ENVIRONMENT FRIENDLY INDUSTRY
OFFICE PREMISES ON LEAVE & LICENSE BASIS

Dear Members,

As you are aware that Maratha Chamber of Commerce, Industries and Agriculture constantly strives for the betterment of the industrial development. One of our missions is to facilitate industrial growth while balancing socio-economic environment and also to ensure the finest infrastructural development and facilities with a futuristic edge.

With this view in mind, we would like to extend our infrastructure support of the following available premises to be let out on leave and license basis:

1. SB Road office (In MCCIA ICC Tower):
   Fully furnished office space 570 sq ft at A Wing, 5th Floor, MCCIA Trade Tower, 403-A Senapati Bapat Road, Pune 411 016. Common parking space in the building. Common Security and lift facility available.

2. Tilak Road office:
   Office space on 2nd, 3rd & 4th floors totally admeasuring 2638 sq ft, Mezzanine floor 770 sq ft (Semi furnished) at MCCIA, Tilak road, Near Swargate, Pune 411 002. Round the clock common security available, DG Set back up and lift available.

3. Bhosari Office (Near Quality Circle, Telco Road):
   Office space 1800 sq ft, on 1st Floor, DG Back up, Separate WC provided for this area. Ample parking for 2 and 4 wheeler vehicles. Round the clock common security and DG back up available. 677 sq ft on ground floor (Semi furnished).

Preference will be given to members of MCCIA.

Interested parties please contact:
Mr. Shrikrishna Gadgil / Mr. Arun Khisty
(020) 25709000
Mon. to Fri. between 10 am to 5 pm.
Since the Publication of previous Sampada Issue (May 2019), the nation has observed significant developments on Political front. We now have Second Term of the NDA Government. We wish the Government the very best for its new term as we promise to continue to play our role as a Chamber in terms of:

a. Providing feedback from our members to improve existing Policies or come up with new ones and

b. help the Government and its agencies to promote policies and schemes that are designed to help Commerce, Industry and Agriculture and thereby larger economy.

As I take to write this editorial, the office is abuzz with celebrations of Environment Day. This month, we have decided to dedicate the Sampada Issue to the Topic of Environment! We have received contributions from many of our members that are captured in this issue.

Last month we had organised a Stakeholder Consultation jointly with World Trade Centre (WTC), Mumbai on Regional Comprehensive Economic Partnership Agreement (RCEP). RCEP is a Free Trade Agreement (FTA) being negotiated involving 16 countries (India, ASEAN, China, Australia, China, Japan, New Zealand and South Korea) to discuss inputs from the business community around Pune for Government of India.

While trade and commerce is very important for us at the Chamber, so is the ‘Sustainability’ and hence we had organised a Programme on ‘Reinventing Organization’ to raise awareness among the MSME sector on topics that have a greater impact on sustaining their business, beyond profitability.

Over the last few months, the Chamber, on its part is also organizing a series of Meetings with various banks to address the issues of credit availability to the MSMEs. You will find reports of these and some more events in the ‘MCCIA News’ Section in the issue.

As always, I am keenly awaiting to hear your suggestions over email: sampada@mcciapune.com on how best we could improve context and delivery of our communication through this 74 year old tradition of Sampada magazine.

While we go for the print, we await the first rains of monsoon. Here is wishing you all a great monsoon season ahead.

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57 MCCIA News
Building a “Nirmukta” manufacturing ecosystem
Empowering and fuelling MSMEs in India, triggering the next phase of growth and leadership

a) Absence of adequate and timely banking finance

Though, MSMEs are considered as the backbone of the Indian economy, contribute in GDP and GNP of India and act as a breeding ground for entrepreneurs to grow from small to big, MSME Sector has been witnessing various constraints and its overall potential is being capped for various reasons. Some of the challenges include:

- Micro, Small and medium enterprises (MSME) sector, known as India’s ‘Engine of Growth’, have grown significantly over the years on the back of increasing awareness, digital advancements and better opportunities that have encouraged many entrepreneurs to offer innovation and emerge as success stories. MSMEs play a pivotal role in the economic and social development of the country. It also plays a key role in the development of the economy with its effective, efficient, flexible and innovative entrepreneurial spirit. In India, MSMEs contribute 31% of the GDP, 45% of exports, employ over 124 million people and create nearly 1.3 million jobs every year. Entrepreneurial growth and development is not restricted to the urban sector only, of 55.8 million MSMEs, 59% are based in rural India.

