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Dimensions of Livelihood in Rural India

CHIEF EDITOR

DR GOVIND SINGH



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CHAPTER - 01

WATER ENTREPRENEURSHIP, A FUTURE CHALLENGE?

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1.1 INTRODUCTION

The impending water crisis presents multi-faceted challenges to the water sector. Groundwater over-pumping and aquifer depletion are now serious problems in the world's most intensive agricultural areas in India. Twenty-one percent of irrigation in India is achieved by pumping ground water at rates that exceed the water's ability to recharge (and most water used for irrigation cannot be recycled). The crises around the world are more alarming. In the Arabian peninsula, groundwater use is nearly three times greater than recharge and, at the current rate of extraction, Saudi Arabia is running toward total depletion in the next 50 years; Israel's extraction has exceeded replacement by 2.5 billion meters in 25 years and 13 percent of its coastal aquifer is contaminated by seawater and fertilizer run-off; current depletion of Africa's non-recharging aquifers is estimated at 10 billion cubic meters a year; water tables are falling everywhere throughout India; land beneath Bangkok has actually sunk due to massive over-pumping; and Northern China now has eight regions of aquifer overdraft while the water table beneath Beijing has dropped 37 meters over the last four decades.(Anonymous,2012)Sustainable water management in India posing numerous challenges: bridging the increasing gap between demand and supply, providing enough water for production of food, balancing the uses between competing demands, meeting the growing demands of big cities, treatment of wastewater, sharing of water with the neighbouring countries and among the co-basin states, etc.,(Jain,2012)

1.1.1 CHALLENGES

Improving access to water is difficult because responsibility for water resources management is usually spread across many different parts of the government in developing countries. No single government department can take the lead, as they often have conflicting views. For example, agricultural departments are usually more interested in promoting irrigation and food production, while other ministries will be more interested in improving the supply of drinking water and sanitation. Today, more than 2 billion people are

affected by water shortages in over 40 countries. Appropriate long term financing and commitment of government as well as people is required to improve access to water and sanitation and to conserve present water resources. Improvement in delivery facilities and delivery services for all citizens need to be improved to resolve the competing demands for water and other related environmental challenges.

Both, surface and ground water resources are increasingly under pressure from population growth, economic activity, and intensifying competition among users. Water withdrawals have increased more than twice as fast as population growth and currently, one third of the world's population live in countries that experience medium to high water stress. Pollution is further enhancing water scarcity by reducing water usability downstream. Shortcomings in the management of water, a focus on developing new sources rather than managing existing ones better, and top-down sector approaches to water management result in uncoordinated development and management of the resource. More and more development means greater impacts on the environment. Current concerns about climate variability and climate change demand improved management of water resources to cope with more intense floods and droughts. As well as creating major environmental problems, overtapping of ground water and rivers is exacerbating another potential crisis—world food security. Irrigation for crop production claims 65 percent of all water used by humans, compared to 25 percent for industry and 10 percent for households and municipalities. The annual rise in population means that more water is needed every year for grain production (for humans and animals), a highly water-intensive activity. There are some dry areas which are not able to serve needs of farming as well as urbanization. If these regions are to meet everyday water requirements, they might have to permanently import all or most of their food. This raises the prospect that lack of water will make some countries chronically dependent on others, or on the international community at large. Achieving economically efficient use of our limited water and financial resources requires attention to gender. It enables:

- **Effective investment:** Water infrastructure can be more widely and optimally used, maintained and sustained when women's and men's demands, expectations, experience, involvement and knowledge are considered. Such consideration enables targeted solutions in technology, payment and management systems, and other domains, and can result in better use of limited funds, human resources and water.
- **Enhanced cost-recovery:** Recovery of investment in water services can be improved if women's and men's traditional roles in water management are recognised and promoted in an equitable manner.

- Enhanced ownership: Communities feel more committed to water projects that properly target gender-specific issues.

Water has a value as an economic good as well as a social good. Many past failures in IWRM are attributable to ignoring the full value of water. The maximum benefits from water resources cannot be derived if misperceptions about the value of water persist.

1.2 ROLE OF ENTREPRENEURSHIP

An entrepreneur is a person who organizes, manages, and assumes the risks of a business or enterprise. He is an agent of change. Entrepreneurship discovers new ways of combining resources. When the market value generated by this new combination of resources is greater than the market value these resources can generate elsewhere individually or in some other combination, the entrepreneur makes a profit. The French economist Say first coined the term in 1800, defining an entrepreneur as a person who “shifts economic resources out of an area of lower and into an area of higher productivity and greater yield”

Successful entrepreneurs expand the size of the economic margin for everyone. Bill Gates made the software that increases human productivity, He expanded our ability to generate more output and hence the income, resulting in a higher standard of living for all. Entrepreneurship can be defined as the purposeful activity (including an integrated sequence of decisions) of an individual or group of associated individuals, undertaken to initiate, maintain, or aggrandize a profit-oriented business unit for the production or distribution of economic goods and services with pecuniary or other advantage the goal or measure of success, in interaction with (or within the conditions established by) the internal situation of the unit itself or with the economic, political, and social circumstances (institutions and practices) of a period which allows an appreciable measure of freedom of decision

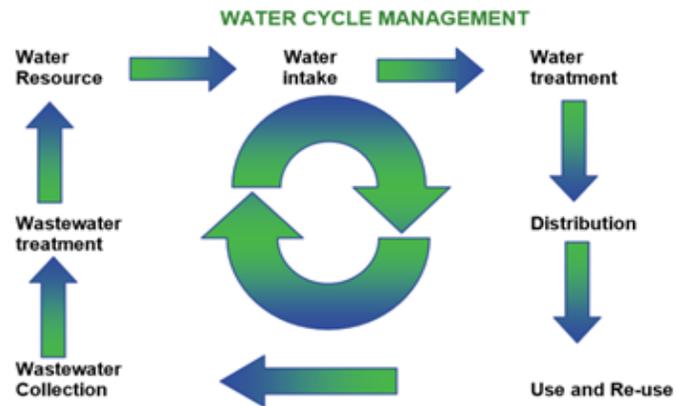
1.2.1 VALUE VERSUS CHARGES

The value of water in alternative uses is important for the rational allocation of water as a scarce resource, whether by regulatory or economic means. Conversely, charging for water is applying an economic instrument to achieve multiple objectives as follows:

To support disadvantaged groups

- Influence behaviour towards conservation and efficient water usage;
- Provide incentives for demand management;
- Ensure cost recovery; and
- Signal consumer willingness to pay for additional investments in water services.

Treating water as an economic good is imperative for logical decision making on water allocation between different, competing water sectors, especially in an environment of water resource scarcity. It becomes necessary when extending supply is no longer a feasible option. This shows the water cycle, all water can be efficiently used between the resource, the use for drinking water and the treatment and reuse.



Each part in the figure represents a point where costs are made and revenues can be obtained. It is also possible to deal with the process in an integrated way. Taking the water cycle as the point of departure, In India, there are problems in managing the resource or the quantity of water. Problems with the quality of water arise when making the resource usable for human consumption, agriculture, or industry and when we want to recycle the used water. It is important to involve the stakeholders at each stage and to promote private initiative. In a more systematic way, we can point to the following processes or forces that make water an issue to deal with:

- Economic growth, leading to more demand for water, and more pollution of the existing resources;
- Population growth and increased urbanisation, leading to more consumption and pollution;
- Concerns about the health of people and the environment;
- Forces to increase the scale of production and to go towards bigger utilities and more modern equipment;
- Government failure to deal adequately with the issues;
- Market failure (In a number of cases related to water, the private sector has also not stepped in to solve the issues);
- Increasing critique on the poor management of utilities and river basin organisations;
- The search for achieving economic, environmental and social sustainability; and
- Climate change

The Dublin principles implied that water is a social and an economic good. It is a scarce product, with multiple competitive uses, that needs to be treated and which commands a price. The rational use of resources usually requires that consumers, farmers and industrialists contribute to the cost of managing the water, cleaning it and bringing it to their houses, farms or factories. In general, it seems preferable to have a system in which water users (be it consumers or producers) pay for any private benefits from water they get, whereas the public sector mainly finances activities and functions which are related to the provision of public goods in water-related activities.

1.3 A SOCIAL GOOD : EQUITY ISSUES

Water is also a social good, meaning social considerations play a role in allocation decisions. Many countries follow a lifeline approach, meaning that everybody needs at least 20 litres of water per day; and this quantity is supplied free of charge. If you consume more, you have to pay; and through cross-subsidies, the great consumers pay for the poor. When we speak of achieving equity in water, we have in mind mainly the situation of vulnerable groups of society, which are excluded from access to basic goods and services, in this case to water. A particularly acute equity problem is the case where the poorest group pays more per unit of water than all other social groups, which is a situation we find in cities with partial coverage of potable water. The situation of women and children is often very acute. They find it hard to gain access to safe water, or it would require major efforts in money or time.

An important equity issue in irrigation occurs when farmers that are located downstream receive less water than anticipated due to increasing losses in distribution. Marginal sectors on irrigated areas are the first to suffer from shortages when a drought strikes, for instance. Gender issues can also be considered as an equity issue. Opening a water market (a market where water is bought and sold based on specified property rights) may improve the wellbeing of the parties that can use the market, but may have adverse effects on the wellbeing of other agents who are not participants, without these latter effects being fully incorporated into the market mechanism. Mobile water vendors in those areas where there is no piped water system Micro-savings and credit for originally saving and then paying connection fees for water and sanitation connections, which would otherwise be too expensive for poor people, Cross-subsidies, charging more to the bigger consumers, to allow a lower tariff for poor people. Development of water market, competitive entrepreneurship is necessary for water resource sustainability and ecological resilience under proper governance to ensure equality in water resource distribution, maintaining quality and resource wastage.

1.4 DEFINING ECONOMIC INSTRUMENTS FOR WATER MANAGEMENT

The need for using economic instruments in water management appears when there is an imbalance between supply and demand in water services. Because there are often no markets to solve the problem, authorities will public goods involved, economic instruments will also be used to raise revenues in order to finance the provision of these public goods. Also, authorities may consider introducing market-like instruments, like tradable water permits or tradable pollution permits. Economic instruments can be defined as (i) price-type or administered price instruments, like water tariffs, taxes and subsidies; but also fees, connection charges, abstraction charges (at water source level) and discharge charges; and (ii) market-type instruments: allowing water rights to be tradable fully or partially in markets.

Water tariffs are among the most important economic instruments and are set up to charge users for the recurrent use of water services. These may or may not cover full costs of the water service. If the full cost of water is covered by a water tariff, we can define taxes and subsidies as deviations from that tariff. Other important instruments are water fees, which might be charged when water permits are issued. Such fees will play the role of a licence that is linked to a permit regime. Water fees are also used for charging access to water-related aesthetical and recreational sites, or are considered as connection charges; and these fees will be paid when a user wants to connect to a water network.

Water abstraction charges, on the other hand, are similar to water tariffs, but are charged to multiple users at the source of water withdrawals. These charges are increasingly important for financing IWRM activities. They can either be charged as a fixed amount (like a fee) or depend on water use. Such charges are also known as bulk water pricing, and may be differentiated across user types (industrial, agricultural or utilities). They are potentially important economic instruments for managing inter-sector water allocations. Discharge charges are applied to activities that discharge effluents into water bodies. These charges are increasingly used to control and reduce water pollution – especially in developed countries – and will vary according to the quantity and quality of the load being discharged. The costs of administering and monitoring these discharges are generally high. Therefore, poorer countries are less likely to impose these, even when there may be considerable pollution due to economic activities in their main watercourses or water bodies.

Economic instruments are powerful devices for water management, especially when there are supply–demand imbalances. Increasing water tariffs in water management may reduce demand, Substitutes become cheaper and due to Increase supply , Marginal projects become affordable , economic incentives can be provided to reduce water losses also the managerial

efficiency will increase due to increased revenues which will Improve maintenance, Improve staff training and education ,Make modern monitoring and management techniques affordable and it will lead to sustainability , Reduces demands on resource base, Reduces pollution loads due to recycling of industrial water and may reduce the per-unit cost of water to poor people, Increases coverage of poor urban and peri-urban populations because additional water is available for extending the system, Reduces reliance by the poor on water vendors (Rogers et. al 2002). The use of market-like instruments is also an important economic instrument for water management, especially for signalling the opportunity cost of water and for reallocating water among sectors with acute differences in water values. Tradable permits may also be a useful instrument for water pollution control, where the authority sets a maximum level of effluents to be discharged on water bodies, and these are divided into quotas which can be marketed by users. The use of water markets, however, is still rare, as these are controversial and there are complex issues (externalities, transaction costs) which affect the correct operation of these.

1.5 WATER VALUATION AND ECONOMIC INSTRUMENTS

Economic instruments are important for water management, especially when there are notorious supply–demand imbalances and misallocations. As markets are seldom available for solving these problems, water authorities will decide about levels and features of water instruments (tariffs, fees, taxes) in order to influence behaviour and allocations. In deciding about this, information is required regarding how users value different water services, i.e. about their willingness to pay for these services.

For example, one important role of economic instruments is that these may allow reallocating water among uses, and types of users, without necessarily increasing water infrastructure. In this case, it is very important for decision makers to know the relative value of water for different users and uses, so that informed decisions can be made about using sound economic instruments to improve water allocation³. Even if expanded infrastructure and/or expanded water services are needed, there are compelling reasons to measuring what benefits are to be expected from the additional investments and how (and whom) to charge for covering the costs of generating those. In these important cases, water valuation methods are needed to guide for appropriate water investment decisions.

Although water valuation methods can be used for a diverse type of decisions, the most important uses for practical purposes are generally set up within a framework of cost-benefit analysis, in which water managers must consider the incremental cost and benefits of their decisions. ***Economic instrumentation or entrepreneurship can be applied***

- To reallocate water among alternative uses or type of users
- To expand water infrastructure
- To improve the quality of water
- To expand the water service to include sanitation and wastewater treatment
- To include water management actions at the basin level (very important for IWRM)

In all these cases, decisions will generate potential benefits but also costs for water stakeholders, being these producers, consumers or units of government. A few large users may dictate the system design capacity, one of the most important and costly design parameters for water systems, which makes it inequitable for smaller users who must share water costs. Large users may also have high usage rates, high peaking requirements, or both. In both these cases, the majorities (small users) are actually subsidising the needs of a few large users, and an apparently equitable charging system is actually inequitable.

1.6 CONCLUSIONS

The institutional arrangements developed to deal with the management of resources, such as water, have become scarce. Development of water markets, competitive entrepreneurship is necessary for water resource sustainability and ecological resilience under proper governance to ensure equality in water resource distribution, maintaining quality and resource wastage. Proper policies, mechanism to assure prices, and quality checks are necessary to ensure good water governance in water resource management and development of sustainable “water markets”. The role of institutions is important to maintain norms and traditions, legal frameworks and policies, rules and procedures for proper demand management. Social enforcement and some kind of control over the respect of these institutions are desirable.

