustainable use of natural resources, and public education and outreach. Biodiversity conservation efforts can be carried out at local, national, and international levels, and involve a range of stakeholders including governments, non-governmental organizations, communities, and individuals.

1. Biodiversity loss: According to the International Union for Conservation of Nature (IUCN), approximately one million species are at risk of extinction, which represents one in eight of all known species on the planet. The rate of extinction is now estimated to be 1,000 to 10,000 times higher than the natural extinction rate.
2. Protected areas: Protected areas such as national parks, nature reserves, and wilderness areas are essential for conserving biodiversity. Currently,

protected areas cover about 15% of the earth's land surface and 7% of the oceans.

3. Illegal wildlife trade: Illegal wildlife trade is a major threat to biodiversity. It is estimated that the global illegal wildlife trade is worth $23 billion per year.
4. Habitat loss: Habitat loss is the most significant threat to biodiversity. The loss of forests, wetlands, and other habitats due to human activities such as deforestation, agriculture, and urbanization has resulted in the decline of many species.
5. Climate change: Climate change is also a significant threat to biodiversity. As temperatures rise, many species are unable to adapt and are at risk of extinction.
6. Conservation funding: Despite the urgent need for conservation, funding for biodiversity conservation is inadequate. It is estimated that the total annual cost of conserving biodiversity is $300 billion, but current funding is only around $50 billion per year.
7. Success stories: While there are many challenges to conserving biodiversity, there are also many success stories. For example, the conservation of the giant panda in China is a well-known success story, with the population of pandas increasing by 17% between 2004 and 2014.

Need for Biodiversity Conservation

1. According to the International Union for Conservation of Nature (IUCN), as of 2020, 32,000 species are threatened with extinction. This represents around 27% of all assessed species.
2. The rate of extinction is estimated to be up to 1,000 times higher than the natural background rate, due to human activities such as habitat destruction, climate change, and over-exploitation.
3. The loss of biodiversity has significant economic costs, with estimates suggesting that the annual global cost of biodiversity loss and ecosystem degradation could be as high as $10 trillion by 2050.
4. Protected areas cover around 15% of the earth's land surface, and 7% of the world's oceans are designated as marine protected areas. However, many protected areas are not effectively managed, and some are even being degraded by human activities.
5. Conservation interventions such as habitat restoration, captive breeding programs, and protected area management can be effective in preventing extinctions and restoring populations. However, these interventions are often expensive and require sustained effort.
6. Indigenous peoples and local communities play a critical role in biodiversity conservation, as they often have deep knowledge of local ecosystems and have developed sustainable ways of using natural resources. However, their rights and knowledge are often ignored or undervalued in conservation efforts.

Issues, challenges and solutions for sustainable conservation of biodiversity

Ecosystem fragmentation

Ecosystem fragmentation refers to the process of breaking up large, continuous natural habitats into smaller, isolated fragments. This can occur as a result of human activities such as urbanization, agriculture, mining, and road construction, as well as natural events such as wildfires or landslides. The fragmentation of ecosystems can have a significant impact on the plants, animals, and other organisms that rely on those habitats for survival. Small, isolated fragments may not be large enough to support viable populations of certain species, leading to local extinctions. The loss of habitat connectivity can also disrupt migration patterns, alter food webs, and reduce genetic diversity. In addition to its ecological effects, ecosystem fragmentation can also have social and economic impacts. It can reduce the availability of ecosystem services such as clean air and water, and limit recreational opportunities. It may also increase the risk of conflicts between humans and wildlife, particularly in areas where human activity has encroached on natural habitats.

Loss of biodiversity

Loss of biodiversity is a global issue, but it is particularly acute in developing nations. There are a number of factors that contribute to this problem, including habitat destruction, climate

change, pollution, over-harvesting of resources, and invasive species. One major cause of habitat destruction in developing nations is the conversion of natural habitats such as forests, grasslands, and wetlands into agricultural or urban areas. This often results in the loss of biodiversity as species are forced to adapt to new habitats or are displaced altogether.

1. According to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), up to one million species are at risk of extinction in the coming decades, many within the next few years.
2. The World Wildlife Fund's Living Planet Report 2020 found that global populations of mammals, birds, amphibians, reptiles, and fish have declined by an average of 68% since 1970.
3. The International Union for Conservation of Nature (IUCN) Red List, which is the world's most comprehensive inventory of the conservation status of plant and animal species, reports that more than 38,000 species are threatened with extinction.
4. The IUCN Red List also shows that approximately 25% of all known mammal species, 13% of birds, and 41% of amphibians are at risk of extinction.
5. Habitat destruction is the leading cause of biodiversity loss, followed by climate change, pollution, overexploitation, and invasive species.

According to the International Union for Conservation of Nature (IUCN) Red List of Threatened Species, as of 2021:

- 41,415 species are currently threatened with extinction, representing more than a quarter of all assessed species.
- Of these, 16,306 species are considered to be endangered, which means they are facing a very high risk of extinction in the wild.
- 8,432 species are classified as vulnerable, which means they are facing a high risk of extinction in the wild.
- 16,677 species are considered to be near threatened, which means they are at risk of becoming threatened with extinction in the future.
- The remaining assessed species (over 120,000) are currently classified as least concern, data deficient, or have not yet been evaluated.
- Climate change is another major factor contributing to biodiversity loss. Rising temperatures, changes in precipitation patterns, and extreme weather events can all have a significant impact on ecosystems and the species that rely on them.
- Pollution is also a major threat to biodiversity, as it can harm or kill plants and animals, and alter the ecological balance of an ecosystem. Developing nations often have less stringent environmental regulations, which can lead to increased pollution and its associated impacts.
- Over-harvesting of resources, such as timber, fish, and wildlife, can also lead to the loss of biodiversity. Many developing nations rely heavily on these resources for their economies, which can lead to unsustainable practices that deplete populations of species and damage ecosystems.
- Finally, invasive species are a significant threat to biodiversity in many developing nations. These species can outcompete native species for resources and disrupt ecological processes, leading to the loss of biodiversity.
- Overall, the loss of biodiversity in developing nations is a complex and multifaceted issue that requires coordinated efforts to address. This includes efforts to reduce habitat destruction, mitigate the impacts of climate change, reduce pollution, promote sustainable resource use, and manage invasive species.

