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Mr. Ratan N. Tata

Chairman Emeritus,
Tata Sons and Tata Group

Mr. Ratan Naval Tata, 84, is one of the best known and most respected business leaders in India. He was the Chairman of Tata Sons from 1991 till his retirement on December 28, 2012. Tata Sons is the holding company of the Tata Group, one of the country's largest conglomerates which comprise nearly 100 firms with revenues totaling about 10,300 crores USD. Post retirement, he has been conferred the honorary title of Chairman Emeritus of Tata Sons. Mr. Tata is named among the leading philanthropists in India with interests ranging from education, medicine and rural development. He is the recipient of the second-highest civilian award in India, the Padma Vibhushan, in 2008. He has also received honorary doctorates from several universities in India and overseas. This column presents snippets of his wisdom that provide a peek into the thinking of this iconic industrialist.

If you want to walk fast, walk alone. But if you want to walk far, walk together.

I admire people who are very successful. But if that success has been achieved through too much ruthlessness, then I may admire that person, but I can't respect him.

Take the stones people throw at you, and use them to build a monument.

Apart from values and ethics which I have tried to live by, the legacy I would like to leave behind is a very simple one - that I have always stood up for what I consider to be the right thing, and I have tried to be as fair and equitable as I could be.

I have always been very confident and very upbeat about the future potential of India. I think it is a great country with great potential.

Young entrepreneurs will make a difference in the Indian ecosystem.

Power and wealth are not two of my main stakes.

At Tatas, we believe that if we are not among the top three in an industry, we should look seriously at what it would take to become one of the top three players.. or think about exiting the industry.

None can destroy iron, but its own rust can! Likewise none can destroy a person, but its own mindset can!

World Leadership Academy

Connecting Thinkers...

World Leadership Academy

Prof. Sasmita Samanta

Editor

- **Academician**
- **Author**
- **Speaker**
- **Writer**
- **Visionary**
- **Leader**
- **Social Worker**

From EDITOR'S DESK....

Amid the Pandemic and scourge of wars, the whole of humanity is in uncertainty the likes of which have never been seen before. The irresponsible responses to the events and environment by world leaders have taken thousands of lives and left millions of people homeless and parentless. The orphans and widows are on the road for the want of food and other basic needs.

Indianism is the treasure of values, virtues and attitudes. India needs an anchor to educate the world with the unexplored wisdom of this country. The spiritual treasure of Vedas, which manifests that learning itself creates realisation and passion for the cause, is now spreading widely over all the sectors of knowledge like life, soul, self, work, society, medicine, art, culture, science, etc.

The knowledge of universal tolerance and universal peace relates to inner calmness and not being disturbed by outward activities; but does not restrain to be indifferent. Emotional is the true form of spiritual, feel for others, feel for poor, and feel for suffering; followed by the manifestation of actions.

Renunciation of actions is not peace. Actions for giving hope to others and making others feel happiness, while deriving inner bliss is peace.

Peace is respect for humanity in all its forms, irrespective of artificial separations on the basis of territory, religion, colour or gender. According to the Bhagavad Gita, the knowledge given by Lord Krishna, a person should not be anxious to get honour and be calm while getting dishonoured and disrespected by others. These teachings form the essence of tolerance or inner calm.

Thinking about the globe, working for the goodness of humanity and living for lives is peace, is serenity, is.....

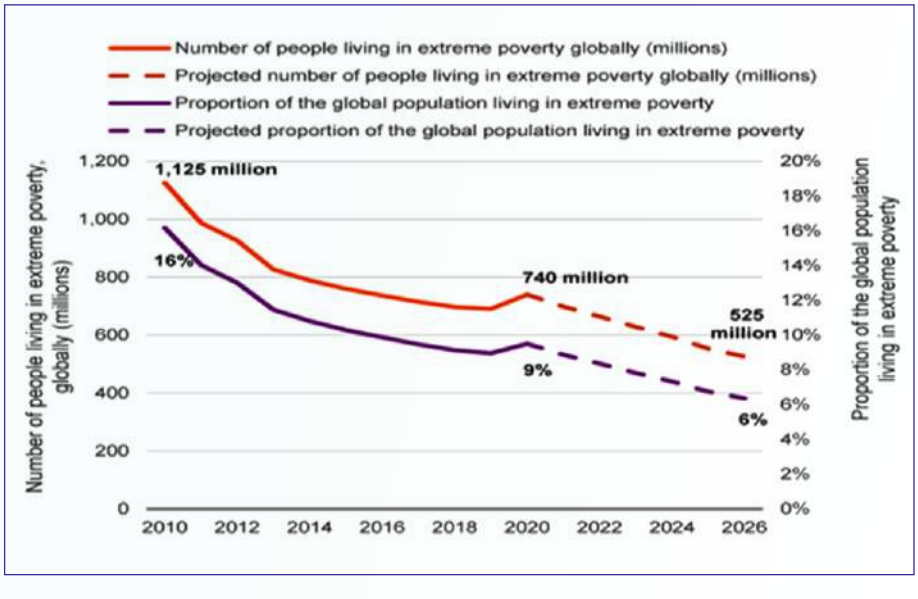
CONTENT

Poverty Alleviation: Balance between Economy and Ecology

Sasmita Samanta

Poverty Alleviation is the structured thoughts translated into effective actions, aimed at eliminating the consequences of poverty like hunger, malnutrition, illiteracy, social exclusion and inefficiency. It is not only an economic problem but also a humanitarian problem. The one-seventh population of the globe live in poverty and are mostly deprived of all human rights including sanitation, good health and access to a better life. They do not have enough access to the economy, education or the available developmental framework. Southern Asia and Sub-Saharan Africa have experienced poverty, which is estimated to have increased post-pandemic. It has been brought to the world's notice through a baseline survey that in 2030, six per cent of the world population will stay below the poverty line or will have a daily income of less than or equal to 1.9 USD. Even in 2030 a newborn or a small child may face the impact of deprivation like malnutrition, and illiteracy and may not have the access to an economy or a good decent life.

United Nations' effort for Poverty Alleviation through Millennium Development Goals focusing on increasing accessibility and inclusion had brought momentum. During the fifteen years from 2000 to 2015, poverty across the globe was down to 10 % in 2015 from 25% in 2000 even though 800 million people got added to Below Poverty Line (1.9 USD or less per day) Category in the last two decades. The Universal Declaration of Human Rights was passed in Paris on 17th October 1948 in favour of thousands of people those who are victims of extreme poverty, hunger and violence, and 17th October was declared as the International Day for Eradication of Poverty to commemorate the day by General Assembly of the United Nations on 22nd December 1992. Sustainable Development Goals (SDG 2015-2030) have been developed as a balanced vision among Equality, Inclusiveness and Growth. It starts with SDG1-No Poverty, SDG2-Zero Hunger, SDG8-Decent Work and Economic Growth, SDG16-Peace Justice and Strong institutions and ends with SDG 17-Partnership for the Goals. It addresses diversified human, economic and social needs to be fulfilled through awareness, inclusivity, and accessibility to building institutions and strategic alliances.



Source: Development Initiatives based on World Bank PovcalNet and IMF World Economic Outlook. (Taken from https://devinit.org/resources/poverty-trends-global-regional-and-national/)

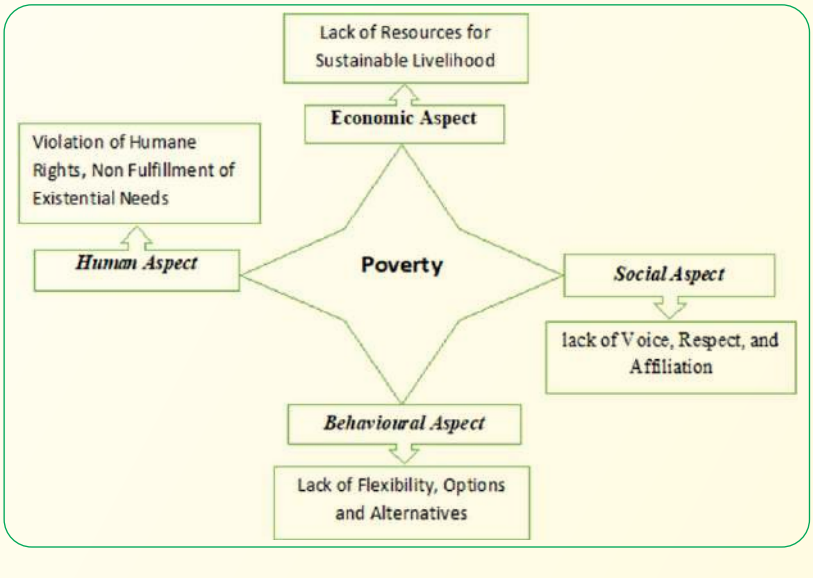
Economic Aspects of Poverty: The lack of income or productive resources restrains to have a sustainable livelihood. It manifests in hunger, malnutrition, lower purchasing power and exclusion from economic decision-making processes. It leads the whole of humanity toward a diseased population, who are physically and psychologically unhealthy. The multi-Dimensional Poverty Analysis (MDPA) Model of Sida focuses on four major aspects i.e. lack of resources, fewer opportunities and choices, no power and less voice, and lack of human security. Less or low purchasing power leads to low economic growth, unhealthy competition for survival and growth and economic monopoly. Poverty is a major economic pollutant.

Social Aspect of Poverty: Lister defines poverty not only as economically disadvantaged or inaccessible to material needs but also as a " shameful and corrosive social relation ". He focuses on five major social dimensions of poverty i.e. lack of voice, disrespect, humiliation, reduced dignity and self-esteem. OECD has focused on more extended aspects of poverty covering social humiliations, social exclusions and social deprivations, which keep the people away from social rights and luxury. The terrific consequences are social dis-empowerment and shame.

Behavioural Aspect of Poverty: Hemingway says there is no issue of poor people that can't be solved with a little more money. The rich are working and marrying as much as they can, which the poor have not done. They behave differently than any one of the rich. But if we clearly imagine, little money for some time can aggravate many situations of the poor like getting involved in activities, which will give them pleasure for some time and push them into desires, which may not be fulfilled any time throughout their life, which can push them to do crime or to solve a one-time situational problem and again back to the same place. The requirement is that the poor adopt mainstream behaviour and develop the attitude to participate in developmental decision-making, not only on the receiving end.

We come across two types of behaviour of poor. First is when the family pushes the poor children to involve in just miniature economic activities to fulfil their needs and desire, sometimes moral and sometimes immoral, which leads them to have lifetime poverty. Second is when the family closely monitor the behaviour of a child and teach them to have the desire to be rich in moral, intellect and education, which slowly leads them to be rich intellectually, morally and financially. We see on the street, parents get involved in a miniature job and slowly they motivate their kids to involve in those activities, instead of going to school and getting educated. At the same time, a few are there who in, spite of hardships send children to school, nurture them emotionally to have faith in the power of knowledge and motivate them to get engaged in the intellectual journey, which slowly changes them to adopt mainstream behaviour and connect them to social mainstream to grow.

Human Aspect of Poverty: Extreme Poverty is not only concerned with the economy, but it has a multidimensional effect and these are the cause for violation of Human Rights. Starting from



deprivation of healthy food, a safe environment, the right to education and good health are the causes of poverty. Any nation or province, which can afford to provide those facilities to all the citizens helps them to have those basic necessities and should try to eliminate poverty. The absence of such facilities creates social, economic and human disasters. Rightly analyzed by the Nobel Laureate Prof. Abhijeet Banerjee that for the growth and development of the Indian Economic Condition, the purchasing power of each and every individual should have the luxury to have money and spending. Around 1.3 billion population still lives below the poverty line as per the report of the United Nations Development Program (UNDP), 2019.

Continuous struggle to have access to basic necessities creates an unhealthy environment both in economy and ecology. Human Rights Council in its resolution in 2011 and 2013 had requested all to explore possibilities and approaches to eliminate poverty. Special focus should be given to women, children and persons with disabilities, and the most vulnerable group impacted by Poverty. No more it should be taken as charity but as a serious Human Issue to be explored and solved strategically. National and provincial policies should be made to address it. The 'Mission Shakti' movement of the Government of India is one of the pioneering steps to empower those groups of people, to participate in the economy. Many other Policies like the Right to Food and Right to Education Act of India are among a few strategic mandates to eliminate the cause of poverty in the nation.

Types of Poverty

Situational Poverty

Being jobless because of specific economic conditions at a particular time like a recession, divorce, or pandemic cause situational poverty. Most of us come across such situations in a life time. We have seen such conditions during Covid-19 particularly to the employees working in the Hospitality, Hotel and Tourism Industries. Millions of people across the globe became jobless, homeless and their purchasing power got reduced. The effective management of situation with supporting policies and actions can reduce the impact.

Generational Poverty

Many families suffer from poverty for generations (more than two). They live in a particular way like struggling for basic needs throughout life and are deprived of the luxury of dreaming for big or highly paid jobs, big houses and smart education in good schools and universities. Such Poverty can be eliminated by providing minimum food products and giving exposure to the higher order of human needs such as safety, hygiene and self esteem need.

Absolute Poverty

It is extreme poverty, where people cannot access food, health and education. It leads to social trauma, shame and self-abuse. In most of developing nations, millions of people suffer from such poverty. Special intervention is required both economic and emotional to address it.

Relative Poverty

Many people, particularly middle-class people, are not deprived of basic needs of food and health, but their purchasing capability is a little low in comparison to others in the community. It does not create human rights violations but creates social pressure and stress, which is purely psychological.

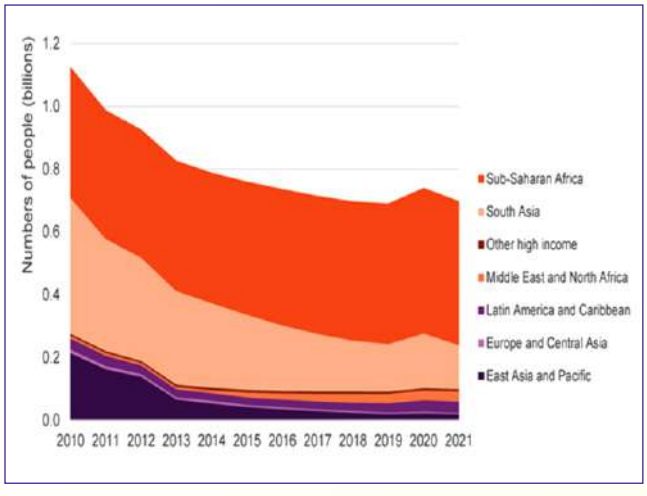
Urban Poverty

In such cases, people are well informed about the developmental policies and plan and have access to all high-tech facilities like 24X7 access to the good internet network, and banking facilities and can get economic engagement to earn their livelihood. But the issue here is those groups are informed, but do not have the courage and attitude to access it. Confidence building counselling can be done to connect them to the social mainstream.

Rural Poverty

In rural areas, the reasons for poverty are lack of employment opportunities, low or no access to mainstream infrastructural facilities, no education and exposure etc. They live in villages without sufficient electricity, internet, good transportation

etc. Building infrastructural facilities is one of the major steps, which can address those issues.



Source: Development Initiatives based on World Bank PovcalNet and national sources. (Taken from https://devinit.org/resources/poverty-trends-global-regional-and-national/)

Poverty Alleviation Strategies

Global Strategies

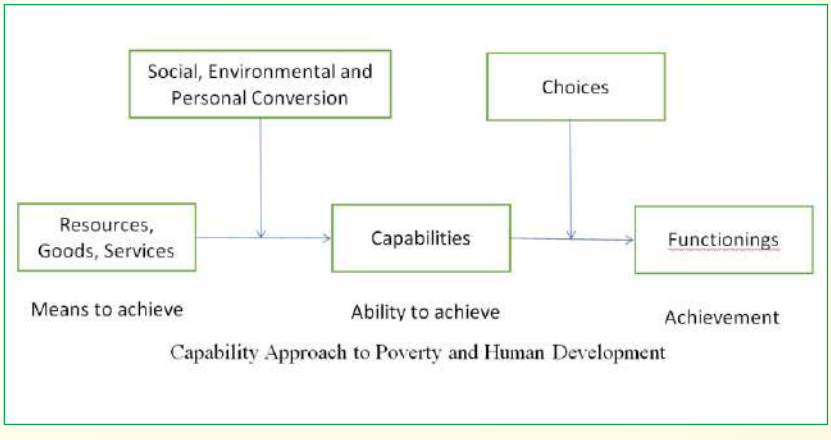
United Nations' Sustainable Development Goals are meant to create awareness about global human and social issues and provide guidelines and directions to all the nations to think on those agendas. The number one Goal of SDGs is "No Poverty" because Poverty is the most vulnerable pollutant to the Economy and Society. Integrated approach to poverty alleviation can only solve this issue by taking livelihood, education, health and environment together. So 17 SDGs are the Integrated Approach of United Nations to have a just human society in the Globe. UNDP and UNFPI are coming with number of Programs whole through the year to address the issues.

Poverty Reduction Strategy Document of World Bank focuses on macroeconomic, social and structural policies of the nations and the design of developmental programs to address poverty. According to the report, the collaborative action plan can help for equitable distribution of resources and reduce the gap. International Monetary Fund emphasizes on the proper study of the reasons for poverty and brings out the Poverty Reduction Strategy Report for execution. Special Focus is given to Inclusivity, Equity and Accessibility.

Source: www.un.org/

National Strategy

In developing countries poverty is considered a multidimensional phenomenon and its impacts are not confined to only economic or less purchasing power for the fulfilment of desire. The capability deprivation approach by noted economist Amartya Sen defines poverty as not only confined to access to the economy or goods but also having deprived of developing certain capabilities that lead to a successful life. The contemplation of disparities between individual income and actual capabilities developed out of that creates serious issues because of the ignorance, lack of awareness and confidence to take decisions.



Capability Approach to Poverty and Human Development

United Nations Development Program (UNDP) defines poverty much more than just less purchasing power and follows Amartya Sen's theory of Capabilities Deprivation for poverty measurement. The first Sustainable Development Goal "Ending Poverty in all its forms from Everywhere" is the motto of the Globe by 2030. Microfinance is one of the major strategies to do away with economic poverty. Industrialization and Entrepreneurship help develop echo systems to drive the community to learn, strategize, execute and grow. Many studies, particularly in the last two decades, have shown that the global and national strategies focused on inclusivity and equity have helped millions of people, particularly in Asian countries like China, India, Bangladesh etc. to come out of economic poverty and others will follow in time.

Many studies show the microfinancing concept pioneered by Md. Yunus has helped to bring transformation in Health, Education, Livelihood etc. and has helped many, particularly women and the deprived to come out of economic and social suffering and lead a life with respect and dignity. World Development Report 1990 focused on poverty alleviation strategy combining economic and essential services together for developing economic and social safety net. While the microfinance approach helps to build strong institutions, the capacity-building approach helps to build a skilled confident workforce, motivated to learn, work and earn. The market approach helps to identify the strengths and gaps. Good governance helps to increase inclusivity irrespective of diversity and socio-cultural differences.

Many studies have been conducted in Asia, Europe, USA and Africa to establish a relation between ecosystem services and human well-being recognizing social and ecosystem direct/indirect impacts on the socioeconomic environment. Ecosystem services directly contribute to developing countries for improvement or betterment of economic ecology and degradation in all those services directly impacts the human well-being; physical, economic, social and psychological.

The poverty Alleviation programs started in India in a broader sense from the 1980s onwards after identifying the poverty margin. The Integrated Rural Development program started in 1980-81 and continued up to 1991 aggressively contributing to reducing economic poverty. This program is entirely dependent on human attitude to work and learn

skills. In the last thirty years, we see the poor families in rural areas remain at 50 million under IRDP program. Many social developmental plans have been executed to address those issues. At present, the central leadership is trying to develop a number of diversified solutions to cater to the need of poor people and addressing to the issues seamlessly starting from livelihood, skill, education, health care, employment, innovations and development. According to him, the issues should be addressed from multiple angles to give feasible solutions. The investment of the government in those families was not sufficient to help them generate at least Rs.2000/- per month per family. One of the major reasons was the involvement of unskilled and inexperienced people in the management of such projects.

Many Plans including all 11 Five Years Plan focused on Poverty Alleviation and with that many plans designed by Government of India between 1980 to 2022 in the name of Integrated Rural Development Program, Pradhan Mantri Grameen Awaas Yojana, Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA), National Urban Livelihood Mission, Atma Nirbhar Nidhi Mission etc. have helped a lot in reducing poverty particularly in rural areas though as per the 2011 census, rural poverty is 25.7% in comparision to urban poverty of 13.7 %.

Atma Nirbhar Plan is meticulously designed to make India self sustainable both in production and consumption focusing on reducing the dependency on import. During Covid-19, many achievements have been made starting from the production of vaccine to personal protective equipment kit and registration and engagement of thousands new manufacturing industries in diverse fields starting from Electronics to FMCG and Handicraft products. Many made in India products are seen in the market. It may take a couple of years to stabilize their quality and capture the market. It is a continuous process. Such initiatives are creating a positive climate for acquiring particular skills in different regions and getting involved in such activities. The involvement of women in Self Help Group initiatives is producing a number of usable products, particularly in food, garment and FMCG sectors. Those developmental strategies have brought lots of positive changes in poverty reduction to 10.2 % in 2019 from 22.5 % in 2011.

Good Leadership and Governance

Sudarsan Nanda

Human being are perhaps the best creation of God and are good in all respects. But depending on circumstances some people may have behavior and personalities which are not ideal. Behavior and personalities may depend on various factors such as hereditary, physical features, cultural, family and social factors, some may develop ego, aggression, reaction, self theory etc, intelligence and language etc. may be different for different people. Different people may develop different attitudes depending on relation to needs, attitudes and behavior may be different towards colleagues, employees, higher authority and some may have adjustment problem with others. Human values and ethics may be different for different people. Those who are in leadership position some may be democratic and may have participative style; some may be autocratic and may have directive style. Some person may be emotional, logical, illogical, selfish, having high expectations and self interest, may react when self interest is not fulfilled. Importance attached to jobs, style of working, supervision, tolerance for stress and be different for different people. Different people may have different perception for the goals, vision, mission and development of the organization with which they are associated, some may prefer for working only during specific working hours. There may be organizational conflict which a leader has to settle.

A leader in any organization such as academic, administrative, govt. sectors, private sectors, corporate, politics etc is said to be a good leader if he / she leads all sorts of people with different behavior and personalities and still can develop the organization to world class. In order to be a successful Leader, for that matter a successful person one has to develop the following six qualities.

Table 1

1. To take care of own health and remain physically and mentally fit.
2. To develop intellectual mind, have capacity to learn
3. To have emotional maturity
4. To have esthetic beauty
5. To develop social desirable values like hard work, team work, discipline etc.
6. To develop concentration, ethics, human values and spiritualism.

Not to think of the following eight blunders as was observed by Mahatma Gandhi.

Table 2

1. Wealth without work
2. Knowledge without character
3. Science without humanity
4. Politics without principles
5. Pleasure without conscience
6. Commerce without morality
7. Worship without sacrifice
8. Rights without duties and responsibility.

Martin Luther King observed six steps for social changes which every leader / researcher should have, they are essential for every person to be successful in life.

Table 3

1. Education
2. Information gathering
3. Personal commitments
4. Negotiation
5. Direct action
6. Reconciliation

A good leader, leader having the above stated qualities in tables 1, 2, and 3, can provide 'good governance'. Good governance has nine major attributes. These are

1. Participatory
2. Follows rule of law
3. Transparency
4. Responsiveness
5. Consensus oriented

6. Equitable and inclusiveness
7. Accountability
8. Effective and Efficient
9. Strategic Vision

It is better to elaborate, to some extent, the nine principles stated above.

Participation: Sharing of powers, ability to influence others, allowing freedom of expression and association.

Rule of Law: To act as impartial, unbiased, protect human rights and values and follow the law of the land.

Transparency: Decisions taken and implemented are easily, freely available to all, particularly who will get benefit and who will be effected by such decisions.

Responsive: To get the work done in a reasonable time period.

Consensusness: Mediation and discussions with stake holders to obtain consensus and interest of the society as far as possible.

Equitable and Inclusive: No one should feel excluded from the main stream.

Accountability: It should be clearly known to all regarding who is accountable to whom and who is reporting to whom.

Strategic Vision: Besides short term plan there should be long term and broad perspective vision and it should be made known to all.

A good leader is one who will have to look at the following 6R's for the growth and development of the organization

1. Realization of needs, challenges, opportunities, strengths, weakness and threats
2. Requirements of suppliers, customers, process owners, products and services
3. Rethink structures, systems, procedures, rules, processes, technologies
4. Redesign the total system, eliminate waste, optimize processes and output.
5. Retool the delivery system, transformation methods, technologies, systems
6. Reevaluate results, performances, indicators and goals.