REFERENCES

- Anonymous (2006). Adapted from Department for International Development (DFID)
- Anonymous(2008). Economics of sustainable water Management Training Manual and Facilitators’ Guide March 2008
- Asad, M., Azebedo, L., Kemper, K. and Simpson, L. 1999. Management of water resources. Bulk water pricing in Brazil. World Bank Technical Paper No. 432., USA.
- Bahl, R.W. and J.F. Linn, 1992. Urban public finance in developing countries. Washington: World Bank.
- Dijk, M.P. van, 2004. Water utility reform: How to do it? Presentation during the Water for African cities programme in Delft, The Netherlands. November 23, 2004, 16 pages.

- Brouwer, S., and F. Biermann. 2011. Towards adaptive management: examining the strategies of policy entrepreneurs in Dutch water management. *Ecology and Society* 16(4): 5. <http://dx.doi.org/10.5751/ES-04315-160405>
- Cole, Arthur H. "An Approach to the Study of Entrepreneurship: A Tribute to Edwin P. Gay," *Tasks of Economic History, Supplement to the Journal of Economic History*, 1946.
- Dijk, M.P. van, 2007. Urban management and institutional change: An integrated approach to achieving ecological cities. Contribution to an International seminar Sustainable Urbanisation in Libya.
- Drucker, P. D. 1985. *Innovation and entrepreneurship*. HarperCollins, New York, New York, USA. <http://dx.doi.org/10.1080/07377366.1986.10401060>
- Jain S.K.(2012) Sustainable water management in India considering likely climate and other changes *CURRENT SCIENCE*, VOL. 102, NO. 2, 25 JANUARY 2012.
- Franceys, R. and A. Bos, eds, 2003. Incentives for water utilities to serve the urban poor. Geneva: IMO Working Group, Water Supply and Sanitation Collaborative Council.
- Jaspers, Frank, 2001. *Institutions for Integrated Water Resources Management. Training Manual*. UNESCO-IHE, Delft, The Netherlands.
- Maude Barlow(2001) *The Global Water Crisis and the Commodification of the World's Water Supply* Council of Canadians Chair, IFG Committee on the Globalization of Water Revised Edition Spring
- Randall, A. 1988. Market Failure and the Efficiency of Irrigated Agriculture. In Gerald O'Mara (ed), *Efficiency in Irrigation. The Conjunctive Use of Surface and Groundwater Resources. A World Bank Symposium*. World Bank, Washington D.C. pp. 21–32, USA.
- Rogers, P., de Silva, R., Bhatia, R. (2002). Water is an economic good: How to use prices to promote equity, efficiency, and sustainability. *Water Policy* (4), pp.1–17. Varian, H. 1993. *Intermediate microeconomics: a Modern Approach*. Third edition. New York, W.W. Norton.
- Young R.A., 1996. *Measuring Economic Benefits for Water Investments and Policies*. Technical Report. 338. Washington: World Bank
- Zegarra, E. 2004. The market and water management reform in Peru. *Cepal Review* No. 83, August 2004. pp 101–113.

CHAPTER – 02

SOCIAL ENTREPRENEURSHIP FOR SUSTAINABLE RURAL DEVELOPMENT

Prof. Amarjeet Singh

Dean RDBM and Director and Link Officer CMCLDP, MGCGV, Chitrakoot, Satna (M.P.)

2.1 INTRODUCTION

The father of nation Mahatma Gandhi said that there is a sufficient resource for survival of each person but entire planet is less for a greedy person. This statement indicate that natural resources are not only limited but some of them are non-renewable and do not permit unlimited utilization of the resources for development. Sustainable development is based on the process of sustainability which is concerned with meeting the need of the present generation without compromising the ability and avenues of future generations. In simple term, we can say that all the policies of the public and private sector should be on the basis of the positive answer of the question that- “Will our grand children and their further generations also be able to enjoy living in the way we are living?” The present “LPG”(Liberalization, Globalization, and Privatization) based uncontrolled economy that annually powers billions of tones of pollution into our environment making it unhealthy, consumerism along with multiple exploitative modes of resources, chemical based modern agriculture, unlimited utilization of petroleum and other fossil fuels based transport and energy systems and disparity increasing economic system is not at all sustainable. The current trend in population growth consumerism, socio-ecological disorder, increasing poverty and unemployment, corruption and illegal process of exploitation etc. raises serious concern about the long term sustainability of ecosystem and society. So we can say that fast reaching uncontrolled developmental process of 20th century is last reaching a dead end. So it is a need of 21st century, for ecologically friendly and socially just society for sustainability of the developmental process.

Sustainable development as a concept, practice and an alternative for the existing economic order was proposed by the World Commission on Environment and Development (WCED) known as Brundtland Committee, in 1987. Sustainable development is the kind of development that meets the needs of the present without compromising the ability of future generations to meet their own needs. We have two major questions before us – (a) What needs to be sustained, namely, nature, life support system, and community and (b) What is to be developed, namely, individuals, the economy and society. This debate has originated

from the fear of environmental disorder that moved beyond boundaries when all the countries ratified Agenda 21 that binds sustainable development as policy priority in all economic, social and political space of the globe. Though the Agenda binds equally all nations across the globe, United Nations claimed that it may not be possible to come up with a single blueprint of sustainability for the entire globe, as economic and social systems and ecological conditions vary significantly among countries. Irrespective of these differences, sustainable development as a global framework should be considered as the ultimate objective of this discourse (United Nations General Assembly, 1987) while each nation to have own agenda. Sustainable development as a debate started with environment protection. Subsequently it has shifted to interrelation between production processes, environment and exploitation of resources for the production. The challenge of sustainable development is to maintain balance between environmental imperatives and economic growth with equal attention to the social dimension to 'promote diversity, protection of human rights, reduce poverty, and enhance workplace equity and social justice'.

The concept of social entrepreneurship is a rising concept in social sciences, and so it reflects several takes and interpretations, being that it tries to justify an array of entrepreneurship practices that have the double objective of creating and sharing the wealth in order to favour social development. Being that it is a new intervention area, it is also increasingly a public power challenge, namely in terms of city policies and social cohesion, challenging new methodologies and solutions for social problems of structural nature, such as poverty and exclusion. Therefore, it is increasingly present in European, National and Regional Agendas. It is also rising in terms of being considered as a municipal challenge, still having

2.2 SOCIAL ENTREPRENEUR

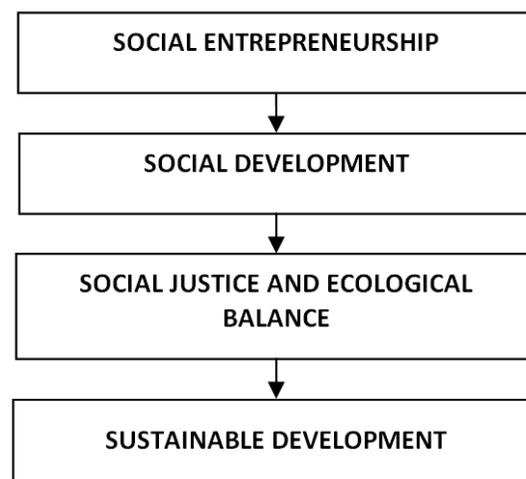
The term *social enterprise* was created by the American non-profit community in the 1970s, which began to create and operate their own businesses as ways to create job opportunities for the disadvantaged, homeless and other at-risk people. The idea is that a nonprofit business venture or revenue-generating activity can create positive social impact while operating with reference to a financial bottom line. Today, NGOs understand that only by establishing an independent means of support, can they continue to fulfill their mission. An NGO's new vigor and growth enables it to provide and expand vital services to its constituents and members while moving the organization toward self-sufficiency. Social Enterprises operate as commercially run businesses, aim to make profits, Generate the bulk

of their income through sales of goods or services, use good business practices and principles and use the majority of their profits to further social or environmental goals.

A **social entrepreneur** is an entrepreneur who works to increase social capital, often by founding humanitarian organizations. At first sight the idea of social entrepreneurship might seem paradoxical. Entrepreneurs are hero figures in the profit-seeking private sector. Social entrepreneurs are often community entrepreneurs, attempting to regenerate the locality, estate or neighborhood in which they are based. However, not all social entrepreneurs are based in geographically defined communities.

Social entrepreneurs are most usually found in what is called the voluntary sector. Yet this description can be misleading. Certainly they run not-for-profit organizations, which rely on a great deal of voluntary help and effort. Yet they are also distinguished by a professionalism and dynamism most commonly seen in small, fast growing businesses. Much of the voluntary sector is slow moving and specialist: that is one of its strengths. Voluntary organizations can be innovative but many also operate with a very fixed idea of their clients' needs. But increasingly, social entrepreneurs are not confined to voluntary organizations. As the welfare state becomes more decentralized with the spread of a contract culture, there will be more room for experimentation and diversity. Large private sector companies may also become involved in social innovation, through partnerships with voluntary organisations and a growing role in the provision of education and social insurance. Large private sector companies will find they need entrepreneurs who can bring together commercial and social needs.

Social entrepreneurs play the role of change agents in the social sector, by: adopting a mission to create and sustain social value (not just private value). Social entrepreneurship is a new concept where enterprises are establishing on the basis of the principles of social development; where the developmental process carried for the development with social justice. Now social entrepreneurship is identified as the process of development with sustainability. Social entrepreneurship is a process of establishing innovative enterprises which will increase social welfare and social development with providing sufficient



opportunity of employment without disturbing ecological system. Its ultimate goal is social development. In the previous centuries the process of development was identified as economical development where per capita income and entire national income (GDP) but fruits of development was in the benefit of a few on the place of majority of the population then it was identified that economical development can't be the ideal model but it would be shifted to social development.

The social development is the process of development where the economical development will be based on social justice, where care and share for the benefit of the majority and all will participate into developmental process and profits. The process of social entrepreneurship can be described by the given diagram. Diagram shows that the process of social entrepreneurship leads to social development which is based on social justice and ecological balance by eco-friendly business where equitable and just society will be established. This process improved quality of human life without any discrimination and without harming the environment. This process will lead to sustainability of development without compromising with the interest of the future generation which is the goal of sustainable development. Major social entrepreneurship programmes of these NGOs were related to the sector of agriculture, health, human resource development, community development and industrial and trade programmes. Majority of the beneficiaries, non-beneficiaries, workers of NGOs and workers of other development agencies considered social entrepreneurship works of the NGOs as effective for sustainable rural development.

Social entrepreneurship may bring measurable benefits to the wider economy by creating jobs, generating output or saving on public spending in the medium run, they have great value as potential models for the reform of the welfare state, If they can work more productively in alliance with the public sector their more important long run contribution is their ability to create and invest social capital.

2.3 THE LIFE OF RURAL PEOPLE

Most of the rural population depends, directly and indirectly, on small-scale food crop agriculture, fishery, pastoral animal husbandry or rural wage labour associated with plantations and ranches, and ancillary activities linked to the economies of the rural life and rural townships. Many rural families need to diversify their sources of income and employment in view of increasingly smaller parcels of land, low agricultural productivity, volatile weather conditions and soil erosion. The rural non-farm economy plays an important role for wealth creation and well-being across countries. Rural households with fewer than 0.5 hectares earn over half of their total income from non-farm sources.

2.3.1 AGRICULTURE SECTOR : NO MORE JOB PROMISES

Agriculture has traditionally been most promising avenue of livelihood generation. But present scenario has a different picture to reveal. Over the last 100 years, the proportion of working population engaged in the primary sector ie agriculture and allied activities indicated a marginal decline from about 72 % in start of twentieth century to about 57% at the end of century. The employment scenario has witnessed a decline of 8.6% between 2004-05 to 2011-12. The only possible solution to job creation in rural arena is in non farm sector. This sector needs attention since a large percentage of population dependent on the primary sector are victim of large scale disguised unemployment and consequently of low percapita labour productivity and prevalence of wide spread poverty.

2.4 A TOUGH TIME AHEAD

The report by CRISIL (2013) presents an alarming situation on the employment generation scenario in the country. It anticipates a 25% decline in the non-farm employment thereby reducing employment in nonfarm from present 5.2 crores to 3.8 crores during 2013-2019. This will force about 1.4 crore people to reengage themselves in farm activities as against 3.7 crore people who left agricultural activities in favour of better opportunities in construction and other sectors. The NSS (NSSO, GOI) has found an increase in unemployment from 98 lacs on Jan1, 2010 to 1.08 crores on January 1, 2014. The planning commission estimates the unemployment numbers at 3.6 crores.

2.4.1 RURAL ENTREPRENEURSHIP - A REPRIEVE POSSIBLE

The above table shows that non-farm employment has grown in the period and if this is promoted at full potential, the cherished dream of poverty eradication can perhaps be achieved. One of the targeted activities can be promoting artisan craft development for export markets which can create job and income opportunities in rural areas.

2.4.2 RURAL CRAFT: ALL IS NOT WELL

A leading philanthropic foundation Dasra's "crafting a livelihood" report brings to the fore some stark realities about the state of rural artisans and crafts people in the country.

- Crafts people or artisans are the backbone of nonfarm rural Indian economy with an estimated 7 million artisans (upto 200 million artisans according to other sources) engaged in craft production for earning livelihood.

- Number of artisans has declined by 30% in last 30 years. Global market for handicrafts is USD 400 billion with Indian share below 2% representing a tremendous growth opportunity.
- Craft sector is highly unorganized and informal with 42% artisans working out of their homes
- Crafts is a small scale industry with 39% artisans incurring production expenditure of INR 12000/USD 215 per year.
- 50% of household heads of craft producing families have no education with 90% women of these families being completely uneducated
- Craft is a family activity as 76% of them attribute their profession to tradition and legacy.

2.4.3 WHAT CAN BE DONE

If rural development has to be achieved, it is important that the masses should be provided an opportunity of gainful employment either in government/organized sector or through self employment. The studies by expert groups(S P Gupta Report, Planning Commission, 10 M jobs) have indicated a limited growth prospects in organized sector and advocate for special thrust on unorganized sector. To promote rural entrepreneurship and rural crafts, we have to take following steps:

- Create the Right Environment for Success
- Choosing the right entrepreneur.
- Ensure that Entrepreneurs have access to the Right Skill
- Ensure that Entrepreneurs have access to Smart Capital
- Enable Networking and Exchange

Government Support : Both the Central and State Governments should take more interest in promoting the growth of entrepreneurship.

2.5 WHO CAN BECOME BETTER ENTREPRENEURS?

Although there is no universal formula to spot unfailing entrepreneurs, yet many empirical studies based on psychographic assessment of successful entrepreneurs has revealed that people with higher need for achievement motivation and internal locus of control are likely to become better entrepreneurs.

A) ACHIEVEMENT MOTIVATION (ACHM)

The need for achievement is a distinct human motive which can be defined as a need for success or attainment of excellence. Individuals satisfy their needs through different means,

and are driven to success for reasons both internal and external. McClelland asserted that while most people do not possess a strong achievement-based motivation, those who do, display consistent behaviour in setting goals. They set achievable goals which they can influence with their effort and ability. This results-driven approach is almost invariably present in the character make-up of all successful business people and entrepreneurs (Cassidy and Lynn 1989).