Conserving biodiversity is crucial to maintain a healthy and sustainable environment. Here are some ways to conserve biodiversity:

1. Protecting natural habitats: One of the most important ways to conserve biodiversity is to protect natural habitats such as forests, wetlands, coral reefs, and grasslands. These habitats provide a home for a wide range of species and play a critical role in maintaining the balance of ecosystems.

2. Reducing habitat destruction: Human activities like deforestation, mining, and urbanization have a significant impact on biodiversity. By reducing habitat destruction,

we can minimize the loss of biodiversity and protect the habitats of many species.

3. Controlling invasive species: Invasive species can have a devastating impact on biodiversity by outcompeting native species and disrupting ecosystems. Controlling invasive species can help preserve biodiversity.

4. Promoting sustainable practices: Promoting sustainable practices such as sustainable agriculture, forestry, and fishing can help reduce the impact of human activities on biodiversity.

5. Educating people: Educating people about the importance of biodiversity and the impact of human activities on ecosystems can help raise awareness and encourage individuals to take action to conserve biodiversity.

6. Supporting conservation organizations: Supporting conservation organizations that work to protect biodiversity can make a significant difference in conserving biodiversity.

7. Encouraging eco-tourism: Encouraging ecotourism can help raise awareness of the importance of biodiversity and support local conservation efforts. It can also provide income for local communities and promote sustainable practices.

Climate change

Climate change is a global phenomenon that has been the subject of extensive research and literature in recent years. The literature on climate change is vast and covers a broad range of topics, including its causes, impacts, mitigation and adaptation strategies, and policy responses. In this literature review, we will focus on the key themes and findings from the most influential studies on climate change.

- Causes of Climate Change: The scientific consensus is that climate change is primarily caused by human activities, particularly the burning of fossil fuels. The Intergovernmental Panel on Climate Change (IPCC) has reported that the concentration of greenhouse gases in the atmosphere, including carbon dioxide (CO2), methane, and nitrous oxide, has increased significantly since the industrial revolution, largely due to human activities. The IPCC has also stated that it is very likely that human activities have been the dominant cause of global warming since the mid-20th century.
- Impacts of Climate Change: Climate change is already having a significant impact on the planet, with many areas experiencing more frequent and intense heat waves, droughts, floods, and storms. The IPCC has reported that global warming of 1.5°C or higher is likely to lead to increased sea level rise, more frequent and severe heat waves, and more intense rainfall events, among other impacts. These impacts are expected to have significant consequences for human societies and ecosystems, including increased food insecurity, displacement of people, and biodiversity loss.
- Mitigation and Adaptation Strategies: To address the causes of climate change, the IPCC has recommended a range of mitigation strategies, including reducing greenhouse gas emissions through energy efficiency measures, transitioning to renewable energy sources, and carbon capture and storage. Adaptation strategies, such as developing drought-resistant crops, building sea walls, and relocating communities at risk from rising sea levels, are also critical to prepare for and manage the impacts of climate change.
- Policy Responses: Climate change is a global problem that requires coordinated international action. The Paris Agreement, adopted in 2015, represents a significant step towards addressing the issue by setting a target of limiting global warming to well below 2°C above pre-industrial levels, and pursuing efforts to limit the increase to 1.5°C. To achieve this goal, countries are required to submit nationally determined contributions (NDCs) outlining their efforts to reduce emissions and adapt to the impacts of climate change. The literature has also explored other policy responses, including carbon taxes, emissions trading schemes, and subsidies for renewable energy, as well as the challenges and opportunities of implementing these measures.

Impact of climate change

- Global temperatures have risen by approximately 1.1°C since pre-industrial times, and are projected to rise by another 1.5°C to 4.5°C by the end of the century if greenhouse gas emissions continue to increase at their current rate.
- The concentration of carbon dioxide (CO2) in the atmosphere has reached 414.66 parts per million (ppm) as of May 2021, which is the highest level in at least 800,000 years.
- The last decade (2011-2020) was the warmest decade on record, with each of the last four decades being successively warmer than any preceding decade since 1850.
- The Arctic sea ice extent has declined by 13.1% per decade since 1979, and the rate of decline is accelerating.
- Extreme weather events, such as heat waves, droughts, and heavy precipitation events, have become more frequent and severe in many parts of the world.
- Sea levels have risen by approximately 20 cm since pre-industrial times, and are projected to rise by another 26-82 cm by the end of the century, depending on future emissions.
- The global carbon budget – the total amount of carbon that can be emitted while still limiting global warming to 1.5°C – is estimated to be approximately 420 gigatons of CO2, and we have already emitted about two-thirds of that budget.

Climate change is a complex and global problem that requires coordinated efforts from individuals, governments, and businesses to find sustainable solutions. Here are some potential solutions that can help mitigate the effects of climate change:

1. Renewable Energy: Transitioning to renewable energy sources, such as solar, wind, and hydropower can significantly reduce carbon emissions.
2. Energy Efficiency: Improving energy efficiency in buildings and transportation can reduce the energy needed to run them, hence lowering carbon emissions.
3. Carbon Capture and Storage: This involves capturing carbon dioxide from power plants and other industrial processes and storing it underground, preventing it from entering the atmosphere.
4. Sustainable Agriculture: Practices like crop rotation, cover cropping, and reduced tillage can improve soil health and reduce emissions from fertilizer use.
5. Forest Conservation and Reforestation: Trees absorb carbon dioxide, so conserving existing forests and planting new ones can help reduce carbon emissions.
6. Circular Economy: Moving towards a circular economy, where materials are recycled and reused, can reduce the amount of waste and emissions from manufacturing and production.
7. Education and Awareness: Education and awareness campaigns can encourage individuals to adopt more sustainable lifestyles and push for change at a larger scale.