Whatever has been told till now about the qualities of being a good and successful leader who provides good governance is ideal, it is very difficult , but not impossible, to achieve this. In order to achieve these qualities some people practice Yoga, meditation, prayer and believe in spiritualism and God.

As far as I am concerned, there is no difference between Science and Spiritualism, one is the complement of other and both exist together. Science is based on some axioms (undefined concepts) and spiritualism also is based on some axioms. Of course one can establish relationship among the axioms which explains existing ones. For example, the natural numbers were considered as undefined concepts, but Peano introduced some axioms which defined natural number. There are various versions of 'axiom of choice' and all are equivalent. Similarly various versions of 'completeness of real number systems' are equivalent. It may be noted that the' grand unification theory' of Professor Abdus Salam states that all the forces existing in this Universe are the different manifestations of one and the same force and there exists only one force. Also to achieve something no extreme path is good and only the middle path is better which was suggested by Buddha. One may ask 'Who and what is God' and how many Gods are there. Some of the axioms of existence of God are as follows:

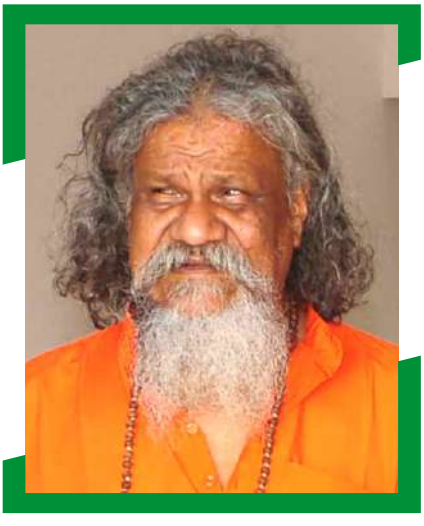
1. God exists and is present everywhere at the same time, here and there
2. Is ultimate reality,
3. Is non - material,
4. Is the divine principle of Law,
5. God rules all over,
6. Is the eternal spirit
7. Indivisible but exists as if divided
8. Responsible for creation, protection and destruction,all powerful, , all knowing, almighty,
9. Exists within and without all beings
10. Moves and moves not

Personal God

1. When it is not possible to concentrate and believe ultimate reality, some people believe in God in different forms, under different names in their house which we may call as Personal God.
2. The other personal Gods are father, mother and teacher etc. Some people follow their principles, way of life and suggestions.
3. Other Type of personal Gods are those who were / are born as human being, but having super power.

Some such examples from Indian mythology are Rama, Krishna etc. and Saint like Buddha, Mohamed, Christ and more recently saints like Ramakrishna, Vivekananda, Mahatma Gandhi, Aurobindo etc.

In conclusion I must say that people who have become successful and great leaders in any field and have done wonders have acquired all or many of the qualities stated in this article keeping in mind the ethical values and developing concentration and spiritualism.



Mystery of Creation

Prasanna Patasani

Is computer is computing? Is computer being above the mind? The mind is computing to the computer. Therefore, the mind is above the computer. Mind is operating inside the whole body. Mind is also transferring the cosmic body with cosmic power. Where is the mind operating? According to the quantum physics, mind goes to attain the state of least excitation. Mind may attain the zero entropy, mind may attain the zero state of consciousness, may lead you the holistic galore. In accordance with laws framed by constitution, is somebody breaking the law is punished by the judiciary but there is another law is constituted by the nature. If that is violated, the human being is punished by the nature and suffering begins.

How your mind is leading you to attain the knowledge to lead your whole life, which is vibrating, that vibration lead to attain the immorality to meet the mortal body. Waking, dreaming, and sleeping are three statesof consciousness and the fourth state of consciousness is the transcendental consciousness. The fifth state is cosmic consciousness. The sixth state is God consciousness. The seventh state of consciousness is unit consciousness. The eighth state of consciousness is the supreme consciousness may lead to attain the ninth state of consciousness which is the fullness of life may lead to attain the zero state of consciousness. So, the fullness of life is vibrating the life may lead you to attain the cosmic power and may lead your life to attain thy breathing process which is being operated by your eternal mind that we all are attaining everyday through our breathing process. How you are realizing that may be named as religion. Religion what I mean is "realize within" may lead to protect and explore to meet the profound knowledge which is structured within your own selves. Un-manifestationof that knowledge is manifested through your action, through your activities and through the natural law.

You do not know that you are "Brahma" and pervading, the word "Brahmana" originated out of tradition that "NA" is the blissful state of consciousness. We should know when that bliss is absent, the God is absent within your body. When you are laughing, you are blossoming like a flower in God's Garden. You are blossoming with fragrance, open to the infinity, synchronization of coherence with body and mind may lead you to attain the infinitesimallevel of the Universe out of that Universe, which is containing the pocketful of cosmic vibration through which the word University is operating to educate not only to your mind but also the entire physical body is operating.

If you know the art how to take care of your own body, the entire body will take care of you. Therefore, if your mind may take care of you to educate you, the human being is converted to God. However, we are lacking that education. If you can take care of your family, the family may take care of you. If your family take care of your village, your own village may take care of you. If you take care of your state, the entire state may take care of you. If know how to take care of the state, the state will take care of the nation and if you know the art of take care of your nation, the entire nation will take care of you. By that the entire globe would be with you.

The global structure may lead the sublime life may lead to attain that heaven. That you do not know the heaven is within you. So let us enjoy the nature, how the sun is rising on early morning, setting in the evening, and loving to invite the darkness with open mind through the galaxy of stars and moon, opening the lily in the night and again in the morning, the sun is opening the red lotus. It is pasted like vermilion on the forehead of your mother. The entire nature is blossoming, and you are enjoying the natural power may lead you to attain the infinitesimal of consciousness. Have you seen penguin to dolphin and birds with golden wings robbing in air and their descending to the sheet of order with greatest act, will lead you to make the life sublime and divine?

The education which is the greatest power to make the life sublime and vibrating your mind to educate yourself to protect the jungle and trees. If you are educated, you are educating the entire globe. If somebody is simple, you are meeting the simple God within yourself, and which can be explored through education. To educate somebody may create that orderliness to save the Universe. The present university may save the world and prosperity which is not visible without education.

One can meet thy invincibility through education only. Once upon a time, greatest philosopher Dr. Radhakrishnan asked the Vedicincarnate Shri BrahmadandaSaraswathi that I donot understand the mystery of creation. Gurudeva answered him to

pick up somewheat in his palm and to break it and asked that what you perceived?He again and again asked to break it to see the smallest particle to his perception. Dr. Radhakrishnan replied that Gurudeva I perceived the zero state of consciousness that is entire birthplace of globe. To meet that global stature,it may lead you from birth to death of the moral body and immortal mind. We all are not realizing the immorality from bird to tree and tree to jungle is saving the universe, University is leading now to make us prosper and fullness.

Nanomanufacturing: Opportunities and Challenges

Mohan Kumar Pradhan

INTRODUCTION

Nanomanufacturing includes any manufacturing process that allows the design, production, control, modification, and manipulation of a technology, as well as a combination of nanoscale components with dimensions ranging from 1 to 100 nanometers. Extremely precise control of substances and methods at the nanometre scale may contribute to unique features, functional capacities, and properties controlled by physics at the nanoscale. Improving product quality, process reproducibility, production scalability, and affordability are all challenges as nanomanufacturing advances.

It is critically important to achieve micro and nanoscale resolution in both manufacturing and many other emerging applications. Micro and nanoscale manufacturing, as well as a variety of other emerging applications, rely on fabrication processes that can produce micro/nanoscale features and structures consistently. Essentially, nanotechnology is the understanding and manipulation of matter in the range of 1-–100 nanometres in size (Fig. 1). Materials constructed from these compounds often exert unusual properties and can achieve important economic and technological breakthroughs.

Technology and the economy depend increasingly on micro and nanofabrication. Several fundamental manufacturing methods exist, including subtractive, additive, and deformation approaches. Modern fabrication processes such as laser micro/nano machining, 3D printing of miniature features, etc., have recently been increasing in popularity because they are reducing manufacturing costs and creating new designs for emerging markets such as smartphones, photovoltaicss, and advanced batteries.

Numerous manufacturing industries, particularly electronics, optical, pharmaceutical, biotechnological, and automobile, have seen a surge in popularity for micro goods and micro components in past few years. Microengines, micro pumps, and medical implants are some applications, along with connectors, switches, micro-reactors, micro engines, and micro delivery systems. For many companies, these microsystem-based products add significant value, contributing to sustainable economic growth. As a result of the current trend towards product miniaturization, micro and nanomanufacturing technologies are in high demand, as well as their integration into new manufacturing platforms. In addition, these platforms should also be capable of combining different functions as well as multi-dimensional architectures (combining macro, micro, and nano dimensions) for existing and new products, while allowing for their cost-effective manufacturing over a wide range of materials.

It might be in three generations depending on the levels of complexity of manufacturing and metrology. First-generation, an economic generation, involves nanostructures incorporated into micro- and macroscopic systems, such as bulk composites as well as coatings based on nanoparticles. The second generation would include

nano but also sub-micron sized feature integrated sub-systems, such as quantum dot layered integrated light-emitting diodes (LEDs) & lasers. The third generation of nanomanufacturing includes entire nanoscale (less than 100 nm) systems such as molecular circuits, and sensor & device systems. A variety of high derivative manufacturing procedures and metrological instruments at sub-micro, nano, and angstrom sizes are urgently needed for the realization of second and third generations of nano produced items.

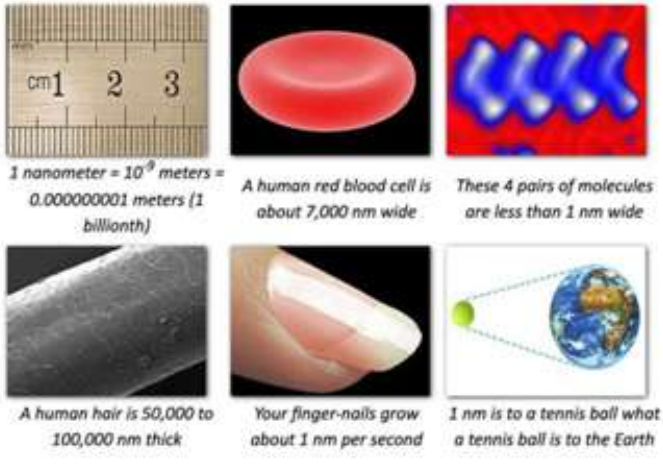


Fig. 1: Size of the nanoscale.
(curtsey: https://www.nanowerk.com/)

Social and Ethical Issues

Every aspect of our lives is influenced by technology. It is difficult to imagine a world without it. Civilization is the source of innovation, it enables as well as supports it. Technologies have been adopted, but they are also spread throughout society, and they are sometimes actively discouraged, objected to, or denied. Advances in understanding nanoscale procedures and materials will lead to recent technologies that may have broad societal influences. Despite the unique ethical and social problems that nanotechnology may pose in the future, much of the public debate has been flawed and inaccurate. When it comes to adopting new technologies, social, scientific, and economic studies can help businesses and governments make the right decisions. The consequences of excessive regulation, especially premature regulation, would be very significant, causing harm to the very people it is designed to protect. Not utilising useful nanotechnology would be immoral.

It involves synthesis, preparation, manufacturing, design, modelling, simulation, and design. The key components are nanoscale, nanostructured materials, nanostructured electrodes, and nanosystems. In addition, the use of tools, equipment, platforms, and how they will be characterised, tested, and assessed. There are challenges and opportunities in nanofabrication at every stage of the development and manufacturing process. Basic predictions of nanosynthesis and nanoassembly processes. Improved methods are being developed to build nanoarchitectures and advanced tools to measure properties at the nanoscale. Controlling and understanding the formation of nanomaterials and nanostructures, as well as determining how catalysts, crystal orientation, atmosphere, chemistry, thermodynamics and other factors affect growth rate and shape. Determine how molecules and materials behave away from equilibrium, for example, how small differences in energy can drive reactions and synthesis.

Sustainable nano manufacturing

opportunities and challengees

New guided assembly and transfer processes involve careful assembly of materials so they do not need to be removed, reducing waste and the number of operations required. So what makes guided assembly-based nanofabrication technology less expensive? The processes used are executed at normal temperature and pressure (no vacuum or high temperature), which results in considerable cost savings in equipment, energy and maintenance. Most of the equipment used in guided assembly processes is simple, mostly dip-coating or spun-based techniques, significantly reducing equipment and operating costs. Many guided assembly and transfer processes are scalable and fast.

This new nonmanufacturing technique faces several problems, some of which are technological in nature and others which are cultural in nature. The majority of the technological issues are around scalability while keeping nanoscale characteristics. Potential environmental and occupational sensitivities should be identified mostly during manufacturing, functionalization, usage, and end-of-life management processes, involving disposal

and recycling.

Research Challenges and Opportunities

Nanomanufacturing research and development incorporates science and engineering wisdom and explores alternative processes and systems to deliver better nanomaterials, control molecular-scale component assembly, and predictably incorporate nanoscale elements into nano, micro, and macro scale components using novel design procedures and tools. Nanomanufacturing is an intrinsically transdisciplinary collection of difficulties dealing with the concerns of working with structures in the nm domain that do indeed integrate a variety of top-down as well as bottom-up procedures.

To accomplish the essential economies of scale for large-scale production, new concepts and principles with innovative methods must be envisioned. A variety of scientific fields are working together to improve our knowledge and control of nanoscale phenomena. The necessity to manage the assembly of 3D complex systems (Fig.2) and process nanoscale structures in high-rate/high-volume use is a critical issue for systems nanomanufacturing. These difficulties highlight the need for study into the characterization of nanomaterials and nanoparticles. To give predictive modelling of nanostructure behaviour, they necessitate improved technology to characterise and quantify nanostructures. Finally, information exchange and outreach are obstacles that must be solved in order to facilitate capacity-building and raise public awareness of nanotechnologies.

Some of the key issues in nanomanufacturing are how to produce and use precursor materials, how to integrate and characterise precursors, how to design and integrate structures into devices and systems, and how to develop the corresponding instrumentation and equipment. The key problem for nanomanufacturing is to fabricate high-precision nanostructures at high levels. For such competing purposes, tradeoffs are highly imperative. It is obvious that the top-down and bottom-up approaches are both useful and complementary to each other. A combination of the two is required to produce future commercial nanoscale products. Another challenge for nanomanufacturing is how to fabricate 3D structures. Several present procedures focus on 2D surface patterning rather than 3D manufacturing, but this might change the way they are created.

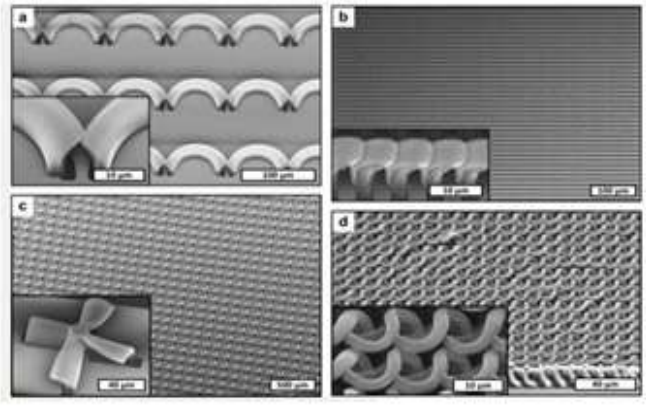


Fig. 2: A range of architecture were created using a process developed by If M's Nano Manufacturing group in collaboration with the Mechanosynthesis Group at MIT.. (Courtesy: http://www.eng.cam.ac.uk/)

Nanometrology

Nanometrology is a technique for measuring dimensions down to 100 nm, which would be useful for assessing surface texture. It is used in biological research to investigate the interaction of two biomolecules. Nanometrology has recently been used to analyse how molecules interact with one another.

Many manufacturing processes in nanotechnology work at the atomic scale. Dimensions and deformations must always be recognized at the atomic level and even below in order to achieve significant control of the motion of systems employed in such techniques. In practice, nanoscale processes must be managed for surface integrity as well as dimensional precision, which is the emerging area of nanometrology. Atomic force microscopy is the most recent instrument designed for this purpose, but laser and X-ray interferometers are also utilised in nano-metrology. To produce nanoscale measurements, many methods such as Scanning Tunnelling Microscopy, near field optical microscopy, Atomic Force Microscopy, Scanning Electron Microscopy, and Transmission Electron Microscopy are utilised. FRET may also be used to quantify the distance between fluorophores between 1 and 10 nm. Fluorophores bind to

biological molecules and aid in determining the distances between active sites of interacting molecules. Fluorophores can be labelled with biological elements like proteins. Using basic optical microscopy, the fluorescing characteristic is used to analyse the interactions between proteins and DNA.

The highlights research needed in five priority areas for nanoscale instrumentation and metrology.

Nano Characterization: One of the most significant scientific fields in the arena of nanotechnology is measuring the physicochemical characteristics of nanoscale materials and devices. It entails comprehending the three-dimensional interactions of complex nanomaterials composed of several individual atoms and molecules.

Nanomechanics: Mechanical characteristics of nanostructured materials in devices and systems, such as friction, stiffness, elasticity, adhesion, longevity, and performance, are measured. Nanoscale sensing and nano-tribology are used in the mechanics of volume-constrained materials.

Nanoelectronics, Nanomagnetics, and Nanophotonics: To effectively incorporate electronics into commercial goods, reproducible measurements of electrical, photonic, or magnetic characteristics (surface or embedding), such as resistance, refractive index, emissivity, and nanoscale devices and materials, are required.

Nanofabrication: Metrology supports the development of tool-like structures with dimensions as tiny as an atom; it includes external tools for manipulating and positioning individual atoms and molecules, as well as interacting with structures and devices.

Nano Manufacturing: Metrology to bear large-scale manufacturing of nanotechnology-based products; the capability to measure, control, as well as forecast the nanoscale structure, performance, and properties of materials and components at the microscopic level, reproducible, and more reliable than those produced on the factory floor.

Some of the problems that need to be tackled are achieving sub-10nm patterns with atomically fine edges in nanoelectronics and managing nanoparticle manufacturing. Nanofabrication challenges include functionality, quality, reproducibility, scalability, and cost. Intense research efforts are being undertaken in materials-electronics-biology, nanoelectronics, nanostructured materials, and applied nanotechnology.

Conclusion

Many current technologies are still in their primary stages of development and are therefore primarily important for the production of nano-or micro-sized goods. These are the disadvantages that make it difficult to deploy nanofabrication technology in industrial contexts. It also limits future study and progress in the field. These features will attract large-scale manufacturing to adopt nanotechnologies, because of the precision aspect and the significant cost, productivity, and flexibility benefits they offer. Many more applications, including sensors, electronics, energy harvesting or storage, medical devices, and functional structures, can be manufactured using fully guided assembly and transfer process platforms.

This paradigm shift in nanotechnology-enabled product manufacturing will not only bring a wave of creativity to sustainable nanomanufacturing, but the lessons learned in this way can be used in other fields as well. Scientists and engineers must work together to realise these production capabilities. With outstanding scientific promise in nanofabrication, nano-enabled devices are hailed as a method to reduce energy and resource use.

A systems-based implementation strategy will enable the responsible and effective marketing of these emerging businesses.

Industry 4.0 A Reality

K.M.Rajan

Introduction

Industries are debating on Industry 4.0, and they are exploring the opportunities in their business. Industry 4.0 digitises and integrates various processes across the entire organisation and horizontal integration with all key value chain partners. In this juncture it is necessary to understand the concept on industry 4.0, its opportunities and challenges are being discussed in this article.

What is Industry 4.0?

Industry 4.0 stands for the fourth industrial revolution which is the new phase in industrial revolution that focus mainly on interconnectivity, cyber physical systems, artificial intelligence, internet of things and real time data analysis.

Evolution of industries

Manufacturing industries and production systems evolved since 1800s in various phases. We can see four distinct industrial revolutions the world has experienced and has been experiencing even today. The First evolution of industries, the world has experienced introduction of mechanisation, steam power and waterpower which happened between late 1700s and early 1800s.The main focus was to convert manual labour performed by people to labour performed by use of mechanisation, steam power and water power. The Second industrial revolution was started in early 20th century with introduction of steel and use of electricity in industries. The introduction of electricity in industry increased the efficiency of production system. During this period the concept of mass production were introduced in industry to increase the productivity. Third industrial revolution has emerged in late 1950s.The production system started adopting more electronics and introduction of computers in industries. The industries started to focus more on digital technology and automation and we are in the verge of adopting fourth industrial revolution called industry 4.0 where focus is on inter connectivity through internet of things with cyber physical systems and automation.

Fourth industrial revolution or Industry 4.0 emphasis on digital technology with the help of interconnectivity through internet of things(IoT), real time data and cyber physical systems. Industry 4.0 connects physical things with digital and allows collaboration or partnership with different departments, vendors, products and people. Owners of industry will have better control and understanding on every aspect of this production system and allow them to improve processes and productivity through real time data through introduction of Industry 4.0.

Technologies involved in Industry 4.0

Industry 4.0 creates a manufacturing system in which machineries in factories are connected with wireless connectivity and various sensors to monitor and visualise the whole production process and take various decisions.

- Industry 4.0 creates "talks to action" which was expected to increase the annual turnover on the company and reduce the cost and make it competitive. The outcome of the implementation of Industry 4.0 would be the transformation of physical enterprise to digital enterprise through various technologies. Broadly speaking it is advancing the technology further with huge sharing of data between manufacturing and production industry using cutting edge technologies. The use of an automation system allows for wireless communication between sensors and monitors, allowing for autonomous decision-making. Even though many technologies are involved in Industry 4.0, the very important technologies that can change the world is given below and shown in figure 1 & 2.
- The internet of things (IoT)
- The industrial Internet of things (IIoT)
- Smart manufacturing
- Smart factories
- Cloud Computing
- Artificial Intelligence
- Cyber-Physical Systems (CPS)
- Augmented Reality & Virtual reality(AR&VR)
- Advance Simulation & digital twin
- Industry 4.0 is characterized by:-
- Even more automation
- The bridging of the physical and digital world enabled by industrial IoT.
- Closed loop-data models
- Personal-Customizable products
- Shifting from the Central Control system to smart production steps.

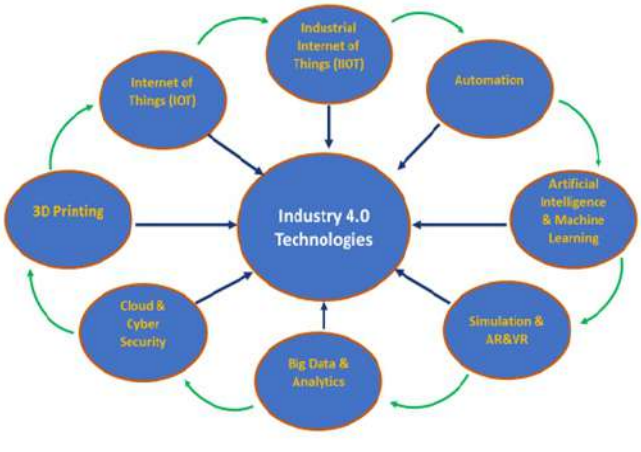


Figure 1.0 Industry4.0 Technologies

Opportunities & Challenges

Adoption of Industry 4.0 is going to open the windows for several opportunities as mentioned below

Opportunities

- Automotive and optimized industry leads to enhanced productivity.
- With multiple frameworks using real time data, the real-time economy can be easily managed.
- IoT enabled real-time monitoring and collaborative robots will lead to higher quality product manufacturing.
- It will provide better working conditions with advanced sustainability.
- With personal and customizable process options and opportunities, it will definitely earn the trust and loyalty of modern consumers.

Challenges

- A gap in technical skill- When the need in the workforce is evolving, the big question that arises is " Are the employees able to keep up with the digital transformation?"
- Data Sensitivity- It is a serious issue all are concerned about. For successful implementation of instructions, data must be shared. However, many companies are reluctant to share because data is a powerful asset- it must be kept secured.
- Cyber Security- It is the current emerging vulnerability. As the physical and digital systems making smart factories come with a risk of an expanded attack surface.
- For developing countries like India, major challenge is to update their existing machineries and make them industry 4.0 enabled. .

Effect of adopting Industry 4.0

Business

Upon manufacturing and supply of goods and services, businesses sustain. Improvement on these industries will cause a ripple effect on businesses like:

- Lower cost of goods- With efficient marketing there is more competition in the market.
- Improved Sustainability- Advanced technologies

Figure 2 Industry 4.0 technologies

consumes lower energy and there is a decline in the use of fossil fuels. It will reduce pollution.

- Faster production and delivery- Advancement in Robotics has resulted in paced production and faster time to market.
- Improved Quality- With cloud computing, advancement in AI and increased use of sensors the defects can be identified sooner which will help to prevent human errors.