B) LOCUS OF CONTROL (LC)

A person's perception of the source of his or her fate is termed as a locus of control, i.e. the degree to which people believe they are master of their own fate. Individuals who believe that they control what happens to them are 'Internals' or internally motivated and have an Internal Locus of Control. Those who believe that outside factors such as luck or chance controls their fate are 'Externals' or externally motivated and have an External Locus of Control. Empirical evidence shows that internals are more suited for jobs which require initiative and independence of action. People with high internal scores on Rotter's (Rotter, 1966) scale are more likely to be successful entrepreneurs. Internals believe that they personally are in control of their destiny and that luck and fate have only a modest influence on the outcome of events. For internals, personal destiny comes from within and therefore they tend to be self-reliant and independent.

2.6 RURAL BUSINESS INCUBATION CENTRES

Business incubation centres are the places where startup firms are nurtured under expert supervision and mentoring. Many educational institutions in India too have business incubation centres in their campuses. The results are very encouraging. The need is to develop rural business incubation centres operating at village/block/cluster. These RICs will be able to attract potential entrepreneurs and with guidance and support of experts, the businesses can be conceived and ideas put to reality with probably less enterprise mortality/losses. An ecological framework for enterprise generation can be developed

Women entrepreneurship is gaining importance in India in the wake of economic liberalization and globalization. Woman constitutes the family, which leads to society and Nation. Social and economic development of women is necessary for overall economic development of any society or a country. The policy and institutional framework for developing entrepreneurial skills, providing vocation education and training has widened the horizon for economic empowerment of women. However, women constitute only one third of the economic enterprises. There exist a plethora of successful business women

entrepreneurs both in social and economic fields in India. They are performing well. Government of India has also introduced National Skill Development Policy and National Skill Development Mission in 2009 in order to provide skill training, vocational education and entrepreneurship development to the emerging work force.

However, entrepreneurship development and skill training is not the only responsibility of Government and therefore other stakeholders need to shoulder the responsibility. In Hindu scriptures, woman has been described as the embodiment of Shakti. But in real life she is treated as Abla. Our increasing dependency on service sector has created many entrepreneurial opportunities especially for women where they can excel their skills with maintaining balance in their life. The increasing presence of women in the business field as entrepreneurs has changed the demographic characteristics of business and economic growth of the country. Women-owned businesses enterprises are playing a more active role in society and the economy, inspiring academics to focus on this interesting phenomenon. This paper focuses on the problems, issues, challenges faced by women entrepreneurs, how to overcome them and to analyze policies of Indian government for and problems faced by them while pursuing their business. The woman entrepreneur in India has various qualities. A woman or a group of women manages the whole business of enterprise. She makes various plans and executes them under her own supervision and control. There may be some persons to help her but ultimate control goes with the woman. There are number of characteristics of a women entrepreneur:

- **A Good Planner and Executor:** A big idea maker of how something can be better and different and ability to organize various factors effectively. She has to understand all the aspects of the business.
- **Risk Taker:** She should be ready to bear risk and uncertainties at any time.
- **Innovator:** All entrepreneurs have a passionate desire to do things better and to improve their products or service. They are constantly looking for ways to improve. They're creative, innovative and resourceful.
- **Inner force to succeed:** Women Entrepreneurs are driven to succeed and expand their business. They see the bigger picture and are often very ambitious. Entrepreneurs set massive goals for themselves and stay committed to achieving them regardless of the obstacles that get in the way
- **Passionate:** Expressive so the idea creates energy and resonance with others

- **Decision Maker:** One has to take right decision at a right time by showing his promptness. Quick decisions are expected but hasty decisions shouldn't be taken. Delay in decisions may increase cost of project and reduce the profits.
- **Continuous Learner and always ready to change:** Constantly exploring and evolving to do best practice. If something is not working for them they simply change. Entrepreneurs know the importance of keeping on top of their industry and the only way to being number one is to evolve and change with the times. They're up to date with the latest technology or service techniques and are always ready to change if they see a new opportunity arise.
- **Negotiation Skills:** Businessman regularly comes into contact with various persons like consumers, workers, government officials, etc. so he should communicate tactfully.
- **Strong beliefs:** Successful entrepreneurs have a healthy opinion of them and often have a strong and assertive personality.
- **Good Controller:** a successful Women entrepreneur has a great control power in his hand for all type of business affairs.

REFERENCES

- Hysum Ibrahim Mohammed Muhmode, (2020), The Role of Social Entrepreneurship in Achieving Sustainable Rural Development. International Conference „Universities, Entrepreneurship and Enterprise Development in Africa“ Conference Proceedings 2020, University of Gezira, Sudan <https://www.rurallink.gov.my/wp-content/uploads/2021/07/Artikel-3.pdf>
- Bansal, S., Garg, I., & Sharma, G. D. (2019). Social Entrepreneurship as a Path for Social Change and Driver of Sustainable Development: A Systematic Review and Research Agenda. <https://doi.org/10.3390/su11041091>
- Entrepreneurship, S. (2017). Workshop 3 - Social innovation and Social Entrepreneurship – What does it mean for rural areas? Tools to support rural communities respond to a “perfect storm” How to support social innovation and social entrepreneurship. (March), 1–4
- ILO. (2017). A Practice Guide to Supporting Social Entrepreneurship and Inclusiveness in Rural Communities Promoting Social Entrepreneurship and Social Capital. Retrieved from www.ilo.org/publns.
- Pimentel, J. L. (2019). Some Biases in Likert Scaling Usage and its Correction.

International Journal of Sciences: Basic and Applied Research (IJSBAR) ISSN, 4531(April), 183–191.

- Alkire, S., and Fang, Y. (2019). Dynamics of multidimensional poverty and uni-dimensional income poverty: An evidence of stability analysis from china. *Soc. Indic. Res.* 142, 25–64. doi: 10.1007/s11205-018-1895-2
- Atahau, A. D. R., Lee, C. W., Kesa, D. D., and Huruta, A. D. (2022). Developing social entrepreneurship in rural areas: A path mediation framework. *Int. Sociol.* 37, 1–21. doi: 10.1177/02685809221095912
- Belz, F. M., and Binder, J. K. (2017). Sustainable entrepreneurship: A convergent process model. *Bus. Strategy Environ.* 26, 1–17. doi: 10.1002/bse.1887
- Chauhan, A, Saini, R. P. (2015). Renewable energy based off-grid rural electrification in Uttarakhand state of India: Technology options, modelling method, barriers and recommendations. *Renew. Sustain. Energy Rev.* 51, 662–81. doi: 10.1016/j.rser.2015.06.043
- Chen, X., He, Y., Wang, L., Xiong, J., and Jiang, R. J. (2022). The legitimization process of social enterprises across development stages: Two case studies. *J. Bus. Res.* 148, 203–215. doi: 10.1016/j.jbusres.2022.04.054
- Cherrier, H., Goswami, P., and Ray, S. (2018). Social entrepreneurship: Creating value in the context of institutional complexity. *J. Bus. Res.* 86, 245–258. doi: 10.1016/j.jbusres.2017.10.056
- Creswell, J. W., and Creswell, J. D. (2017). *Research Design:Qualitative,Quantitative,and Mixed Methods Approaches*. Thousand Oaks, CA: Sage Publications.
- Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization. *J. Bus. Venture.* 30, 674–695. doi: 10.1016/j.jbusvent.2015.01.002
- Dias, C. S. L., Rodrigues, R. G., and Ferreira, J. J. (2019). What’s new in the research on agricultural entrepreneurship? *J. Rural Stud.* 65, 99–115. doi: 10.1016/j.jrurstud.2018.11.003

CHAPTER – 03

ENHANCING RURAL ENTREPRENEURS USING ICT SERVICES

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3.1 INTRODUCTION

ICTs as a complex and heterogeneous set of goods, applications and services used for producing, distributing, processing and transforming information. ICTs consist of computers and data processing applications accessible through their use (email, Internet, word processing, cellular phones, wireless technologies and other data processing applications). ICTs can, indeed, alleviate poverty and improve human conditions, especially amongst rural areas. The benefits of ICTs are difficult to gauge in most developing countries, particularly in the wake of poverty, hunger and disease. The purpose of this paper is to explore the current use and access of Information and Communication Technologies (ICT) situation amongst rural communities to enhance the rural entrepreneurs.

The Computer Education Industry is one of the most profitable industries that emerged in the 90s in India. The design of the Internet was formulated in 1973 and published in 1974. It took as many as ten years to bring the idea into reality and the Internet was set up in 1983. One of the most important events that happened in the 1990s was the invention of the World Wide Web (WWW). Statistics predict that by the year 2010, about 80 percent of the world was connected to the Internet. Now, we can download information at the speed of light, practically, with 4G Internet technology. We can dial up a long-distance telephone number in a matter of seconds, and we can get new programs on our computer through our phone lines. Everything is getting faster, and new technological advances are coming on quicker than ever. Wireless operations permits services, such as long range communications, that are impossible or impractical to implement with the use of wires. The term is commonly used in the telecommunications industry to refer to telecommunications systems (radio transmitters and receivers, remote controls, computer networks, network terminals, etc.) which use some form of energy (like, radio frequency (RF), infrared light, laser light, visible light, acoustic energy, etc.) to transfer information without the use of wires. Information is transferred in this manner over both short and long distances. The proliferation of information and communication technologies presents both opportunities and challenges in terms of the social development and inclusion of youth in rural areas.

Young people often use the ICT services to access entertainment, education, employment opportunities, news sites and a personal meeting space through chat programmes. They are also making use of possibilities provided by new technologies to advance their participation in a number of civic activities. There are still great disparities in the distribution and use of many forms of technology. Thus information and communication technologies have become a significant factor in development, having a profound impact on the political, economic and social sectors of many countries.

3.2 CURRENT STATUS OF ICT SERVICES

The Indian telecom industry is one of the fastest-growing industries in the world. Indian telecom sector is more than 165 years old. Telecommunications was first introduced in India in 1851 when the first operational land lines were laid by the government near Kolkata (then Calcutta), although telephone services were formally introduced in India much later in 1881. The actual evolution of the industry started after the Government separated the Department of Post and Telegraph in 1985 by setting up the Department of Posts and the Department of Telecommunications (DoT). The Indian telecom industry is characterised with intense competition, and continuous price wars. Currently, there are around a dozen telecom service providers who operate in the wired and wireless segment. The Indian telecom industry has immense growth potential as the tele-density in the country is just 36 as compared with 60 in the US, 102 in the UK and 58 in Canada.

Table 1: Telecommunication growth in India (Month's of December)

S.No	Year	Landline	Wireless	Urban	Rural	Tele-Density	Total
1.	2010	35.57	687.71	484.59	238.69	60.99%	723.28
2.	2011	32.69	893.84	611.2	315.34	76.86%	926.53
3.	2012	30.79	864.72	556.96	338.55	76%	895.51
4.	2013	29.08	875.48	545.09	359.48	73.32	904.56

With rapid increase in telephone coverage and related ICT applications, a huge potential has emerged in creating new jobs in the rural areas. The purchasing capacity of rural folk through various social and technical interventions has increased significantly which is manifested in form of assets creation in form of white goods. Approximately 14 million television sets were sold in India in 2012. There are 7.2 million flat-panel display televisions sold in India in 2013. Indian household contain 167 million televisions since 2013. Rural households contains 45-55 per cent own TV. Every month, there are 5 lakh new installations of DTH TV in rural

household. The penetration of paid Cable & Satellite (C&S) television households in India is expected to grow to 173 million by 2017. India has experienced significant growth in PC sales in the past few years. Our report estimates that the sale of desktops and notebooks is expected to grow from 11 million in FY2013 to 15 million in FY2018. According to the latest report by International Data Corporation (IDC), the PC market in India registered a record growth. Personal computer sale in India grew by 3% year on year in the first quarter of 2013 as compared to the same period last year. The overall PC shipment for the year 2013 is 11.5 million units, stood at 2.71 million units.

With 70% of the population staying in rural areas and with rural subscribers forming 43.69 % of the total telephone subscribers of January 2020, India's rural market will be key to growth in the coming years. The Government of India unveiled the National Digital Communications Policy, 2018 in September 2018. The policy aimed to attract US \$ 100 billion worth of investment and generate 4 million jobs in the sector by 2022. The government of India launched the National Broadband Mission with an aim to provide Broadband access to all villages by 2022. India is one of the largest data consumers globally. It has the highest data usage per smartphone at an average of 9.8 GB per month. India ranks as the world's second-largest market in terms of total internet users. The number of internet subscribers in the country increased at a CAGR of 45.74 percent during FY06-FY19 to reach 636.73 million in FY19. The internet subscribers reached 687.62 million by September 2019. Total wireless data usage in India grew 10.58 percent y-o-y to 19,838,886 terabytes between July-September 2019. The gross revenue of the telecom sector stood at Rs 121,527 crore (US\$ 17.39 billion) in FY20 (April-September 2019). Over the next five years, a rise in mobile-phone penetration and a decline in data costs will add 500 million new internet users in India, creating opportunities for new businesses.

With 1.2 billion subscribers, India is currently the second-largest telecom market in the world and has seen rapid expansion over the past years. The industry has increased primarily due to favourable regulatory conditions, low prices, increased accessibility, and the introduction of Mobile Number Portability (MNP), expanding 3G and 4G coverage and changing subscriber consumption patterns. In 2020-2021 the telecom industry contributed 6% to India's Gross Domestic Product (GDP). The telecom sector is set to grow at a Compound Annual Growth Rate (CAGR) of 9.4% from 2020 to 2025. However, with a CAGR of 15.9% throughout the forecast period, the smartphone industry in India will have the fastest growth. By 2025, India's digital economy is anticipated to be worth \$ 1 trillion. The telecom sector in India is the third largest sector in terms of Foreign Direct Investment (FDI) inflows

and accounts for 6.44% of all FDI inflows. It supports 2.2 Mn jobs directly and 1.8 Mn jobs indirectly. In the telecom industry, 100% FDI is currently permitted, of which 49% can be done through an automatic route, whereas beyond this, it needs to follow the government route. The amount of FDI in the telecom sector increased by 150%, from \$ 8.32 Bn to \$ 20.72 Bn between 2014 and 2021. Many telecom services, including telecom infrastructure providers like Basic Cellular, United Access Services and Commercial V-Sat, have invested in the telecom industry.