Conclusion

Biodiversity conservation is essential for sustainable development in developing countries. Biodiversity conservation is essential for the survival of our planet and its inhabitants. Biodiversity is critical for maintaining ecosystem services such as clean air and water, nutrient cycling, and carbon sequestration. It also provides numerous direct benefits to humans, including food, medicine, and recreation. The loss of biodiversity is mainly caused by human activities such as habitat destruction, overexploitation of resources, pollution, and climate change. It is therefore our responsibility to take action to conserve biodiversity and ensure the sustainability of the planet. Conservation efforts can take many forms, including habitat restoration, protected area management, sustainable resource use, and education and awareness-raising. Collaboration between governments, NGOs, businesses, and individuals is also essential for effective biodiversity conservation. While there is still much work to be done, there have been some successes in biodiversity conservation. These include the recovery of endangered species, the establishment of protected areas, and the adoption of sustainable practices in some industries. In conclusion, biodiversity conservation is critical for the well-being of

our planet and its inhabitants. It is a shared responsibility that requires collective action to ensure a sustainable future for all.

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PROTEIN AND AMINO ACID MODULATION IN FRESH WATER FISH *OPHIOCEPHALUS STRIATUS* EXPOSED TO CYPERMETHRIN

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ABSTRACT

Cypermethrin, a synthetic pyrethroid showed non-target effects on the freshwater fish Ophiocephalus striatus The presents study showed the impact of sub lethal concentration (0.0007 µ/lit) of cypermethrin on the concentration of protein and amino acid in two tissues such as liver and muscle of freshwater fish Ophiocephalis striatus at different time intervals. Decrease in protein level was observed in both tissues liver and muscle. But there was observed increase in amino acid level in both tissues muscle and liver of Ophiocephalus striatus at different time intervals.

Keywords: Cypermethrin, liver, muscle, protein, amino acid.

Introduction

Water is main component of the environment which is dynamic entities. It has an effective means of transfer and transport of the waste and other materials. Soil on the other hand is stationary entities, which are indirectly affected by the contaminated water. Toxic waste dumped on a soil may cause harm to the animals and indirectly to human being. The structure and function of lotic ecosystems changed due to pollutants.1 The toxic effect of contaminated water on non target organisms is observed by2,3. One among the environmental problems is the lack of proper management of domestic and industrial wastes which release hazardous chemicals. There is no doubt; these excessive levels of pollutants are causing a lot of damage observed in human and animal health. The organic pollutants may cause declines, deformity and death of autistic life, which in turn cause disease to humans4-6. The aquatic environment is very important because it is a store house of variety of fishery resource. Presently aquatic pollution a serious problem thought out the world. It has been estimated that about 70,000 manmade chemicals are used day to day. These chemical have contributed a lot to the green revolution but their deleterious effects on various ecosystems cannot be ignored7.

Materials And Methods

The freshwater fish *Ophiocephalus striatus* were collected from Wadali lake around Amravati region, India. The fishes were acclimatized at laboratory condition for 1 week. The LC50 value was calculated by probity analysis method8. The LC50 value is 0.0007 µ/lit at 72 h. The acclimatized fishes were exposed to sub lethal concentration for 24 h, 48 h, 72 h and 96 h; simultaneously a control group of healthy fishes were maintained under identical conditions. The fishes were sacrificed at the end of exposure period and liver and muscle were processed for the biochemical estimation. Protein was estimated by the method of Lowry's9 and amino acid was estimated by the method of Moor and Stein10.

Result

The protein contents in the liver and muscle of the freshwater fish *Ophiocephalus striatus* exposed to sublethal concentration of cypermethrin at different time intervals and it showed declined trend as compare to control values. Due to toxic effect of cypermethrin, the process of protein synthesis get altered and an increase in proteolysis activity and possible utilization of its products for metabolic purposes. The amino acid contents in the liver and muscle of the freshwater fish *Ophiocephalus striatus* exposed to sublethal concentration of cypermethrin at different time intervals and it showed raised trend as compare to control value. Rised in amino acid level were the result of breakdown of protein for energy and impaired in association of amino acid in protein synthesis.

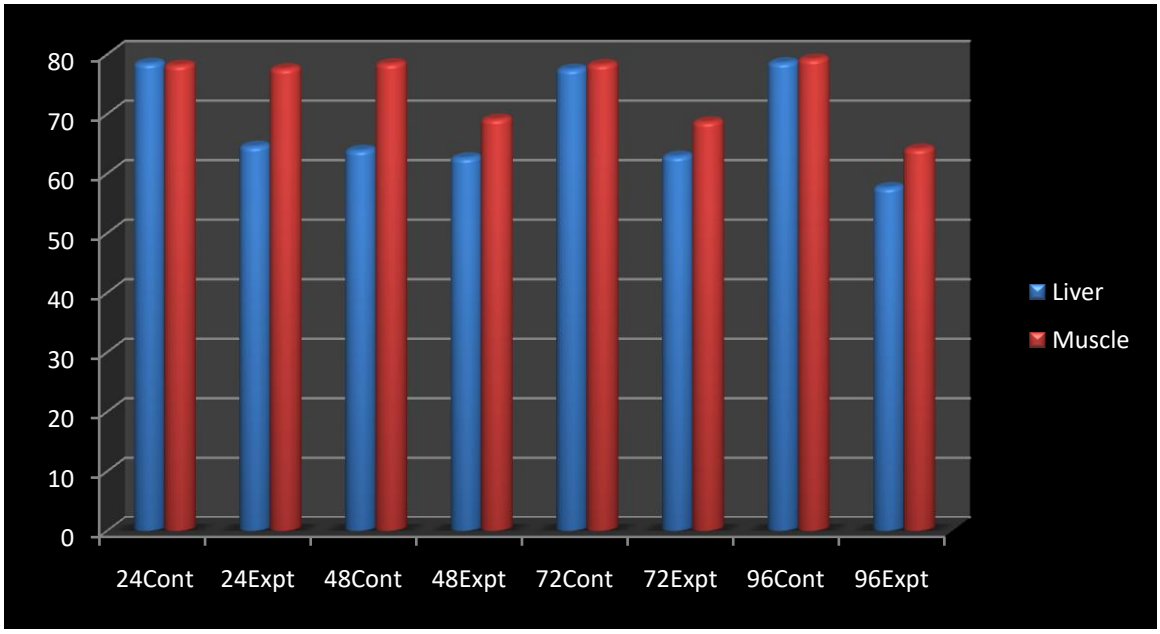

Figure 1: Changes in the Muscles, protein of fish *Ophiocephalus striatus* exposed to sub lethal concentration of cypermethrin at different time interval