People

The main effect of industry 4.0 on people is increased human productivity. We are able to make smart choices with advanced technology. AI and Automation has increased resource efficiency and a circular economy model could be achieved. But on the other hand this rapid technological advancement will affect productivity, competitiveness and employability pattern. Later it seems to have the potential to raise global income and to improve the quality of living of people around the globe.

Benefits of Industry 4.0

In addition to new roles and responsibilities in the 4th Industrial Revolution, it will make sure to replace human labour with automation. Eventually automation and robotics will take over the majority of jobs. It will shape our future with better working conditions even with health care and improved products and resources.

Use of intelligent system creates manufacturing system too advanced. It is fully automated with an intelligent network of systems. It helps logistic chains to be managed without human interference. The machinery uses the internet to monitor the production process. Smart manufacturing is very important to know the technical know-how, to fulfil the requirements, identify errors which will make manufacturing more efficiently manageable and highly accurate. By combining the advanced technologies, the loopholes in traditional manufacturing could be eradicated.

Conclusion

Design, sales, inventories, scheduling, quality, engineering, and customer and field support are all part of the Industry 4.0's product life cycle and supply chain. Everyone has the access to up-to-date, relevant views of production and business operations, as well as it is far more comprehensive and timely analytics. Industry4.0 is going to be the disruptive technology which will to change the entire production system. Data is going to play the vital role in future and reskilling the people to adopt the new technology is going to be a great challenge. Mobile devices and wearables may lead our life with safety and security to the mankind. Industry 4.0 is going to accelerate globalisation with regional favour by adopting digital networks and ecosystem. Hope next future of Industry 4.0 will lead to create infinite opportunities to provide prosperity to the mankind.

Effects of Global Warming on Agriculture

Anil Pattnaik

Global warming is when the earth's atmosphere heats up and temperature increases than the average surface temperature of the earth i.e. around 15 ^{0}C which is tolerable for living bodies. It is measured that the earth's average temperature has risen by 0.75 ^{0}C since last 50 years because of the enhanced greenhouse effect caused by human activities. Climate models predict that the global temperature will rise by about 6 ^{0}C by the year 2100.

Link between CO_2 and Global Temperature Variation

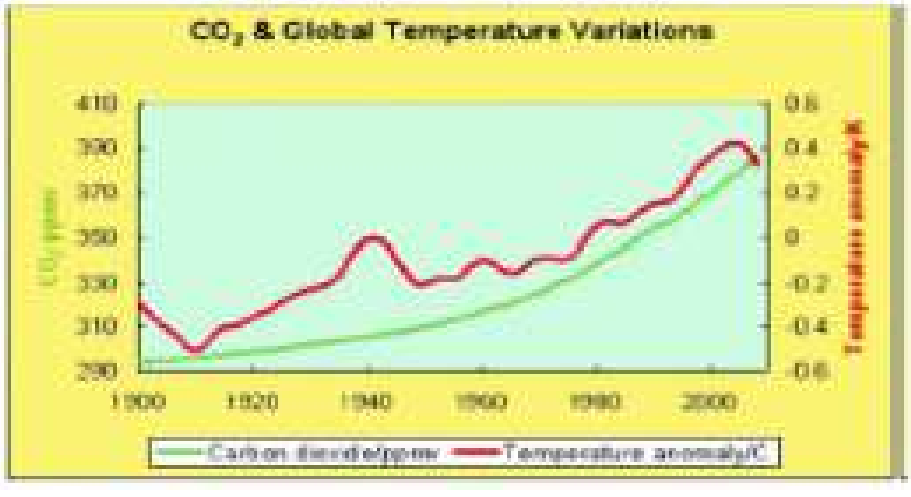
The warming of earth called greenhouse effect is a natural process which made life on earth possible otherwise the earth's average surface temperature would be -18 ^{0}C (Minus Eighteen Degree Centigrade).

The natural greenhouse effect is enhanced by the increasing of GHG in the atmosphere due to rampant deforestation, urbanization, extensive energy use and industrialization. The major source of CO_2 is fossil-fuel combustion (Coal, Petroleum products and Natural gas). The increase in surface air temperature of the globe resulted the consequent impacts as follows:-

The impact of global warming are as follows: -

- Increasing Ocean temperature and rising sea level
- Snow and Ice melting at earth's poles
- Altered Rainfall Patterns
- More Sever Heat Waves
- Extreme Weather Events
- Loss of Biodiversity
- Increased Diseases
- Declining Freshwater Supply
- Food Shortages

For agricultural production, climate plays an important role. So far as human welfare is concerned, agriculture contributes major share of GDP in the economy. In order to meet global demands we will need 60-70 % more food by 2050. Every 1 ^{0}C rise in temperature reduce whet production by 4 to 5 million tons. Due to climatic



Source: A guide book by Bureau of Energy Efficiency (BEE) a statutory body under Ministry of Power, Govt. of India

change, quality water availability for irrigation will be decreased. It is because of precipitation and evaporation patterns change around the world, infiltrate of salty water to fresh ground water due to rising sea levels and loss of crop yielding land due to salinization etcetera. This will affect agricultural output. Increased droughts & floods are likely to decrease expected production output. Agriculture in low-lying coastal areas or adjacent to river deltas may be affected by rise in sea level. Food security is estimated to be at risk and may experience food shortage and hunger.

In addition to changes in frequency of extreme climatic events, changes in rainfall and temperature would decrease potential crop yields which is costly to agriculture.

However thee evolving technologies like Artificial Intelligence (AI), the Internet of Things (IoT), 5G, digital twins, 3D printing and virtual reality (VR), robotics, Space 2.0, augmented reality (AR) offer many innovative applications to mitigate the challenges of climate change across the world.

For example: Data warehouse can be used to detect harmful emissions along the supply chain and advanced 3D printing tool can replace conventional methods to reduce carbon emissions and minimize waste in manufacturing.

To achieve the targeted goals the conference of parties (COP) in the Paris Agreement agreed to tackle climate change by using both new and emerging technologies as well as adopting novel business models like green technology, shifting from coal to clean power, using renewable energy, reducing energy requirements through energy efficiency and conservation etcetera.

India in this direction has taken action and allocated budget in accordance with our honorable prime minister's declaration at COP 26 (Conference of the parties) summit as the UNFCC (United Nations Framework Convention on Climate Change Conference) held at Glasgow, Scotland in the year Nov. 2021.

"PANCHAMRIT" of INDIA
1. Reach non-fossil energy capacity of 5000GW by 2030
2. Full 50% energy requirements via Renewable Energy by 2030
3. Reduce 1 billion Carbon emission by 2030
4. Reduce carbon intercity below 45% by 2030
5. India will achieve the target of Net – Zero by 2070

However COP26 submit acknowledge the need for a sustainable and climate resilient food system, taking into consideration food security and ending hunger throughout the globe, as well as to achieve climate objectives such as emission reduction. The world leaders of almost 200 countries promising to act in this direction for a sustainable growth of the agricultural sector of the globe.

Alternative Materials to Silica Sand for Indian Foundry Industries

Ramesh Kumar Nayak

Near-net shape casting of complex geometry (automobile engine block and helicopter gear box) is manufactured through green or dry sand mold casting process in Indian foundries. However, day by day, the availability of natural or synthetic silica sand has been decreasing and increasing the production cost of sand-casting components. Therefore, there is a need to look into low-cost and readily available alternative materials to substitute the commercial- grade silica sand for the sand mould casting process. The constituent of silica sand is primarily silica (SiO_2), Al_2O_3, and Fe_2O_3. The major constituents of industrial wastes such as fly ash, blast furnace slag, ferrochrome slag, stone-dust and red mud is SiO_2, Al_2O_3, and Fe_2O_3. Therefore, industrial wastes may be used individually or combinedly with silica sand at a different ratio to substitute the commercial-grade silica sand in green mould casting process. Researchers and scientists have evaluated the suitability of industrial wastes and local riverbed sand as an alternative material for green sand mould castings. The present topic summarizes the advantages and constraints of using industrial wastes and local riverbed sand as an alternative to green sand mould casting process.

Automobile Engine Block and Helicopter Gear box Made from Sand Casting Process

Table 1 Chemical composition of commercial grade silica sand used in sand mould casting

Commercial grade Silica sand source	Chemical composition (wt.%)						
	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	K_2O	LOI
Chiral A.P, India	**96.62**	1.54	1.02	0.57	0.57	-	-
Jashipur, Odisha, India	**95.61**	1.74	0.62	0.02	0.01	0.31	-
Chelford, U.K	**97.91**	1.13	0.50	-	-	0.25	0.21
Tamilnadu, India	**87.91**	4.70	0.94	0.14	0.31	0.25	5.15

Introduction

The green sand mould contains 85 – 95% of silica sand, 7 – 10% binder, around 5% coal dust, and 2 – 5% water. Silica is the major ingredient of sand mould for ferrous and non-ferrous casting. The sand mould needs desire mould properties for ferrous and non-ferrous casting. Silica sand is available as a natural resource used in various industries such as civil infrastructure, ceramic, ferro-alloys, foundries, glass, iron, and steel industries, etc. Silica sand is extracted from inland dunes, open-pit mines, beaches and dredged out from ocean beds and rivers. However, sand mining harms the environment. The chemical composition of silica sand used by different countries in sand mould casting is reported in Table 1. It is observed that the sand composition depends on location and rock sources and the wt.% of SiO_2 in silica sand varies from 87-97wt.%. High silica content sand is better for sand casting process. This is because, it can maintain its physical shape at high temperatures.

The green sand mould properties are influenced by sand grain size and shape, water, binders, and additives. The casting defects can be controlled or minimized by achieving desired sand mould properties such as permeability, hardness, bulk density, green compressive, and shear strength. The properties of green sand mould are reported in Table 2. Various optimization techniques are used to optimize the sand mould constituents to reduce casting defects. The demand and price of silica sand are increasing day by day. Annually, 15 million tons of silica sand are used in industrial applications in India.

At the same time, with the increase in river sand mining, environmental pollution has been increasing. Therefore, there is the need to find an alternative material to replace partially or fully of silica sand for green sand mould casting. Fly ash, blast furnace slag, ferrochrome slag, and red mud are the by-product of various industries. These waste materials are generated in huge quantity and which requires a large area to dispose of it. The waste materials are used in bricks, water treatment, ceramics, cement, concrete, road construction, and landfilling. However, these applications are not sufficient enough to consume the industrial by-products completely. Thus, this review emphasizes the advantages and constraints of using industrial by-products as raw materials for the green sand mould casting process.

Fly ash

Fly ash is produced during the combustion of pulverized fuel or coal in different industries. The thermal power plant uses coal as raw material to produce electrical energy. The thermal power plants generated fly ash, polycyclic aromatic hydrocarbons, and bottom ash as by products. During coal combustion, 80% of fly ash is carried out in the air, which is collected by an electrostatic precipitation hopper. Around 20% of bottom ash is generated at the bottom of the boiler. Both the bottom ash and fly ash are mixed with water and form a slurry and discharge through the pipeline into the ash pond. The consumption of electric energy may be

Table 2 Green sand mould properties

Properties of Green Sand Mould	Iron Casting	Heavy Brass or Iron	Small and Medium Brass	Brass and Small Iron
AFS Number	70-80	23-27	180-200	110-130
Moisture (%)	6	7	6	6
Permeability (Large orifice 1.5 mm)	75 min.	250 min.	10 min.	15 min.
Hardness B scale	----------80-95----------			
Compressive Strength (Kg/cm^2)	0.492 min.	0.703 min.	0.35 min.	0.56 min.
Shear Strength (Kg/cm^2)	----------0.105-0.492----------			

increased by 30% by 2035, due to which it is estimated that the increase in coal consumption is around 4032 million tons. Subsequently, the generation of fly ash also increases. The fly ash is used in cement, concrete, bricks, tiles, and fiber-reinforced polymer composites. However, around 56% of fly ash is used in various applications, while the remaining ash is disposed of in ash ponds. Fly ash is a fine powder with a particle size of around 0.5 µm – 300 µm. These particles are generally hollow and solid spherical in shape, and amorphous in nature. The specific gravity of fly ash and bottom ash is around 2.20 and 2.61 Kg/m^2, respectively.

The surface area of fly ash is approximately 2.82 m^2/g, and pH values of fly ash are classified into three groups based on Ca/S ratio: acidic ash, mildly alkaline ash (pH 8 to 9), and alkaline ash (pH 11 to 13). The bottom ash particles are generally irregular and cone-shaped and larger than the fly ash particles. The fly ash is categorized into two groups, class C and class F, as per ASTM C618. The sum of silica (SiO_2), ferrous oxide (Fe_2O_3), and alumina (Al_2O_3) is greater than 70% is categorized in Class F, and between 50 to 70% is categorized in Class C. The chemical composition of fly ash used in mould making is reported in Table 3. It is observed that the fly ash mainly contains SiO_2, Al_2O_3, and Fe_2O_3. Fly ash also contains sodium, potassium, manganese, and magnesium oxides in smaller quantities. Loss on ignition (LOI) represents the presence of unburned carbon in fly ash. Use of high percentage of unburned carbon fly ash in moulding sand reduces mould refractory, and emits CO_2 gas while pouring molten metal into the mould cavity. Therefore, LOI fly ash should be low and suitable for casting mould applications. Therefore, there is a need to use fly ash as an alternative to green sand mould material.

The effect of thermal power plant fly ash in CO_2 sand mould compactibility, permeability, tensile and compressive strength was evaluated for steel casting. It is observed that fly ash has 21.65% CaO, which indicates class C fly ash and has cementitious and pozzolanic properties [ASTM: C618-1985]. The average particle size of fly ash and silica sand used in CO_2 mould was 7.84 and 12.54µm, respectively. The particle size of fly ash is smaller than the silica sand. Therefore, as the wt.% of fly ash increases, the permeability, compressive, and tensile strength of sand mould decreases. However, compactibility increases. In CO_2 mould casting process, maximum of 20% fly ash can replace the silica sand to achieve the desired mould properties for steel castings. It is observed that the tensile, compressive, and yield strength of cast steel using 20% fly ash in CO_2 mould has similar properties to conventional CO_2 sand mould casting. It is also found that the moulding

Table 3 Chemical composition of fly ash of different industries

Fly ash source	Chemical composition (wt%)							
	SiO_2	**Al_2O_3**	**Fe_2O_3**	CaO	MgO	K_2O	Na_2O	LOI
Thermal power plant	**64.16**	**19.50**	**3.03**	-	-	-	-	-
Carbon industry	**62.19**	**18.08**	**3.66**	-	-	-	-	-
Groundnut shell ash	**79.10**	**5.95**	**3.50**	0.18	5.20	3.67	0.78	6.56
Thermal power plant	**43.98**	**23.55**	**4.93**	21.65	1.81	1.84	0.57	2.34
Commercial grade Silica sand	**87-97**	**1-5**	**0.5-1**	0-1	0-1	0.25-0.4	0-0.2	0-5

sand having 2.25% molasses as a binder and 15% fly ash has desired mould permeability, green and dry compressive strength. It is found that the fine and spherical particle of fly ash decreases the mould permeability. However, it gives good surface finish to the casting. Low permeability increases the risk of blowholes and pinholes in casting. The strength of sand mould is also decreased on an increase in fly ash concentration. Therefore, there is a limitation on the percentage of fly ash in green sand mold casting to replace silica sand.

Ferrochrome slag

The carbothermal reduction process is used to produce high carbon ferrochromium material, and it is a common alloying material for producing different grades of stainless steel. During this process, three fractions are generated, which are metal, slag, and bag filter dust. The ferrochromium slag is generated at 1700^0C during the extraction of the ferrochromium alloys from the ore. Due to the low density of molten ferrochrome slag (2.5-2.8 g/cm^3) than the density of molten metal (6.8 g/cm^3), it flows on the top of the liquid metal and easily separated. The molten slag is cooled down with water cooling or air cooling. The water-cooled slag has smaller particles than riverbed sand, and the air-cooled slag has 10-20 mm size, crystalline, and in the form of CaO-MgO-Al_2O_3.

The specific gravity of ferrochrome slag is 2.86 g/cm^3, and particle size is around 45µm. The ferrochrome slag contains SiO_2, Al_2O_3, Fe_2O_3, MgO, and CaO. To produce one-ton ferrochrome material, it generates around 1.1 – 1.6-ton slag. The generated slag is dumped in the dump yard. The ferroalloys plants generate around 6.5-9.5 million tons of ferrochrome slag and likely to be increased by 2.8-3% by 2035 globally. The ferrochrome slag has excellent mechanical properties and is used as a construction material. The ferrochrome is used as a raw material in concrete, geopolymer matrix, bricks, and cement. However, the utilization of ferrochrome slag in foundry industries is a challenge and needs to be explored.

Suitability of other waste materials

Red mud is a solid waste product produced during the production of alumina from bauxite ore. The presence of iron oxide in the bauxite residue makes it reddish and that is the reason why it is called red mud. In a ton of alumina production from bauxite ore, 1-2 tons of red mud is produced. The obtained residue (red mud) is disposed of by three techniques such as landfill, deep-sea dumping, and storage in a pond. The production of red mud depends on the alumina extraction process efficiency and quality of bauxite ore used for it. The red mud contains around 45% ferrous oxide. Therefore, the solidification time of casting decreases on the addition of red mud in sand mould. The porosity in Al-Si alloy casting increases as the concentration of red mud increases

up to 25% in sand mould casting. It observed that the mould property like permeability, compressive, and shear strength is not affected by adding iron up to 5%. However, the solidification time of casting decreases as the concentration of iron filings increases. Therefore, in cast iron casting, the length of graphite flakes of gray cast iron decreases. The coconut shell powder and tamarind powder are waste material produces by agricultural processes. The sand mould green compressive and shear strength increase as coconut shell powder and tamarind powder increase up to 1%. However, mould permeability decreases. Tamarind powder provides high compressive and shear strength than coconut shell powder. The green compressive and shear strength increases as the concentration of banana peel powder increases in the green sand mould. It observed that local riverbed sand could be used in sand mould casting, especially for non-ferrous casting.

Conclusions and future perspectives

Silica sand is available on the earth as a natural resource and is used for various industrial applications. The silica sand used for foundry industries contains primarily silica (SiO_2), Al_2O_3, and Fe_2O_3. The consumption of silica sand in India has been increased by 78.98% from 2010-11 to 2015-16, and the price of silica sand rises by 72.8% in five years. As the demand for silica sand increases, riverbed sand mining and cost also increases. On the other hand, river sand mining creates a variety of environmental issues. Therefore, many foundry engineers, researchers, and scientists are trying to use industrial wastes as an alternative to silica sand in foundry industries to reduce environmental pollution, consume less amounts of natural resources, and decrease the cost of casting products in foundry industries.

Fly ash, blast furnace slag, ferrochrome slag, and red mud are industrial waste materials produced in large quantities by different industries. These waste materials create various environmental pollution and are hazardous. The demand for aluminium, electricity, iron and iron alloys has been increasing day by day, leading to an increase in the generation of waste materials. The waste materials are used in different sectors to add value to the waste. However, the entire consumption of the waste materials is a challenge. Fly ash is used as an alternative material for silica sand. It is observed that the mould compressive strength, hardness, and permeability decrease as the concentration of fly ash increases due to its fine particle size. However, a smooth casting surface can be obtained. Similarly, ferrochrome slag and blast furnace slag are used in the sand-casting process. It is found that slag mould properties are similar to the silica sand mould and can be used for sand casting foundry. However, due to the higher thermal conductivity of slag mould, the as-cast mechanical properties of the casting improved as compared to silica sand mould casting. Nevertheless, the effect of moisture, bentonite clay, and other mould additives yet to be evaluated and optimized for different waste material moulds. Local riverbed sand was used to cast non-ferrous casting and found good results.

The local riverbed sand contains less silica and which reduces its fusion point. Therefore, it is not suitable for ferrous casting. However, local riverbed sand may be used for non-ferrous castings with suitable sand particle size and shape. Ferrochrome and blast furnace slag may be used in foundry industries with the proper technology. Fly ash may be used partially with silica sand and optimum quantity need to be evaluated with industrial trials. Although, scientist and researchers have tried to use different waste materials to replace silica sand in foundry industries, the effect of different sand mould constituents such as binders and additives on its physical, mechanical properties and their castability has to be established.

Power of Light Leads the Life

Biswanath Doloi

Introduction

Light is a beam of photons. Light refers to electromagnetic radiation of particular wavelength or a band of wavelength. Light is emitted at visible, infrared (IR) or ultraviolet (UV) range of wavelength. The wavelength range for visible light is 400 to 700 nm. For infrared light wavelength range is 700 to 1000 nm. For UV light the wavelength range is 10 to 400 nm. Light is of different colour. Light is monochromatic (single wavelength) or non-monochromatic (wide range of wavelength) in nature. Light is coherent or non-coherent.

Sun is the biggest source of natural light. Some elements after excitation can emit light. Light can be subjectively measured as brightness seen by human eye. Light is measured in terms of candela. The power of light is expressed in terms of watt or most commonly as lumen. Light intensity can be measured in terms of flux i.e. lumen per square meter. Light intensity can also be measured in watt per square cm. The speed of light in vacuum is 299792 km per seconds.

Light represents the symbol of life, happiness, clarity, holiness and prosperity. Light overcomes darkness associated with chaos, sins, death and underworld. Light conveys positive things i.e. goodness, hope and progress in life. Light of knowledge and education help us leading better and quality life. In the Upanishad it is mentioned that "Tamso Ma Jyotirgamaya" which means that "Lead us from darkness to light". Light of knowledge and education remove the darkness of ignorance. Things are visible because of light. Without light everything is dark and fear exists.

Light attracts all living being. Some insects are attracted towards light, but few cannot withstand the heat of light. Heat of light should be properly judged to maintain the distance from the source of light to enjoy the beauty of light. Power of light has to be suitably controlled if possible, otherwise some protections are to be needed.

Sun light is absorbed by leafs of plants and food is prepared by photosynthesis process for sustenance of our life. Solar light is the largest renewable and clean source of energy for various house hold applications for water heating, drying, lighting, power generations etc. Light controls our day today activities. The life of plants and animals are controlled by light. In fact the existence of life on earth is possible because of the enormous light energy of the sun.

The light emitted from sun consists of visible light, infrared and some ultraviolet light which are categorised based on the wavelength and frequency. The ultraviolet light is dangerous to living organisms as it damages eyes, human skin and tree leaves etc. The ozone layer in the lower stratosphere absorbs maximum amount of ultraviolet rays coming from sun. The light energy enters the earth atmosphere is only 70 % of the total energy incident on earth and rest 30 percent of the incoming radiation is simply reflected by earth atmosphere to space which helps in the prevention of overheating

of earth.

Human being can control the use of power of light. Too low power as well as high power light are not comfortable to human eye. The brightness of artificial man made light can be controlled for our use. The power of sun light at source cannot be controlled, but we can protect us from its high power using goggles or umbrella. Solar light of high intensity is required for power generation in day time and solar energy is stored in the battery for use in night as well as for transmission. The concept of hybrid solar and wind power energy generation has also come up.

Natural lightening during thunderstorm has immense power which is unreachable by any means, but it can be bypassed by using lightening protection system, otherwise it will damage electronics and electrical devices and sometimes causes loss of life. Therefore sometimes people should learn how to lead their life and protect themselves from natural disaster caused by high power light of lightening and volcano etc

Moon looks beautiful and reflects light as it is enlightened by Sun. Wonders of world, Tajmahal is very beautiful in moonlight. The power of moonlight is not so high, but it creates many positive things in our mind. After delighting with knowledge and education others can also be enlightened and people can act as light emitting and reflecting mirror for this purpose. Light of proper education can be focussed to the ignorant people to enlighten them for removing darkness which is caused by fear and ignorance.

The colours of light

Because of light only our life is colourful. Sunlight is main source of producing different colours. Different colours are again combined to produce single colour. This is the beauty of light. Different colours are obtained from nature. The primary colours of light are red, blue and green. By mixing these colours of different proportions the light beam of varieties of colours can be produced. White light is called as white because it consists of seven colors. The sunlight splits into seven colours namely violet, indigo, blue, green, orange, and red. This is usually called as VIBGYOR. By mixing all these colours, white light is obtained. The formation of rainbow in the sky is also due to colour property of light.

Importance of light leading plants and animals life

Photosynthesis is the process by which green plants and certain other organisms transform light energy into chemical energy. During photosynthesis in green plants, light energy is captured and used to convert water, carbon dioxide, and minerals into oxygen and energy-rich organic compounds. The photosynthesis mechanism is shown in figure1.