Over the past decade, MSME sector has been growing rapidly bolstering the growth of the Indian economy and on the strength of domestic consumption and entrepreneurship. The major advantage of this sector is its capability to generate employment at low cost. The MSME sector is highly heterogeneous. There are different sizes of enterprises, variety of products and services and level of technology. It helps in the industrialization of rural and backward areas. It reduces regional imbalances. It provides equitable distribution of national income and wealth.

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Building a “Nirmukta” manufacturing ecosystem
Empowering and fuelling MSMEs in India, triggering the next phase of growth and leadership

Sudhir Mehta

Despite internal and external economic constraints, India is still being viewed as a fast-growing economy. Global economic relationships, captive consumption and boost in ease of doing business ranking has led to enhancement in the Indian economy and the outlook still stands seemingly positive. Amidst other factors, one of the key elements fuelling the growth of India is the emergence of Micro, Small and Medium Enterprises. If the Indian economy must revive its growth trajectory, it needs to focus on empowering the manufacturing sector with better and favourable policies with better access to finance.

MSMEs – Introduction
Micro, Small and medium enterprises (MSME) sector, known as India’s 'Engine of Growth', have grown significantly over the years on the back of increasing awareness, digital advancements and better opportunities that have encouraged many entrepreneurs to offer innovation and emerge as success stories. MSMEs play a pivotal role in the economic and social development of the country. It also plays a key role in the development of the economy with its effective, efficient, flexible and innovative entrepreneurial spirit. In India, MSMEs contribute 31% of the GDP, 45% of exports, employ over 124 million people and create nearly 1.3 million jobs every year. Entrepreneurial growth and development is not restricted to the urban sector only, of 55.8 million MSMEs, 59% are based in rural India.

Over the past decade, MSME sector has been growing rapidly bolstering the growth of the Indian economy and on the strength of domestic consumption and entrepreneurship. The major advantage of this sector is its capability to generate employment at low cost. The MSME sector is highly heterogeneous. There are different sizes of enterprises, variety of products and services and level of technology. It helps in the industrialization of rural and backward areas. It reduces regional imbalances. It provides equitable distribution of national income and wealth.

Though, MSMEs are considered as the backbone of the Indian economy, contribute in GDP and GNP of India and act as a breeding ground for entrepreneurs to grow from small to big, MSME Sector has been witnessing various constraints and its overall potential is being capped for various reasons. Some of the challenges include:

a) Absence of adequate and timely banking finance
Financial Constraints

Amongst the above mentioned constraints faced by the sector, finance and financing costs are the two key factors that directly impact the growth and survival of the manufacturing and services sectors. As per the IFC report 2018, overall finance demand by MSMEs is INR ~87.7 lakh crores of which INR ~69.3 lakh crores are debt requirement of which INR ~48.5 lakh crores are required for working capital and INR ~20.8 lakh crores are capex investment required for fixed assets.

Whereas the Indian banking system including Private and public banks, NBFCs and foreign financial institutions form the formal part of the financial ecosystem to provide the desired capital, there is a huge gap in catering to the finance requirement of the manufacturing and MSME sector leading to certain micro enterprises falling under service sector such as retail shops, small retail trade and repair shops preferring to raise capital from informal resources. This preference is due to ease of access, speed of disbursal and need of minimal documentation. Since banks and NBFCs are perceived to have bureaucratic and opaque processes that do not favour MSMEs, majority of MSMEs seek credit from money lenders and friends because it is easy to get loans without any loss of time. Of the total debt requirement of INR ~69.3 lac crores ($1.07 trillion), only INR ~10.9 lac crores are raised from formal sources and INR ~58.4 crores are raised from informal sources.

There are several reasons why entrepreneurs and start-ups are opting for informal sources of raising capital. On the supply side, high cost of transaction, innovation, risk appetite and outdated underwriting processes are some of the factors, and on the demand side existing debt, need for collateral and information / policy asymmetry are the key factors, leading to preference for informal sources of raising capital.