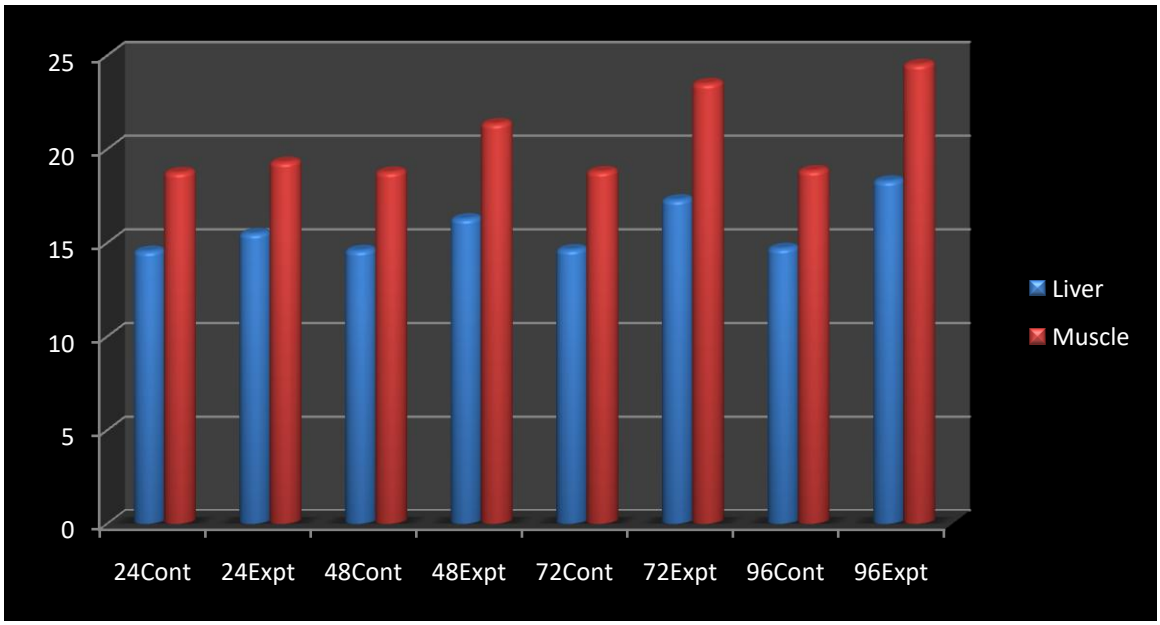

Figure 2: Changed in the Liver and muscle amino acid of the freshwater fish *Ophiocephalus striatus* exposed to sublethal concentration of cypermethrin at different time interval

Discussion

In the present study observed that there was significant decrease in total protein of muscle and liver tissues of freshwater fish *Ophiocephalus striatus* at different time interval exposed to sublethal concentration of cypermethrin. The similar study is given by the11 on the fresh water fish *Channa striatus* and found that there was toxic effect of cypermethrin on the liver and muscle protein level it decreases at different exposure period. Also supported by12, observed that there was effect of cypermethrin on protein content of rainbow trout *Oncarhynchus mykiss*. The depletion of protein fraction in liver, muscle and kidney may have been due to their degradation and possible utilization for metabolic processes. Similar results were also found by13-17.

The protein level showed decreased trend in Nile Tilapia, *Oreochromis niloticus*, in response to the treatment of cypermethrin by18. In *Clarias gariepinus* exposed to cyhalothrin decreased protein observed by19, in common carp.

Cyprinus carpio by20,21; observed the decreased in protein level of due to effect of cypermethrin in freshwater teleost *Colisa fasciatus*. Also the increase in the amino acid level was observed under the toxic effect of a synthetic pyrethroid, cypermethrin exposed to freshwater fish *Ophiocephalus striatus.*

Amino acids are considered one of the most reliable techniques for the detection of changes in protein synthesis in cell and therefore, the protein pattern can be used as a criterion for the differentiation between several organs exposed to some pollutants.

The similar study was also given by22, on the freshwater fish *Cirrhinus mrigala.* The toxic effect of cypermethrin also showed increased trend in *Cirrihinus mrigala*23, observed that there was increase in the amino acid level in the tissues of *Labeo rohita* and *Cirrhinus mrigala* exposed to fenvelerate. Similar increase of amino acid in *Labeo rohita* exposed to endosalfan was observed by24.

The freshwater fish *Clarias batrachus* exposed to cypermethrin, showed increase level of amino acid in muscle and kidney of fish25,26, observed that piscicidal activites of aqueous extract of *Euphorbia tirucalli* on freshwater fish *Chanaa punctatus* were altered the level of amino acid.27 reported the effect of cypermethrin on gill, liver and muscle of freshwater fish *Tilapia mossambica* that increase in amino acid.

Similar study was also given by28, observed that the increase in amino acid level in liver of *Channa maruius* when exposed to dimethoate and monocil.

Concluded that protein decreased because of more utilization due to pesticidal stress also which breakdown protein released amino acid in the tissue which was used in prolonged period.

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SYNTHESIS AND CHARACTERIZATION OF SCHIFF BASES OF BENZOPHENONE AND THEIR ANTIMICROBIAL ACTIVITY

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ABSTRACT

Schiff bases and their metal complexes are intensively investigated area of chemistry.Suchan attempt here to identify the antimicrobial properties of meta nitroaniline schiff base and it's four metal complex derivatives made up of Fe,Zn,Cu and Mn .Their resulting complexes were confirmed by FTIR and antimicrobial activity was determined by using E.coli and S.aureus.