3.3 GROWTH IN INDIA'S TELECOM INDUSTRY

India primarily follows the GSM mobile system, in the 900 MHz band. Recent operators also operate in the 1800 MHz band. In September 2004, the number of mobile phone connections crossed the number of fixed-line connections and presently dwarfs the wireline segment substantially. The mobile subscriber base has grown from 5 million subscribers in 2001 to over 1,179.32 million subscribers as of July 2018. The dominant players are Vi, Airtel, Jio, and BSNL/MTNL. International Roaming agreements exist between most operators and many foreign carriers. The government allowed Mobile number portability (MNP) which enables mobile telephone users to retain their mobile telephone numbers when changing from one mobile network operator to another

The subsectors of the telecommunication sector include infrastructure, equipment, Mobile Virtual Network Operators (MNVO), white space spectrum, 5G, telephone service providers, and broadband. The Indian telecom tower market has expanded dramatically by 65% during the past seven years. It is predicted that 5G technology will boost the Indian economy by \$ 450 Bn between 2023 and 2040. According to the Global System for Mobile Communications (GSMA), there is an excellent opportunity for investment in this sector as India will have almost one billion installed smartphones by 2025 and 920 million unique mobile customers, including 88 million 5G connections. This will make India the second-largest smartphone market in the world, which will increase the manufacturing, advertisement, sales and production market in India. Private-sector and two state-run businesses dominate the telephony segment. Most companies were formed by a recent revolution and restructuring launched within a decade, directed by Ministry of Communications and IT, Department of Telecommunications and Minister of Finance. Since then, most companies gained 2G, 3G and 4G licences and engaged fixed-line, mobile and internet business in India. On landlines, intra-circle calls are considered local calls while inter-circle are considered long-distance calls. Foreign Direct Investment policy which increased the foreign ownership cap from 49% to 100%. The Government is working to integrate the whole country in one telecom circle.

It is estimated that over the next five years, a rise in mobile-phone penetration and a decline in data costs will add 500 million new internet users in India, creating opportunities for new businesses ranging from food delivery and e-commerce to providing online insurance. By 2025, India will need 22 million skilled workers for operating hardware, software-defined networks, computer data and manufacturing in the 5G-centric technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), robotics and cloud computing. The increase in daily subscriber base, along with employment generation and new business opportunities attracts investment opportunities in this sector. The 5G services in India are expected to go live by the end of 2022. This will allow the telecom industry to cross \$ 133.33 Bn mark by 2023. A report by the technology consultant Techarc predicts that the technology will reach many cities and towns by 2023 and beyond. This will give the telecom industry a further boost. To begin with, the first phase of the rollout will witness 13 cities, including Ahmadabad, Delhi, Chennai, Chandigarh, Pune, Gurugram, Hyderabad, Jamnagar, Kolkata, Lucknow, Mumbai, Bengaluru, and Gandhinagar will get the 5G internet services. The government plans to make internet services accessible throughout the country, including urban and rural areas and make it affordable in the next two to three years. Currently, 59.48% of telecommunications connect rurally and 87.26% of the urban regions.

3.4 GOVERNMENT INITIATIVES AND ACHIEVEMENTS IN THE SECTOR

The government has accelerated reforms in the telecom industry and keeps moving ahead to give telecom firms room to expand. Production Linked Incentive (PLI) scheme for telecom and networking products provides a financial incentive to boost domestic manufacturing and attract investments in the target segments of telecom and networking services. According to estimates, using the schemes will likely result in incremental production of around \$ 30 Bn and roughly \$ 25 Bn exports over the next five years. To speed up the growth of broadband internet services, the Prime Minister Wi-Fi Access Network Interface (PM-WANI) was launched in May 2022. It is a public Wi-Fi service offered nationwide through Public Data Offices (PDOs). It is accessible through 2,384 Wi-Fi hotspots at 100 train stations across 22 states. The government, in August 2022, has now launched a 5-P model of people-panchayat-public-private-partnership that will take the PM-WANI scheme to the country's hinterland. In June 2022, the Bharat Net Project for optical fibre cables was launched. It was implemented to provide broadband connectivity to India's gram panchayats. Of the 178,247 gram panchayats where it was laid, 161,870 are now ready for service. The total number of gram panchayats ready for service increased to 166,088 after 4,218 were connected via satellite media. By 2025 the government plans to cover the total number of gram panchayats

and enable broadband connectivity there. Department of Telecommunication launched 'Tarang Sanchar', a web portal sharing information on mobile towers and Electromotive force (EMF) emission compliances. Consumers at home can get information about the towers working in a particular area. This saw over a 75% increase in internet coverage from 251 Mn users to 446 Mn in 2022.

The importance of the telecommunication industry is highlighted by the fact that it enables global communication. The relevance of this industry has increased significantly after the pandemic. Services offered by this industry are more frequently used since it allows for a continued virtual connection. The smartphone market will continue to increase as more people are expected to purchase them in the coming years. Given that government reforms have eliminated ambiguity and risks and established a stable investment environment, India's telecom sector is projected to receive investments totalling \$ 25.2 Bn over the next two years. According to a Zenith Media report, India is the fastest-growing telecom advertising market, with an annual growth rate of 11% between 2020 and 2023. The Indian telecom companies, with the help of this, can expand their network and set up towers which will bring more subscribers and generate employment. It will allow a quicker transition to modern technology and increase rural telecom penetration.

3.5 RURAL ENTREPRENEURS AND ICT SERVICES

India is a land of enterprises, where almost 70% of the population is still self-employed (some place this estimate as high as 80%). Entrepreneurship development in India happens in both the sectors organized and the un-organized sectors in completely different manner. The organized sector has all the limitations of the red tape and the advantages of resource allocation. It is estimated that the government spends about 80% of its resource allocation for enterprises on this sector. The institutions setup for enterprise development has a set pattern of thinking - dictated either through government policy or industrial influence, which again is dictated by necessity. There has hardly been a case where they have envisioned changes in a particular sector and promoted entrepreneurs to meet the changes. ICTs can make significant contributions in encouraging rural entrepreneurship because they offer better process efficiencies and ease participation of people and enterprises. ICTs can also vastly expand economic networks thereby enhancing economic opportunities. With ICTs rural communities can acquire capacity to improve their living conditions and become motivated through training and dialogue with others to a level where they make decisions for their own development. ICTs services broadly cover the set of activities that facilitates capturing, storage, processing, transmission and display of information by electronic means. ICTs can enhance rural community' opportunities by improving their access to market information and lower transaction costs (for poor farmers and traders); increase efficiency, competitiveness and market

access for developing country like India. PCs can reduce the rural-urban divide by impacting entrepreneurs such as education, agriculture, banking, healthcare and increasing the effectiveness of delivery of government to citizen services. PC penetration has a significant socio-economic impact on a country and its people. Some of the promising avenues suitable for rural entrepreneurship are:

Desktop Application: Vocational training in computers and relevant courses to rural youth helps to gain decent employment. The training and employment enhanced the economic stability of village youth which breaks the cycle of poverty. It enables the involvement of local human resources productivity rather than their current loitering around without an aim. The computer based vocational training can provide a job on desktop publishing, data conversion, data entry services, data processing, document management and manual records digitization insurance agents, travel agents, rural journalism, etc.

Repairing and maintenance of ICT equipments: Computer, television and mobile hardware and maintenance program can stop the migration of rural youth. A rural ICT technician can reduce 1200-2400% time and 50-70% maintenance costs of ICT products. An ICT technician might repair hardwares, troubleshoot problem or update company software programs.

ICT Education: India has one of the largest technical manpower in the world. 70% population lives in villages. However, compared to its population, it is not significant and there is a tremendous scope of improvement in this area. In rural India, the emphasis has not been on general education, with vocational education at the receiving end. This has resulted in large number of educated people remaining unemployed. Hence there is a greater thrust on vocationalisation of education related to ICT. Another shortcoming in the area of technical and vocational education is that till now, the number of engineers graduating is more than the diploma holders.

Selling ICT Goods : In recent years, development in ICT led to the proliferation of mobile phones, tablet computers, smartphones and netbooks. Some of these consumer electronic products, like netbooks and entry-level tablet computers are often priced lower as compared to notebooks/laptops and desktop computer since the target market for these products are those living in the emerging markets. This made computing more accessible to people, especially in emerging markets and developing countries where most of the world's poor reside. Now rural people can open own your ICT shop by investing small amount of money and get self employed with sufficient income. Multi services can be provided in a single shop like selling of ICT goods, recharge coupons of mobile and dish antena, multimedia services etc.

CONCLUSION

ICTs are important tools for social entrepreneurs because they enable them to build a strong online presence, interact with customers and donors more effectively, and reach out to new audiences. They also help social entrepreneurs develop better strategies for their businesses. ICTs can contribute to many aspects of rural regions' development such as the improvement of agricultural production and productivity, the production of safer food, the support of businesses and entrepreneurship, the upgrading of skills and competencies of local labour, the strengthening of bonds in the local society. Rural beings must not only have equal capabilities (such as education and health) and equal access to resources and opportunities (such living standards and employment), but also the agency to use these rights, capabilities, resources and opportunities for strategic choices and decisions. the feasibility of ICTs in rural development is only possible when development strategies for information systems and technology are drawn from and harmonized with overall rural national development strategies. There is a growing need to evaluate the social and economic impacts of ICTs and to create opportunities for capacity building that will ensure their beneficial use and absorption within rural economies and society.

CHAPTER – 04

WOMEN ENTREPRENEURSHIP IN INDIA: EMERGING ISSUES, CHALLENGES AND OPPORTUNITIES

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4.1 INTRODUCTION

The economic development of a Nation depends on its industry and its development. The industrial development is based on the entrepreneurial competencies of the people. Hence, the concept of building entrepreneurship Promotion is need of the hour. Defining entrepreneurship is not an easy task. To some, entrepreneurship means primarily innovation, to others it means risk-taking. To others a market stabilizing force and to others still it means starting, owning and managing a small business. An entrepreneur is a person who either creates new combinations of production factors such as new methods of production, new products, new markets, finds new sources of supply and new organizational forms or as a person who is willing to take risks or a person who by exploiting market opportunities, eliminates disequilibrium between aggregate supply and aggregate demand or as one who owns and operates a business. Peter Drucker proposed that “entrepreneurship” is a practice. What this means is that entrepreneurship is not a state of being nor is it characterized by making plans that are not acted upon. Entrepreneurship begins with action, creation of new organization. Entrepreneurship has been globally felt as a developmental & progressive idea for business world. Therefore entrepreneurship is considered as vital ingredient for not only globalization but at the same time for creating diverse opportunities for future potential performers.

Now- a- Days the educated women do not want to limit their lives in the four walls of the house. They demand equal respect from their partners. However, Indian women have to go a long way to achieve equal rights and position because traditions are deep rooted in Indian society where the sociological set up has been a male dominated one. Women are considered as weaker sex and always made to depend on men folk in their family and outside, throughout their life. But, it is a general belief in many cultures that the role of women is to build and maintain the homely affairs like task of fetching water, cooking and rearing children. Since the turn of the century, the status of women in India has been

changing due to growing industrialization, globalization, and social legislation. With the spread of education and awareness, women have shifted from kitchen to higher level of professional activities. Entrepreneurship has been a male-dominated phenomenon from the very early age, but time has changed the situation and brought women as today's most memorable and inspirational entrepreneurs. In almost all the developed countries in the world women are putting their steps at par with the men in the field of business. The role of Women entrepreneur in economic development is inevitable. Now-a-days women enter not only in selected professions but also in professions like trade, industry and engineering. Women are also willing to take up business and contribute to the Nation's growth. Their role is also being recognized and steps are being taken to promote women entrepreneurship.

Despite all the social hurdles, India is growing with the success stories of women. They stand tall from the rest of the crowd and are applauded for their achievements in their respective field. The transformation of social fabric of the Indian society, in terms of increased educational status of women and varied aspirations for better living, necessitated a change in the life style of Indian women. She has competed with man and successfully stood up with him in every walk of life and business is no exception for this. These women leaders are assertive, persuasive and willing to take risks. They managed to survive and succeed in this cut throat competition with their hard work, diligence and perseverance.

Women Entrepreneurs may be defined as “The woman or group of women who initiate, organize and co-operate a business enterprise”. Government of India has defined women entrepreneurs as an enterprise owned and controlled by a woman having a minimum financial interest of 51% of the capital and giving at least 51% of employment generated in the enterprise to women. The Indian women are no longer treated as show pieces to be kept at home. They are also enjoying the impact of globalization and making an influence not only on domestic but also on international sphere.

Women are doing a wonderful job striking a balance between their house and career. Women entrepreneurs engaged in business due to push and pull factors which encourage women to have an independent occupation and stands on their own legs. A sense towards independent decision-making on their life and career is the motivational factor behind this urge. Saddled with household chores and domestic responsibilities women want to get independence. Under the influence of these factors the women entrepreneurs choose a profession as a challenge and as an urge to do something new. Such a situation is described

as pull factors. While in push factors women engaged in business activities due to family compulsion and the responsibility is thrust upon them.

4.2 CHARACTERISTICS OF A SUCCESSFUL WOMAN ENTREPRENEUR IN INDIA

The woman entrepreneur in India has various qualities. A woman or a group of women manages the whole business of enterprise. She makes various plans and executes them under her own supervision and control. There may be some persons to help her but ultimate control goes with the woman. There are number of characteristics of a women entrepreneur:

- (1) **A Good Planner and Executor:** A big idea maker of how something can be better and different and ability to organize various factors effectively. She has to understand all the aspects of the business.
- (2) **Risk Taker:** She should be ready to bear risk and uncertainties at any time.
- (3) **Innovator:** All entrepreneurs have a passionate desire to do things better and to improve their products or service. They are constantly looking for ways to improve. They're creative, innovative and resourceful.
- (4) **Inner force to succeed:** Women Entrepreneurs are driven to succeed and expand their business. They see the bigger picture and are often very ambitious. Entrepreneurs set massive goals for themselves and stay committed to achieving them regardless of the obstacles that get in the way
- (5) **Passionate:** Expressive so the idea creates energy and resonance with others
- (6) **Decision Maker:** One has to take right decision at a right time by showing his promptness. Quick decisions are expected but hasty decisions shouldn't be taken. Delay in decisions may increase cost of project and reduce the profits.
- (7) **Continuous Learner and always ready to change:** Constantly exploring and evolving to do best practice. If something is not working for them they simply change. Entrepreneurs know the importance of keeping on top of their industry and the only way to being number one is to evolve and change with the times. They're up to date with the latest technology or service techniques and are always ready to change if they see a new opportunity arise.

- (8) **Negotiation Skills:** Businessman regularly comes into contact with various persons like consumers, workers, government officials, etc. so he should communicate tactfully.
- (9) **Strong beliefs:** Successful entrepreneurs have a healthy opinion of themselves and often have a strong and assertive personality.
- (10) **Good Controller:** a successful Women entrepreneur has a great control power in his hand for all type of business affairs.

4.3 REASONS FOR WOMEN TO BECOME AN ENTREPRENEUR IN INDIA

The boundary lines are shattered and women are found indulged in every part of business. The entry of women into business in India is traced out as an extension of their kitchen activities, mainly 3P's, Pickle, Powder and Pappad. But with the spread of education and passage of time women started shifting from 3P's to modern 3E's i.e., Energy, Electronics and Engineering. Skill, knowledge and adaptability in business are the main reasons for women to emerge into business ventures. There are some other reasons for becoming an entrepreneur. Education and qualification, Innovative thinking ,New challenges and opportunities for self fulfillment , self identity and social status, support of family members, Role model to others, Employment generation, Freedom to take own decision and be independent, Government policies and procedures, Family occupation, Success stories of friends and relatives, Bright future of their wards, Need for additional income etc.