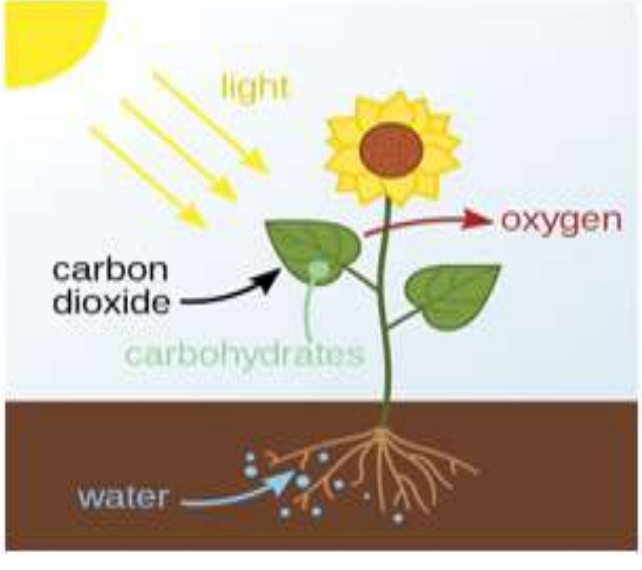
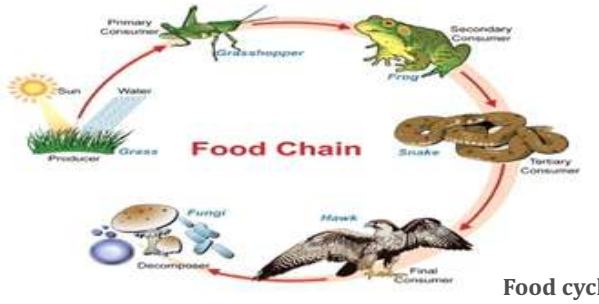


Fig.1 Photographic view of Photosynthesis mechanism

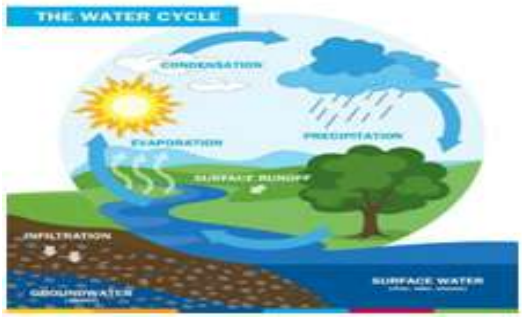
The carbohydrate thus formed consumed by living organisms for their survival and oxygen gets released to atmosphere. In fact various food chain and water cycle on earth could not be possible without sunlight. Thus it serves as a main constituent to provide various cycle on earth. The food cycle and water cycle are some of the examples as shown in figure 2.

Importance of light leading humans life

Light allows us to see the surrounding world by distinguishing details of individual colours and brightness. It has a very big impact on a human in



Food cycle



(a)**Water Cycle**

Fig.2. Schematic view of Cycles on earth (a) Food cycle (b) Water cycle

terms of the physiology and psyche. But light also has extremely important functions in relation to a lot of biological processes that occur in our body. This is, e.g., the correct metabolism, blood circulation and hormone balance of a human. Sun light bathing of our body increases vitamin level in our body for achieving high immunity against some diseases.

Another important source of light for humans has been obtained from ancient camp fires to modern kerosene lamps. With the development of electric lights and power systems, electric lighting has effectively replaced firelight. It is present in so many forms and is arguably the most influential force on how we perceive and connect with the world around us. We live, communicate and celebrate in all of its mediums. Light has the power to give life and save life. It plays with our emotions and considerably affects the way we feel.

Application of Light in Engineering

Using electrical energy sources, the different electrical appliances such as bulb, tube light, light emitted diode (LED), Semiconductor Diode Laser, Solid State Laser, Gas Laser devices etc can produce varieties of light with different wavelength and power intensity for different applications.

There are many light sensitive photo-polymeric materials and while these are subjected to light, their phase is changed. This concept is used in 3D printing for making part made up of polymer. Laser is used as source of light. Laser light based additive manufacturing processes such as selective laser sintering, selective laser melting, laser engineering net shaping etc are used for 3D printing of metal implants.

With the development of artificial lightening source, researchers also look forward to utilise the properties of light in manufacturing process. Laser is one of the examples which is widely used now-a-days for various engineering operation such as cutting, drilling, marking, welding etc. The laser generation consists of three fundamental elements as shown in figure 3:

Source of excitation energy
·Optical mirrors for light amplification
·Amplifying Lasing Medium

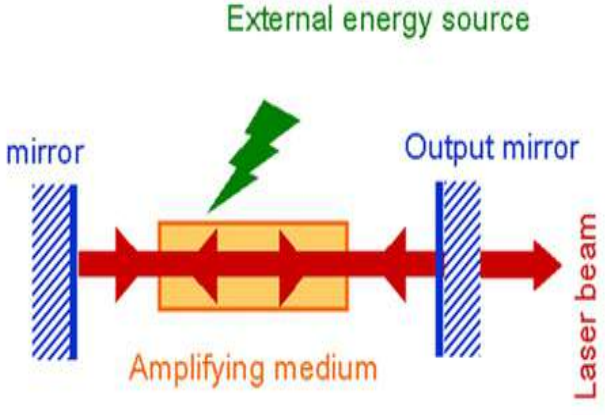


Fig.3 Schematic diagram of laser generation principle

The different types of laser are used for different engineering requirements based on the types of materials taken into consideration. They are

Laser cutting

Laser welding

(a)Laser marking

generally used to machine material when it is found to difficult by any other conventional techniques. It has least material removal rate with minimal harm to the materials. Fig.4 shows the photographic view of laser light in manufacturing application.

High energy of laser light is used as heat source for manufacturing applications such as welding, heat treatment, marking, surface texturing, material removal of varieties of materials from plastic to diamonds. High power laser light is used for material forming applications such as bending, extrusion and rolling etc. Light is used for non-contact type of measurement with high accuracy and precision based on coherent correlation interferometry (CCI) for multifunctional and flexible 3D metrology. Laser light is used for decoration and light and sound music show. Laser light is used in toys those are liked by children.

Light of varying power intensity is used to proper photography for making film. The lighting plays a big role in film industry. Laser light is used in pointer, printer and plotter, bar code generation as well as sensing. Laser light is used in biomedical surgery such as eye surgery, bloodless micro-surgery and skin treatments etc. The direct exposure of Ultraviolet C type radiation (UVC) destroys the outer protein coating of the SARS-Coronavirus. UVC lamps are often called "germicidal" lamps. This UVC light source is used for disinfection of surfaces of different materials. However the uncontrolled exposure of UVC light causes skin and eye burning.

Concluding Remarks

The power of light has direct impact on life cycle. Proper lighting gives us comfort and pleasure to lead our life. People can work with full energy and motivation in natural day light and even in night with proper lighting condition. The sunlight with proper control is utilized for various applications for our day today life. Light makes our life colourful. Various form of high power light with special characteristics such as ultraviolet light, infra red and visible light can be generated for different engineering applications. Specially laser light with high power intensity is applied for processing of advanced materials. Laser light is generated based on population inversion. More number of lasing ion or molecules are in higher energy levels.

From this principle it is learnt that more people are to be enlightened with knowledge and education at higher level so that we can lead better quality life. Light excites lasing medium to emit high power light i.e. laser. In our society also a human being can motivate and excite other human being to do better quality work for leading their quality life. The power of light should be controlled properly, otherwise several problems such as damage of skin and eye, thermal deterioration of materials etc are to be faced. For leading the quality life, power of light with proper control is inevitable.

Stainless Steel Evolution

Sukanta Prasanna Das

Unlike iron, which has been in use for over a thousand years, stainless steel is a relative newcomer to the materials science world, having first been produced only 100 years ago. This may seem hard to believe at first, given the ubiquity of the metal in almost every facet of modern life, but this is simply a testament to what an important breakthrough stainless steel was. The metal has revolutionized the modern world and has found applications in almost every manufacturing sector, from healthcare and catering equipment, to the automotive and construction industries. Furthermore, it has out-performed more traditional competing materials such as copper, aluminum, and carbon steel.

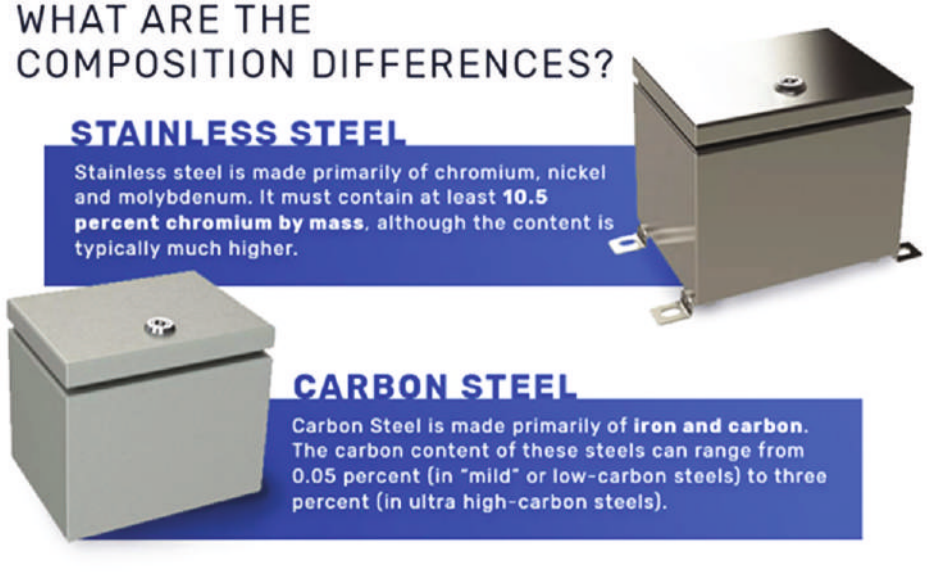
What makes Stainless Steel Special

Stainless steel is often confused with mild steel or carbon steel. While carbon steel is a less flexible alloy of steel, stainless steel is an alloy of iron and has minimum 10.5% Chromium as a chief component. The increased resistance to corrosion in stainless steel is due to the naturally occurring chromium-rich oxide film formed on its surface. Although extremely thin, this inert film is adherent to the metal and is highly protective in a wide range of corrosive media. The film is rapidly self-repairing in the presence of oxygen if damaged by any external force.

Evolution of Stainless Steel

In the early 20th century, researchers around the world worked to develop new, stainless, and acid resistant steels, especially for the chemical industry. At that time, already known nickel and chromium steels, with increased demands from the chemical industry, were prone to corrosion and brittleness. Strauss and Maurer, the fathers of stainless steel, reduced the carbon content to below one percent. They combined chromium and nickel as alloying elements and developed a suitable method for heat treatment to improve corrosion resistance and strength of the steel. Thus began the worldwide success of stainless steels.

The rapid success of the stainless steel market in 1920s can be credited to the development of an economic process to produce and process stainless



steels. Earlier, stainless steels were produced in oil fired, tilting pans. The invention of the induction melting furnaces later simplified the process. Early 60s saw the introduction of a melting technique with optional vacuum (VOD) or argon (AOD). The new production technique lowered the cost of production and at the same time extended the range of properties sustainably. The 80s witnessed another quality and commercial milestone for stainless steel making introduction of the continous casting method, the conditions for a near net shape casting. Computer aided control engineering drove the reproducibility of stainless steel products, thus advancing towards new application areas. The study for materials resistant to overheated gases and vapors in the chemical industry was the driving force behind the invention of stainless steel. Increasingly, weldability and formability of stainless steel gained importance.

Only a few years after its invention, stainless steel inspired architects and planners as a building material. Being weather resistance, strong, durable, stainless steel makes itself through long life with minimum maintenance costs. It forms an essential part of a wide array of architecture ranging from structural, corrosion-resistant concrete and masonry enforcement, protective facades, conventional roof covers, green roofs, lightning protection, ceilings or floors, swimming pools, elevators, escalators, doors or gates, balustrades, car parks, hotels, stadiums, train stations, airports etc.. In 1929, the Chrysler Building in New York adorned 4,500 large sized stainless steel shingles. Later, the Petronas Towers in Kuala Lumpur, the Atomium in Brussels, the Burj Khalifa in Dubai or the new Landmark of New York, the One World Trade Centre, all employed stainless steel showcasing its remarkable aesthetics. The tallest buildings of the past 100 years carried a distinctive stainless steel touch. Today, Stainless steel is a synonym for creative expression and sustainability.

Types of Stainless Steel

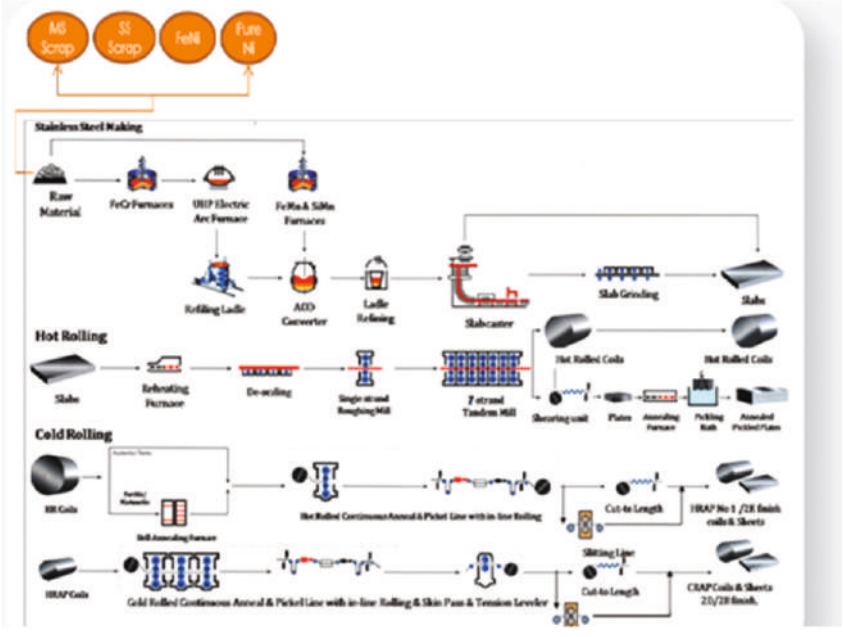
Primarily Stainless steel is divided into three types on the basis of the phase structure.

1) Austenitic Stainless Steel
This is the most common type of stainless steel. This category has two major characteristics. First, the chromium content is high (i.e. above 16%). Hence, this type stainless steel is comparatively more corrosion resistant. Second, they are non magnetic in nature, although they can become magnetic with a cold forming process.

2) Ferritic Stainless Steel
This type of stainless steel is magnetic in nature. Chemically the content of Nickel is less and hence they are economical compare to Austenitic stainless steel. Items produced can be hardened through cold forming.

3) Martensitic Stainless Steel
This material is the least common type of stainless steel alloy. Martensitic stainless steel is used in applications where high tensile strength is needed





or a lot of impact resistance. In many cases, this material is also combined with a protective polymer coating to improve corrosion-resistance

Stainless Steel Process

In India, stainless steel is prepared by scrap based route. The raw material for Stainless steel is the different kind of metal scrap and binding alloys. The raw materials used are stainless scrap, iron, nickel and chromium. All this substances are added into an Electric arc furnace (EAF) where electrodes heat the mix to its melting point. The mix is then treated in Argon Oxygen Decarburization (AOD) convertor where pipes blast Argon and Oxygen gases into it. The AOD minimizes undesired oxidation and removes excess carbon from the mix. The mix is then treated in a tank degassing unit which is additionally equipped with an oxygen lance. Due to reduced carbon monoxide partial pressure under vacuum condition, this process helps in reducing the carbon content of high alloyed stainless steel grades. The stainless steel mix is cast into stainless steel slabs and blooms through a process called continuous casting. The stainless steel slabs/blooms go through a grinding process to remove any surface defect that has occurred during casting.

The Stainless steel slabs are then reheated due to which a rusty scale (oxide) is accumulated on the surface. This scale is removed from the surface by high pressure water jets in a process called as descaling. The stainless steel slab is then sent back and forth through the Roughing mill to reduce its thickness and increase its length, without changing it width. Having acquired the shape of a sheet, it is now sent to further thinning in the Finishing Mill, depending on costumers' requirement. These stainless steel slabs are now tuned into plates or coils as per order after several intermediate processes. The hot rolled (HR) coil undergoes a thermal process called annealing, in which the metal is given a consistent, uniform internal structure and homogeneous properties. This helps to improve the mechanical stability and corrosion-resistance of the coil. The stainless steel coil then goes through a chemical process, Pickling, in which mill scales, surface oxides, and annealing oxides are removed.

There is quality testing at each stage of production, where a samples is taken from the product, and sent to labs for physical and chemical examination. Each gram of our stainless steel is planned to perfection. The resultant product is called Hot Rolled Annealed Pickled (HRAP) stainless steel coil which goes either directly to the customer, or to be made into Cold Rolled Annealed Pickled (CRAP) stainless steel coil. CRAP coil goes through several production processes aimed at customizing surface finish, thickness, product chemistry and mechanical properties. Different kinds of stainless steel finishes such as CR, BA and 2D/2B are produced during these processes. The stainless steel coils in cold rolling division are reduced to different widths as per the customer requirement.

The Future of Stainless Steel

The growth of stainless steel is likely to increase as the sustainability benefits of stainless steel become more widely known. Researchers have even found that coating stainless steel with certain bio-inspired adhesives makes it anti-bacterial, thus adding to the long list of benefits of stainless steel. This innovative material is therefore a material that is very likely to extend its use well into the next century and beyond.

Climate Change, Effects and Actions

Gyoo Soo Chae

Climate Change:

Climate change is the long-term alteration of temperature and weather patterns. The combustion of fossil fuels (such as coal, oil, and gas), which results in the production of heat-trapping gases, has been the main cause of climate change since the 1800s, despite the fact that these changes are natural.

Climate change has occurred in the past, but it is happening now far more quickly and is not due to natural causes. Instead, the problem is with greenhouse gas emissions, particularly with carbon dioxide (CO2) and methane. The combustion of fossil fuels for energy is the main cause of the majority of these emissions. Forest decline, industrial activity, and agricultural activity are further sources. Sunlight can pass through greenhouse gases and heat the Earth's surface because they are permeable to sunlight. The infrared radiation that the Earth emits as heat is absorbed by the gases, which keeps it close to the surface. Things like the decline in snow cover that reflects sunlight make global warming worse as the world heats.

Impact of Climate Change:

Due to climate change, there are more heat waves and wildfires, and deserts are expanding. Increased heat in the Arctic has been linked to melting permafrost, glacier retreat, and sea ice loss. Rising temperatures are causing storms, droughts, and other weather extremes to become more severe. Rapid environmental change in the highlands, coral reefs, and the Arctic is causing many species to move or go extinct. Threats from climate change include a lack of food and water, greater flooding, extreme heat, an increase in disease, and economic loss.Human migration and conflict may arise as a result. The World Health Organization (WHO) claims that the biggest threat to global health in the

(Source: NASA Climate Change)

twenty-first century is climate change. Even if efforts to stop global warming are successful, some effects will persist for millennia. Examples include rising sea levels and waterways that are warmer and more corrosive.Some climate impact descriptions are given below.

Environmental effects

Oceans, ice, and weather are all affected by the huge and far-reaching environmental effects of climate change. Changes can come about gradually or suddenly. These consequences are supported by historical studies on climate change, modelling, and current observations. Since the 1950s, droughts and heat waves have started happening more frequently together. During the monsoon season, extremely wet or dry occurrences are growing increasingly frequent in East Asia and India. The intensity and frequency of hurricane and typhoon rainfall are expected to increase. The frequency of tropical cyclones has not changed as a result of climate change. But according to a study that appeared in Nature Geoscience in 2021, tropical cyclones' expected geographic range will likely expand poleward as the Hadley circulation warms.

(Source: The Conversation)

Nature and wildlife

Many terrestrial and freshwater species have moved poleward and toward As a result of recent warming, many terrestrial and freshwater species have migrated poleward and to higher elevations. A longer growing season and increased atmospheric CO2 levels have contributed to global greening. On the other hand, heatwaves and droughts have reduced ecological productivity in some regions. How these opposing forces will be balanced in the future is a mystery. Climate change has facilitated the expansion of arid climate regions, such as deserts in the subtropics. Rapid and significant changes in ecosystems are becoming increasingly likely as a result of global warming. Numerous species are predicted to go extinct as a result of climate change.

(Source: Future Learn)

Humans

All across the world, humanity has been impacted by climate change. Climate change and changes in precipitation are primarily to blame. All continents and ocean basins are currently experiencing effects, with low-latitude, developing regions being the most vulnerable. If global warming persists, "severe, pervasive, and enduring repercussions" may befall people and ecosystems. In both emerging and developed nations, the risks are unequally distributed, but they are disproportionately larger for the poor.

Food and well-being

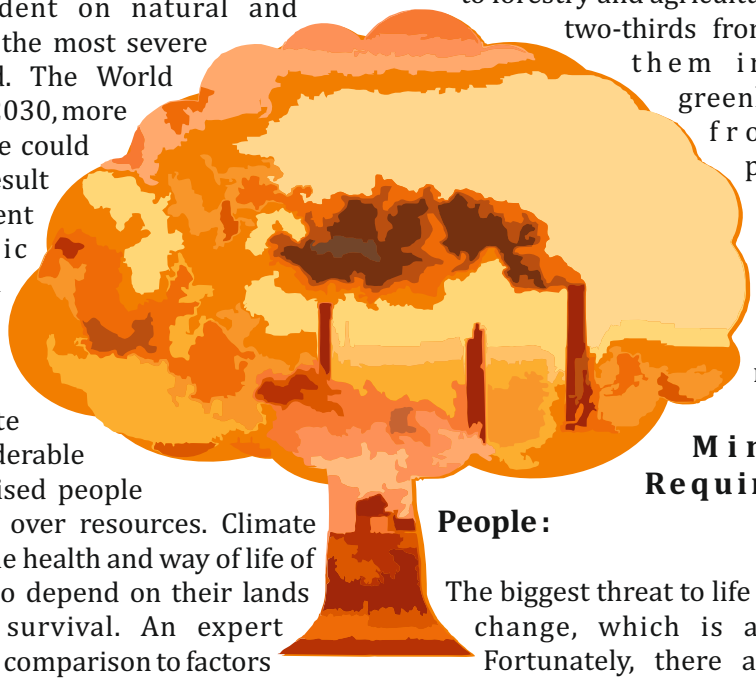
Climate change has an effect on food security. Global maize, wheat, and soybean yields decreased between 1981 and 2010. Global crop output could be further reduced by future warming. Although effects in northern latitudes could be either positive or negative, crop yield in low-latitude countries will almost surely be negatively impacted.

Climate change is the greatest threat to world health in the twenty-first century, according to the World Health Organization. Extreme weather causes damage and death, and crop failures result in malnutrition. Various infectious diseases, such as dengue fever and malaria, are more easily transmitted in a warmer climate. Children under the age of five are the most vulnerable to food shortages.Extreme heat is dangerous to both

children and the elderly. Climate change, according to the World Health Organization (WHO), may result in an additional 250,000 fatalities each year between 2030 and 2050. They looked at heat-related fatalities in the elderly, as well as increases in diarrhoea, malaria, dengue fever, coastal flooding, and childhood malnutrition. Reduced food availability and quality are expected to result in over 500,000 additional adult deaths each year by 2050.

Livelihoods

Climate change may have significant economic repercussions with potentially disastrous results. Climate change has most likely already led to an increase in global economic inequity, and this trend is predicted to continue. In Sub-Saharan Africa and South-East Asia, where a large portion of the population is dependent on natural and agricultural resources, the most severe effects are anticipated. The World Bank estimates that by 2030, more than 120 million people could fall into poverty as a result of climate change. Current social and economic inequities have been made worse by climate change. The mitigation, adaptation, and recovery from climate shocks provide considerable problems for marginalised people who have less control over resources. Climate change will endanger the health and way of life of indigenous peoples who depend on their lands and ecosystems for survival. An expert elicitation found that, in comparison to factors like socioeconomic disparity and governmental capacity, climate change has had very little impact on armed conflict.



(Source : Max-Planck Gesellachaft)

(Source:National geographic Kids)

Agriculture and industry

The issues that agriculture and forestry face include reducing greenhouse gas emissions, avoiding further conversion of forests to agricultural land, and supplying the growing world food demand. If a series of actions are adopted, emissions connected to forestry and agriculture may be decreased by two-thirds from 2010 levels. Among them include decreased greenhouse gas emissions from agricultural production, decreased demand for food and other agricultural goods, improved land productivity, and the preservation and restoration of forests.

Minimal Actions Required by Common People :

The biggest threat to life on our planet is climate change, which is already taking place. Fortunately, there are several recognised solutions to the problem of climate change. In reducing climate change, everyone can play a part. Everything we do, including how we travel, how much electricity we use, and what we eat, has an impact. To start addressing the climate crisis, follow these ten actions.

Save energy at home: Our electricity and heat are largely derived from coal, oil, and gas. Lowering your thermostat, switching to LED light bulbs and energy-saving electric appliances, washing your clothing in cold water instead of the dryer, and hanging your clothes to dry instead of using the dryer are all ways to cut back on your energy usage.