Keywords *:- Schiff base, Benzophenone, metal Complex, antimicrobial activity.*

Introduction

Schiff bases or (azomethine) were first named by Hugo Schiff in 1864.There are compound formed from the condensation of primary amine with carbonyl compounds[1].Schiff bases with a azomethine group that contains a carbon and nitrogen double bond with the nitrogen atom connected to an Aryl group,or alkyl group[R],but not hydrogen.i.e.R1 R2C=N-R3, where R is an organic side chain[2,4].Schiff base ligands are good coordinating ligands and forms a stable complex with number of different transition metal ions, have shown a number of extensive applications in the field including Pharmaceutical,lifescience,chemicalscience including analytical as well as inorganic chemistry[5,6]. A wide range of biological properties of schiff base including antibacterial and antifungal activities[7-10],anticancer[11,12] and diuretic activities[13].Isatinschiff bases were reported that containantiviral,antiprotozoal and anthelmintics activities [14],O-phenyl enediamine Schiff base show clinical properties[15].

Aromatic Schiff base metal complexes catalyze some chemical reactions on oxygenation [16,17], hydrolysis [18],electro reduction[19] and decomposition[20].

Materials and methods

Synthesis of benzophenone and p-nitro aniline Schiff base [L]

0.01Mbenzophenone was mixed with 15 ml ethanol to this solution 0.01M of para nitroaniline was added.On magnetic stirrer the solution was mixed with addition of 2 to 3 drop of NaOH solution.For2-3 hours, mixture was allowed to reflux and then cold water was added. After filtration green coloured solid product was obtained and then dried.

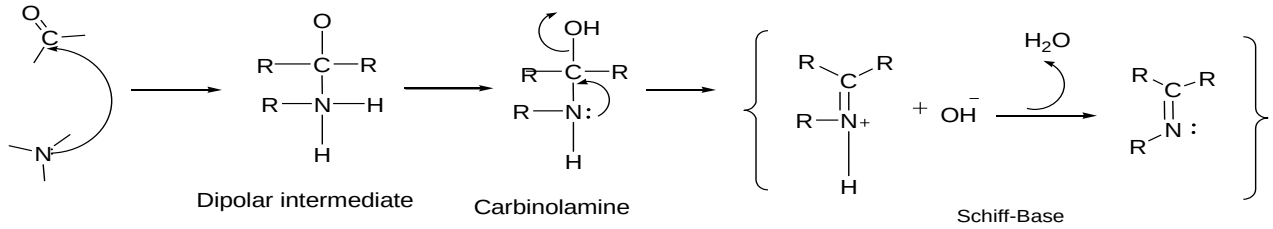

Figure:-1

General reaction mechanism of Schiff base

Synthesis of Schiff base metal complexes

For synthesis of metal complexes Fe,Zn, Mn and Cu used as metal. In the reaction 2.5 gramschiff base was dissolved in 15 ml ethanol. 0.02 mole of metal chloride solution were added. This mixture was stirred and reflux for 3 hours. The obtained product was filtered and then dried.

MX_n =$FeCl_2$, $ZnCl_2$,$CuCl_2$, $MnCl_2$

FTIR analysis

To confirm the formation of schiff base metal complexes Fourier transforms infrared spectrophotometer analysis was studied.

Antimicrobial activity

Antimicrobial activity was done by disc diffusion test method against E-Coli and S. aureus.The incubated disc with respected samples were then placed on the inocculated surface of agar plate and zone of inhibition was observed after 24 hours.

Results and discussion

FTIR analysis

In IR spectra of schiffbase ,absence of bands at ~1732 and 3300 cm-1 due to carbonyl v(C=O)and v(NH_2)stretching vibrations,show that the formation of metal complexes.Anewband was appeared at ~1622 cm-1 assign for azomethine v(C=N) linkage, showing that the substrate amino and ketos moieties for synthesis have been converted into ligands.

Antimicrobial activity

Table 1 shows the antimicrobial activity of the schiff base and their metal complexes.

Table 1

Schiff base and metal complex.	zone of inhibition (in mm)	
	E.Coli.	S.aurius
L1	14	12
$FeCl_2$	17	15
$ZnCL_2$	12	11
$MnCl_2$	17	19
$CuCl_2$	15	17

Results of antimicrobial activity indicate that the Schiff base metal Complex made up of Fe,Mn and Cu has more reactive in inhibiting the microbial growth as compared to schiff base ligand.

Conclusion

It was evaluated that metal complexes of shiff bases have more effective antimicrobial activity than its original form and highly dependent on the metal ion used for formation of schiff base metal complex.

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THE DIVERSITY STUDY OF ZOOPLANKTON FROMARUNAVATI RIVER, ARNI DIS-YAVATMAL

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ABSTRACT

Zooplanktons are worldwide distributed organism and they are found to be inhabiting in all tropical and subtropical freshwater Wetlands. They also acts as the bio indicator .The present investigation deals with the study of diversity of zooplankton studied out at Arunavati river of Arni region Dis- Yavatmal. There were 10 speciesfound belonging to 4 different classes from Zooplankton diversity. The classes of Zooplankton wasRotifera – Copepoda – Cladocera – Ostracoda. We found 3 species of class Rotifera (Keratella , Epiphanus,Branchionus), 2 species of class Copepoda (cyclops,,Diaptomus,), 4 species of class Cladocera (Daphnia, lactone, leptodera and Alona) and 1 species of class Ostracoda (Cypris).

Keywords :*Arunavati River, Zooplantons, Rotifera, Copepoda, Cladocera, Ostracoda*.