4.3.1 CHALLENGES FACED BY WOMEN ENTREPRENEURS IN INDIA

Entrepreneurship isn't a walk in the park for anyone and it can be even more challenging if you are of the "female persuasion". Even with all of the advancements that women have made in the business world, there is still a long way to go before the success. There are some of the top challenges that female entrepreneurs need to overcome to be more successful as a whole. **Not Being Taken Seriously:** In the business world, women's opinions and advice are not always viewed as "expert" compared to a man's opinion. And when a female starts a business, sometimes family, friends, and others in the business community can view it as a hobby or a side project to family duties, rather than a bona fide business. So, there is a need to realize that this is a true gender bias obstacle.

Letting Fear Stand in the Way: In general, women can be less prone to taking risks and can let their own fears (such as the fear of failure, fear of success, fear of being on their own etc.) stand in the way of "going for it" and pursuing the path of entrepreneurship. Confidence is a

great way to combat these fears and the best way to feel confident. Also, believe on efforts and capabilities. Subsequently, women can have a harder time saying “No”, which can lead to under-charging for their products/services or being too giving of their time and help in general. This typically comes at the expense of their own needs, business or otherwise.

4.3.2 PROBLEMS FACED BY WOMEN ENTREPRENEURS IN INDIA

Women in India are faced many problems to get ahead their life in business. Women entrepreneurs face many problems in their efforts to develop their enterprise. The main problems faced by the women entrepreneurs in India are as follows:

- **Lack of Financial Resources:** Women entrepreneurs always suffer from inadequate financial recourses and working capital. They are not able to afford external finance due to absence of tangible security and credit in the market. Women have a very less property and bank balance to their name. Male members of the family do not want to invest their capital in the business run by women due to lack of confidence in their ability to run venture successfully. Most of the women entrepreneurs fail due to lack of proper financing facilities, because finance is life blood of every business activities. Obtaining the support of bankers, managing the working capital, lack of credit resources are the problems which still remain in the males domain.
- **Marketing problems:** Women entrepreneurs often depend upon the middlemen for marketing their products who pocket large chunk of profit. The middlemen exploit the women entrepreneurs. Women entrepreneurs also find it difficult to capture the market and make their products popular. A lot of money is needed for advertisement in these days of stiff competition from male entrepreneurs. Women entrepreneurs also lack energy and extra efforts needed to be investing and to win the confidence of customers and popularize the products. Women entrepreneurs continuously face the problems in marketing their products.
- **Lack of raw materials availability:** The shortage of required raw materials is also one of the big problems faced by women entrepreneurs. Women entrepreneurs find it difficult to procure the required raw materials and other necessary inputs for production in sufficient quantity and quality. Women entrepreneurs encounter the problems of shortage of raw materials. The failure of many women co-operations in 1971 such as these engaged in basket making were mainly because of the inadequate availability of forest-based raw materials.

- **Cut throat competition:** Women entrepreneurs have to face severe competition from organized industries and male entrepreneurs having vast experience. Many of the women enterprises have imperfect organizational set up. But they have to face severe competition from organized industries.
- **Limited managerial ability:** Women entrepreneurs may not be expert in each and every function of the enterprise. She will not be able to devote sufficient time for all types of activities. High cost of production: The high cost of production is another problem which undermines the efficiency and restricts development of women entrepreneurs.
- **Low risk taking ability:** Women entrepreneurs suffer from the problem of low risk taking ability as compared to their male counterparts, because they have led a protected life. They even face discrimination in the selection of or entrepreneurial development training. Inferiority complex, unplanned growth, lack of infrastructure, hesitation in taking quick decision also increases the rate of risk and chances of loss.
- **Family Conflicts:** One of the main duties of women in India is to look after the children and other family members. A very little time and energy is left for business activities. A married woman entrepreneur has to make a perfect balance between domestic activities and business activities. The woman entrepreneur cannot succeed without the support and approval of husband. Their success in this regard also depends upon supporting husband and family. Thus, occupational back grounds of families and education level of husbands have a great influence on the growth of women entrepreneurship.

Women also face the conflict of performing of home role as they are not available to spend enough time with their families. They spend long hours in business and as a result, they find it difficult to meet the demands of their family members and society as well. Their inability to attend to domestic work, time for education of children, personal hobbies, and entertainment adds to their conflicts.

- **Patriarchal Society:** One of the biggest problems women entrepreneurs is the social attitude in which she has to live and work. There is discrimination against women in India despite constitutional equality. Women do not get equal treatment in male-dominated Indian society and male ego puts barriers in their progress.
- **Legal Formalities:** Women entrepreneurs find it extremely difficult in complying with various legal formalities in obtaining licenses etc.
- **Travelling:** Women entrepreneurs cannot travel from one place to another as freely as men do. Women have some peculiar problems like staying out in the nights at distant

places etc. There are some other problems like Lack of entrepreneurial training, Credit Facilities etc.

4.3.3 SUGGESTIONS TO OVERCOME THE PROBLEMS FACED BY WOMEN ENTREPRENEURS

Women entrepreneurs face many different "stumbling blocks," throughout their careers and are offered the following suggestions:

- There should be number of financial support cell open to provide easy finance to women entrepreneurs. These special cells should provide finance to women entrepreneurs at low and concessional rates of interest and on easy repayment facilities.
- Marketing co-operatives should be established to encourage and assist to women entrepreneurs. Government should give preference to women entrepreneurs while purchasing their requirements. The required, scarce and imported raw-materials should be made available to women entrepreneurs at priority basis at concessional rate.
- The educational and awareness programmers should be arranged to change the negative social attitudes towards women. The attitude of elders needs to be changed about the potential of girls and their due role in society. There should be some training and developments programmers play very essential role for the development of entrepreneurship. Special training schemes should be so designed that women can get full advantages. Mobile training centers, part time training facilities etc.
- As well as Wes man advised all women entrepreneurs to write up a business blue print when starting out that includes a clear description of the product or service, their target audience and how the business will be run on a daily basis. This blueprint should also touch on the specific responsibilities of the business owner and employees, as well as an estimate of what it will cost to run the business in the first year.

Team Building is an important aspect of a business to overcome from any problem. Money can be a touchy subject for many women, Wes man said, and many have trouble discussing pricing terms. This uneasiness often leads female's business owners to under value their products or services. "It does not understand what it actually costs you to produce a product, or what it costs you to deliver a service," Wes man said. "Women also under price themselves in the workplace, and the same thing happens when you are an entrepreneur. "While many small businesses adopt that "family" mentality, female entrepreneurs are often very guilty of getting too close with their workers, Wes man said."They treat employees like

family and friends," she said. "It's about having a good business relationship, but not getting involved in too personal relationship." When a relationship reaches that point, it becomes harder to make decisions in the best interest of the business.

4.4 ROLE OF GOVERNMENT TO DEVELOP WOMEN ENTREPRENEURS IN INDIA

Development of women has been a policy objective of the government since independence. Government and non government bodies have paid increasing attention to women's economic contribution through self employment and industrial ventures. The growth and development of women entrepreneurs is required to be accelerated because entrepreneurial development is not possible without the participation of women. Therefore, a congenial environment is needed to be created to enable women to participate actively in the entrepreneurial activities. There is a need of Government, non- Government, promotional and regulatory agencies to come forward and play the supportive role in promoting the women entrepreneur in India. The Government of India has also formulated various training and development cum employment generations programs for the women to start their ventures. These programmes are as follows:

In the **seventh five-year plan**, a special chapter on the "**Integration of women in development**" was introduced by Government with following suggestion:

- **Specific target group:** It was suggested to treat women as a specific target groups in all major development programs of the country.
- **Arranging training facilities:** It is also suggested in the chapter to devise and diversify vocational training facilities for women to suit their changing needs and skills.
- **Developing new equipments:** Efforts should be made to increase their efficiency and productivity through appropriate technologies, equipments and practices.
- **Marketing assistance:** It was suggested to provide the required assistance for marketing the products produced by women entrepreneurs.
- **Decision-making process:** It was also suggested to involve the women in decision-making process. The Government of India devised special programs to increases employment and income-generating activities for women in rural areas. The following plans are lunched during the

Eight-Five Year Plan:

- Prime Minister Rojgar Yojana and EDPs were introduced to develop entrepreneurial qualities among rural women.

- 'Women in agriculture' scheme was introduced to train women farmers having small and marginal holdings in agriculture and allied activities.
- To generate more employment opportunities for women KVIC took special measures in remote areas.
- Women co-operatives schemes were formed to help women in agro-based industries like dairy farming, poultry, animal husbandry, horticulture etc. with full financial support from the Government.
- Several other schemes like integrated Rural Development Programs (IRDP), Training of Rural youth for Self employment (TRYSEM) etc. were started to alleviate poverty. 30-40% reservation is provided to women under these schemes.

Economic development and growth is not achieved fully without the development of women entrepreneurs. The Government of India has introduced the following schemes during **Ninth Five-Year Plan** for promoting women entrepreneurship because the future of small scale industries depends upon the women-entrepreneurs:

- Trade Related Entrepreneurship Assistance and Development (TREAD) scheme was launched by Ministry of Small Industries to develop women entrepreneurs in rural, semi-urban and urban areas by developing entrepreneurial qualities.
- Women Component Plan, a special strategy adopted by Government to provide assistance to women entrepreneurs.
- Swarna Jayanti Gram Swarozgar Yojana and Swaran Jayanti Sekhari Rozgar Yojana were introduced by government to provide reservations for women and encouraging them to start their ventures.
- New schemes named Women Development Corporations were introduced by government to help women entrepreneurs in arranging credit and marketing facilities.
- Small Industrial and Development Bank of India (SIDBI) has introduced following schemes to assist the women entrepreneurs. These schemes are:

- (i) Mahila Udyam Nidhi
- (ii) Micro Cordite Scheme for Women
- (iii) Mahila Vikas Nidhi
- (iv) Women Entrepreneurial Development Programmes
- (v) Marketing Development Fund for Women

Further, the **tenth five Year Plan** aims at empowering women through translating the recently adopted National Policy for empowerment of Women into action and ensuring survival, Protection and Development of women and children through rights base approach.

Consortium of Women entrepreneurs of India provides a platform to assist the women entrepreneurs to develop new, creative and innovative techniques of production, finance and marketing. There are different bodies such as NGOs, voluntary organizations, Self-help groups, institutions and individual enterprises from rural and urban areas which collectively help the women entrepreneurs in their activities. The following training schemes especially for the self employment of women are introduced by government:

- Support for Training and Employment Programme of Women (STEP).
- Development of Women and Children in Rural Areas (DWCRA).
- Small Industry Service Institutes (SISIs)
- State Financial Corporations
- National Small Industries Corporations
- District Industrial Centres (DICs)

SIDBI has developed this fund for the entrepreneurial development of women especially in rural areas. Under Mahila Vikas Nidhi grants loan to women are given to start their venture in the field like spinning, weaving, knitting, embroidery products, block printing, handlooms handicrafts, bamboo products etc. In 1993, Rashtriya Mahila Kosh was set up to grant micro credit to poor women at reasonable rates of interest with very low transaction costs and simple procedures.

4.5 CONCLUSION

Entrepreneurship is presently the most discussed and encouraged concept all over the world to overcome economic challenges. Women being the vital gender of the overall population have great capacity and potential to be the contributor in the overall economic development of any nation. Therefore, programs and policies need to be customized to not just encourage entrepreneurship as well as implement strategies which can help support entrepreneurial culture among youth. It can be said that today we are in a better position wherein women participation in the field of entrepreneurship is increasing at a considerable rate. Media and government have the potential to play the most vital role in entrepreneurial development by creating and highlighting all such platforms which can bring out the creativity and innovation among the women and men to grow entrepreneurship culture in society. After Independence there is a promise of equality of opportunity in all Sectors to the Indian women and laws guaranteeing for their equal rights of participation in political process and equal opportunities and rights in education and employment were enacted. But unfortunately, the government sponsored development activities have benefited only a small section of women. The large majority of them are still unaffected by change and

development activities have benefited only a small section of women i.e. the urban middle class women. Women are willing to take up business and contribute to the nation's growth. Their role is being recognized and steps are taken to promote women entrepreneurship. Women entrepreneurs must be molded properly with entrepreneurial traits and skills to meet changing trends and challenging global markets, and also be competent enough to sustain and strive in the local economic arena.

REFERENCES

- Arora, R.;and Sood, S.K.(2005), —Fundamentals of Entrepreneurship and Small Business
- Baporikar, N. (2007) Entrepreneurship Development & Project Management- Himalaya Publication House.
- Renuka V. (2001) Opportunities and challenges for women in business, India Together, Online Report, Civil Society Information Exchange Pvt. Ltd.
- Women Entrepreneurship: Emerging Issues, Challenges and Strategies (2 Vols.) by A.K. Singh, K. Suguna and R.V.M. Reddy
- Renu Arora and S.K.Sood, “Fundamentals of Entrepreneurship and Small Business”, Kalyani Publishers, Pp. 60-69.
- Dhameja S K (2002), Women Entrepreneurs: Opportunities, Performance and Problems, Deep Publisher (P) Ltd., New Delhi. Gordon E. & Natarajan K.: (2007) Entrepreneurship Development – Himalaya Publication House, Second Revised edition.
- Women Entrepreneurship The Emerging Workforce in 21st Century: Turning Challenges into Opportunities Ayesha Kalim Innovative Educational Solutions (IES), Lahore
- Meenu Goyal*; Jai Prakash**(2011), Women Entrepreneurship in India –Problems and Prospects

Websites

www.economist.com, www.google.com, www.wikipedia.org/wiki/Female_entrepreneur
www.icfajournals.com, info@ijrcm.org, www.dcmsme.gov in/schemes/Schemes for the development and promotion of women entrepreneurs, Women Entrepreneurship Development in India, www.indianmba.com

CHAPTER – 05

ENTREPRENEURSHIP DIMENSIONS AND RURAL DEVELOPMENT

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5.1 INTRODUCTION

India derives nearly 33% of the gross domestic population from agriculture and has 66% of economically active population, engaged in agriculture. The share of livestock product is estimated at 21% of total Agriculture sector. India owns the largest livestock population in the accounting for nearly 57% of the world buffalo population and 16% of the cattle population. In India at present the milk production is around 112.5 million tonnes and per capita availability of milk 263 gms/day .India possesses enormous bovine wealth, but the milk productivity in India is very low as compared to many countries of the world. This is due to a wide gap between the recommended innovations and that being practiced by the farmers. Rural development is presently, more than ever before linked to entrepreneurship. Institutions and individuals promoting rural development now see entrepreneurship as a strategic development intervention that could accelerate the rural development process. Further, more institutions and individuals seem to agree on the urgent need to promote rural enterprises; development agencies look into rural entrepreneurship as an enormous employment potential; politicians take it as the key strategy to prevent rural unrest; farmers make it as an instrument for improving farm earnings and women see it is an employment possibility near their homes which provide autonomy, independence and reduced need for social support. To all these groups, however, entrepreneurship acts as a vehicle to improve the quality of life for individuals, families and communities to sustain a healthy economy and environment.