Bias of financial institutions towards MSMEs is surprising even though NPA rates in the MSME portfolio continue to remain lower than those for the large corporate segment. NPA rate in MSME portfolio was ~11.5% in 2018 compared to 19.5% in large and medium accounts. This can be evaluated against backdrop of overall NPA rate for the commercial lending portfolio which was in the range of 14-15 % during this period. Entities with credit exposure in the range of INR 10 lakhs to 5 Crore demonstrated lower NPA (~8%) compared to other entities (~11%) classified as MSMEs based on their credit exposure.

Recommendations for empowering the Indian Manufacturing Sectors

Indian manufacturing sector, especially the MSMEs and unorganized manufacturing and services sectors are on a growth trajectory. Ease of doing business, regulatory approvals and easy access to capital would help in amplifying their growth as well as the growth of the overall Indian economy. With the union election recently
concluded, the Government should now focus on empowering the manufacturing sector, thereby setting in motion the overall economy.

Given the size, scale and potential of micro, small and medium manufacturing and services sector of India, the new Government should focus on two primary factors:

1. Finance Availability and Interest Rates
2. Debt Financing, Equity Financing, VC, PE and FDI

1. Finance Availability and Interest Rates
a. Triple Credit Growth. Minimum 200 BP further reduction in rates by RBI needed
b. Reduction in Net interest margin of banks by increasing competition
c. Banks to restart risk-based lending to manufacturing sector. Also lending to risky ventures to be enabled (Future Industries can only be created by intelligent risk taking)
d. Differential CRR / SLR by RBI towards banks - Reduction only in case lending rate to industry is reduced
e. Capitalize on the reach of informal money lenders
f. Expedite the processes / changes necessary for facilitating movable asset-based lending. You can take 1 crore luxury car on finance in one day but not a machine!
g. Take remedial measures to enhance the effectiveness of the Credit Guarantee Scheme
h. Tripling Credit Growth & improving credit availability can create ~20-25 million new jobs over a few years as well as reduce inflation. Also improve export competitiveness.

2. Debt Financing, Equity Financing, VC, PE and FDI
a. Collaterals sought by Banks to be limited to 133% of the exposure rather than unlimited collateral in sync with the limited liability principle.
b. Personal Guarantees to be taken only in the case of collateral shortfall and not otherwise where enough collateral is available from firm’s resource
c. In case of collateral shortfall, personal guarantees to be taken from Whole time / Executive Directors only and not from External Directors, who provide guidance and have no role to play in the day to day operations
d. Requirement to return Bank Guarantees (BGs) to close claim period needs to be removed. The sanctity of the claim period as stated in the BG should be honoured and any existing anomalies to be removed
e. Charges for the BGs for over 2 years to be debited on an annual basis and not upfront as a step to ease cash flow pressures on the MSMEs. Annual BG charges for longer period validity should be lower for subsequent years due to diminishing efforts required by the Bank
f. In line with the “No Claim Bonus”
more social venture funds be

h. Bank officials to be insulated from

g. Like London Stock Exchange, other

f. Global Stock Exchanges should

e. Like London Stock Exchange, other

like London Stock Exchange, other

like London Stock Exchange, other

banks and financial systems play a vital role in the economic growth of a nation, and while in the current scenario where the Indian financial ecosystem is at the crossroads of reorganizing itself, one sector which is suffering the most is SME and MSME. Testing time lies ahead for the new Government as regards to its economic policies and performance of Indian Economy post demonetization, implementation of GST, make in India and other key reforms brought about to propel the economic development faster. Micro, Small and Medium Enterprises are the propellers of growth, economy and employment in India and have a potential of competing globally if provided with the appropriate business environment. It’s time for the Government to “Nirmukta” them from the challenges on hand and empower them to make a difference globally.

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discounts for Insurance, those

MSMEs having no defaults should progressively receive discounts on the “normal” margin requirements for these facilities commensurate with their lower risk profile.

Like London Stock Exchange, other Global Stock Exchanges should also be invited for easy and affordable equity.

Bank officials to be insulated from honest failures.

More Social Venture Funds be encouraged so that the conversion of Micro Enterprises to Small Enterprises can be factualized.

Simplification of IPO process to encourage more companies to access capital markets. SEBI

compliances have stopped flow of domestic capital to such entities.