Walk, cycle, or take public transport: The majority of the cars on the world's highways burn either diesel or gasoline. By walking or riding a bike instead of driving, you may reduce greenhouse gas emissions while also enhancing your health and fitness. For longer distances, think about taking the train or bus. Whenever possible, carpool as well.

Eat more vegetables: By consuming more fruits, vegetables, whole grains, legumes, nuts, and seeds while consuming less meat and dairy, you can lessen your influence on the environment. Plant-based foods need less energy, water, and land to manufacture and emit less greenhouse gases.

Consider your travel: A lot of fossil fuels are burned by aeroplanes, which produces a lot of greenhouse gas emissions. So one of the simplest ways to reduce your carbon footprint is to take fewer flights. If at all possible, meet virtually, travel by train, or omit the long trek.

Throw away less food: Food waste results from wasting the resources and labour used to grow, produce, package, and transport it. As food rots in landfills, it also releases methane, a strong greenhouse gas. Use what you purchase as a consequence, and compost the remainder.

Reduce, reuse, repair & recycle: The electronics, clothing, and other goods we purchase emit carbon dioxide from the time the raw materials are mined until they are manufactured and distributed. To help the environment, buy fewer things, shop secondhand, fix what you can, and recycle.

Change your home's source of energy: To find out whether your house is fueled by gas, coal, or oil, contact your utility company. If at all possible, try switching to alternate energy sources like solar or wind. As an alternative, you might mount solar panels on your roof to provide electricity for your house.

Switch to an electric vehicle: If you're in the market for a car, think about going electric because there are increasingly more reasonably priced models available. Even while they still need electricity produced from fossil fuels, electric cars emit far fewer greenhouse gases than gasoline or diesel-powered vehicles, which helps to minimise air pollution.

Science & Leadership as a Scientist

Kshipra Misra

My independent research career started in 1984 when I joined Explosives Research & Development Laboratory (ERDL), Pune, India, DRDO India. For the next 30 years of my experience I never thought that what I was doing, was actually creating a path for leadership and my control over the scientific attributes. As the time went by I moved to work with Defence Materials Stores R & D Establishment (DMSRDE), Kanpur, India, a laboratory of the Defence Research and Development Organization (*Ministry of Defence, Govt. of India*) to Center for Environment and Explosives Safety (CEES), Delhi, India, a laboratory of the Defence Research and Development Organization (*Ministry of Defence, Government of India*) and to name a few exceptionally with *Ministry of Defence, Govt. of India.* As a bench scientist.

I have carried out several innovations which were granted on to the next levels such as Development of herbal products based on pharmacological active mushrooms and plants to improve human performance at high altitude, Filtering Device for the Removal of Arsenic from water (Granted, Patent No. USA 0308,484). However, a peak on my leadership skills was felt when I joined International Cooperation Division, Department of Science and Technology (DST), Ministry of Science &Technology, Government of India, New Delhi, India. The challenges to independently look after Science & Technology programs in SAARC (South Asian Association for Regional Cooperation) countries, Myanmar, Vietnam and BIMSTEC (Bangladesh, India, Myannar and Srilanka Technological & Economic Cooperation) countries developed the curiosity for supervising various international projects in the field of Science and Technology. This time period gave a wing of leader to plan, propose and guide the upcoming projects for India in cutting-edge technologies for/under international S & T collaboration. This time zone created a path where people started recognizing me as an individual for taking decisions and for creating an articulate clear vision.

According, to my perception I always felt any person who possess a strong self-confidence, strong-communication skill, creative and innovative, willing to take risks irrespective of any discipline is an effective leader. Out of all these, one of the best example which I have given to the society as a leader pertaining to take risk is "Arsenic-removal drinking-water filter" which are currently being used in rural areas of West Bengal, Bihar, Tripura and Uttar Pradesh provinces of India. Besides, some novel adsorbents were also developed for water treatment.

Some of the recognitions received in recognition to my skills are WATI (Women and Technological Innovation), 2004 National Award, ASCE (American Society of Civil Engineers) State-of-the-Art of Civil

Engineers Award, 2007, Bharat Jyoti Award, 2012, ESDA National Green Award 2020. Slowly moving forward, I learnt new skills to manage different activities such as Planning and Coordination Group in different fields of work. Currently, I am working as the President of an NGO, Save the Environment (STE), Kolkata, India. The main goal of STE is to create awareness and preparedness against national / international environmental hazards, with special focus on combating arsenic poisoning, especially in rural areas. STE is committed towards regularly conducting various programs and initiatives in under privileged are as to facilitate provisions of clean drinking water, food, health related products along with other basic requirements. Throughout my career I have been actively striving for promotion of environmental sciences among young minds and researchers.

Lastly, my message for the young generation is *"Wherever you see a successful business, someone once made a courageous decision"*. Leadership in the next generation will be about taking not one, but many courageous decisions.

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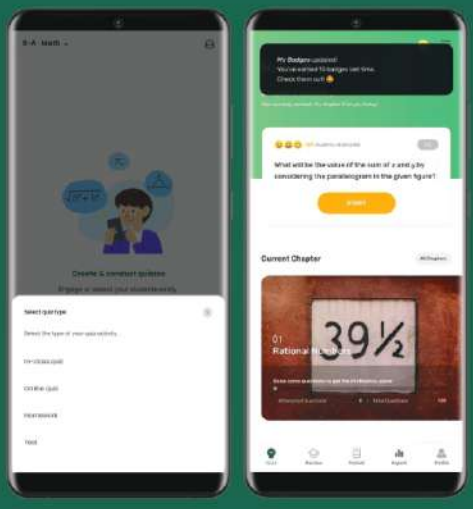

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Warren Buffett

"Read 500 pages like this every day. That's how knowledge works. It builds up, like compound interest. All of you can do it, but I guarantee not many of you will do it.

Antonio Guterres

"Countries should also end all new fossil fuel exploration and production, and shift fossil fuel subsidies into renewable energy. By 2030, solar and wind capacity should quadruple and renewable energy investments should triple to maintain a net zero trajectory by mid-century.

Bill Clinton

"People around the world have always been more impressed by the power of our example than by the example of our power.

Emmanuel Macron

"I thoroughly believe that reading and literature can help a society to better understand itself.

Sundar Pichai

"As a leader, it is important to not just see your success but focus on the success of others.

Formation of New Alliances and the Dream of a Collective Global Society

Jyotiranjan Gochhayat

The world has been much fragmented for centuries with long standing disputes, conflicts, and differences among countries. The differences and disputes during nineteenth century and the subsequent conflicts such as World War I and II forced the nations to think about the need of resolving the differences peacefully and enhancing the relationship between countries and states. The formation of the United Nations (UN) was primarily for the purpose of addressing the issue and maintaining international peace and security, creating an environment for cordial relations among states, to achieve international cooperation, and to be an agent for recognizing the acceptable actions of nations. However, the United nations has not been completely successful in achieving its objectives over years.

The influence of powerful and rich countries in the functioning of the UN, resistance of a handful of countries to proposed reforms in the UN structure, the inability of the UN to protect the interest of small, and poor countries seem to be reasons for the limited success of the UN. The nature of the reasons are not imperative. What matters is the fact that, it lead the countries to go for other alternatives for their security and stability.

Inter-American Treaty of Reciprocal Assistance was formed in 1947 among many countries of North and South America for collective security. Attack on one country was considered to be an attack on all member states. The North Atlantic Treaty Organization (NATO) came into existence in 1949 just a few years after the formation of United nations with 12 founding members for the purpose of collective security. This was possibly a display of lack of trust in the UN system. NATO has further expanded to 30 member states with some other states aspiring to be a member of NATO. The Middle East Treaty Organization (METO) or the Central Treaty Organization (CENTO), was formed in 1955 by Iran, Iraq, Pakistan, Turkey, and the United Kingdom for military alliance.

The Southeast Asia Treaty Organization (SEATO) was also created in 1955 with 8 countries for collective defence of the member states. The Five Power Defence Arrangements (FPDA) were created in 1971 comprising nations Australia, Malaysia, New

NATO Ambassadors signed the Accession Protocols for Finland and Sweden at NATO Headquarters. (Source:https://www.nato.int/)

Zealand, Singapore, and the United Kingdom for immediate action in the event of any attack on any of the FPDA member countries. The G7, a formal association of major economies, was created in 1973 for finding solutions to major global issues, especially in the areas of trade, security, and economics. Though G7 is considered primarily a non-military cooperation, the influence the group exerts over security and stability across regions is substantial.

The Regional Security System (RSS) came into existence in 1982 with four member countries to manage and reduce the instability in Eastern Caribbean region. The formation has since grown to 7 member countries. After the dissolution of the then USSR in 1992, the Collective Security Treaty Organization (CSTO) was created under the leadership of Russia. It was perceived to be an alliance to respond to the perceived threats by NATO. The Shanghai Cooperation Organisation was initiated in 2001 for deeper political, economic, security and military cooperation around the Russia-China-India axis. AUKUS was formed by Australia, United Kingdom, United States for focusing on development of military capabilities and collective security. Quadrilateral Security Dialogue (QSD), often called Quad was formed by US, Japan, India and Australia for boosting security cooperation in the Indo-Pacific region.

Quad Leaders
(Source:https://thediplomat.com/2022/05/quad-summit-indicates-growing-strength/)

Some of such coalitions and alliances have ceased to exist for their non-relevance in a changed scenario such as ANZUS (Australia, New Zealand, United States Security Treat), and The Middle East Treaty Organization (METO) or the Central Treaty Organization (CENTO). Some proposed alliances such as Northeast Asia Treaty Organization (NEATO) remained in the proposal stage. Beyond the multilateral coalitions, there are numerous bilateral security and military pacts such as Franco-Greek defense agreement, Union State, Taiwan Relations Act, Cino-North Korean Mutual Aid and Cooperation Friendship Treaty etc. Having several different military and security coalitions and alliances can be a double edged sword.

At one hand, such coalitions address the specific regional need of the member states providing the much needed stability and security in the region. However, some of such alliances are perceived to oppose each other and targeted against certain other states, and coalitions.

Maintaining a balance between two opposite coalitions often becomes difficult for the non-member countries and it creates a divided world with exclusive alliances, where division among countries increases, and cooperation and trust decrease. Such coalitions often undermine the United Nations, and act on their own. In such scenario, the essential objective of the formation of the United Nations to have a common world order and a collective global society seem to be a distant dream. The world leaders perhaps need to rethink about the numerous exclusive military alliances and find a path for a collective global society.

The Philosophy of Decent Work in New World of Work

Durga Prasad Nayak

By the turn of the century, the new world of work had come to realize the civilizational reality of socialistic convictions through the lens of economic emancipation. Deeply rooted human values channelized through the timeless philosophy of "Decent Work" stand as a moral compass in the contemporary world. The metaphor "Decent Work" has been introduced by the declaration of 87th session of International Labour Conference in 1999. The philosophy of decent work encapsulates the entire aspirations of human beings with significant working lives. The cornerstone of the philosophy is grounded on the agnostic radicals like human dimensions of employment, social protection at work, fundamental rights of workers and sensitizing the social dialogue. Decent Work is inseparable and inimitable from the universal philosophy of human value. The moral strength of the said philosophy transits from psychology of working theory to employment intensive investment, from mechanistic dimensions of working to unmatched human dimensions of working.

Source:https://www.onsitesafety.com

Human dimensions of employment include all types of employment which ensure human dignity across different sectors. It includes both qualitative and quantitative aspects of employment settings. It covers both formal and informal economy from regulated employment structure to unregulated wage worker, freelancer, side hustler, gig worker etc. It also ensures the ample of opportunities for work, fair wage, workplace safety entitlements and proper working condition. World employment report reveals 56 million people transited from formal employment settings to freelancing and side hustling due to lack of employment opportunity and workplace rights. The report also indicates employees of formal employment settings are under paid by 29% as compare to freelancers.

Providing social security to labour force for ensuring their income security and social capacity building are the building blocks of labour mainstreaming. After the hit of unprecedented COVID19 catastrophe to the world of work, it takes the entire ecosphere of work, workforce and workplace into reverse modulation. The recent World Social and Economic Outlook report reveals that global labour participation rate is decreasing by 2% and pushes 207 million people into

unemployment and underemployment. The global working hour deficit creates labour market disruptions. As a result 52 million full-time job switch into temporary employment. It throws millions into poverty by interrupting the social building blocks. For this social crises, we need human centric recovery with the motto "No one is safe until everyone is safe".

The protection of fundamental labour rights can be ensured by guaranteeing freedom of association, nondiscrimination at work, and the absence of forced labour and child labour. These fundamental rights are means of social justice which can foster sustainable and inclusive growth at conditions of human living. Humanitarian crisis or cease of labour rights affects the weakest, most vulnerable and deprived masses, making the uneven world of work more uneven. These bundles of rights are universal and serve all the human purposes at the work. International Labour Organization (ILO) social protection study report shows 46.9% of global labour force are still deprived of social protection and security amenities. It also portrays that 30.2% of global labour forces are still unaware about their fundamental rights at workplace. Monitoring the safety at workplace by considering the fatal and non fatal measures of occupational injury reveals that 5.7 per 100000 faces fatal occupational injury whereas 10 per 100000 faces non fatal occupational injury. Sexual discrimination by glass ceiling and cliffing, wage discrimination, sexual harassments continue to be the bedrocks of workplace. Globally 327 million wage earners including 152 million female workers draw less than the minimum wage rate in work place. World Economic Forum indicates 152 million child labour aged 5-15 yearsare engaged in the world of work out of which 73 millions are working under hazardous condition. Statistics reveal that one out of 8 Children is engaged in child labour.

Ensuring the Social Dialogue of the worker at workplace to maintain the industrial democracy and promoting the workers participation in the civic discussions like negations regarding work related matters and defend their interests in the utmost layer of organization are necessary. Nothing ever happens in isolation as the transitions from conflicts to cooperation need a global response guided by a shared sense of humanity. Collective Bargaining resolutes all forms of conflicts and enables participation and cooperation in tripartite connotations. Social Dialogue report indicates that under a single employer, employee gets 15.8% collective bargaining rate whereas under a structured multiemployer setting, employees get 71.7% collective bargaining rate.

Source of the image: https: //www.negotiations.com/articles/collective-bargaining/

Creating opportunity for all in both qualitative and quantitative means of employment, creating economy more inclusive, providing fair wage in the world of work can uplift the vulnerable working population throughout the globe. There should be zero discrimination in condition of work, ensuring gendered participation. Providing utmost facility for occupational safety is both ethical and legal. Awareness initiatives from government and employer side should be provided to make the decent work successfully implemented in workplace. Forced labour, Child Labour must be banned in workplace to ensure inclusiveness and social sustainability. Collective bargaining must become legal rights in the global community to strengthen the social dialogue in every sphere of work. Decent Work ensures Human dignity in the workplace, So, Decent Work is Social Justice.

Food Security Crisis in the Horn of Africa: The Case of Somaliland

Yousuf Abdurahman Mohamed Qasim

Concerns about the impact of the sharp rise in food prices since 2006 on the world's poor have been widely expressed. According to reports, the increase in prices has a particularly negative impact on the poor, who spend a big portion of their income on food. Poor rural households and farmers, many of whom are claimed to be net consumers and as a result suffer from higher prices, are also affected, as are poor urban consumers. Due to the concomitant consequences of prolonged drought, floods, desert locust infestations, the economic effects of COVID-19, and violence, 5.6 million people in Somalia are currently food insecure, and 2.8 million people cannot satisfy their daily food requirements. The International Federation of Red Cross and Red Crescent Societies (IFRC) will be able to assist the Somalia Red Crescent Society (SRCS) in providing humanitarian aid to more than 500,000 individuals in Somaliland and Puntland thanks to the Emergency Appeal. It will support the Pan-African Zero Hunger Initiative of the IFRC, which aims to free the most vulnerable Africans from poverty and remove the reliance on food aid. Lack of constant access to enough food for a healthy and active life is known as food insecurity. In other words, millions of people worldwide experience a food shortage and are unsure of their ability to provide for themselves at the end of the day or the next day.

Africa has experienced a very significant decline in crop production over the last two to three years. According to recent assessments by the Food and Agriculture Organization (FAO) and the African Union (AU), several African countries have recently experienced a severe food security crisis affecting an estimated 346 million people in Africa. Somaliland, the region includes Somalia and Djibouti. The Republic of Somaliland, a self-declared sovereign nation in the Horn of Africa, is also referred to by this name. The state stands out as a place of comparatively calm and democratic stability compared to Somalia, yet international recognition has remained out of reach. The government's ability to deliver services to its roughly four million citizens has been constrained by the country's weak economy and the limited opportunities for foreign trade and investment.

Recent years have witnessed a crisis in food security. Food production has decreased as a result of inadequate rainfall, civil wars, and global conflicts. In remote areas, Somaliland faces potentially dangerous food availability conditions that might lead to famine or extreme poverty.

The Somaliland people, and rural residents, in particular, try to produce their own food. The issue is that when the rain falls, the United Nations branch of the World Food Program (WFP) provides ready food and tiny pocket money, which may cause the population to quit their farming. They do not continue to get assistance, but they always time their readiness to cultivate their crops with the arrival of rain. Even though the food crisis is a global issue, the global communities observe a gradual rise in the price of food while production remains flat, and on the other hand, an increase in the world's population is seen.

THE FOOD INSECURITY PROBLEMS

The food availability depends on how many kgs the country produces, not how many hectares the government and people can farm. There are various strategies to help Somaliland overcome its food shortages, but the problem is that they could cause economic problems. We observe that whenever the growing season comes, numerous food distribution projects can be led by large NGOs, such as World Vision, HPA, Action aid, WFP, and many more local NGOs, who always coordinate their food distribution with the growing season. This is why the government should first create a cultivation schedule to reduce the cultivation blocking projects. Rural and IDP residents discontinue cultivating after receiving basic food. Now because 70% of the food consumed in Somaliland is imported, the government's GDP and the standard of living of its citizens have suffered for more than 31 years after the country declared its independence.

The individuals in this shot are IDPs who were present for a food distribution event in Somaliland. They came from extremely rural places and arrived in cities as a result of a drought that killed all of their livestock and sources of income. They moved to these large cities in order to survive.

The project table has been released by the Integrated food security phase of clarification

Region	Population (2020/21)	Number of Acutely Food Insecure People (Rural, IDP, and Urban Combined)						
		Updated Estimates (Mar 2022)			Updated Projection (Apr-Jun 2022)			
		Stressed (IPC 2)	Crisis (IPC 3)	Emergency (IPC 4)	Stressed (IPC 2)	Crisis (IPC 3)	Emergency (IPC 4)	Catastrophe (IPC 5)
Awdal	538,209	142,540	89,980	18,300	147,580	115,580	19,030	-
W. Galbeed	1,224,715	330,250	213,540	53,500	335,930	314,040	65,500	-
Togdheer	728,224	173,680	172,140	48,610	169,540	202,150	67,090	-
Sool	464,487	97,090	140,870	54,220	96,810	161,600	68,160	-
Sanaag	362,723	62,080	97,330	38,640	78,480	112,480	39,800	-
Bari	1,042,591	239,570	143,070	55,710	279,880	163,290	67,100	-
Nugaal	534,573	155,790	141,740	57,450	180,590	170,850	85,370	2,030
Mudug	1,243,526	405,290	375,490	114,410	348,680	430,960	189,210	23,260
Galgaduud	687,573	165,930	188,160	68,640	133,390	213,370	95,130	19,190
Hiraan	427,124	105,190	104,390	40,790	103,910	116,550	67,450	1,910
M. Shabelle	855,895	209,210	175,780	51,960	222,300	194,500	83,050	-
L. Shabelle	1,347,934	293,820	244,910	42,950	339,750	247,700	83,930	-
Bakool	459,747	103,120	122,180	57,080	97,370	147,750	81,580	10,200
Bay	1,055,913	250,140	305,300	168,790	195,720	385,280	233,090	24,510
Gedo	736,704	224,010	204,870	83,020	226,880	226,730	109,790	-
M. Juba	363,930	93,740	106,010	43,750	99,130	120,460	54,040	-
L. Juba	929,998	250,140	281,870	114,220	258,800	313,720	149,940	-
Banadir	2,683,312	538,100	538,100	90,400	627,060	583,300	180,800	-
TOTAL	15,737,178	3,839,690	3,645,730	1,200,240	3,896,440	4,220,310	1,740,170	81,100

Table 1https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155438/

The data in the table shows the stressful and urgent scenario in Africa including Nigeria, Ethiopia, and Gabon, but this table is exclusive only to Somalia. The chart demonstrates how the people are subject to poverty, famine, and catastrophic conditions.

Local Somali farmers occasionally encounter challenging circumstances during harvest time because the market is unfavorable and occasionally their supply and demand are not equal. This is because the government hasn't established any clear guidelines for maintaining and promoting an increase in the volume of locally produced food and this could discourage farmers, cause them to stop farming once more, cause a food shortage, or even trigger a food crisis.

LOCAL FARMERS IN SOMALIA, THIS PHOTO IS OF THE LOCAL CROPS THERE.

The impacts of drought on the agricultural sector and household income, ongoing political instability that may compromise Somalia's IMF-supported budget and debt relief plan, and global price shocks are undermining the rebound in economic activity that occurred in Somalia in 2021 after the worst impacts of the COVID-19 pandemic

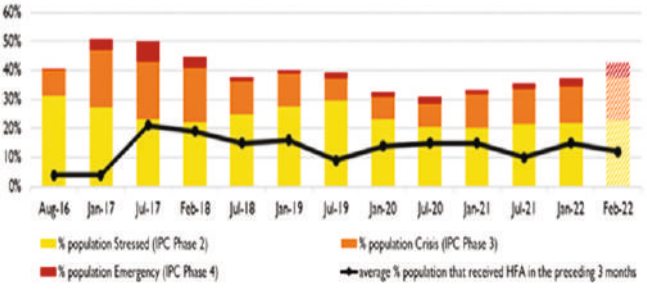

Figure 1 https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155438/

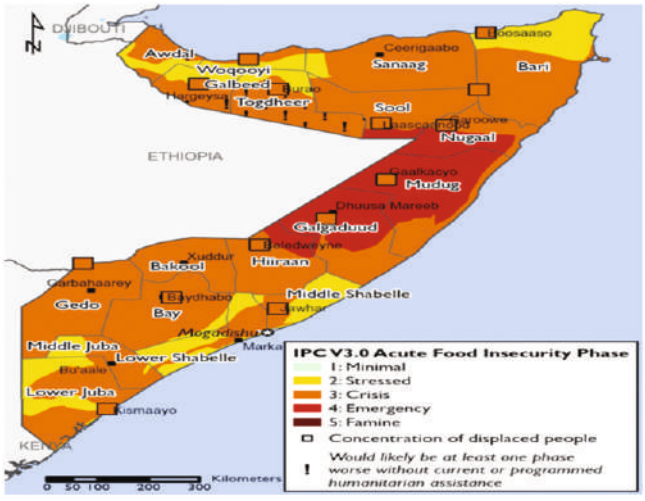

Figure 2: IPC estimates (Aug. 2016-Jan. 2022) and FEWS NET/FSNAU estimate (Feb. 2022) of the percent of the total Somali population in Crisis (IPC Phase 3) or worse and the average share of the Somali population that received humanitarian food assistance

Source: data from Somalia IPC workshops; data from the Somalia Food Security Cluster; FEWS NET; FSNAU

After a third consecutive below-average rainfall season occurred in late 2021, the ongoing drought in Somalia, which started in late 2020, has gotten worse during the January–March 2022 Jilal dry season. In southern, central, and portions of northeastern Somalia, the October–December 2021 Deyr rains largely failed, falling between 40% and over 70% below the 40-year normal.

THE (IPC) RECOMMENDATIONS & NEXT STEPS, INTEGRATED FOOD SECURITY PHASE CLASSIFICATION

To prevent extreme food insecurity and acute malnutrition, including starvation and excess mortality, in areas facing an increased Risk of Famine through at least September 2022, an urgent and timely scaling up of integrated humanitarian assistance is necessary. In particular, the mortality rate and malnutrition in the Bay region's Baidoa and Burhakaba districts already indicate to a very worrying situation as of May 2022. Although only one of the IPC Phase 5 criteria for famine has been met in the Baidoadistrict as of May, there is growing concern that if humanitarian assistance is not scaled up urgently in these two districts, further declines in food consumption, acute malnutrition, and increase in mortality rate may result in IPC Phase 5 famine in these two districts. In order to better determine the likelihood of famine (IPC Phase 5) in the Bay Region, a fresh round of data collecting will be carried out in June. Additionally, according to long-range estimates, Somalia is anticipated to see its fifth consecutive below-average rainy season between the upcoming Deyr season in October and December 2022. Therefore, it is anticipated that national humanitarian needs would grow and continue to be severe long into 2023.