Introduction

Zooplanktons are heterotrophic, minute aquatic organisms present in the water bodies which acts as bio-indicators of pollution and plays an t role in food chain of fishes as animal food as it is rich source of nutrient to fishes. Zooplanktons are responsible for controlling thetropic link between primary producers and higher tropic level. e. Thus, can be used to assess the conditions in aquatic ecosystems (Primo et al., 2015). Their richness decreases in systems with increasing amounts of phosphorus, a nutrient commonly associated with eutrophic processes, and that certain species of cladocerans are especially sensitive to increased phosphorus (Jeppesen et al., 2011) .Rotifera, Copepoda, Cladocera, Ostracoda are the three major groups of fresh water Zooplanktons found abundantly in all the possible environmental conditions hence attracted attention of many ecologists . Thus, they can to be used to assess the conditions in aquatic ecosystems (Primo et al., 2015). Various researches carried out work to study the zooplanktons of different fresh water bodies

Jayabhaye (2010) studied zooplankton diversity of river Kayadhu, near Hingoli city Maharashtra. Vanjare*et al.*, (2010) reported zooplankton from a polluted river, Mula of pune India, with record of Brachionusrubens (Ehrenberg, 1838) epizoic on Moinamacrocopa (Straus, 1820) the occurrence of which coincided with lower dissolved oxygen (DO) content. Kabraet.al., (2016) carried out a research work to analyze zooplanktons of Fresh water ecosystem in Washim town, Maharashtra, India.

The study of Khaire (2020) deals with monthly variations in the zooplankton dynamics and their correlations with some physicochemical characteristics of Sina dam and observed 17 genera of zooplanktons belonging to four major groups. Pal and Chakraborty (2014) studied the physical and chemical parameters such as temperature, acidity, total hardness, pH, electrical conductivity, total dissolved solids, turbidity, chloride concentration and dissolved oxygen for the survivability of the zooplanktons and the aquatic ecosystems; these matters have been discussed in the study.

There is lot of work on Zooplanktons from different areas of India but no back record found about the zooplankton diversity of Arunavatiraiver in Arniregion ,DistYavatmal , hence this investigation was undertaken for the short period of time.

Materials and Methods

The study was conducted for a period of six monthe from Dec 2021 to May 2022. Zooplankton were sampled weekly from the site **of** the Arunavati river in the (Lantitude : 20.062103 and Longitude : 77.947907) , Arni

Maharashtra, India. The samples were collected directly from the water body in the morning hours with the help of net of mesh size 25 micron . Net of planktons acts as a filter and it is most common method for collection of zooplanktons .The sample is brought to the laboratory without any disturbances. The concentrated zooplankton samples are carefully transferred to the beaker.

Few drops of sample water was taken on a slide with the help of dropper and 2 to 3 drops of glycerins or saline solution was added into it and then we observed it under Microscope.with its standard identification and its monographs as well as keys which were suggested by APHA (1985); Tonapi (1980); Dodson and Frey (1991) and Williamson (1991) and following the systematic key by Battish (1992) and Altaff (2004).

Result and Discussion

In present investigation in the year of 2021-2022on the wholea total 10 species of zooplankton belonging to four groups Rotifera – Copepoda – Cladocera – Ostracoda.were recorded . Among the recorded , 3 species of class Rotifera (Keratella , Epiphanus,Brachionus), 2 species of class Copepoda (cyclops, diaptomus), 3 species of class Cladocera (Daphnia, lactone, leptodera,Alona) and 1 species of class Ostracoda (Cypris). Similar observation was made by many researchers throughout the country Kar and Kar (2013) reported 26 species of Zooplankton from an oxbow lake of Cachar, Assam;

During the study period, among Rotifera, *Brachionus sp., Keratellasp.,*. were recorded throughout the study months.AmongCladocera, Daphnia pulex sp. were recorded throughout the work.; among Copepoda Cyclops, sp.andCyprissp from Ostracoda were recorded throughout the study period. During the present study, Rotifera group and Cladocera was reported to be dominant among all other Zooplankton groups. In tropical freshwater wetlands, dominance of rotifera group is a common characteristic, similar was reported from the studies of Mwebaza-Nadwula, 2005.

Phylum	Genera	Dec	Jan	Feb	Mar	April	May
Rotifera	*Keretella*	✓	✓	✓	✓	✓	✓
	Epiphanus	-	✓	✓	✓	✓	-
	Brachionus	✓	✓	✓	✓	✓	✓
Copepoda	*Cyclops*	✓	✓	✓	✓	✓	-
	Diaptomus	-	-	✓	-	-	✓
Cladocera	*Daphnia pulex*	✓	✓	✓	✓	✓	✓
	Lactona	✓	✓	✓	-	-	✓
	Leptodera	-	-	-	-	-	✓
	Alona	-	✓	-	✓ -	✓	✓
Ostracoda	*Cypris*	✓	✓	✓	✓	✓	✓

Table 1:Abundance of different groups of Zooplankton during December 2021 to May2022

Conclusion

The present investigation reveals that the diversity of zooplanktons plays very significant role in the functioning of freshwater ecosystem. Were recorded 10 species of zooplankton among 06 species belonging to Rotifera,Rotifera – Copepoda – Cladocera – Ostracoda. The presence and dominance of zooplankton species played a very significant role in the functioning of freshwater ecosystem.

The Biodiversity of aquatic life conservation todays an important task because day to day pollution is increase and their directly effect on aquatic life concluded that the quantity of zooplanktons in water provided significant information about the available sources for supporting life for fishery development. Thus Conservation of biodiversity is the need of today. Thus, keeping in view the importance of

the study, steps should be taken for the conservation and maintenance of the freshwater wetland.

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SOCIO-POLITICAL AWAKENING AND THE PUNJAB PRESS

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The Press as spring board of their ideas regarding the socio consciousness and nationalism. Press to a society is like a mind to a body. It reflects and contemplates on social conditions, formulates social goods, inculcates aspirations and in the process creates social consciousness. The press guides social actions for the achievements of those goals. But there are two parameters- one, it requires a society of literates which puts a limit on the functioning of press; second, it is rooted in the society. As regards the nature and character of the Punjab society it was at that time primarily agrarian based tribal society with a limited commercial class-living in the urban areas. Besides the three basic segments- the Hindus, the Muslims and the Sikhs, the Punjab society was divided into a large number of castes, communities and tribes.