Be it defaulting business enterprises, NBFC fiascos or increasing corporate NPAs, past couple of years have been witness to several incidents which have led to resource crunch and tighter liquidity. Given that banking and financial system plays a vital role in the economic growth of a nation, and while in the current scenario where the Indian financial ecosystem is at the crossroads of reorganizing itself, one sector which is suffering the most is SME and MSME. Testing time lies ahead for the new Government as regards to its economic policies and performance of Indian Economy post demonetization, implementation of GST, make in India and other key reforms brought about to propel the economic development faster. Micro, Small and Medium Enterprises are the propellers of growth, economy and employment in India and have a potential of competing globally if provided with the appropriate business environment. It’s time for the Government to “Nirmukta” them from the challenges on hand and empower them to make a difference globally.

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We request you to send your feedback on this Issue and suggestions for forthcoming issues to:
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Environmental Stewardship at Tata Motors
Dr. Arun Kale

Tata Motors Limited (TML) manufactures a wide range of automobiles from 7 manufacturing facilities across India. Our Plants are energy intensive and we have a range of environmental aspects associated with these manufacturing operations. All TML Plants have been assessed on CII’s-GreenCo Rating framework (a holistic factory based assessment on 10 parameters covering process and product), of which 2 Plants have achieved Platinum rating, 4 have achieved Gold rating and 1 plant has achieved Silver rating.

TOP MANAGEMENT’S COMMITMENT TOWARDS ENVIRONMENT PROTECTION and CLIMATE CHANGE MITIGATION
Guided by its Environmental Policy, Climate Change Policy and Environmental Procurement Policy, we are focused on minimising the environmental impact of its products, processes and services throughout the life-cycle. All policies are signed by our MD and CEO affirming the complete commitment and support of Top Management for implementation of strategies and actions to drive environmental performance. At the Company level, we have identified climate change as an enterprise level risk as a part of our formal Enterprise Risk Management (ERM) process. Tata Motors has a SHS (Safety Health and Sustainability) Committee at Board of Director level which periodically reviews SHE performance at enterprise level and provides critical inputs, directives and resources. Plants track energy and environmental performance in a periodic and structured manner at Head-Operations level. KPI’s related to Energy, Greenhouse Gas emissions, Renewable Energy, Water, and Waste are tracked in both absolute and intensity terms and action plans are reviewed to achieve set targets. TML actively benchmarks energy and environmental performance between Plants as well as peers and adopts best practices across Plant locations for maximum impact.

As per Tata Motors Environmental Policy, we are committed to establish sound environmental objectives and targets, reduce emission levels of vehicles etc., use of environmentally sustainable technologies and practices for prevention of pollution and continual improvement in environmental performance. These actions lead to lower energy and resource consumption, ultimately reducing our environmental footprint. In view of the Transport sectors contribution to Climate Change, Tata Motors has also articulated a separate policy on Climate Change which specifically mentions *Minimising year on year GHG emissions from products, operations and services by adopting eco-friendly technologies, *Developing products powered by alternate fuels and having higher recyclable and recoverable content.

Energy Efficiency and GHG Mitigation: Our Greenhouse Gas (GHG) mitigation approach includes driving Energy Conservation in manufacturing operations and generation/procurement of renewable energy.

While Energy Conservation (ENCON) has always been a planned and budgeted activity to conserve energy, our manufacturing Plants have systematically worked to increase the amount of renewable energy used for manufacturing. Tata Motors is signatory to RE-100 and has made huge strides in past decade towards this goal.

RE100 is a collaborative, global initiative of influential businesses committed to 100% renewable electricity, working to massively increase demand for- and delivery of- renewable energy.
| TML’s RE100 Strategy… | • Create in-house capacity (rooftop solar PV, solar thermal, bio-methanation, etc.)  
• Source renewable energy from grid through open access (third party power purchase agreements).  
• Invest in off-site wind farms which connect to the State grid. |
| Current in-house capacity | • 21.95 MW Captive Wind Power Plant in Maharashtra;  
• 3.8 MW Roof-top Solar PV installation at Pune;  
• 2 MW Roof-top Solar PV installation at Sanand;  
• 2 MW Solar PV installation at Lucknow  
• RE capacity was enhanced by 2MWp Roof-top Solar PV Project at Lucknow and Pimpri Pune Plants and 0.5MW at Chinchwad Pune in Fiscal 2019.  
• In 2019, we have signed a Power Purchase Agreement (PPA) with Tata Power Renewable Energy Ltd. (TPREL) for setting up additional 7 MWp capacity of roof and ground mounted solar photovoltaic (PV) installations across Jamshedpur, Pantnagar and Dharwad Plants. |