WAYS OF GETTING OUT OF SOMALILAND FOOD CRISIS

The government of Somaliland needs to develop a well-defined strategy for empowering the farmers and providing them with all they require, such as training, equipment, funding, and a plan for consuming locally produced food. To encourage local farmers to be productive and produce more than the projected kilograms, the government of Somaliland, in particular the legislative organs, should draft and adopt rules and regulations regarding their economic obligations on them, this includes forgiving taxes and removing any obstacles. The government should implement this policy by discouraging the import of food, encouraging the consumption of local crops, and establishing a value-added business. The changes in the agricultural sectors, including those affecting crops, seafood, all varieties of vegetables, and juices, should be capitalized on by the government. This will serve as a form of benchmark accountability to compare the degree of progress made from the start. The government of Somaliland should develop effective market and marketing strategies to encourage local investors and achieve food security status as some local farmers have recently complained about the squandered corps after harvesting due to improper marketing.

Who Can Be A Leader

Debahuti Pattanaik

Only the person who practices shatya , Dharma , Shanti, Prema and ahimsha(truth , righteousness, peace peace , love , and non violence) experiences joy there from and shares that joy with others can be called a leader . In addition to the qualities a good leader should be selfless and be imbued with spirit of sacrifice (tyaga).he should have the people's welfare at heart and seek to win their approbation by his service . He must be prepared even to make the supreme sacrifice for the sake of the people . A leader is one who gives up all ideas of possessiveness strives only for he well being of society and holds himself forth an ideal human being.

Selflessness: The Foundation of ,selflessness is based on ideal or a vision an individual as his or her goal in life. The higher the ,the higher the degree of selflessness and ,higher the potential for leadership this is virtually a law .Selfless people are neither greedy nor looking for shortcuts to success hence their integrity never waves . They seek no unfair advantage over others hence , honesty comes naturally to them . They are not selfseekers , hence their loyalty is steady and strong . When people have these virtues then their thoughts , words and deeds become well integrated. They say what they think and do what they say there is no double think and double speak in their nature that establishes their credibility and they are trusted. Trustworthy people alone can become leaders . A leader must be prepared to serve as servants for all their lives . Never think of being a leader , without becoming a servant you cannot become .Aleader must learn to follow before becoming a .we find the world in an unfortunate state ,today people become leaders without knowing how to become good followers. In that context you must be prepared to spend all your lives in the service of humanity. In the first instance you must serve your own home ,then you must serve your village, then the country.

A leader should develop self confidence without which he or she will experience many troubles. Self confidence is faith in God . One with such faith has no problems. Life will have no value if the person will not have faith in himself . He or she and God are not separate. Faith in yourself is same as faith in God .

In simple terms leadership means knowing what to do plus“ GETTING THINGS DONE' Getting things done by dealing appropriately with people is eighty eight percent of leadership.To be a good leader an individual has to be a “ Sthitapranjnya” In the West it is a common advice that you have to be a gentle man before you can be an officer.InBhagabata Gita leadership means “ An hones man a man with a sense of duties and obligations of his position,whatever it may be; a man who tells the truth; a man who gives to others their due; a man considerate to the weak ,a man who has principles and stands by them; a man who is not elected by good fortune,and not too depressed by bad; a man who is loyal;a man can be trusted.Great spiritual leader Sri Satya Sai Babadeclard that A true leader shouldhave the head of Adi Shankar, the heart of Buddha and the hands of King Janaka. The head of Adi Shankar means having fundamental discrimination instead of individualdiscrimination.The of Buddha signifies a heart full of compassion and love that does not tolerate suffering or hurting any one. The hands of King Janaka refers to hands that selflessly serve others.This is leadership.Leadership is not based on power or position but on embodying an ideal character.

In India may great people such as Mahatma Gandhi,Vallabhabhi Patel, Bal GangadharTilak ,

Subhasa Chandra Bose, LalaLajpat Rai, MadanamohanaMalabya ,Bipin Chandra pal,JabaharalalaNeheru and many others participated freedom movement.Besides these prominent leaders who led the freedom struggle,therewere many more that played a key role at various levels in a quiet manner. They may not be remembered by posterity, but they left their indelible foot prints on the canvas of Indian history and consciousness.

Only a person whose thoughts , words and deeds are in harmony can become a good, and effective leader, His or her thoughts are pure;theirsource is not related to lust anger,attachment,greed,egotism or jealousy such leaders say that what they think(there is no duplicity in them) and they do what they say(there is no insincerity or hypocrisy in their deeds) In brief they are transparent and straightforward people in word and conduct.wetrust a person,whose thoughts words and deeds are in harmony. We can succesful leaders only if we are disciplined followers, who do not issue commands to others but rather set an example of service in our actions..

Millet: A Sustainable Solution to Global Food Nutrition Security and Climate Change

Nirmal K Mandal

New Beginnings for Old Grains

Millets, often overlooked by much of the world, are now gaining much-deserved attention due to their excellent nutritional content, climate-resilient crops, minimal input requirements, low risk crop for farmers, and low carbon footprint. **While millets have been produced and consumed for generations, the Food and Agriculture Organization (FAO) of the United Nations has just recently designated 2023 as the "Year of the Millets" on India's request.**

Millets are one of the earliest food grains and have long been an important element of the human diet. Millets are popular in developing countries such as India and Africa, where food security and nutrition are key concerns. Africa, followed by India, accounts for more than 55 percent of global output. In 2020, India accounted for over 41% of total global production. India is the largest producer. The other major millet producing countries are Niger, China, Nigeria, Mali, Sudan, Ethiopia, Burkina Faso, Senegal and Chad. In India, farmers have been cultivating millets using mixed-farming techniques for years. Pearl (bajra), finger (ragi), and sorghum (jowar) are the most popular millets consumed in India, as are other small millets such as kodo, proso, little, foxtail, and barnyard.

They were a prominent component of cultivated grains prior to the green revolution in the 1960s. Post 1960, India's agricultural policy has primarily centred on high-yielding and high-input utilisation crops such as paddy and wheat neglecting millets. This is to meet the demand for national food security. This can be explained by that the fact that Millets accounted for 20% of national food grain production from 1952 to 1954. By 2018, Millets accounted for only 6% of the grains cultivated in the country. More subsidised rice and wheat through the public distribution system, as well as state nutrition programmes, have played a significant influence in modifying people's eating patterns and reducing consumption. Changes in tastes and preferences, rapid urbanisation, rising incomes, the time and effort required to cook millets, the lack of "value-added" millet-based products, a lack of awareness about their nutritional properties and the negative social connotation of millets as a "poor man's food" are all factors that have contributed to the decline in consumption (DHAN Foundation and Wassan 2012; Government of India 2014).It should be observed that millets thrived despite being neglected. Cultural organisations and festivals played an important part in their preservation. Millet celebrations are being held across India today.

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Climate Smart Cereals

Millets are environmentally friendly grains. They are hardy crops that can grow in low-rainfall areas and can tolerate high temperatures. Millets, for example, require 350-400 mm of water per acre, whereas rice requires 1200 mm. To put it in perspective, **1 kilogramme of rice takes 5000 gallons of water, whereas millets only require 250-300 litres. They use less than 70% of the water that other crops do. Some pearl millets can withstand temperatures of up to 46 degrees Celsius. This makes it a good option for dry areas.** They demand little in the way of resources and almost no pesticides. As a result, they are low-risk, climate-resilient crops for farmers. Most crucially, these crops assist to alleviate the effects of climate change by having a lower carbon footprint, with 3,218 kg equivalent carbon dioxide per hectare compared to 3,968 kg and 3,401 kg, respectively, for wheat and rice.

Today's Nutri-cereals

Nonetheless, millets have the ability to help solve global food and nutrition issues, notwithstanding demand limitations. Millets, once known as coarse grains, have evolved into today's nutri-cereals.

Food security concerns have spread across the globe. Undernourishment is especially severe in African and Asian countries, with roughly 700 million people suffering from hunger worldwide. Furthermore, the Russian invasion of Ukraine has raised the issue of global food insecurity. According to reports, Russia's Black Sea port blockade might result in the loss of tens of millions of tonnes of Ukrainian grain, "triggering a food crisis that will affect Asia, Africa, and Europe. Rice feeds around half of the world's population and wheat feeds more than a third.

It is a time to start looking for alternatives to common staples like rice and wheat. Millets may be a viable alternative. Millets can also aid to combat malnutrition because of their high nutritional values.

Millets have experienced a slow resurgence in popularity, particularly in areas where they were once a staple crop. It's sparked by increasing interest in their health benefits for a city population with changing dietary requirements. This growing trend is mirrored by a global trend toward organically farmed ancient grains, or cereals with minimal genetic alteration throughout time. These cereals grown with little inorganic inputs are an excellent solution for meeting this requirement.

They are assuming their place on the plate and, by choice, becoming a part of the diet of health-conscious people. They are being considered as viable replacements in two primary categories: breakfast cereals and plant-based dairy substitutes. They are growing in popularity because they are gluten-free, low in trans-fat, and abundant in micronutrients. This is especially true following the covid epidemic. 'Immunity boosting foods' have gained popularity with the advent of the novel corona virus disease (COVID-19). Micronutrient-rich millets are appropriate replacements in this context for recovering our traditional food systems while keeping ecological balance with nature. When compared to rice and wheat, many young people believe millets are a healthier option.

Business Prospects

The demand for millets-based products is growing in urban areas, which means there are plenty of prospects for new market entrants. Millets have been embraced in mixed forms by health-conscious consumers in metropolitan cities, such as "multi-grain atta", "ragi-based dosa batter" and so on. This is most likely the start of a new trend that could lead to a demand reversal, not just in metropolitan areas

but also in rural areas, where the rural population typically desires to adopt the eating habits of its urban counterparts. Millets can be used to create a more inclusive rural economy by encouraging entrepreneurial activities. Value-added products like Ready-To – eat (RTC), Ready to Cook (RTC). Millet Vermicelli, Pasta, Flakes, and Puffs are becoming more popular in households today. There is a need to build the ecosystem to assist start-ups and entrepreneurs in developing millet based recipes and value-added products.

Global Demand

Millets are expected to reach $12 billion in worldwide demand by 2025, as the globe explores for healthier food grains. Millets were the 3,641st most traded product in the world in 2019, with a total trade value of $201 million. They have witnessed a considerable increase in demand in recent years, with global exports increasing by 44.8 percent between 2018 and 2019. With a share of roughly 30% in worldwide exports, the United States leads the way. India is now the world's fifth largest exporter of millets. It exported millets worth $26.97 million in 2020-21, accounting for roughly 20% of the total millet export value. Countries like Indonesia, Germany, Iran, Belgium, and South Korea, among others, import 50% of the millets produced globally, establishing the Asia Pacific, Middle East, and EU as important global demand regions.

In 2018, the Indian government commemorated the National Year of Millets. **NITI Aayog, the think tank of Government of India also inked a Statement of Intent with the United Nations World Food Program (WFP) on December 20, 2021, to help India take a worldwide lead in knowledge sharing** by using the opportunity of 2023 as the International Year of Millets.

Challenges & Way Forward

Millet cultivation is still an area with a lot of room for ecosystem-level interventions. Millets are mostly planted for fodder or home consumption, and farmers lack the financial incentive to grow them commercially, especially given the dominance of wheat and rice. Several difficulties must be addressed along the value chain, from pre-production to consumption, including, but not limited to, reasonable farmer remuneration, consumer education, simplifying supply and establishing processing, and value-added capabilities, particularly in developing nations.

Increased cultivation necessitates additional processing. It may not be out of place to mention here that Millets require extensive processing and value addition due to their coarse texture and flavour. However, processing entails high-cost activities. Surprisingly, processing facilities are concentrated in affluent countries, which may explain why the United States exports more millets than it produces.

Seed conservation to select exceptional seeds, customization of processing technology, and demand creation through global food festivals and recipe development are all necessary today. There is a need for well planned public and private investment in the areas including but not limited to seed development, value addition and processing. Farmer producer organizations must also be strengthened by providing modern processing and packaging techniques and improving their ties with marketing agencies. Asia and Africa's production can't even meet local demand, let alone generate enough for export. This is why government involvement is required. Odisha, Telangana, and Andhra Pradesh state in India have developed particular programmes to promote these crops in India. In line with these states, other governments may launch a mission-mode campaign on millets as a cure to lifestyle problems, changing people's perceptions of millet as a poor man's diet, particularly among urbanites. Millets may be gradually included into public distribution systems and the Integrated Child Development Scheme by governments.

In millet-producing countries, a favourable ecosystem with proper policy and institutional support is also needed to enhance millet production and consumption. However, concerted efforts, collaboration, and sharing of learning among stakeholders on a global scale should help millets gain popularity across the globe in the future.

Gandhism and Revival of Humanism in Leadership

Mr. Smruti Ranjan Nayak's painting on Mahatma Gandhi titled 'Reviving Humanism' depicts the dire need to revive Gandhi's values in today's war-torn world.

Gandhi is not confined to a man, it connotes a legacy; a legacy of truth, ahimsa, sacrifice and humanism. In a world devoid of humanism, it becomes essential to revive 'Gandhism'. The painting shows Gandhiji and one of his monkeys enclosed within the modern world marred with conflict and violence. Gandhi and his moral monkey have been shown looking at one another perhaps suggesting that people have become blind to Gandhian morals. Present day leadership is becoming increasingly separated from humanism in its blind pursuit of power and wealth. In such situation, Gandhiji's monkey is a timeless beacon of inspiration for generations to come.

Human soul, which has become a slave of greed, jealousy and lust, desperately seeks freedom. In fact, Gandhiji's message has become even more relevant in the present day and has the power to free humanity from its most pressing problems. This painting suggests the need to revive Gandhism as the call of the hour.

ART CORNER

Artist: Smruti Ranjan Nayak

Title : Reviving Humanism

size : 36" X 42" ; Acrylic on canvas

Concept of the Spiritual Manager at Workplace

Mangal Mishra

Since times immemorial, India has considered the role of a manager in any organization as that of paramount importance. There are several hymns in Sanskrit literature that depict the importance of a manager, although the word "manager" has not been used much. Kautilya was first author to use the word "manager" in his famous book Arthshastra.He has said that there is not a single latter which can not be a part of a hymn, there is not a single herb out of which medicine can not be prepared, there is not a single man in the world who is totally useless, the need is that of good manager. He can make use of them in proper manner.

Mahabharata emphasizes the necessity of a king as a manager. It has been said that the residents of a kingless state should submit to a powerful monarch. Indian philosophy condemns the anarchical state and emphasizes the necessity of a king(manager) all the time. The most prestigious epic Mahabharata emphasizes some virtues and qualifications necessary for a king, i.e. for manager. He should be truthful and he should always stick to truth. He should proceed to conquer his enemies, ministers and others only having control over himself. Courtesy and modesty should always be present in a manager, whosoever is desirous of working for a long time. He should be compassionate. Virtuous behaviour also is praiseworthy in a manager.He should live in the company of good men.The knowledge of scriptures-in modern sense latest knowledge-was an important requisite for the manager. The ancient Indian literature lays stress on exertion and activism and says that man's efforts are superior to destiny. He should be active and not lethargical.

Ancient Indian liteature says that virtues bring prosperity and help a manager in making achievements, whereas vices present hinderances on the path of progress and finally lead to the downfall of a manager or his regime.These vices are carelessness, greed, ignorance etc.He is expected to avoid pride, desires , passion and anger. They have been treated as eternal enemies and it is only after defeating them that a manager attains victory. At several places, the ancient Indian literature says that a manager should shun these as well as other vices like excessive sleep, fear, drowsiness, attachment, strong words and hard punishments.

In ancient Indian monarchy was the normal and popular form of government-so special attention was paid to it. The Mahabharata gives elaborate instruction to a king(manager) about the duties which he should perform in order to strengthen his hold on the people, lead them to prosperity, earn name and fame here and enjoy in the regions of Gods thereafter. The duties of a manager as laid down in the Mahabharata, were primarily three-a.maintenance, b. nourishment and

c. protection of his subjects. A manager was expected to maintain justice and impartially inflict punishment upon the culprit in accordance with the gravity of their crimes.

The complete picture of an ideal manager has been presented in ancient literature of India. It makes him a highly virtuous and moral person, free from all vices and possessing qualities leading to a noble existence for him as well as for his subjects and regime. The idea presented in ancient Indian literature can act as a light-house for the current managers working in complex organizational situations.

Introduction

India, that is Bharat itself signifies a land where the light of knowledge has come out of spirituality. Ancient authors and sages involved themselves in deep meditation and realized the realities of life. Spirituality has always been a guiding torch for Indian thinkers. Almost in entire ancient literature, every person is expected to fulfill four functions in life. They are known as four PURUSHARTHAS-viz. Dharma, Artha, Kama and Moksha.It is true that along with spiritual thoughts, stress has also been laid on materialistic philosophy. In this process, the idea of spiritual manager has come out.

In entire ancient Indian literature, there is not a single book which gives us complete information about ancient Indian system of administration. But, there are thousands of quotations (slokas) which inform us about the various skills and techniques used in the administration and management.

Organisation and Organisational Behaviour

Atharv Veda describes in detail about organizational activities. It says that we should develop organization.(1). It is duty of all persons that they should cooperate in the activities of the organization. Organisation leads to prosperity.A person leading the organization e.g. manager should love his subordinates in the same way as a cow loves her calf.(2)Whosoever is against us can be converted as our colleague by good behaviour. In Rig Veda, we find a prayer that we should be selfless.The materialistic prosperity prevailing in this world does not belong to any one person. We are all owner of this prosperity. Yajurveda says that let minds should be pure and concentrated towards good deeds-"Me manah, shiv sankalp mastu"(4)We should keep off evil thoughts. No person of the society should try to snatch any other person's property or right.Vedic thoughts provide an extraordinary formula for the maintenance of group peace-

"Sangachhadvam, Samvaddhvam, Samvo Manasi Jayatam,

Deva Bhagam Yatha Poorve, Sanjanana Mupasate"(5)

It means that we should move together, speak together and our hearts should be one. We should cooperate with each other in the same way as Divine powers do.On the same lines, we find another formula –

"Samani Va Aakootih, Samana Vradyani Vah,
Samanmastu vo mano yatha, Vah Susahati"(6)

It means that our thoughts and hearts should be one and we should collectively try to attain the desires goals.

In ancient times, the medium of communication was primarily oral. So, Indian philosophy believes that we should use only soft words leading to peace and avoiding conflicts.(7) "Vacham Vadat Bhadrya" means that our voice should be soft and loving. Even for materialistic progress, soft spoken persons are very much important. Even sight has been considered a medium of communication. We should see every person with peaceful sight and in friendly style-

"Mitrasyaham chakshusha sarvani bhootani sameekshe.

Mitrasya chakshusha sameekshamahe"(8)

It means that I should all living creators with

friendly sight and all living creators should also see me in the same way. The Vedic literature feels that there should be friendship everywhere and no enemity-

"Samano mantra, samiti samani, samano manah sah chitta mekham"(9)

It means that our thoughts should be similar, there should be no differences in performing a task. Our hearts and minds should be concentrated on similar lines.(10)

There are several sayings in ancient Sanskrit literature of India which propound the importance of organization and the role of manager in it. There is a story of Shatpath Brahmin(11)

which describes the importance of cooperation in any organization. There were two ancestors of Lord Prajapati-Divine and Demons. Once upon a time, they were invited to attend a lunch. There hands were attached with a long stick so that their hands could not bend. Demons used to eat themselves, so they starved, while Divines sat in front of each other and eat food. The essence of the story is that whosoever is selfish, will have to starve at the end and whosoever is filled with Divine spirit, will enjoy the benefits.

Ancient Indian literature says, that jealousy is the root cause of all evils. It burns the heart and prevents the noble thoughts to come in. Jealousy burns the mind. As the water cools down the fire, in the same way, jealousy should be cooled by noble thoughts and peace. One should always try to help others as rivers and fountains do.God helps those who help themselves. God supports a person with zeal of work and not to a lazy person. So, a person should always be active. It one has actions in his right hand, then the victory will be in his left hand.

Code of Conduct of a manager-

Ancient Indian thinkers thought that organization is a big responsibility and a person holding the responsibility of the organization should be perfect with certain qualities-"Rajyam hi samahat tantram"(12)Mahabharata lays special emphasis on the qualities of a manager (the king). It says that whosoever is brave, truthful, merciful, self-controlled, able to control the anger, intelligent, well versed in literature, able to keep the confidential talks to himself and concentrated in the welfare of his subjects is fit to be a manager. A manager is expected to fulfill various duties during the course of his work. The code of conduct as propogated by Mahabharat still seems relevant for every manager even today. In Shanti Parva of Mahabharata, Yudhishtar asks Bheeshma about the qualities of a manager. Bheeshma says that a manager (king) should possess 36 basic qualities. These qualities can be described as a code of conduct of every manager(13)-

1.The manager should follow Dharma but should not let bitterness come in,
2.He should be be atheist but should behave love with others,
3.Money should be collected but without cruelity,
4.Actions and consumptions should be ethically limited
5.Speak soft words but without begging,
6.Should be brave and not outspoken,
7.Should give donations but not to unworthy,
8.Should be bold but not cruel,
9.Should not be in company of cruel persons,
10.There should be no quarrel with friends and relatives,
11.Avoid using a kith or kin for spy purposes,
12.Should do activities without harming to others,
13.Should not reveal the secrets to shrewd persons,
14.Avoid self-appraisal,
15.Do not snatch money or wealth of good persons,
16.Should not take refuge to bad persons,
17.Should not penalize any person without holding a proper inquiry,
18.Keep confidential thinks to himself,
19.Should not give money to greedy persons,
20.Should not trust any person who has cheated previously,
21.Should protect women without jealousy,
22.Should observe purity, but should not hate with others,
23.Avoid excessive involvement with women,

24.Should eat pure and tasty food and avoid harmful food,
25.Should respect to hon'ble persons with politeness,
26.Teachers should be respected without prejudices,
27.Worship God without pride,
28.Should expect wealth with good intention,
29.Should serve subjects unbiased,
30.The manager should be efficient, but should be ignored with the change of opportunity,
31.Should not give any such assurance which cannot be fulfilled,
32.Should not blame others just for the purpose of obligation,
33.Should not attack anyone without knowing his intention,
34.Should not feel sad after killing the enemies,
35.Should be able to show anger, but not casually,
36.Should be soft, but not for the persons who do not respect the obligation.

Qualifications of a manager-

The ancient Indian thinkers believed that if the manager was corrupt, he will encourage others too to be dishonest because as was the manager, so were the people. So, they laid certain principles, virtues and qualifications for the manager. Some of these virtues are as follows-

1.Satya-Satya means truth. The ancient Indian literature says that truth and only truth is the only key to success. A truthful manager enjoys here as well as hereafter, whereas that manager, who speaks a lie perishes. Hence , a manager should avoid untruth and stick to truth. (14)

2.Self-control-A manager should proceed to conquer his enemies ,assistants and others only after having self control. Kautilya stressed the necessity of self restraint for a manager.(15)He says that there are managers, who perished because they lacked self-control. Even, Shukracharya says that the manager should first control himself, then to his relatives, subordinates and other servants. Self restraint leads to happiness. Various other books like Manu Smriti, Matsya Purana and Agni Purana lay stress on this moral value.

3.Courtesy and modesty-A manager who is desirous of working for a long time, should observe courtesy and modesty. Kautilya says that these qualities are very important for a manager.(16)Many kings perished because they did not possess these qualities. Politeness is the root of policy. A manager should see that his subordinates are disciplined and have practiced courtesy, otherwise the entire regime will be ruined.

4.Protection to suppliant-The Mahabharata says that a manager should be compassionate. He should provide shelter even to an enemy, if he asks for it.

5.Virtuous behaviour- It is praiseworthy for a manager to maintain virtuous behaviour. It helps a manager to earn prosperity. A good behaviour also brings other virtues like righteousness, truth, good conduct and power.

6.Proper company-The role of a company is very important for a manager. Company plays an important part in the formation of the character of a manager. A manager should live in the company of good persons. He should never live in the midst of robber-like and corrupt persons, subordinates and colleagues.

7.Knowledge of scriptures-The manager is expected to possess a perfect knowledge of the scriptures. A manager is likely to perish without this knowledge even if he is powerful. Kamandaka goes to the extent of saying (17) that a manager, who has no knowledge of scriptures, is blind.