Entrepreneurship - The word entrepreneurship appeared first in French. In the early 16th century men engaged in leading Military expeditions were referred as entrepreneur. Around 17th century the term was used for architects and contractors of public works. Later it was coined by Mark Casson (1991) as 'an entrepreneur is a person, who specializes in taking judgmental decisions about the coordination of scarce resources. Entrepreneur is an innovative agent, who introduces something new into the conomy a new method of

production or a new product, a new source of material or new markets. An entrepreneur's function is to revolutionize the pattern of production by exploiting an invention or introducing an untried technological possibility for producing a new commodity.

5.2 DAIRY ENTREPRENEURSHIP IN INDIA

Dairy farming is one of the important activities of the rural population of our country. In India at present the milk production is around 112.5 million tonnes and per capita availability of milk 263 gms/day Rural development is presently, more than ever before linked to entrepreneurship. Entrepreneurship is a process undertaken by an entrepreneur to augment his business interest. Basically, it is an exercise involving innovation and creativity that will go towards establishing the enterprise. Entrepreneurship development plays important role in dairy enterprise to make dairying as most profitable sector. Entrepreneurship stands as a vehicle to improve the quality of life for individuals, families and communities and to sustain a healthy economy and environment.

Dairy Entrepreneurship - The advent of "Operation Flood" has made the farmers in rural areas to realize the importance of dairy units as the potential source of additional income and employment, but the facts remain in the uneven distribution of gains from livestock enterprise across the country. Hence, entrepreneurship development plays important role in dairy enterprise to make dairying as most profitable sector.

Role of Entrepreneurship - After independence, conscious efforts were made towards economic and social transformation. India followed socialistic pattern of development policy within the framework of five-year plan. Accordingly government concentrated on the development of infrastructure for industrial and agricultural development. Thus, it was during late sixties that the small-sector began to be recognized as an instrument for tapping entrepreneurial talent. In the initial stages government envisaged a promotional package to facilitate setting up of units. This package consisted of financial assistance and incentives, infrastructural facilities technical and managerial guidance through a network of a number of support organizations of central, state and local levels. But the insufficient progress of this sector however made the planners to realize that facilities and incentives were necessary but not sufficient in themselves to ensure adequate entrepreneurial response. In fact, entrepreneurial growth required focus on the human resource development more than anything else did. Since then entrepreneurship development programmes became an integral part of our economic development programmes.

Government of India established National Institute for Entrepreneurship and Small Business Development in 1983. Like wise many such governmental and non-governmental training institutes were established to organize and conduct training programmes for entrepreneurs to impart necessary skills and knowledge about financial, technical and managerial aspect of business and also giving infrastructural support for establishing new business enterprise.

Factor governing Entrepreneurship - The economic and non-economic factors, which govern entrepreneurship are:

- Social mobility for example, the caste structure in India restricted social mobility of people and people born in a specific caste confined themselves to particular economic functions.
- Psychological factors like need achievement.
- Competence, attitude alone does not make an entrepreneur and ability to complete effectively is necessary and cultural factors.

Problems of Dairy Entrepreneurship – There are many factors responsible for dairy Entrepreneurship. insufficient education, lack of skill, less motivation, lack of decision making skills and attitude, low confidence, low exposure to business, less access to market information, insufficient raw material, low access to credit channels, low access to training, inadequate infrastructure, limited access to technology, low access to business networks, lack of labour legislation.

5.3 RURAL ENTREPRENEURSHIP: PAST, PRESENT & POTENTIALS

Wisdom based creative ventures are called entrepreneurship. It is a French word which denotes endeavor. Each and every creature/specie on this universe is unique. It is up-to enterprising people to explore the resource potentials and the latent talents available in abundance, to transform them into valued products in demand. The basic condition for emergence of entrepreneurship is the need and if it is there, the people always try to apply their minds and utilize the brains to an optimum level. The developmental history of the advanced countries like USA, Russia, and Japan and the developing countries like China and India has enough evidence to nurture their dreams and desires into solitude. In the developmental process, an entrepreneur applies his ideas into action, arranges and assembles resources/innovations/capitals and establishes institutions to realize the products with the eye at future avenues. The history of golden India is the history of open culture of rural entrepreneurship. In the golden era neither any product (natural or manmade) was useless nor the people unemployed. The rural artisans were basically entrepreneurs of

excellence, doing their better best for the services of the society and the society too always tried to pay optimum, not merely for their products but also for skills applied. Hopefully, the entrepreneurs of the Indian origin engaged in making the golden history of various countries, in near future along with young entrepreneurs, can change the risk adverse rural society into rural entrepreneurs.

Rural development in India is directly linked to entrepreneurship. Organizations and other associations promoting rural development have of late come to realize entrepreneurship as a strategic development intervention that could accelerate the rural development process. Moreover, institutions and individuals seem to agree on the urgent need to promote rural enterprises. The reason is that these agencies see rural entrepreneurship as a huge employment potential. The governments also see it as the key strategy to prevent rural economic disorder and instability, and farmers see it as an instrument for improving farm earnings; and women see it as an employment opportunity near their homes which provides autonomy, independence and a reduced need for social support. These groups have discovered that entrepreneurship stands as a vehicle to improve the quality of life for individuals, families and communities and to sustain a sound economy and a healthy environment. The entrepreneurial orientation to rural development accepts entrepreneurship as the key and viral force of economic growth and development, without it other factors of development will either remain stagnant or will go waste. However, the acceptance of entrepreneurship as a central development force by itself will not lead to rural development and the advancement of rural enterprises. What is required an enterprise-friendly environment in rural areas. The existence of such an environment largely depends on policies promoting rural entrepreneurship. The effectiveness of such policies in turn depends on a conceptual framework about entrepreneurship.

5.3.1 SYSTEM APPROACH TO RURAL TECHNOLOGY AND RURAL INDUSTRIALISATION

Technology is the tool for development. Industrialisation leads to development and it needs adequate **Resources** and **Appropriate Technology**. The road to Indian development starts from rural areas and it is this reality that makes effective application and hassle free advancement of rural technology so vital. At present rural population earning their livelihood from non agriculture operation is very low but this was not always so in our country. This is a wrong conception put forward by the Britishers and believed by our educated persons that rural India relied heavily on agriculture as its only meaningful and viable source of livelihood. Non agriculture sector has had always an important role in rural economy. It was eroded in the English rule which turned the rural areas as a supplier of resources with negligible

processing. About 30 % of rural population was earning their livelihood by non agriculture sector even at the start of eighteenth century which came down to less than 10 % at the time of independence.

Agriculture continues to be the backbone of the rural economy. Industrial planning of the rural areas has to rely on **Farm sector** on one hand and **Non farm sector** on the other hand. In fact both should go together and run parallel. They should complement each other. Both the sectors require **value addition** to the available resources, constant feedback and necessary modifications based on the feedback of the users. Indian Rural Industries can be classified into three categories. First category includes those industries which are based on locally available raw materials. Food processing based industries viz. pickles, jelly, squash, sauce, bakery, rice milling, dal mills, oil expelling, jaggery making; brick making; coir products; quarrying and processing of minerals viz. stone, lime, mica etc fall under this category. Industries based on locally available skills viz. handicrafts, traditional textile processing and other similar ventures relying heavily on the skills and talents nurtured traditionally in the area come under the second category and Industries and trades based on locally needed products viz. Black smithy, pottery, metal working etc come under the third category.

The industries coming under the 1st category require significant amount of energy, mostly commercial in nature and requiring a minimal organisation and it is this category that requires promotion in an organised way for mass benefit. Nevertheless the industries coming under the 2nd and 3rd categories also require the attention of the researchers, planners and developers in order to put a model of integrated development. Use of **Renewable sources of energy**, optimum use of the Non Renewable and commercial energy sources and reducing wastages will be the key factor in this regard. Research, Development and Dissemination of Technologies should be on a coherent and continuous basis and for that an effective mechanism of providing the field realities and information to the Research Institutions as well as transferring the technologies back to the fields. There have been efforts in the past for a synchronisation of transfer of knowledge and technology from land to lab and lab to land but this has been very half heartedly as a result of which many researches end at being purely academic in nature. Scientists, developers and planners have to go and live in rural areas for a considerable period of time in order to have a better feeling and understanding of the ground realities. It will be only then that they would be able to evolve and better technologies.

We need a **system approach** for developing a Technology that is people friendly and give best possible results utilising minimum of resources i.e. give optimum results. For this we have to understand the system and the sub systems within the system. We have to take into account the effects of other systems on the main system for which technology is being developed. Various **simulation** techniques are available. We can have a **modelling** technique which we take a living society as a model and replicate the same to other similar societies. All this requires a better understanding of the diversified nature of our country having vast difference spanning over so many factors and the situation can easily be tackled by giving practice based teaching and constant interaction of the researchers and planners with the people for which research or developmental activities are undertaken.

5.4 PROMOTION OF TOURISM THROUGH SOCIAL ENTREPRENEURSHIP

The World Tourism Organisation (UNWTO) defines tourism as: “activities of persons travelling to and staying in places outside their usual environment for less than one year, for leisure, business or other purposes not related to remuneration from within the place visited”. In most countries, tourism is the leading industry and the fastest growing economic sector in terms of foreign exchange earnings and job creation. The concept of social entrepreneurship, which might be described as the application of innovative solutions to pressing social issues, within the tourism industry pushes the idea of tourists “giving back” to another level. Greater numbers of tourists are seeking to have a real and meaningful impact on the destinations they visit. Growth in niche tourism activities such as voluntourism, travel philanthropy, educational tourism among others is an indicator that many tourists are no longer satisfied with merely observing. With the aging of the boomer population as well as the growth of more travel savvy college-student population, there is greater demand for meaningful travel experiences that serve a purpose.

Before the European settlement in the late 18th century, Australia was originally populated by around 250 individual nations, now referred to as the Indigenous population (mainland Aborigines and Torres Strait Islanders). The American continent was first inhabited by many different peoples and tribes before the colonisation period started in the 16th century. These "new" countries are now a melting pot of people from all over the world, and the Indigenous people have been created as a distinct group. The economy of poor countries in the world depends on tourism as the primary source of foreign income. Yet much of the capital and resources involved in the burgeoning tourism industries do not trickle down to the local communities and aid in effective, economic development programs or to support the Indigenous cultures.

In Indian context, tourists visiting Andaman and Nicobar Island prefer to visit habitats where indigenous community live, but depicting nudity as an object has been criticised. In Madhya Pradesh, visiting habitats of primitive tribes like Baiga has been focus of attraction for tourists. In Chitrakoot, two prominent social and charitable organizations are working since long. The Deen Dayal Research Institute has already started a hotel in the name of Panchavati in a lush green environment on the bank of river Mandakani. Sadguru Seva Sangh Trust has also a guest house to serve the hospitality of spiritual tourists. This paper reflects on the promotion of social entrepreneurship through tourism, in particular the social enterprises that have been created, which not only fulfill the tourist needs but also create jobs and opportunities for the local community.

5.5 FOLK ART AND ITS ROLE IN ENTREPRENEURSHIP IN RURAL INDIA

Art is a cultural identification of the region and its relation to human lineage is since long time. It has always sympathized and consoled human in the time of despondency, frustration and disappointment. It has given us the flight of imagination and provided us the medium to make this dream come true. The way to express or exhibit the feelings of human heart is what we call 'Art', where creativeness comes accompanied with aptitude. Through art, man has learned the manifestation of feelings and learned the way to express his thoughts without words and voice. Long time ago, when men hunted, since then they started taking support of art activities during their resting time, to establish signs and to get rid of tension, fear and danger. At that time, this exhibition was just a way of expressing feelings based on the obvious nature. The medium was useless and the subject-matter was based on daily routine but, was closer to nature. None the less, these art samples were able to provide them peace, relaxation, joy and happiness. In nutshell, it became an integral part of human life. That is why, *Bhartihari* has written-

Sahitya sangeet kala vihina ! Sakshat pashu puchha vishan hinah !!

Means without art, man is like an animal which lacks tail and poison. That's why, we found rural and folk art everywhere in India. There is a huge and regular demand of folk and regional art everywhere in India and abroad. So, it can be opted as a profession.

Today people want to install a sculpture on road-junction, park, in a lawn, corridor of a building or in a drawing room of a house. Even shopkeepers need art pieces for their advertisement of their products and articles, especially in cloth store and jeweler shop we find different types of models wearing attractive clothes and putting on precious jewelry. We also want to cover front or interior wall with a huge panel of painting, mural or relief. Today

everybody wants to decorate his/her house with painting and sculpture which may be folk or realistic or abstract. Finally, we can say the folk and rural art plays an important role of entrepreneurship in rural India.

5.6 CONCLUSION

Rural entrepreneurship is looked as a means to increase income and employment as well as providing stability and growth in rural communities. It is defined as “the creation of a new organization that introduces a new product, serves or creates a new market, or utilizes a new technology in a rural environment”. Here the entrepreneur tries to look at the problems and opportunities of solving problems in the rural areas. To put it in simple words, we can say that entrepreneurship emerging in rural areas is called rural entrepreneurship. Thus, entrepreneurship emerging at village level which can take place in a variety of fields of endeavour such as business, industry, agriculture and acts as a potential factor for economic development. In other words, the rural entrepreneur is one who is staying in village producing goods and services mainly with local resources. He organizes factors of production and takes risk. In India nearly 70 % of the population lives in villages depending mainly on agriculture and allied activities. There is widespread unemployment and underemployment with labour abundance and capital shortage.

Hence, the development of rural entrepreneurship is very important for creating employment opportunities in rural areas and rural development. Rural migration to the urban areas has become a common phenomenon. The rural people migrate to urban areas due to concerns of livelihood, unemployment, smaller land holdings, relatively more opportunities of earning and stability in urban areas, peer pressure and so on. One of the major challenges of entrepreneurial growth in rural space is lack of supportive ecosystem for individual growth, culture and enterprise support. Hence, it is a major policy concern to address this issue. Boost for rural entrepreneurship and equitable development is a much desirable impact any state would like to ensure through its policy interventions. The interventions must facilitate the development of rural entrepreneurship culture in the rural areas for the empowerment of rural people.