Such a society divided on castes and communal lines suffered from a large number of social evils. Backward, steeped in ignorance and superstitions, the Punjab society suffered from such obnoxious vices as depressed position of the woman, child marriage, prostitution, ritualism so on and so forth. It is pertinent as well as significant to mention in Punjab this practice was restored to amongst the *Bedis*, and Hill *Rajputs*, more from a feeling of pride than from their inability to pay the marriage expenses. The girls who belonged to weaker sections or whose parents were poor, mostly remained unmarried for a long time, sometime to an old age. Their lives were really miserable and pitiable. Thus, costly marriage became one of the causes of poverty. Sometimes dowry could even lead to murder or suicide.[1]

After the *Brahmo Samaj*, was founded in Lahore, in 1863, by Babu Navin Chandra Roy,[2] there came into existence several societies, *Sabhas* and Leagues in Punjab. The *Sat Sabha* was founded at Lahore in 1866. It was to impart elementary truths of the western knowledge to the people of Punjab through their own languages. Its main objectives were social reforms and religious developments in all parts of the province. However, the movement soon lost ground; it died out by the close of the 19th century. The *Anjuman Hymala* was another society which was founded at Kangra. Its branches were opened at Dharmsala, Nurpur and other places.[3] It propagated social reforms; it too uplifted the down trodden. *Nit Parkash Sabha* and Amritsar *Dharma Sabha* were other two social organizations at Amritsar which aimed at irradiating the various religious and social abuses prevalent there.[4]

The *Patiala Akhbar* of March 21st, 1873 tells that *Sat Sabha* was set up at Amritsar with a view to carry out social and religious reforms in the Hindu community.[5] Another native association 'the Indian National Society' was founded at Lahore by some educated members.[6] It was believed that the Punjab *Sabhas* and conferences of *Jats, Sarins* (the *Punjabi Khatri*), the *Khalsa* (the Sikhs) and Jain communities were formed along with a number of *Brahmin* caste associations.[7] These reforms activities were supplemented by the activities of the *Brahmo Samaj*, the *Arya Samaj*, the *Singh Sabha*, the *Sanatan Dhama Sabha* and other such societies.[8] Lala Dev Raj, Lala Munshi Ram, Lala Hans Raj and Lala Lajpat Rai were some of the prominent supporters of the social conferences when some orthodox individuals did not favour the radical ideas especially of the *Arya Samaj*. In Punjab Pandit Din Dayal Sharma, whose vigorous attack on the *Arya Samaj* gained strength, founded the *Sanatan Dhrama Sabha* in 1895 at Delhi.[9] The *Bharat Dhrama Maha Mandal* conducted its first conference at Delhi in 1900. It was presided over by *Maharaja* of Darbhanga. Raj Pandit Suraj Mal and Justice Chatterjee helped in its work.[10]

According to the report of the fourth National Social Conference, widow Marriage Association, *Hindu Sabha, Guru Singh Sabha* and Sindh Social Reform Association were doing very useful work in the field of social reforms.[11] In its fifth report, National Social

Conference added some more names in the line of associations which were doing fruitful work in the field of social reforms. The *Khatri Sabha, Kashmiri Pandit Sabha, Sami Sabha, Kakarni Sabha, Bhera Anand Sabha,* Purity Association, Temperance League and *Shudhi Sabha* were founded in Lahore which worked for the social upliftment in this area particularly.[12] They drew their leadership and followers initially from western educated caste men and not from traditional caste leaders. They were aware of social reform movement and for whom advancement of their caste implied adoption of modern social ideas.[13]

In Punjab, despite this relative inertia among the Muslims, social reform movement started among them which raised the voice against Muslim orthodoxy in order to prove that there was nothing in the *Quran* which stood in their way. Taking to English education and imbibing rational and advanced thoughts based on scientific knowledge of the west, the Muslim intelligentsia was convinced that without the English education the Indian Muslims were doomed.[14] Maulvi Ulfat Hussain founded the *Anjuman-i-Imami*; it was the first Muslim socio- religious society. It was established for adopting measures for reforms in the customs and ceremonies of Muslims of *Shia* sect and remarriage of widows. *Anjuman-i-Islamia* was another social reform organization and a new Muhamadan society at Lahore for the socio-cultural emancipation and development of the community of Muslims.[15] The *Anjuman-Akhwan-ul-Safa* was another Muslim association which was founded at Gujranwala. It was to work for the social upliftment of the Muslims.[16]

Consequently, these social organizations of the Hindus and the Muslims realized the importance of the press. So they started their own newspapers to propagate their social reform programme and policies against the social evils. No doubt, the press was an effective weapon in the hands of the social reform associations and societies to expose social evils and organize propaganda against inhuman institutions, such as untouchability. In fact, the growth of early press and newspapers considerably stimulated by the public interest in socio- religious matters like widow-remarriage, female education, female infanticide, prostitution, idol worship, superstition,[17] etc.

Infanticide was a very widely prevalent vice and evil social practice in Punjab at the advent of the British in 1849. The *Punjab Akhbar* commenting upon the census report of Punjab noticed the fact that infanticide was quite common there. The Deputy Commissioner of Ambala reported that female children were so few in number that girls were sent from Patna to be married in Ambala District.[18]

The Government passed the Act VIII of 1870 to suppress infanticide. But it was not expected to serve the purpose unless backed by the public opinion. The *Akhbar-i-Am* complained that infanticide was very cruel system among the inhabitants of Punjab. The Government was requested through the columns of *Akhbar-i-Am* to adopt stringent follow up measures to put a stop to it[19]at once. The *Aftab-i-Punjab* reported that infanticide was very much in vague among some tribes, such as 'Sidhu', 'Sodhi', 'Sandhu', 'Gill', 'Delum', 'Dhaliwal', etc. in Punjab, particularly in the Ferozepur district. The Punjab press complained that the Government had not yet adopted any effective measure to check it. The expensive marriages among the Hindus were the principal factor of the evil in question.[20] It required a firm social check. It was also reported that police took bribes and deliberately this crime was not prevented. The *Zamindars* of the Jullundur district sent a petition that infanticide was prevalent in the district and the police officials being corrupt did not check it. They also suggested that it could be prevented if heavy expanses in marriages were prohibited by the Government. The Census Report of 1891 stated clearly the excess of male over females for Muslims 14%, the Hindus 25% and the Sikhs 22%.[21] Undoubtedly, illiteracy was another factor responsible for this cruel undesirable practice. So the opening of schools was demanded. Of course, numbers of schools were started by different socio-religious associations and societies. But the removal of illiteracy was a long social process.