8.Activism and exertion-Indian literature does not take a despondent view of life. It lays stress on exertion and activism. It believes that man's efforts are superior to destiny. A manager should be active and not lethargical. Mahabharata is a staunch supporter of activism. This Epic repeatedly says that the manager should never be inactive, because one, who is inactive has to face many difficulties. Moreover, such a manager is destroyed easily like an anthill.(18)

Practical Significance-

The value-based management is getting wider importance globally. It seems that materialistic progress blended with values can only survive in the long run. India being the torch-bearer of values since times immemorial, has always laid deep stress in values. It is not possible for an individual to search the entire ocean of Indian ancient knowledge in one life ! Thousands of sages, preachers and thinkers have made long studies on values and laid certain principles which are of paramount importance in this 21st century. The ethical sermons are always relevant. They are just like light-house in this vast ocean of globalization. It is important to note, that even the western world has attracted towards the ancient Indian knowledge and the Sanskrit literature is being studied there with great curiosity. Indian philosophy believes in the world famous quotation-

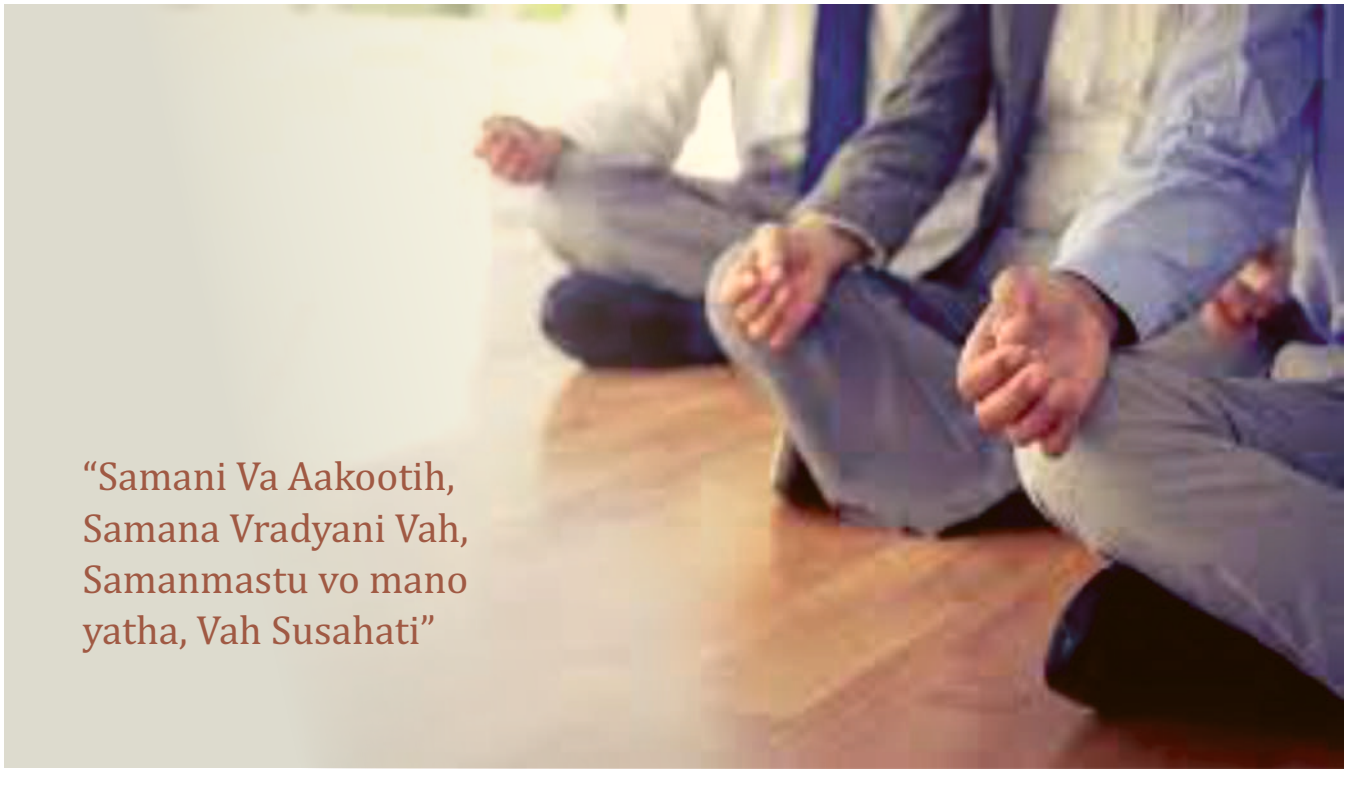
"Sarve bhavantu sukhinah, sarve bhavantu niramayah, Sarve bhadrani pashyantu, ma kashchit dukh bhag bhavet"

It means that everyone in this world should be happy, everyone should be healthy, free from illness, everyone should see and visualize good, and there should be no suffering at all. This philosophy is the essence of the entire Indian literature. Ved Vyas concludes that-

"Ashtadash puraneshu , vyasasya vachanam dvayam, paropakaraya punyanam, papaya par peedanam"

It means that in 18 Puranans, the conclusion of Ved Vyas is that, it is virtue to help others and it is sin to trouble others. This is the core objective of Indian spiritual manager, which is relevant irrespective of time, place and situation.

There are various Shlokas (hymns) in our literature, they provide a formula for the solution to the problem. Even in modern complex business situations, these hymns are just like guiding principles. Particularly in understanding human behaviour and organization behaviour, these hymns are very useful. A deep insight into this literture can reveal more relevant formulae.



Where There's a Wheel, There's a Way – The Past, Present & Way Forward

Malaya Mohanty

Often in our childhood, we have heard a famous saying, “Where there is a will, there is a way”. That's how human species have grown over the years. If we look back in the pages of history, we can see how people started the first civilizations near water bodies. Why water bodies? Well, water as we all know is the second most important commodity to live, first being the air which is freely available everywhere. Drinking waterwas limited to rivers and people started living on their shores. They got battered by the floods and their will power helped them build dams to store waters. Slowly they understood they need roads to move and again with their will& intelligence they started constructing roads. Over the time, human race developed tremendously despite many wars, epidemics, and pandemics. Everything achieved through will power. But now, we have reached such a point where more than will, its wheels that help us reach places faster, move things in less time and help connect the whole world and that's why the saying has changed now. “Where there is a wheel, there is a way.”

'Transportation' –the term which modern world has coined has been a revelation like no other. Romans were the first race who realized its importance and in 312 BC, started making the first roads across their cities. With time, the technique was adopted, changed, and modernized to the roads that we see and travel on today. In India, in 16th century, Sher Shah Suri, an emperor of Northern India, built a major road running across the Gangetic plain which was known as "Sadak-e-Azam". Well, now we are in 21st century and guess what, we have developed like no one else. We have found ways to make different kinds of roads; good looking, made with bituminous top, less cost but less design life (flexible pavements) and then the concrete roads which lasts longer but also is expensive (rigid pavements). And now, we are also trying to make green roads; the roads which shall utilize various waste materials and help them recycle. We have also understood how to measure the strength a road can take. This helps in deciding what kind of roads to build based on what kind of vehicles are expected to run on it. In India, back in

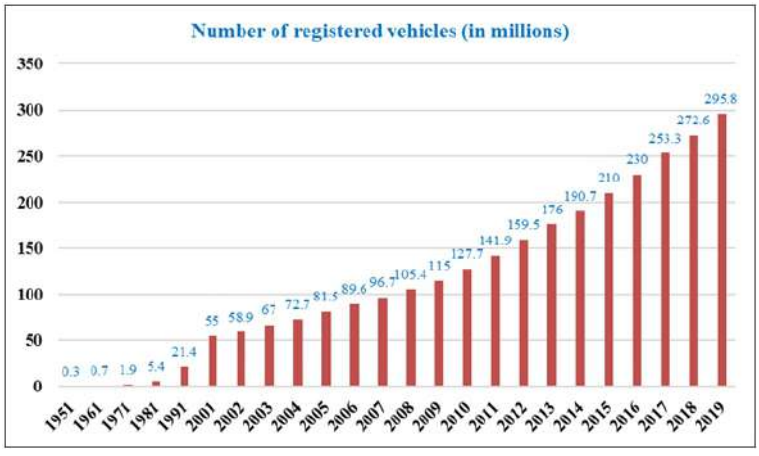
1943 (Nagpur road plan from 1943-63), the roads were classified into National Highways, State Highways, District roads, and village roads based on the places these roads connected. We kept on building more and more roads, and the whole world did. But it came with other problems.

Roads have always been built with one purpose; to reduce the distance and time between 2 places. In attaining this prime objective, humans had to go for intersections/junctions where two or more roads met. But then, humans realized that roads could take lives too. One vehicle can collide with another leading to deaths or loss of property. And there started a new field in transportation engineering called the traffic engineering and planning. Humans understood that they can't allow anyone to drive at any speeds. Further, they can't keep on constructing roads wherever they wish. They also understood that at junctions they need to give traffic signals and can't allow everyone to drive at the same time.

The first electric traffic signal was put into place on the corner of Euclid Avenue and East 105th Street in Cleveland, Ohio, on August 5, 1914. Ofcourse before that, in 1868, traffic lights resembling the railway signal was installed outside the House of parliament. In India, the first traffic light was installed at Egmore Junction, Chennai in 1953 (although it was not electric).Believe it or not, today only in the capital city of New Delhi, around 400 traffic signals are present and in Chennai, 407 traffic signals. But that didn't decrease the number of road accidents in India which was the major motive behind installing these traffic lights. Why? The simple reason is enormous exponential increase in number of registered vehicles after independence in India.

In 2001, 55 million vehicles were bought in India and in 2019, 295.8 million vehicles have been bought. The figure is not cumulative. It's the record of every year. This shows why, in spite of all traffic measures, every year 1.5 lakh people die due to road crashes in India. Moreover, the number of road accidents per lakh population in India has increased decade by decade with more than doubling itself from 1970 to 2010. The decrease in 2020 is just an outlier and side-effect of covid.In order to cater for the increasing road demand, our governments started building more roads, so much that in 2022, the road transport and highways ministry aims to construct a record 18,000 km of highways at a pace of 50 km per day. If land is not available, we have started building flyovers, roads on roads, roads on rails, and what not. Along with road crashes, and

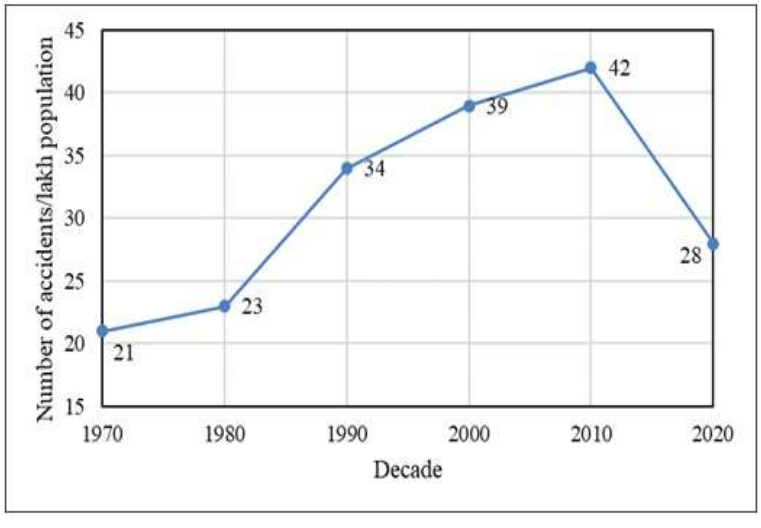
road crash related deaths, traffic congestion is another plague that has started hitting tier – II cities and is at large in tier – I cities. Going through road users' experience on Quora, in Bangalore, if you start to commute to your workplace between 8:45 am to 10:15 am, it will take 20 to 30 minutes extra than before 8:15 am or post 11 am. On an average, a road user in Bangalore spends 1.5 to 2 hours daily just to go to office and come back to home.

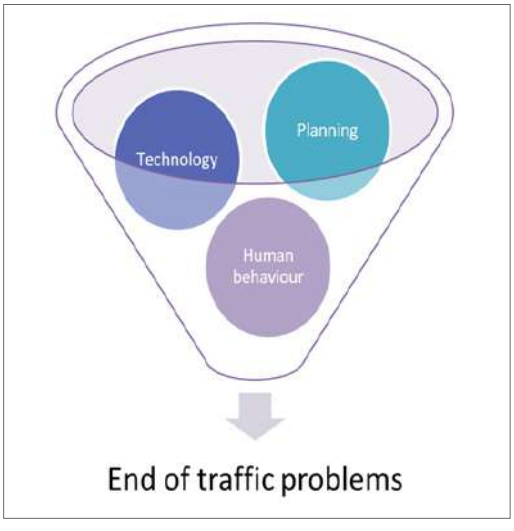


Considering 5 days a week, on an average 8 hours per week and 32 hours per month is spent by people just to go to office and come back home. It will amount to 384 hours or 16 days on road every year just for commuting between home and workplace which are located just 10-12 kms apart. Imagine what has human become in the name of technology, work, money and how important it is to find a sustainable solution to this issue. Where will all this end? Where will all this lead to?

Congestion, road crashes, deaths. Building more roads is good but it's not the permanent solution,because everything has a limit and one day these resources will perish. If humans asked themselves, they could understand that they themselves are the solution to these congestions and crashes.

There has to be a blend of technology and planning, with conscious human (driver) behaviour to eradicate our traffic woes. We have to pursue sustainable practices like usage of public vehicles foreveryday use along with use of bicycles for very near places rather than always depending on personal cars which take up a big space on road with just one individual inside it. But that can be possible only when proper transportation planning is done for bus scheduling and optimized travelling. Similarly, use of technologies like ITS can help reduce road crashes and related deaths. Together we can, and together we will as this is not for anyone else but for us, for the human race to strive and move forward sustainably and gift a better world to our next generations. If rivers were cradles of civilization, roads are the catalysts to move the civilization forward and we are the flagbearers of how we handover these catalysts to our next generation.





"Are Leaders Born or Made"

A Never Ending Debate

Jyoti Prakash Rath

Leadership may be seen as an art of motivation used to influence a group of people or a team towards attainment of a predetermined target. Leader is the person who leads from the front but take the team forward. A leader is a perfect blend of motivation, action and inspiration. He or she may leave his or her impression in the heart, mind and soul of people which ultimately induced them to reach their goal. Leader possesses specialized skill, talent, vision, foresight and most importantly the daring to face any sort of situation on front foot. Now, a pertinent question arises about Leader whether Great Leaders are Born or Made! There are some schools of thoughts advocate in favour of natural talent while some consider this as hard work and commitment. People may differ from each other on the basis of their personal postulates and assumptions that develop individual perceptions. But the reality cannot be ignored or completely eliminated from the race course.

Each and every individual have their own talent and inclination for success. These are the important attributes make them fascinated and excited about reaching their targets make a clear distinction between a common man and a leader. There are number of leaders who have grown up throughout their childhood and youth ordinarily but evolved with time as great leaders. They may face many obstacles in their journey of being an ideal leader. They might have witnessed many ups and downs, failed to reach target, somehow survived but finally succeeded in their mission.

Hence, it can't be conclusively state that leaders are born, rather it can be seen from a different perspective where commitment, vision, dedication, passion, daring and most importantly the courage to fight for right are some of the key factors responsible for making of a leader. All leaders are born no doubt but they became leaders by identifying the leader hidden inside self.

What makes a Leader?

There are number of traits available with leaders reflected in their work.

Positive attitude

Leaders should have positive attitude and mindset towards work. It is highly essential for managing and handling work pressure. This positive approach may help the leader to control and regulate the team. In an adverse situation, leaders may take some important steps to keep the working environment relax and stress free. Entire office will feel the positive vibes from its leader and start performing better with time.

Creativity

A leader with creative thoughts and ideas may do the trick for institutional development. A good leader may find answers to the challenges with creativity at times with out of box solutions. In this process, ideas

may be collected through a brainstorming session with the entire team members. It will develop employee participation in the decision making process.

Enthusiastic
A good leader is required to be enthusiastic towards work and achievement of goal. People will be more responsive to the open hearted people. Leaders are able to motivate people by words as well as induce them towards action. Leader is full of enthusiasm and dedicated towards accomplishment of desired goal. There is always a gap between the role and responsibilities of leaders, still their level of enthusiasm made a bridge.

Inspire
A leader always inspires. It is an important quality which motivates employees performing under his leadership. Leader makes their way in reaching the goal and target of business by motivating the human work force. Inspiring or influencing words of a leader at the time of adverse situations will certainly enhance the confidence and morale of the workers in an enterprise.

Empathy
Empathy represents the ability of one person to understand the feelings or experience of others. Leaders of extraordinary caliber and capability carry this quality within. They appreciate people for their good work in public while address their loopholes or limitations in private. Such leaders can understand the feelings of their team mates and take all required steps deemed fit for their betterment. If any employee did a mistake or anything went wrong on his or her part, an ideal leader shows empathy and helps the employee to rectify his or mistakes rather playing the blame game.

Honesty
One should be honest in work and approach. Honesty is one of the most important aspect should possessed by an individual as a key element of effective leadership qualities. A leader is responsible and accountable for the performance of the team. An honest leader may influence the entire team of workers at the work place for being honest, fair and to remain accountable. Honesty of leader may get followed and reflected in the performance of the subordinates.

Delegate
Decentralization is essential for effective management of any enterprise. Hence, it becomes essential for the leaders to delegate authority along with responsibility to the employees finding worth of taking the onus. A leader shows his trust always on teammates irrespective of the situation and position. Delegation represents the trust and belief of the leaders on others working under his leadership. It boosts their confidence level and interest to perform better towards achievement of goal.

Communication
Effective communication will do the trick in a business. It is the key to success in any form of business. Absence of proper communication may lead to create a gap between employee and management. Manager possessing leadership skills always try to ensure effective two way communication in the business. It helps the employees to understand their work, target, goals and most importantly the expectations of management from them. Good communication is a crucial attribute of leadership qualities.

Confidence
Leaders should show confidence and belief on the subordinates working in the enterprise. Sometimes, employees may fail to reach their predetermined target completely or partially. It reduces their moral and confidence level. It is the responsibility of a leader to boost the morale of his team and motivate them to perform better in time to come. Confidence shown by the leader on the team and their caliber certainly make them prepared better for future.

Commitment
Leaders with commitment towards work motivate the entire team to work with zeal and enthusiasm. It may be seen as one of the most important motivational techniques substantially affects the

mindset of the people at the work place. They get motivated by seeing their leader's commitment towards work. This leadership quality of the leader brings him respect and recognition from the employee corner. By showing his commitment level, leader sets an example for the staff members in the organization. It is truly defined in a single line – "Set the Tone of Commitment and Others will follow Suit".

Perspectives what matters

Perspectives of leaders may get different from each other but all will end with accomplishment of group goals by taking the whole team together. Some of these important perspectives of leaders are given below:

Talent Recognition

All great leaders possess the quality of recognizing talent and nurture those to groom. This is not a easy process though still talent can't be hided long from their eyes. They are identifying and measuring the qualitative characteristics and talent of the employees at first. Further, leaders are framing different plans for different individuals out of the talent pool and motivated them to work towards attainment of organizational goal by putting their best efforts. It will lead to provide job satisfaction to the employees in an organization.

Understanding Emotions of People

It is an important characteristic of an ideal leader to understand the feelings and emotions of people and act accordingly. They are always trying to win the heart of the people by leading from the front and setting examples from their work ethics. They inspire, motivate and induce their followers by feeling their emotions.

Induce to go beyond the limit

Sometimes workers are restricting themselves to a limit and taking a plea of achievement of predetermined target. It is an important perspective of a leader to induce workers to go beyond the limit set earlier for them and to prove their worth by reaching far more. AT times, leaders provide guidance and support to their subordinates to cross the boundaries of prefixed goal.

Setting of New Height

It becomes essential for a leader to set examples through high level of performance in front of others. One can't only expect better from all others not doing or achieving anything self. Leaders are to show their commitment, hard work, capability, skills, talent and most importantly passion towards work. All these attributes may certainly result in excellence and ultimately set the new height for fellow workers.

Need to be Compassionate

A leader needs to be compassionate. It is considered as one of the most crucial qualities of a great leader. These qualities are reflected in side a exceptional human being who can truly motivate and guide others towards learning life lessons.

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"Leaders are always Leaders, may be by born or may build or develop to be One"

Green Composites for Sustainable Development

Ratnakar Das

Introduction

In the 21st century researcher and scientists are focusing on development biodegradable materials which can cater sustainable issues with remarkable improvement in the field of green composites production.

The green composites decompose by themselves at the end of their life without polluting the environment, which can't be possible with synthetic fiber reinforced composites. Previously synthetic (man-made) fibers like carbon, aramid, and glass fibers were widely used in polymer composites because it has high stiffness and strength. However, these synthetic fibers have a drawback in terms of biodegradability, energy consumption, recycling, initial cost, health hazards, etc. The introduction of the biodegradable fibers extracted from natural sources can be degradable or recyclable fibers, reinforced in the polymer matrix.

The source of natural fibers extractions is from plants, bird feathers, fish cells, grasses, animals, human hair, etc as shown in Figure:1. These fibers are well organized and have an excellent reinforcement potential for structural engineering materials. The natural fibers contain cellulose, lignin, hemicellulose, wax, dust, dirt, etc, that absorb moisture from the atmosphere which leads to poor adhesion at the interface making weak bonding strength with matrix materials. Additionally, the chemical bound structures of natural fibers and matrices are completely different so coupling between them at the interface is difficult, it causes an inefficient stress transfer matrix to the fiber during loading. Therefore, to improve the bond strength at the interface with proper coupling by the adhesion of the fiber and matrix, it needs chemical treatment for modification of fiber surface. Using these natural fibers as reinforcement is advantageous to a pollution-free environment. It required more focus on the sources which grow in a short duration (grass families) or the product (date leaf, jute, fruit pulp, fish cells, wood dust, coconut leaf, fruit, etc.).

Reinforcement and Matrix materials for green composites

The reinforcement is a process to improve the desired properties of the matrix material according to the application area. Reinforcement may be in different patterns like continuous, discontinuous, random, and partial reinforcement (fillers or dust). These different forms of reinforcement have a different impact on the composite properties.

The continuous fibers may improve the tensile strength and modulus along with the fiber reinforcement but discontinues reinforcement cannot sustain as much as continuous one because of fiber discontinuity. Partial reinforcement improves the surface properties of the composite like wear resistance, erosion resistance, scratch

resistance, etc. Nowadays more research is going on the nano-particle reinforcement because it greatly improves the bound strength, mechanical strength, and surface properties also increase. These days the biodegradable particles being used in reinforcement are fly ash, marble dust, coal dust, cenosphere, wood dust, animals' bones dust, etc.

Figure: 1 Source of Natural Fibers (a) Ratan Plant (b)

Snake plant (c) Sabai grass and (d) Sisal fiber [Source: AIP Conf. Proc., ICATCHCOME 2022]

Green composite manufacturing requires degradable or recyclable matrix and reinforcement materials. For this reinforcement materials are extracted from natural sources. But what about the matrix materials? The matrix must be degradable or recyclable so it must be selected from the natural sources or man-made which are recyclable. As we know man-made matrices are two types of Thermosets and Thermoplastic. The thermoset cannot be recycled, and the thermoplastic can be recycled and reused after separating from products. For green composite manufacturing, the thermoplastic or natural sources matrix can be used. The thermoplastic matrices which are being used in biocomposites are nylon, polypropylene, polyetheretherketone, polyphenylene sulfide, etc.

Impact on environment and villager's life

Biodegradable composites production reduces the load on the manufacturing of non-toxic materials. The production of the toxic product can cause diseases and environmental pollution.The use of natural sources of fibers may motivate people to increase plantation and use the parts of the plant as reinforcement materials. For the continuous production of biocomposites required continuous extraction of natural fibers which can be fulfilled by nature that can be extracted in a short duration, regular interval or by the parts (pulp, bark, leaf, fruits, seeds, etc,). The production of biocomposites increases the demand for natural fibers which can be mostly extracted from plants or grasses that comes from the rural areas. Where the villagers get occupation regarding planting and extracting fibers from plants pats and grasses. So that they can have better economical status and spent a good lifestyle. At the same time, the large number of plantations can give a fresh atmosphere for the man kind as well.

Conclusion

The green composite fabrication and control over climate change must go hand in hand. To make it possible to replace the synthetic materials, the bio materials sources are to be identified with cost effective modes. In the coming days, these biocomposites will be in demand in manufacturing industries and will also prove its way to get control of climatic change too. Biocomposites are emerging materials the areas of application are still limited. The quality of biocomposites depends on the quality production of fibers and it may depend on the farming quality, atmosphere, watering, and types of fertilizer used. The process of fibers extraction also may affect the fiber quality. If the chemical treatment of fibers is required then it is very important to select the correct method and process so that it cannot decrease the strength of the fibers and increase the bond strength without polluting the environment.

Conserving Goa's Built Heritage

Divay Gupta

BACKGROUND

The Portuguese who entered Goa in 1510 CE have left their impression on the attitudes, architecture and the lifestyles of the people of Goa and given the place a definite identity of its own. However, Goa is also rich in pre-Portuguese cultural and architectural heritage that is mostly unknown and neglected.