TML Plants consumed 94.2 million units of renewable electricity in its operations (16.1 % of total power consumption). Energy Conservation (ENCON) projects implemented at all Plants and Offices of the Company in fiscal 2019 have resulted into * energy savings of 1,07,415 GJ (76,185 GJ power + 31,230 GJ fuel), and * avoided emission of 20,218 tCO₂e for operations. The approaches included - * Change in manufacturing process, * Waste/Scrap conversion, and * Supply Chain related. This initiative aims to ultimately achieve ‘Zero Waste to Landfill’ status from manufacturing operations. The quantum of hazardous waste diverted from landfill / incineration was higher by 33% over fiscal 2018. Some of the important initiatives include:

- Salvaging of waste paint powder and used for powder coating of internal sheet metal part.
- Re-cycling of paint sludge through approved re-cycler and use of recycled paint on castings / in-house.
- Re-cycling of waste flushing thinner through approved re-cycler and use of re-cycled thinner for low end purposes.
- Outsourced washing and re-use of painter boiler suit through off-site Service Provider.
- Salvaging of leftover / waste sealant for re-use
- Value based segregation of Packaging Scrap for increased revenue realization through scrap sale / auction

Water Management: Water sourcing practices at manufacturing Plants are varied but all Plants continually work on lowering the water consumption through water conservation in operations, re-cycling treated effluent for re-use in process and harvesting rainwater. A total of 9,82,152 m3 of water was conserved through these efforts in FY 2018-19, which amounts to 13.8% of total water consumption. Specific water consumption performance is driven by improving water use efficiency, re-cycling of treated effluent and rectification of underground pipeline leakages (in older Plants).

Hazardous Waste Management: Specific Hazardous Waste disposal to landfill / incineration performance is driven by minimizing waste generation and enhancing reuse and re-cycling of waste. We commenced an initiative across Plants in fiscal 2019 called “Value from Hazardous Waste”, aimed at diverting hazardous waste from landfill / incineration at Approved sites and instead derive value from the same. While this led to cost avoidance and revenue generation, it also reduced the environmental burden of landfill/incineration and generated value for operations. The approaches included - * Change in manufacturing process, * Waste/Scrap conversion, and * Supply Chain related. This initiative aims to ultimately achieve ‘Zero Waste to Landfill’ status from manufacturing operations. The quantum of hazardous waste diverted from landfill / incineration was higher by 33% over fiscal 2018. Some of the important initiatives include:

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Biodiversity: Tata Motors Manufacturing Plants in India include Township / Residential Areas at Jamshedpur and Pune and significant area under Green Belt within Plant at all locations. All Plants have also created lakes and wetlands as a part of their wastewater management system. This has led to a focused approach to biodiversity conservation and management. Our manufacturing locations in India are not located within the vicinity of any identified/notified biodiversity hotspots or protected water bodies. A variety of avian fauna are seen throughout the year and migratory birds are seen in the winter. Biodiversity assessment carried out 3 older Plants, has shown that our premises are rich in local flora and fauna (especially migratory birds).

At Pune Plant, a colony of Painted Stork (Mycteria leucocephala) nest throughout the year at the wetland created adjacent to plant. Bombay Natural History Society (BNHS) has accorded the Green Governance Award in 2006 to Pune Plant for its biodiversity conservation efforts.

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‘Global Environmental Issues’- the effect on the climate due to human actions, in particular the fire of fossil fuels (coal, oil and gas) and large-scale deforestation, which cause emissions to the atmosphere of large amounts of 'Greenhouse gases', of which the most important is carbon dioxide.

Mother Earth is currently facing enormous environmental concerns. The environmental problems like global warming, acid rain, air pollution, urban sprawl, waste disposal, ozone layer depletion, water pollution, climate change and many more affect every human, animal and nations on this planet. Climate Change in India will have a disproportionate impact on the sizeable population that make up India’s poor. This is because so many depend on natural resources for their food, shelter and income.