The *Wazir-ul-Mulk* (Sialkot) published in one of its columns that if the custom of child marriage was abolished, the number of

widows, in due course of time, would be greatly diminished. The memorial from Baptist Missionary Society prayed for certain changes in the Indian marriage law as regarded infant marriage.[22] Some papers did not like the Government intervention in socio-cultural and religious matters. However, the various social reforms bodies could not stop their agitations. Consequently, the Government took a decision to consider for legislation the question of the age of consent, in 1889.

The vernacular press particularly in Punjab and Bengal was the first to sound alarm at the British renewed interest in the Hindu marriage system. The slogan was raised by them to defend the country from alien attacks, such as the Age of Consent Bill. Among the supporters of the Bill, the *Hindustan* approved the revised age of consent from 10 to 12 years, so did the *Dharam Jiwan*,[23] published from Lahore.

However, the papers which had conventional socio-religious views, denounced the Bill. The *Akhbar-i-Am* (Lahore) also denounced the measure. It reported that several memorials were sent to the legislative councils protesting against the Bill. The *Ain-i-Hind* (Lahore) strongly deprecated Government intervention in the internal affairs of the people in Punjab.[24] The *Bharat Jiwan* considered the Bill as an unjust attack on the Hindu religion and culture. It opposed even to the provisions of the Queen's proclamation of 1858. The *Aftab-i-Punjab* and the *Aftab-i-Hind* thought and advocated that the Bill was unjust and injurious. The *Pate Khan* protested against the passing of the age of consent Bill on social and religious grounds.[25]

Some organizations like the *Widhwa Ashram* (Widow Remarriage Association) had been formed at Ludhiana. Jai Chand, the Secretary of *Arya Prtinidhi Sabha,* Punjab observed that it was due to the sins and misdeeds of the people that India had sunk to the lowest ebb of degradation. The widow re-marriage was performed under the auspices of the *Arya Samaj* at Lahore on January 9, 1900 between Karam Devi and Lala Tola Ram of the *Khatri* caste; perhaps it was the first instance of remarriage in this caste.[26] Another instance of remarriage, in March 1900, of *Vaishya* girl Parwati with Lala Kalu Ram took place under the auspices of the *Arya Samaj* in Lahore.[27] In March 1906, two widow remarriages took place in Punjab, one at Amritsar and another in Lahore.[28] The *Arya Darpan* of May 1902 published an article in the form of an appeal to Lord Curzon in which the British Government was urged to protect the interest of widow.[29] It is significant to state that the vernacular press influenced the local government and the Governor of the province and it was through them that the Indian Government was pressurized to adopt necessary legislation.

Similarly, the socio-religious movements as well as the press took up in their hands the crucial issue of expanses incurred at the time of marriage and also on the marriage. In fact, most of the practical reforms in this regard had already been undertaken by the caste association through the instrumentality of the press. The point was hammered home at needlessly high marriage expanses constituted a main cause not only of poverty but also of immorality among both the Hindus and Muslims. The press sought the attention of the people and the government. The *Urdu Delhi Gazette* urged the authorities to take steps to stop their evil practice in so far it was neither religious nor a wise custom.[30] Social reform organization also took initiatives in this direction.

Several articles published in different vernacular papers, drew public attention to the most abominable evil social practice of prostitution. Prostitution was a commercialized evil.[31] Though some legislative measures were taken to stop it, the gigantic and wicked custom continued. The press drew attention to the objectionable conduct of women whoever reported to sit in public and cause much annoyance and demanded that their freedom should be stopped.[32]

Another evil which was highlighted and strongly denounced was the untouchability in the social structure of the Hindus in Punjab.[33] No doubt, untouchability by this time had become the chief plank of all social reform movements. Their deplorable conditions aroused the sympathy of such educated Hindus as had been affected with the western liberal democratic ideas. They adopted the press as the best means of molding the public opinion to

ameliorate the conditions of untouchables. The pioneering work in this sphere as started by the *Brahmo Samaj*, the *Arya Samaj*, etc. The growth of Hindu opinion on the subject was positively due to the influence of western ideas, culture and way of life.[34] The educated people, who studied the liberal philosophy and democratic institutions of western countries, became the standard bearer of anti-caste revolt.[35]

The *Arya Samaj* started the *Shudhi* movement to purify the downtrodden caste. The *Shudhi Sabha* of Lahore undertook the task of partaking of food with Muslims, Sweepers, *Chamars*, etc. after their conversions.[36]

Conclusion

Hence, from the above discussion and facts it became clear that the relationship of press and society was circular and spiritual. The press definitely aroused awareness among the masses. They expressed aspirations which led to constant interaction among the different sections of the society. He knew it well that in Punjab, socio-religious system was more backward, because the society was more tribal in its character than orthodox and religious. In Punjab, the Brhamnical domination was less dominant because of historical reasons. The Punjab society made quick response to westernization as well as modernization, because of the economic pressure they had been experiencing since the days of the annexation of Punjab. Therefore, socio religious movements sprang up quickly. These orgaizations helped in the spread of education and with the development of education, soon press became an important institution in Punjab.

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31 Regarding the origin of Prostitution and its various aspects which affected the society see MA Elliot and EE Merill, *Social Disorganization*, Delhi, 1941, 243; G.R. Madan, Indian Social Problem, Vol. I, (n.d.), 212-15; R.B.K. Jayakar, "Article on Prostitution and immoral traffic in India", Social *Welfare in India*, 1955, 350-55; Kautilya, *Arthshasthtra*, Book 11, Chapter 28.
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34 S. Natarajan *A Century of Social Reform in India*, Delhi.
35 A.R. Desai, *op.cit*., 217-220.
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