The State of Goa has several centuries of history in the making of its cultural identity. Being small in size, it is perceived as manageable and was among the earliest to have the State Archaeology Act and the concept of Conservation Zones for the protection of its urban and rural heritage. Awareness of heritage issues is also high and presumably, its built heritage is amply safeguarded. Within the existing framework for safeguarding and management of heritage properties, only the centrally and state protected properties and the Conservation zone areas have a control over the setting of the listed properties. Consequently, a huge chunk remains prone to change of the original setting.

Goa has 21 ASI and 51 State Archaeology protected monuments including a World Heritage Site in form of Churches of old Goa. beside this there are several unprotected heritage buildings and sites. INTACH has listed about 3419 such properties spread across Mormugao, Ponda, Tiswadi, Salcete, Sanguem, Quepem, Canacona, Sattari, Bicholim, Bardez and Pernem.

The typology of built heritage in its various forms of existence – ruins, remains, sites and extant - can be categorized broadly into the indigenous/ traditional type and the Portuguese Colonial influenced type. The former ranges from prehistoric engravings and rock-art, caves and cave temples, monolithic and

Basilica of Bom Jesus : Exterior View

Basilica of Bom Jesus : Exterior View

Church Saint Augustine

St. Jancito Church

structural temple structures, indigenous traditional housing, urban and rural spaces, forts, mosques and sacred groves. The latter broadly covers churches, chapels, convents, temples, forts, urban, rural housing, individual palatial houses, institutional and administrative buildings, bridges, monuments and landmarks.

Government of Goa had prepared a report on conservation of buildings and sites of historic importance. The report quoted that it is not only neglect in cases of churches and temples, which is threat to such sites, but even well intended efforts to 'beautify'' these already pleasant sites have in some cases particularly destroyed them.

As a follow up of this report Govt of Goa, Department of Archives and Archealogy identified a few priority monuments and heritage sites for conserving them to international standards. To start with, several conservation plans and proposals were prepared by INTACH with the involvement of the author, including for the conservation of Fort Estavam, Reis Magos Fort, Capora Fort, Cabo de Rama fort, Church of St. Anne, Temples of Saptakoteshwar and Narayandev etc. As a pilot project on restoration of a fort, St. Estavam was taken up and St. Anne at Talaulim, was taken up for conservation of a Church.

CHURCHES IN GOA

he building of Churches in Goa commenced immediately after the Portuguese conquest of the then City of Goa, present days Old Goa in 1510. However, the building of churches got a major fillip with the arrival of the Christian Missionary Orders through the 16th century – the Franciscans, Dominicans, Jesuits, Augustinians, etc and the establishments of their convents in the City and its surroundings. Each attempted to surpass the others in architectural and materialistic splendour.

Architecturally, there was no model in the local vocabulary for church structures; hence the designs of the times were imported from Europe, which at this time was undergoing a phase of change through the Gothic to the Renaissance and Baroque.

There were replicas, at times crude, of some of the churches of Europe; the most notable being the Church of O.L. of Divine Providence of the Convent of St. Cajetan at Old Goa which closely reassembles that of St. Peter's Basilica of Rome. These were mostly built under the supervision of the Priests without a formal architectural principals followed.

The architecture of the Churches has deeply impacted the traditional architectural vocabulary of Goa and the immediate surrounding region as these new forms introduced provided the local artisans with fresh means to work with.

The island of Tiswadi with its villages surrounding the Old City of Goa was the main theatre of activity being the earliest to be occupied by the Portuguese where many of the older and architecturally ambitious Church structures are to be seen.

With the decay and abandonment of Old Goa, the fortunes of the immediate surrounding villages waned to quiet an extent with desertion by its

After Restoration

Before Restoration

During Restoration

Northern Central Façade : Before Plaster

populace including that of The Church of St. Anne, in village Talaulim in central Goa.

CHURCH OF ST. ANNE

The village of Talaulim with the Church of St. Anne is located at the foot of the hill on the other side of Old Goa and is accessed via an old paved road over the hill. The village with its close proximity to the Old City then developed as an idyllic suburb for the elite of the City as a fashionable country resort. The church befittingly occupied the most prominent of the places in the village located at an elevation at the foot of the hill and held by a massive retaining wall in laterite stone masonry reminiscent of a podium. With the decline and abandonment of Old Goa and shifting of the centre to Panaji in the 19th century the village was relegated to the hinterland.

The origins of the church date back to 1577 when the property was originally bought and a chapel constructed by priests attached to St. Paul's College of Old Goa of the Jesuit Order. The church to its present form was taken up for reconstruction in 1681 under Msgr. Francisco de Rego and completed in 1695 by his successor Fr. Antonio Francisco Da Cunha. The date is found engraved on the front main door. The church was planned as a grand edifice and the front façade closely resembled the Church of Our Lady of Grace of the Convent of the Augustinian Order at Old Goa built in 1597 and one of the largest and richest Churches of Old Goa.

The Church of St. Anne was built entirely of large laterite stone blocks, as the main building material and bound with mud mortar with thick walls rising to two stories of massive proportions and capped by a vaulted ceiling in stone masonry. The structure was a Latin cross in plan with the central nave stretching along with the main altar area on the far side and a split level choir floor on the near side

Northern Central Façade : After Plaster

Plinth Protection : After Restoration

above the entrance. The nave is cut above the middle laterally by the transepts stretching out on either side to complete the Latin cross plan. On either side of the entrance, are square towers – housing the belfry and other the baptistery. As is typical of church architecture the front façade is the most prominent feature of the church imparting it with a distinct identity. The front façade is the highest in this church structure and the height progressively decreases as one moves towards the Altar at the far end. The front is divided in height and length into five parts by horizontal ledges and vertical pilasters respectively. The central three portions have a pediment typical of churches facades. The towers on either side rise high above the façade and are decorated with pinnacles. The front is plastered in lime plaster & characteristically white washed to stand out prominently against the verdant green backdrop of the landscape.

Plinth Protection : Before Restoration

The sides are split into three levels with the lower level having large arches in proportion with the over all façade with the actual windows recessed in these. The Altar area too externally features two levels in keeping with the decreasing height. The side and rear walls are un-plastered exposing the laterite stone masonry. The interior is grand and majestic. The nave for most of its part is a double volume space rising two storeys high with a vaulted ceiling intersected by cross vaults. The lower area has as semi-circular arched recesses housing the windows. The windows have high sills in keeping with the over all proportions. The upper area in line with the choir level has overlooking galleries on the side walls built into the massive thickness of the walls and are accessed by passages behind. These are reminiscent of an opera house and apparently were used to seat the nobility of the village during the high masses. The interior surfaces are profusely decorated with pilasters, moldings, pediments, stucco designs, etc of proportions in keeping with that of the church. The Altar area too has a vaulted ceiling with small cross vaults intersecting. This area is notably low in height compared to the rest of the nave, which according to noted author Jose Pereira is a characteristic feature of Indian architectural vocabulary of the diminutive sanctuary.

The Parish of St. Anne started declining with the decline of the Old City of Goa which was severely ravaged by epidemics towards the turn of 17th - 18th century when the Church was just about complete.

Old Goa was finally abandoned in the mid-18th with the shifting of the Governor's residence to Panaji. Historical records point that by 1783 the village of Talaulim was also similarly abandoned by its population as its existence was irrelevant with the shifting of the capital city. The parishioners numbering 12000 fell to approximately 400 then with mass migration. The Church structure also apparently fell to disrepair since then. There are records of an Archaeology Commission of the then Portuguese administration visiting the Church in 1907 to see measures necessary for the repairs of the Church.

The Church was declared a Protected Monument under the Goa Ancient Monuments & Archaeological Sites and Remains Act 1978 of the Government of Goa.

RESTORATION OF THE CHURCH

The restoration work of the church was carried out in 2012 and completed by 2017. The restoration works were undertaken by the department of Archealogy who were assisted technically by the author as director of INTACH. This was preceded with the preparation of a detailed action plan based on the condition of the structure and the various defects and anomalies surveyed.

The decay and deterioration in the structure was severe with the neglect due to the sheer monumental scale of structure and the miniscule parish constituents.

There were vertical structural cracks seen in the structure especially in the barrel vaults and the towering belfry and baptistery leading to loosening of the arch stones and collapses. There was water ingress into the structure through the damaged roof with the heavy rains at the place leading to deterioration of the plaster and stone. Wood work in doors and windows, railings, etc was under termite attack and hollowed in places beyond repair.

The defects were identified based on their severity and impact on the structure as follows and accordingly dealt with:

- Structural defects – precarious state – which affect the structural integrity of the structure
- Defects with Potential for Further Damage - These are defects which at the moment are small and/ or inconspicuous but have the potential to inflict further damage and aggravate problems at instances resulting in structural problems in displacements and dislocations.
- Architectural Defects - There are defects which do not affect the structural integrity of the building but affect the integrity of the structure as a whole. These are defects in the architectural parts of the building
- Cosmetic Finishes - The various cosmetic finishes are only cosmetic in nature but are indicative of the overall health of the building.

The materials and techniques used were as original as possible in the interest of conservation of the church. Lime plaster was used in place of cement as also in the wood work teak wood was used. New services and technology were utilised to prevent further decay as well as make the structure relevant in the contemporary scenario. Metal sheets were used under tiles to prevent rain water leakages as also in the electrification of the church and illumination highlighting the architectural features. It is hoped that the restoration work of the church for almost 4 years is a milestone in the long-term conservation of the church.

CONSERVATION OF ST. ESTEVAM FORT

The fort is located about 18 kms from Panaji in the picturesque island village of Jua or Juvem. The fort was meant to defend the then important 'City of Goa', presently called Old Goa. the Fort traces its origin during the rein of Adil Shah of Bijapur (1498-1510) which was later strengthened by Portuguese. The fort lost its relevance once old Goa was abondoned in mid 18th Century and the Portuguese

Before Restoration

After Restoration

Flooring and Battlement : After Restoration

Restoration of the Central Chamber

Main Chamber

extended it's territory further east. The fort fell into neglect resulting in becoming a ruins with many collapses and vegetal growth. The directorate of Archives and Archaeology, Government of Goa, took up its conservation as the fort is strategically located on a hillock offering a 360 degree view of the surrounding landscape and was approached by steep climb via old steps which have now been replaced by a motorable road.

The fort is a irregular polygon in plan, with massive retaining walls at the sides, built using massive laterite blocks with a slight batter support a raised platform atop the walls. the retaining wall had collapsed at various places and was bulging precariously at the north west side mainly due to vegetation growth. The sharp acute angled corners project as bastions, a modification done by the Portuguese to the Adil Shahi fort, which were designed to counter gun powder artillery. There is only one narrow access into the fort by means of an arched doorway reached through a ramp and flight of steps. Within the fort there are remnants of a structure with two small rectangular rooms and a circular domed room, which perhaps functioned as a garrison. the roof on this structure was long gone and was replaced as part of the restoration process.

The restoration involved measures to stabilize and consolidate the retaining wall, with repairs of damaged walls and the ruined structure to its near original state. Reconstruction of the missing parts were done with identical feature and materials, to maintain the historicity of the structure.

To prevent the fort from further decay a reuse plan was also develop with an interpretation and art gallery proposed in the restored structure, as well as develop tourism recreational areas around the fort integrating it with the nearby Monument to the Christ the King through a landscape plan.

The main challenge facing the fort is that though the fort was restored to its original glory its envisioned reuse was never implemented or put on the tourism circuit, because of which the fort is once again moving towards a neglect and oblivion.

REIS MAGOS FORT

Before Restoration

After Restoration

Before Restoration

After Restoration

POST SCRIPT

During and post conservation process several important issues and challenges emerged. One was lack of availability of some original materials like the flat shells used in historic windows in place of glass, use of this marine shell has since been banned as the sea creature, whose shell were used to make it, is now endangered and thus a look alike plastic alternative was used. Even the quarrying of laterite stone has been banned due to environmental concerns , this is a basic building block of historic building, but its limited availability impact the authentic conservation process as standard small like stone was used during the restoration as this was the only available local stone.

Further many additions and alteration made to the church recently by local parish from their own efforts and funds were required to be kept considering their sentiments attached with the same. thus the new cement floor could not be removed on account of this as was the newly constructed community kitchen.

Another important aspect was lack of regular maintenance of the church post restoration. though the government paid for one time restoration of the church its regular upkeep has been left to its local parish, which is in a highly diminished form from its original strength. this has been a recurring problem faced by many churches in Goa. However restoration of these historic building but also prevented their further deterioration. Restoration was done in accordance with heritage conservation principles, maintiaing the authenticity of the building, These conservation projects ushered in an awareness for the need for conservation of Goa's neglected heritage and also enhanced the local capacities in achving that long term goal.

The XYZ Conundrum: Shaping Aspirations of Generations

Sharada Prasad Sahoo

The contemporary world is a constellation of diverse generational aspirations. The human character,values and means of survival have undergone series of metamorphosis. The changes that we witness today can be attributed to globalization of knowledge enabling diffusion of ideologies, technological convergence and an entrepreneurial talent pool redefining the tenets of our life and living. The most convenient way of understanding a generation is to analyze their traits with respect to the prevailing socio-cultural, economics and political trends of a particular time frame. A wide array of research has been conducted to orchestrate the generational differences with respect to time.The most conventional understanding on generational differences rests on the critical appraisal of the demographic cohorts such as Generation X and Generation Y and Generation Z. Each generation belongs to a specific time zone in which their demographic traits have shaped their aspirations. Generation X is having connotations such as Xennials, Generation Catalano and the Oregaon Trail generation. Conceptually, Gen X surfaced during 1965 and 1981. Generation X believes in the philosophy of work and produce, leaving no scope for idealism. Gen X have survived the worldly events Cold War, Watergate, corporate greed, AIDS, Live Aid, the Dot Com Boom and Bust of the '90s, nuclear disasters, Space Shuttle Challenger disaster, fall of the Berlin Wall, the Global Financial Crisis and wars including Bosnia, Afghanistan, and Iraq. Gen X is characterized by strong sense of innovation and entrepreneurial culture. The creative pursuit of Gen X has gifted this world organizations like Tesla Moors, Space X and Solar City. Gen X has been characterized by a number of progressive traits that include self-sufficient, result oriented and achievement oriented. Gen X values diversity and embraces social media as means of exchange of ideas. Gen X have a strong emphasis on family time and work life balance. They are master of self-depreciation. Gen X emerged in the formative days of computer revolution. The Gen X professional were focusing stability, social security and stable career growth.

The next phase of time witnessed the rise of Generation Y or Millennials or Digital Natives. They are born between 1980s to early 2000. The Gen Y is co-existent with internet revolution. They are a tech savvy generation. Gen Y places high priority on freedom and flexibility. Gen Y focuses on working with the organization and not for the organization. They are a self-confident generation who look for a meaningfulness in their job and career. They just don't look for a survival, they look for sustainability and growth.

The current generation is termed as Generation Z or the generation emerging after 1995. Psychologist Jean Twenge has defined Generation Z as the "i generation" referring a range of those born between

1995 and 2012. This is the most techno savvy generation being identified as an online community. Gen Z is alternatively classified as digital natives. Gen Z being exposed to internet, social networking and application-based systems is becoming a generation attuned with hypercognitive capability and adoptable to collecting and cross-referencing many sources of information and with integrating virtual and offline experiences.Gen Zers value individual expression and avoid labels. They mobilize themselves for a variety of causes. Theyprofoundly adhere to dialogue to solve disagreements and bring order the world. Finally, they make decisions and incline to institutions in the most analytical and pragmatic manner. Being integrated with technological innovations, this generational transition is transforming the consumer landscape in a fashion that cuts across all socioeconomic strataand extends beyond Gen Z, permeating the whole demographic pyramid. The possibilities now emerging for companies are transformational as well as challenging. Businesses need to redefine how they deliver value to the consumer, recalibrate scale and mass production against customization, and above all practice what they preach when they deal with marketing issues and workplace ethics.Gen Z being confronted with wide array of careers issues and their confused preference for any occupation, entrust them with a title Identity Nomads.

In the present scenario, three generation X, Y and Z are converging at the workplace, the professionals in the decision-making affair are expected to diagnose the career needs and aspirations of the employees and maintain harmony in the organizations. McKinsey research has synthesized the characteristics of Gen Z as presented below:

	Gen X 1960-79	Gen Y 1980-94	Gen Z 1995-2010
Context	• Political Transition • Capitalism & Meritocracy	• Globalization • Economic Stability • Emergency of Internet	• Mobility & Multiple Realities • Social Networks • Digitally natives
Behavior	• Materialistic • Individualistic • Competitive	• Globalist • Questioning • Oriented to self	• Undefined ID • Communaholic • Dialoguer • Realistic
Consumption	• Status • Brands & Cars • Luxury Articles	• Experience • Festivals and Travel • Flagships	• Uniqueness • Unlimited • Ethical

Source: McKinsey& Company, 2018

The new millennium organizations are following expansionism and accept multiculturalism, the most pressing challenge before any human resource professional is to act as a catalyst in shaping and balancing the aspirations of the workforce belonging to threedistinct phases of time.

Facing and Fighting Deep-seated Fears

Suchitra Mahapatra

"Feel the fear and do it anyway" - *Susan Jeffers.*

Time and again, fears and facing said fears are brushed off or simply taken lightly due to the fact that it is a complicated, intangible subject, and people do not know how to approach it but what we must comprehend is how these fears affect results of several medical, scientific and psychological experiments and can alter the course for important studies.

We decided to explore and analyse some actual fears of people to understand what exactly caused the fear, how it affected them and their lives, how they were able to cope and live with it, to finally being able to overcome it or not being able to overcome it, and their course of action to overcome it.

Our first respondent shared his fear of water, he was around five years old when he developed said fear at the beach where he had been knocked over by waves and could not breathe. He mentions how this simple fear that latched onto him at a very young age led to a drastic change in his lifestyle. He overcomes his fear of water by constantly facing it, which is constant exposure through different means and that it was not death but the fear of death that creates terror in our mind.

Another respondent, who fears being judged and shamed based on their appearance, which they continue to struggle with to this day, mentions how they try to confront their fear by wearing clothes they wish without caring for what people might say but it has its setbacks like the opinions of the public that has an impact on one's fear, physically and

mentally, which might further help developing eating disorders, mental health disorders. Scars and other impediments do not change the person from the inside as long as they are not treated differently.

Research shows that everyone is fearful of something, and it is, in fact, completely normal. Fear instinctively helps you protect yourself from harm whether it is mental, emotional or physical.

One way to live with deep-seated fears is to face them, CHOOSING to face them and not backing down in the face of adversity. While avoiding the situations you fear might make you feel better in the short term, avoidance can cause increased anxiety in the long term.

The process of facing fears is called exposure. The brain has to experience repeated exposure to fear in order to get over it, but it is essential to do so in a healthy manner that helps you move past the fear rather than in a way that traumatises you.

Fear. Overcoming fear - there's nothing to fear but fear itself.
One thing that can be said with great confidence is that fear is biological, a universal biochemical process that we cannot help, but it is also psychological, which means we can do something about it.

We got to understand fear in its simplest form, like the fear of water, a biochemical process but also in its complex form, like the fear of being judged which is merely psychological. While we were aware of it, it still manages to astonish many of us as to how much of a portion these fears take in an individual's life and how much it mentally torments people and does not let them live

freely.

We also got to see some individuals who managed to overcome their fear(s) and how it makes us vicariously happy to see how proud they were of it and the level of confidence they showed was truly inspiring.

It even makes us think about our fears, to be able to empathise more with ourselves, as well as with other people and realise how for granted we can take people in our life; because they manage to hide these fears so well.

Many people think that fear acts as a hindrance and prevents us from performing to the best of our abilities, but on the contrary, the desire to defeat the fear leads to attaining inner contentment. Fear does not always have negative impacts, it helps us perceive potential threats, and it motivates people to step out of their comfort zones because how is a bird supposed to know how high it can fly if it fears heights?

Kalinga Institute of Industrial Technology (KIIT)

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KIIT (Deemed to be University) has only one permanent campus in Bhubaneswar, Odisha.
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SUSTAINABLE OUTREACH AND UNIVERSAL LEADERSHIP LIMITED

VISION-

- Care for citizens and society as a whole and reflection of the same in each of our service offering
- Commitment to the professional development of our people, driventhrough objective performance measures, while ensuring adequate work-life balance
- Responsible, sincere, fair and trustworthy organization culture and reflection of the same in our dealings with our customers and partners

SOUL is part of the KIIT University ecosystem and therefore, have the access to the resources of the KIIT University, specifically the academic think tank, centres of excellence and other research & development (R&D) facilities, which provides SOUL an unparalleled advantage of conducting several activities related to its engagements, efficiently and effectively, by leveraging such assets.

Introduction

Sustainable Outreach and Universal Leadership Limited (SOUL), established in 2021, advises its clients on strategy for business transformation, focused on sustainability through delivery process realignment, organization restructuring, skill development, smart negotiation & contracting, and digitalization, to achieve improvements in operational efficiency, capital productivity and workplace harmony. We also support our clients implement such strategies and help them achieve the desired outcomes.

We have expertise in the designing & deployment of educational aid, including enterprise solutions to manage the business processes of all kinds of educational institutions.

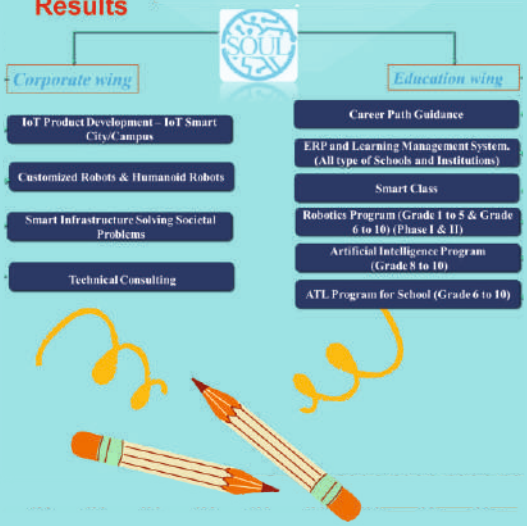
We also focus on the IT and ITES enablement, covering business solutions starting from infrastructure services to IT-enabled services covering digital, analytics and IoT & Robotics.

Objective

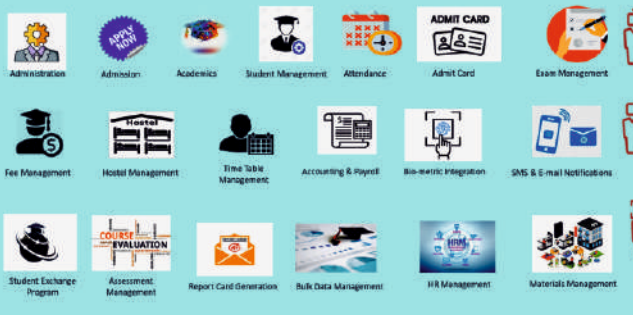
- Creating a better environment to live, work, grow and sustain safely.
- Identifying issues and helping people, organizations, systems and society to get sustainable solutions.
- Designing quality products and services to built and lead a community with trust and confidence.
- Empowering people through transparency and autonomy.
- SOUL solutions helps in decision making(wisdom, knowledge, process & system).

Our Products and Services

Results



Top Use-case EDULEAD'S



ROBOTIC'S :

Your Educational Companions
Teaching assistants in schools. Can be assembled and programmed by students.

Your front Desk Assistants
Help you in various spaces such as banks, shopping malls, airports; help desks; answering and guiding you.

Your Surveillance Assistants
Help you monitor zones that need special attention and monitoring on a regular basis. Also, alert the concerned in case of any turbulence.

Your Analysts
Learn and understand data; analyse patterns and generate reports.

Your Companions
Understand your likes and dislikes; help you with your daily chores.

Your Entertainers
Can engage people asking various questions, can entertain kids with tricks and dances; conducts games on special occasions.

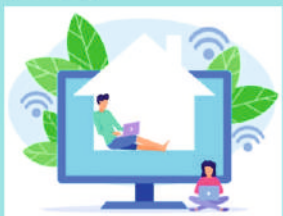
Your Health Care Assistants
Monitor heart rate, pulse; alert when patient is in distress.

Your Hosts
Can be MC in seminars, shows, events; inaugurate and conduct.

Your Visitor Managers
Recognise people when known and remember them when they visit again.

Many more in the making...

IOT'S



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SUMMARY

Sustainable Outreach and Universal Leadership (SOUL) Limited is led and staffed by eminent academicians of the KIIT University, and experienced professionals from leading management and technology consulting firms. SOUL's management have previously worked with clients in multiple sectors and in large and complex engagements involving policy making, policy implementation, business strategy formulation & implementation, information technology enablement and digital transformation, organization restructuring, institutional strengthening and capacity building. Collectively, We are significantly experienced in the development sector projects and have worked with policy makers, governments, regulators, government agencies / departments and International Donor Agencies.

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Universal Tolerance

"Accepting the existence of opinions, thoughts, responses, may feel good or bad to oneself, depicting the goodness in actions is the Peace, Peace and Peace..."

-Sasmita Samanta

WORLD LEADERSHIP ACADEMY

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