India is home to an extraordinary variety of climatic regions, ranging from tropical in the south to temperate and alpine in the Himalayan north, where elevated regions receive sustained winter snowfall. The nation’s climate is strongly influenced by the Himalayas and the Thar Desert. As the climate warms, it changes the nature of global rainfall, evaporation, snow, stream flow and other factors that affect water supply and quality. Specific impacts include: Warmer water temperatures affect water quality and accelerate water pollution.

The effects of global warming include its effects on human health. The observed and projected increased frequency and severity of climate related impacts will further exacerbate the effects on human health - Impact on vascular diseases, Impact on mental health, Soil sustainability, impact on natural resources, livestock, plant based foods, nutrition, extreme weather, deforestation, displacement / migration.

The Industrial Revolution impacted the environment. The terrible Effects of Industrial Pollution- Industries and factories give off various pollutants into the environment including the land, air, and water. Even so, there are a wide range of industrial pollution effects along with their serious consequences.

Govt of India and more specifically
Govt of Maharashtra has shown great deal of sensitivity towards the environment protection and laid down the several stricter regulations, while ensuring the consistent Industrial growth year after year.

Serum Institute of India is manufacturing highly specialized lifesaving biologicals like vaccines using cutting edge genetic and cell based technologies, anti-sera and other medical specialties. At present Serum Institute has highest no of WHO Pre-Qualified products.

With the increasing global carbon footprint together with the environmental damage caused by industry toxins & emissions, many companies world over have switched over to eco-friendly processes & operations. Serum Institute in its bid to protect & save the environment has taken many of following approaches,

Recognizing the linkage between energy, environment and climate change, our organization - Serum Institute is actively reducing its dependence on fossil fuels by working on renewable green projects such as Wind power generation and Steam generation through Carbon neutral solid fuel like agro-waste Briquettes & use of CNG. Installed STP & ETP, Harnessing Rain water harvesting etc. Serum Institute’s these initiatives to cutting down on carbon dioxide emission.

Wind Power Projects: With growing concerns for the environment, Serum institute has undertaken measures to reduce its carbon footprint by ensuring a reduction in GHG emissions by installing Wind power projects and utilizing the available wind energy. This generated electricity will displace equivalent electricity that would have been produced from Conventional fossil fuels. Serum Institute has demonstrated leadership in environment management by the way of installing the systems to have major share in conservation of such energy resources. Energy Saving Measures are committed for integrating Leaner, Cleaner and Green concepts in products and Manufacturing processes

Rain water harvesting: Serum Institute implemented the rain water harvesting scheme. The surface runoff and roof water is being separately collected, transferred, treated and stored in large volume tanks (2 Million litres capacity - 2 Nos) and also such water is being used to recharge to water charging wells.

Sewage treatment plant: STP is designed to treat all liquid waste collected from office washrooms stream. The technology adopted to treat this waste is Membrane based Bio reactors (MBR) treatment scheme. In total - The plant is having primary secondary and tertiary treatment scheme to meet the standard norms as applicable and imposed by MPCB. The treated sewage water is further recycled by way of using it for various general application like gardening, Toilet flushing, cleaning within premises.

Effluent treatment plant: Installed ETP system to treat the Process Waste. The scheme consists of Primary Secondary and tertiary treatment units. The technology adopted is based on MBBR system. The treated effluent is further send to water recycle plant.

Water recycle system: In order to recover the water to the maximum extent - Treated effluent / waste water is being further fed to Membrane based recovery system (Reverse Osmosis or RO). Permeate or product water is being recycled within the system thus
reducing the Burden on fresh water intake. The reject water from the RO system is further treated in crystallizer evaporator to ensure the goal of Zero Liquid Discharge.

Zero liquid discharge: The Zero Liquid Discharge system is designed based on advanced technology of mechanical vapour compression driven - Forced Circulation Crystallizer system with Centrifuge. The high purity distillate produced in this system can be used. The Forced Circulation Crystallizer is a fully integrated automated system using a mechanical vapour compressor to provide the driving force for evaporation. It is to handle the bulk precipitation of salts from the brine as evaporation occurs. The system concentrates the waste stream to slurry of salt crystals and mother liquor containing about 50% total solids. The brine slurry fed to the centrifuge and back in continuous loop. The Centrifuge operates on a continuous basis to deliver a dewatered salt cake.