REFERENCE

- Aageson, T. (2008), Cultural entrepreneurs: Producing cultural value and wealth. In: Anheier, H.K., Isar, Y.R., editors. *The Cultural Economy*. Los Angeles: SAGE. p92-107. X
- Ahuja, V., Akhtar, A., & Wali, O. P. (2019). Development of a comprehensive model of social entrepreneurial intention formation using a quality tool. *Journal of Global Entrepreneurship Research*, 9(1), 41.
- G., Maring, H., et al. (2002). Chemical, microphysical, and radiative effects of Indian Ocean aerosols. *J. Geophys. Res.* 107, AAC–20. doi: 10.1029/2002JD002463

- Rani, A. (2016). Women spirit wins: A case study of LijjatPapad. *International Journal of Applied Research*, 2(2).
- Ratten, V. (2011) 'Social entrepreneurship and innovation in sports', *International Journal of Social Entrepreneurship and Innovation*, Vol. 1, No. 1, pp.42–54.
- Schwela, D., Haq, G., Huizenga, C., Han, W. J., Fabian, H., and Ajero, M. (2006). *Urban Air Pollution in Asian Cities: Status, Challenges and Management*. Routledge.
- Sen, A., Ahammed, Y. N., Banerjee, T., Chatterjee, A., Choudhuri, A. K., Das, T., et al. (2016). Spatial variability in ambient atmospheric fine and coarse mode aerosols over Indo-Gangetic plains, India and adjoining oceans during the onset of summer monsoons, 2014. *Atmos. Pollut. Res.* 7, 521–532. doi: 10.1016/j.apr.2016.01.001
- Sharma, A. R., Kharol, S. K., Badarinath, K. V. S., and Singh, D. (2010). Impact of agriculture crop residue burning on atmospheric aerosol loading—a study over Punjab State, India. *Annal. Geophys.* 28, 367–379. doi: 10.5194/angeo-28-367-2010
- Sharma, M., Kaskaoutis, D. G., Singh, R. P., and Singh, S. (2014). Seasonal variability of atmospheric aerosol parameters over Greater Noida using ground sunphotometer observations. *Aerosol Air Qual. Res.* 14, 608–622. doi: 10.4209/aaqr.2013.06.0219
- Sharma, S. K., Mandal, T. K., Srivastava, M. K., Chatterjee, A., Jain, S., Saxena, M., et al. (2016). Spatio-temporal variation in chemical characteristics of PM10 over Indo Gangetic Plain of India. *Environ. Sci. Pollut. Res.* 23, 18809–18822. doi: 10.1007/s11356-016-7025-2
- Sharma, S., Zhang, M., Gao, J., Zhang, H., and Kota, S. H. (2020). Effect of restricted emissions during COVID-19 on air quality in India. *Sci. Total Environ.* 728:138878. doi: 10.1016/j.scitotenv.2020.138878
- Shastri, H., Barik, B., Ghosh, S., Venkataraman, C., and Sadavarte, P. (2017). Flip flop of day-night and summer-winter surface urban heat island intensity in India. *Sci. Rep.* 7:40178. doi: 10.1038/srep-40178
- Shastri, H., Paul, S., Ghosh, S., and Karmakar, S. (2015). Impacts of urbanization on Indian summer monsoon rainfall extremes. *J. Geophysic. Res.* 120, 496–516. doi: 10.1002/2014JD022061
- Shaw, N., and Gorai, A. K. (2020). Study of aerosol optical depth using satellite data (MODIS Aqua) over Indian Territory and its relation to particulate matter concentration. *Environ. Dev. Sustain.* 22, 265–279. doi: 10.1007/s10668-018-0198-8
- Shepherd, J. M. (2005). A review of current investigations of urban-induced rainfall and recommendations for the future. *Earth Interact.* 9, 1–27. doi: 10.1175/EI156.1

- Siddiqui, A., Halder, S., Chauhan, P., and Kumar, P. (2020). COVID-19 pandemic and city-level nitrogen dioxide (NO₂) reduction for urban centres of India. *J. Indian Soc. Remote Sensing* 48, 999–1006. doi: 10.1007/s12524-020-01130-7
- Singh, A., Rajput, P., Sharma, D., Sarin, M. M., and Singh, D. (2014). Black carbon and elemental carbon from postharvest agricultural-waste burning emissions in the Indo-Gangetic Plain. *Adv. Meteorol.* 2014, 1–10, doi: 10.1155/2014/179301
- Singh, B. P., Srivastava, A. K., Tiwari, S., Singh, S., Singh, R. K., Bisht, D. S., et al. (2014). Radiative impact of fireworks at a tropical Indian location: a case study. *Adv. Meteorol.* 2014. doi: 10.1155/2014/197072
- Singh, C., Madhavan, M., Arvind, J., and Bazaz, A. (2021). Climate change adaptation in Indian cities: a review of existing actions and spaces for triple wins. *Urban Climate* 36:100783. doi: 10.1016/j.uclim.2021.100783
- Singh, R. P., and Chauhan, A. (2020). Impact of lockdown on air quality in India during COVID-19 pandemic. *Air Qual. Atmosp. Health* 13, 921–928. doi: 10.1007/s11869-020-00863-1
- Singh, R., Sharma, C., and Agrawal, M. (2017). Emission inventory of trace gases from road transport in India. *Transport. Res. Part D Transp. Environ.* 52, 64–72. doi: 10.1016/j.trd.2017.02.011
- Swedberg, R. (2009). Rebuilding Schumpeter's theory of entrepreneurship. Marshall and Schumpeter on evolution, 188-203. x Schuyler, G. (1998). Merging Economic and Environmental Concerns through Ecopreneurship. Digest Number 98-8.
- Tanaya Singh," How a 25-Year-Old Delhi Boy Is Creating Solar Entrepreneurs in Rural India" *The Better India* 24-10-2016 retrieved from <https://www.thebetterindia.com/72824/solar-entrepreneurs-laksheysehgale-energy-delhi/> on 21-01-2021

CHAPTER – 06

IMPACT OF SOCIAL LOCKDOWN ON ENVIRONMENT DUE TO COVID-19 IN INDIA

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6.1 INTRODUCTION

The 2019 pandemic novel coronavirus was first confirmed in India on 30 January 2020, in the state of Kerala. A total of 4778 confirmed cases, 382 recoveries and 136 deaths in the country have been reported as of 6 April 2020. The world's governments are adopting different levels of interventions including travel restrictions and lockdown to contain the spread of the highly contagious virus. The lockdown was first imposed on January 23, 2020 in the city of Wuhan in China where the first case of this deadly virus was reported and later followed by other countries. From March 25, 2020, India, the second-most populous country in the world with 1.3 billion people, went into lockdown which mean restricting movement of people and shutting down business and industrial establishments and closing of all factories, markets, shops, and places of worship, most public transport suspended and construction work halted, as India asks its citizens to stay home and practice social distancing.

The COVID-19 pandemic has challenged many aspects of our economic and social life fundamentally. We witnessed a significant breakdown of food security and livelihood systems across the country. Millions of people lost their jobs, and struggled for access to food for prolonged periods. Farmers were confronted with the labour crisis during the peak harvesting season. Many farmers had to struggle¹ very badly to access the market/consumers for their products. The economic crisis has further deepened in the last few months.

6.2 LOCKDOWN AND WATER POLLUTION

India is a home to 4 per cent of the world's freshwater resources, and it ranks among the top 10 water-rich countries of the world. In spite of being home to the major river systems, both perennial and non-perennial, India is a designated water stressed region (NITI Aayog, 2019). The river basins suffer from the pressure of an ever-growing population, and rapid industrialization and urbanization across the country. All these factors make the basins

vulnerable to the incessant release of effluents in the form of sewage and large volumes of solid and industrial wastes. Over the years, this discourse on water pollution has made their way into policy-making

Rapid urbanization and industrialization are root causes of river pollution and resulted in a significant rise in sewage generation and untreated wastewater on riverbed across the country. However, before the sudden emergence and outburst of the Covid-19 pandemic, all natural and anthropogenic activities were continued by normal rhythm. During the pre-lockdown phase, intensification of various human development projects has been generated huge pollution loads and these are dumped into nature. Due to Covid-19 pandemic situation, India took the decision of sudden full lockdown and it was effected from 25th March, 2020 and it continued on 31st May 2020. Meanwhile, a short period restriction of industrial sectors and economic activities offered an opportunity to restore the river water quality (RWQ) or river health itself from the usual exploitation by urban-industrial activities.

During pre lockdown, the untreated industrial effluents (solid/liquid) are directly discharged into river and these are mixed with river water. A metadata analysis showed that all physicochemical and biological water quality parameters were much higher than their permissible limit as indicated by WHO and BIS during pre lockdown and unlocks phases. Higher concentration of chloride and sulphate indicated regular mixing of solid and liquid waste water from nearby industries during pre-lockdown and unlock phase. It also indicated the very high mixing of inorganic chloride matters to the riverbed by iron and steel industries and sponge iron factories which are situated beside river bank. High abundance of hot waste water, untreated effluents and contained heavy metals was considerably found at these locations. Supply of magnesium, chloride, sulphate promotes ionic activities in river water and it leads to unsuitable for human consumption. Hot waste water and mixing of heavy metals in river water promotes growth of aquatic microorganisms. Bacteria in water consume dissolved O_2 and release dissolved CO_2 . It positively helps to create such a favourable condition for algae growth.

6.3 LOCKDOWN AND AQUATIC ENVIRONMENT

Water quality of our rivers improved significantly during lockdown. In India, during the COVID-19 confinement, most Ganga basin districts encountered a 60% excessive rainfall, which induced an escalation of the river flow and a pollutant dilution. The lockdown had a positive impact on the water quality of river and Lake. River water quality (RWQ) is very much important for aquatic ecosystem and riparian organisms. Various numbers of

zooplankton, phytoplankton, bacteria, fishes, mollusc types living components build their habitat in aquatic environments¹⁰. Therefore, biologically it is a very sensitive and diversified area that maintains the natural cycle of ecosystem. Riverbed and riparian environments are highly dependent on various physico-chemical and biological parameters. Any changes on one of them can cause serious environmental hazards to the entire biotic community of water. Not only that, human and other animal species, plant species could get hampered by ecological deterioration of water quality. Toxic heavy metals are one of the main causes of environmental hazards to aquatic ecosystem. Heavy metals can transfer among many communities by food chain and directly affects the physiological system of biotic communities.

In the recent years, degradation of aquatic environment, river water quality (RWQ), pollution and health, river ecosystem services etc. has been amplified due to rapid urbanization, industrialization and execution of various developmental activities. The majority of the large world rivers are polluted by anthropogenic activities such as non degradable agriculture fertilizers and untreated industrial sewage discharge into rivers. The river water quality is also declined gradually through toxic materials and excess nutrients supply from agrarian fields. CPCB reported that around 38,000 million liters per day untreated sewage and wastewater are discharged into the Indian River systems. Due to limited sewage treatment capacity, around 52% of untreated sewage and industrial effluents (integrated spared pollution) are discharged into Indian rivers. RWQ parameters are typically spatiotemporal variables and it is very difficult to measure because constant change of attributes and severe anthropogenic stress. In the Covid-19 lockdown situation, toxic materials and untreated industrial sewage discharge into rivers are bunged due to limited anthropogenic activities. That time, water quality assessment and monitoring are more important for the identification of pollution sources, pollution level and types of anthropogenic stress.

6.4 LOCKDOWN AND WATER QUALITY OF YAMUNA RIVER

Novel coronavirus has created the biggest human disaster since World War II and set off the biggest economic crisis in decades. But it has given environment a chance to recover from humans' onslaught for economic development. In Delhi, the visible result is improvement in the quality of Yamuna river water. Raghav Chadha, the current vice-chairman of the Delhi Jal Board, has said the survey of the Yamuna river water has found improvement in its quality. "After testing the water of Yamuna River at many places in Delhi, we have come to know that the quality of water of Yamuna River has improved," Chadha said. He said also, "A

detailed report is being prepared but factors that have helped include closures in industries in Delhi and around. Industrial discharge is not going to the Yamuna. Water flowing from Haryana is also clean and ammonia-free." Recently, the National Green Tribunal-appointed Yamuna Monitoring Committee had asked the Central Pollution Control Board (CPCB) and the Delhi Pollution Control Committee to ascertain the impact of coronavirus-induced lockdown on the water quality of the Yamuna, and submit a report. A senior CPCB official said, "We have collected the samples. Report will be submitted in one week. We will know only then whether the quality of Yamuna river water has actually improved or not." Meanwhile, several photographs and videos claiming improvement in the quality of Yamuna river water in Delhi are doing rounds on social media.

6.5 LOCKDOWN AND AIR POLLUTION

The nationwide lockdown to stop the spread of Covid-19 has led to a dramatic drop in the level of air pollution in India. While minimum vehicles traffic, suspended construction and industrial activities due to the lockdown have brought the air quality of cities to "satisfactory levels," the impact is going to be short-term and temporary. Achieving long-term air quality thus, still remains a wider concern for the government. Air pollution is a matter of serious concern in megacities where the pollution levels often exceed the permissible limits due to its associated health risks for city residents. The metropolitan cities of India are exposed to unhealthy and unhygienic conditions due to air pollution. The continuous and alarming increase of urban air pollution is an emerging environmental issue in the Indian megacities for the last few decades. Major outdoor and indoor air pollutants in urban areas can be primary or secondary air pollutants. Primary air pollutants that are emitted directly include particulate matter {PM2.5, PM10, suspended particulate matter (SPM), respirable particulate matter (RPM)}, SO_x, NO_x, CO, ammonia, and dust particles while the secondary air pollutants involve ozone, smog, Peroxyacyl nitrates (PANs) etc. The developing nations like India with ongoing urbanization are suffering from increased air pollution issues due to the lack of services such as adequate transportation management, suitable roads, and unplanned distribution of industries

The congested roads in cities reduce average vehicular speed resulting in higher vehicular emissions adding to air pollution levels (West Bengal Pollution Control Board, 2010). The increasing and unplanned urbanization coupled with industrialization and population growth are posing threat to human health by increasing air pollution levels leading to number of health issues. Additionally, the complex and intensive human activities in these urban areas are fueling the problem by increasing emission of pollutants. In Indian cities, the air

pollutants are either emitted from natural sources such as long-range transport of desert dust influx originated from the western arid regions of Africa, Middle-East and Thar (Rajasthan) regions, predominately during summer and pre-monsoon season. Vehicular emissions (95%) have been identified as prevalent source of high NO₂ concentrations followed by industries and fuel burning, thereby increasing air pollution in urban areas of India. The combustion of low-quality fuel in Indian cities causes SO₂ emissions. Air pollutants are also emitted from crude oil wells and flared natural gas. Besides, open burning and landfill fires of municipal solid waste were recognized as chief source of air pollution for Mumbai, India in a study reported by National Environmental Engineering Research Institute. Open coal liming, fluoride mining, lime stone mining, thermal power plant, natural and domestic burning of coal, cement industry, and road dust were another primary source of air pollution in India. Road dust (61%) was identified as major source of high particulate matter concentration followed by vehicular emissions, industrial emissions, vegetation, and solid fuel burning for another Indian city (Pune).

6.6 REASON OF AIR POLLUTION

Plastic industry, domestic waste burning, and food processing factories were the main sources of air pollution in Nashik city. Diesel generators, coal based industrial emissions, oil refinery emissions were major source of PM in Agra. Also, thermal power plants in most of the cities in addition to large- and small-scale industries are contributing to high air pollution levels. For Kolkata, 51.4% of the air pollution is contributed by motor vehicles followed by 24.5% emissions from industries and 21.1% dust particles (West Bengal Pollution Control Board, 2005). The deterioration of air quality has been further aggravated by emission of toxic pollutants such as particulate matter, greenhouse gases like SO_x, NO_x, and O₃. Emission of aerosols from deserts, oceans, forest fires, and volcanoes into the atmosphere also adds to air quality depletion. Increase in population, urbanization, and industrialization has depleted air quality and hence adversely affects human health.

To breath in pollution free environment is a fundamental requirement for the population. Ambient is a major cause of morbidity and mortality in India. The effect of air pollution results in adverse health conditions which results in increase in hospital admission, emergency condition and pre-mature deaths. The increase in hospitalization also results in high out of pocket expenditure on the population and thus leads to increase in financial burden on the family. Air pollution contributes to around two million deaths every year and the estimated number is expected to be double by 2050. Air pollution is one of the leading risk factors of death in low- and middle-income countries. Air pollution currently is

growing public health issue which needs to be addressed at once. According to the World Health Organization's (WHO) Ambient Air Pollution database, 13 of the top 20 cities in the world with the highest annual levels of PM2.5 are now in India, with Delhi featuring at the top of the list. The major health problems related to air pollution are heart disease, chronic obstructive pulmonary disease, lung cancer, and acute respiratory infections in children. Top health risk that the population suffer due to polluted air.

6.7 AIR POLLUTION AND WHO REPORT

In 2017, air pollution accounted for 12.4 lakh deaths in India, which included 6.7 lakh deaths due to outdoor particulate matter air pollution and 4.8 lakh deaths due to household air pollution. Like many of the other conditions in this list, these can be caused by both long-term exposure and short-term exposure to high levels of air pollutants. As per WHO report worldwide ambient air pollution accounts for:

- 29% of all deaths and disease from lung cancer
- 17% of all deaths and disease from acute lower respiratory infection
- 24% of all deaths from stroke
- 25% of all deaths and disease from ischemic heart disease
- 43% of all deaths and disease from chronic obstructive pulmonary disease

The Global Economy and Social life has badly affected by this pandemic range from \$2.0 to 4.1 trillion, equivalent to a loss of between 2.3% and 4.8% of global gross domestic product (ADB 2020). But despite the severe impacts there are reports that lockdown has temporarily improved environmental conditions around the world. The lockdown improved the air quality of the 103 cities in India, the most polluted country in the world which has 21 out of the 30 world's most polluted cities. Air pollution is the single largest environmental health risk in the world causes seven million people die prematurely every year globally as a result of exposure to air pollution, more than 91% of the world's population lives in places where air quality exceeds the World Health Organization's guidelines (WHO 2020). In the capital, New Delhi, government data shows the average concentration of PM 2.5 plunged by 71% in the space of a week, falling from 91 microgram per cubic meter on March 20, to 26 on March 27, after the lockdown began. The World Health Organization considers anything above 25 to be unsafe. Nitrogen dioxide went from 52 per cubic meter to 15 in the same period also a 71% fall. Mumbai, Chennai, Kolkata and Bangalore have also recorded a fall in these air pollutants

During the first three weeks of March, the average nitrogen dioxide levels declined by 40-50% in the cities of Mumbai, Pune and Ahmedabad, compared with the same period in 2018 and 2019, sources from the System of Air Quality and Weather Forecasting And Research (SAFAR) under India's Ministry of Earth Sciences. On April 21, the National Aeronautics and Space Administration (NASA) also released an image, according to which its satellite sensors observed aerosol levels at a 20-year low for this time of year in northern India after just a week of reduced human activities. According to a data tracker developed by the Energy Policy Institute at the University of Chicago, India's electricity consumption has fallen by 18.72% (till April 3) due to the lockdown. Similarly, as per the data compiled by the Centre for Research on Energy and Clean Air (CREA), there has been a clear reduction of consumption of petroleum products and coal by industries in regions within and around cities. Consumption of diesel decreased by 24% in March 2020 compared to March 2019, with most of the fall post the lockdown.

Overall consumption of petroleum products in India decreased by 18% during the same period. High levels of aerosols have been a major factor in unhealthy, high levels of air pollution throughout India, especially in urban areas which is drastic decrease due to less movement of vehicles. The people of Jalandhar could see the majestic snow-capped Dhauladhar mountain range of Himachal Pradesh, 250 km away, for the first time in 30 years. Not only that the snowy Himalayan peaks of the revered Gangotri glacier over 200 km away and Kanchenjunga peak also emerged from Siliguri with AQI level 50. Reduction in economic activities during the pandemic-related lockdown had resulted in decrease in air pollution in most parts of India, but satellite observations show that parts of central-western and northern India recorded an increase in pollution in contrast to the general trend. Scientists at the Aryabhata Research Institute of Observational Sciences (ARIES), an autonomous institute under the Department of Science and Technology, utilised the EUMETSAT and NASA satellite observations for the year 2018, 2019, and 2020, and investigated the influence of significant cutoff of activities on the changes in distribution of ozone, carbon monoxide and nitrogen di-oxide during the lockdown period.

6.8 AIR POLLUTION AND MOST AFFECTED CITIES

In a statement, the Science and Technology Ministry said scientists have identified that regions in the central-western part of India and north India are prone to higher air pollution exposure based on state-of-the-art satellite observations and hence are exposed to greater risk of respiratory problems. "In 2020, a complete nationwide lockdown was imposed over India to impede the spread of coronavirus disease. This enormously disrupted the economy

with a single positive side effect, a short-term improvement in the air quality near the surface. The satellite-based observation of toxic trace gases ozone, NO₂ and carbon monoxide near the surface and in the free troposphere mostly showed reduction of the pollutants over India.

With vehicles off the road and industries shut due to the ongoing lockdown imposed to combat the coronavirus outbreak, the presence of major pollutants in the air PM_{2.5}, PM₁₀ and NO_x has reduced by at least 50 per cent in Delhi. The three pollutants PM_{2.5} (atmospheric particulate matter that have a diameter of less than 2.5 micrometers), PM₁₀ (atmospheric particulate matter that have a diameter of less than 10 micrometers) and NO_x (nitrogen oxide released in traffic emissions) are some of the most dangerous pollutants and prolonged exposure to these can lead to serious respiratory disorders. According to an analysis by the central government-run System of Air Quality and Weather Forecasting and Research (SAFAR), the highest reduction in these three pollutants has been seen in Delhi. India is currently under the biggest lockdown with around 1.3 billion people asked to stay home in view of the coronavirus outbreak, which has claimed over 100 lives and infected more than 4,000 people in the country.

Under the lockdown, industries have been shut and people have been urged to avoid unnecessary travelling, significantly reducing the traffic movement across the country. In Delhi, the comparison made from the second week of March (before lockdown) to first week of April (April 6), reduction in PM_{2.5} was found to be by 62%, PM₁₀ by 57% and NO_x by 50%. In Mumbai, the comparison in the same period showed a reduction in PM_{2.5} by 45%, PM₁₀ by 51% and NO_x by 60%, the data showed. In Pune, a reduction in PM_{2.5} by 31 %, PM₁₀ by 32% and NO_x by 62%, according to the data provided by CPCB. In Ahmedabad, a reduction in PM_{2.5} by 57%, PM₁₀ by 47% and NO_x by 32%, according to the data provided by CPCB. Environmentalists have said these figures prove that the most air pollution is man-made. "Meteorology at this time of the year assures us of lower pollution compared to winter months but this year, the lockdown has added to met factors. These three pollutants NO_x, PM_{2.5} and PM₁₀ are mainly generated from vehicular combustion and road traffic, especially NO_x.

6.9 CONCLUSION

According to the study, published in the 'Environmental Science and Pollution Research', ozone, carbon monoxide and NO₂ showed an increase of about 15 per cent over the central-western part of India. According to the results, carbon monoxide showed a consistent increase (as high as 31 per cent) of concentration at higher heights during the lockdown. The

long-range transport and downward transport from the stratosphere significantly increased ozone concentrations over north India during the lockdown, and remote regions like the Himalayas and coastal cities showed the bare minimum influence of lockdown in air quality, with a tendency to increase in criteria air pollutants. The cleaner River Ganga sightings with fishes have emerged from Uttar Pradesh's Kanpur as well as Varanasi. The clear water is a result of the shutdown of most industries. River Yamuna has also started to appear clearer in southeast Delhi's Kalindi Kunj, the heavy amount of toxic foam that is usually seen around the year still continues. The toxic foam is caused due to a mix of sewage, detergents and chemicals from industrial waste. This lockdown will facilitate enhanced free movement of animals never seen before like dolphins near Mumbai shores, Elephant strolling through Dehradun, deer on Ooty Coimbatore road, leopard sauntered into the city of Chandigarh and peacocks and other birds found from various locations in urban areas.

REFERENCES

- Agarwal, A. K., Singh, A. P., Gupta, T., Agarwal, R. A., Sharma, N., Rajput, P., et al. (2018). Mutagenicity and cytotoxicity of particulate matter emitted
- Bhattacharya, S., Sharma, C., Dhiman, R. C., and Mitra, A. P. (2006). Climate change and malaria in India. *Curr. Sci.* 90:369–375
- Central Pollution Control Board (CPCB). Water Quality. 2020. Available online: <https://cpcb.nic.in/nwmp-data-2020/> (accessed on 5 November 2021).
- Chattopadhyay, S., Gupta, S., and Saha, R. N. (2010). Spatial and temporal variation of urban air quality: a GIS approach. *J. Environ. Prot.* 1, 264–277. doi: 10.4236/jep.2010.13032
- Chaudhury, S. K., Gore, J. M., and Ray, K. S. (2000). Impact of heat waves over India. *Curr. Sci.* 79, 153–155
- Cheval, S.; Adamescu, M.C.; Georgiadis, T.; Herrnegger, M.; Piticar, A.; Legates, D.R. Observed and Potential Impacts of the COVID-19 Pandemic on the Environment. *Int. J. Environ. Res. Public Health* 2020, 17, 4140.
- Chowdhury, S., Dey, S., and Smith, K. R. (2018). Ambient PM_{2.5} exposure and expected premature mortality to 2100 in India under climate change scenarios. *Nat. Commun.* 9:318. doi: 10.1038/s41467-017-02755-y
- from biodiesel-fueled engines. *Environ. Sci. Technol.* 52, 14496–14507. doi: 10.1021/acs.est.8b03345

- Ganguly, N. D., Tzani, C. G., Philippopoulos, K., and Deligiorgi, D. (2019). Analysis of a severe air pollution episode in India during Diwali festival—a nationwide approach. *Atmósfera* 32, 225–236. doi: 10.20937/ATM.2019.32.03.05
- Gautam, R., Hsu, N. C., and Lau, K. M. (2010). Premonsoon aerosol characterization and radiative effects over the Indo-Gangetic Plains: implications for regional climate warming. *J. Geophys. Res.* 115. doi: 10.1029/2010JD013819
- Gupta, N., Tomar, A., and Kumar, V. (2020). The effect of COVID-19 lockdown on the air environment in India. *Global J. Environ. Sci. Manage.* 6, 31–40. doi: 10.22034/GJESM.2019.06.SI.04
- Guttikunda, S. K., Nishadh, K. A., Gota, S., Singh, P., Chanda, A., Jawahar, P., et al. (2019). Air quality, emissions, and source contributions analysis for the Greater Bengaluru region of India. *Atmos. Pollut. Res.* 10, 941–953. doi: 10.1016/j.apr.2019.01.002
- Hondula, D. M., and Barnett, A. G. (2014). Heat-related morbidity in Brisbane, Australia: spatial variation and area-level predictors. *Environ. Health Perspect.* 122, 831–836. doi: 10.1289/ehp.1307496
- Kant, Y., Mitra, D., and Chauhan, P. (2020). Space-based observations on the impact of COVID-19-induced lockdown on aerosols over India. *Curr. Sci.* 119, 539–544
- Khan, I.; Shah, D.; Shah, S.S. COVID-19 pandemic and its positive impacts on environment: An updated review. *Int. J. Environ. Sci. Technol.* 2021, 18, 521–530
- Khatri, N.; Tyagi, S. Influences of natural and anthropogenic factors on surface and groundwater quality in rural and urban areas. *Front. Life Sci.* 2015, 8, 23–39.
- Kulk, G.; George, G.; Abdulaziz, A.; Menon, N.; Theenathayalan, V.; Jayaram, C.; Brewin, R.J.W.; Sathyendranath, S. Effect of Reduced Anthropogenic Activities on Water Quality in Lake Vembanad, India. *Remote Sens.* 2021, 13, 1631.
- Kumar, M.; Patel, A.K.; Shah, A.V.; Raval, J.; Rajpara, N.; Joshi, M.; Joshi, C.G. First proof of the capability of wastewater surveillance for COVID-19 in India through detection of genetic material of SARS-CoV-2. *Sci. Total Environ.* 2020, 746, 141326.
- Kumar, P., Hama, S., Omidvarborna, H., Sharma, A., Sahani, J., Abhijith, K. V., et al. (2020). Temporary reduction in fine particulate matter due to ‘anthropogenic emissions switch-off’ during COVID-19 lockdown in Indian cities. *Sustain. Cities Soc.* 2:102382. doi: 10.1016/j.scs.2020.102382
- Kumar, V., Shukla, T., Mehta, M., Dobhal, D. P., Bisht, M. P. S., and Nautiyal, S. (2021). Glacier changes and associated climate drivers for the last three decades, Nanda Devi region, Central Himalaya, India. *Quaternary Int.* 575, 213–226. doi: 10.1016/j.quaint.2020.06.017

- Lokhandwala, S.; Gautam, P. Indirect impact of COVID-19 on environment: A brief study in Indian context. *Environ. Research* 2020, 188, 109807.
- Mukherjee, A.; Babu, S.; Ghosh, S. Thinking about water and air to attain Sustainable Development Goals during times of COVID-19 Pandemic. *J. Earth Syst. Sci.* 2020, 129, 180.
- Peeri, N.C.; Shrestha, N.; Rahman, M.S.; Zaki, R.; Tan, Z.; Bibi, S.; Baghbanzadeh, M.; Aghamohammadi, N.; Zhang, W.; Haque, U. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the NEWEST and biggest global health threats: What lessons have we learned? *Int. J. Epidemiol.* 2020, 49, 717–726.
- Rupani, P.F.; Nilashi, M.; Abumalloh, R.A.; Asadi, S.; Samad, S.; Wang, S. Coronavirus pandemic (COVID-19) and its natural environmental impacts. *Int. J. Environ. Sci. Technol.* 2020, 17, 4655–4666
- Tarazona, J.V.; Martínez, M.; Martínez, M.A.; Anadón, A. Environmental impact assessment of COVID-19 therapeutic solutions. A prospective analysis. *Sci. Total Environ.* 2021, 778, 146257.
- Uttar Pradesh Pollution Control Board (UPPCB). River Water Quality. 2020. Available online: http://www.uppcb.com/river_quality.htm (accessed on 6 November 2021).
- World Health Organization (WHO). Water, Sanitation, Hygiene and Waste Management for the COVID-19: Technical Brief, 3 March 2020. 2020b. Available online: <https://apps.who.int/iris/handle/10665/331305> (accessed on 1 October 2021).
- <https://aqicn.org/scale/>
- <https://edition.cnn.com/>
- <https://www.space.com/>
- <https://www.researchgate.net/>
- <https://qz.com/india>
- <https://scroll.in/article>
- <https://india.mongabay.com/>

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