Briquette boiler / Gas fired boilers as against oil fired boilers: Use of Briquette (Agricultural waste based Biomass - solid fuel) in Boilers. The project has also adopted another green technology project i.e. adoption of CNG as a fuel to reduce overall emission load in the environment. This has reduced Green House Gas emission for steam generation and helps conserve the rapidly depleting natural resources. Use of Briquettes also contribute to social benefits such as production of Briquettes generate man days employment opportunity, provides additional income to farmers as 70 % of Indian populations depends on agriculture

Green cover (plantation): Serum Institute as per green initiative has developed the green belt area by means of the planting trees, shrubs and lawns in the premises.

SERUM INSTITUTE as a policy decision keen on protecting environment, contributing through, waste water recycling thru ETP, STP & Rain water harvesting thus reducing burden on valuable resource - WATER. Reducing carbon foot print thru use of alternate fuels like Briquette & CNG for Steam generation & use of WIND mills for power generation. Use of Zero discharge systems ensure no pollution of environment. More so adding to green cover by plantation.

As part of CSR initiative SERUM INSTITUTE has started project “Adar Poonawalla Clean city Movement” as a contribution towards environment protection initiatives. This is part of SWACH BHARAT programme. This is supporting to Pune Municipal Corporation with infrastructure and management of solid waste and organic waste management including day to day operations for the city. It reflects personal vision and commitment of our CEO. Our CEO Mr. Adar C. Poonawalla is nominated as Brand Ambassador of SWACH BHARAT Movement by Govt. of India.

Company has constructed and is maintaining several gardens in the city that offer health benefits and wellbeing of surrounding community. Also company has contributed towards construction of roads, sanitary drains, public toilets, bridges etc. to improve the life in general for communities around us.

----------------------------------------------------
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Looking back at progress of technology, it is moving towards becoming more efficient as well as more environment friendly. The electricity generation has moved from coal based generation to renewable energy based generation or illumination technology has progressed from incandescent lamps to energy efficient LED lamps. Vehicles and locomotives are moving from Diesel propulsion to Electric propulsion. Any technology to sustain and flourish it has to be environment friendly and one which improves the existing environment around us.

The environment nowadays is the key element to influence the choice of a certain technology. The surroundings with all its elements such as atmosphere, location, geographical formations etc. will put limitations to certain technology applications. Aspects such as Greenhouse gas (GHG) emissions, hazardous waste generation, consumption of natural resources etc. which is resulting into Global warming, damage to biodiversity and environmental pollution will be the key driving factors for selection of technology in future.

We at Kirloskar aimed to equally implement towards continual improvement technologies for the betterment & sustenance of environment within & beyond fence of the company. The goal of this sustainable development strategy is to reduce carbon foot print, increasing energy & water efficiency as well as reducing waste generation.

Environment friendly technologies implemented at Kirloskar Oil Engines Limited (KOEL) can be broadly classified into three categories,

1) Reduction in Carbon foot print.
2) Resource Conservation
3) Waste recycling

- **Energy Efficiency**:-
  Koel has implemented various energy efficient technologies such as,

- **LED based illumination**: LED lamps require 50% less energy than conventional type lamps. LED lamps are free of heavy metal such as mercury which was used in conventional lamps. The life of LED lamps is 8 to 10 times higher which thereby reduces the waste generation also.

- **Heatless component washing machines**: - Using special additives which gives same washing results at room temperature has eliminated usage of electrical heaters for component washing machine. These additives are environment friendly.

- **Hybrid HVAC (Refrigeration – Evaporation)**:- This hybrid technology requires 90% less energy than conventional air
conditioning systems. This system also helps to maintain better air quality as it pumps in fresh air.

Kolhapur by utilising solar energy which eliminates approximately 6000 tons of CO₂ emission. System comprises of more than 17000 Solar panels installed on roof top as well as ground.

- **Dry metal cutting for CNC Machines**: Using special metal cutting tools which does not requires coolant system during cutting operation.

- **Turbo-Centrifugal Air compressor**: This is the latest and most energy efficient technology in existing air compression systems. This technology is 20% more efficient than conventional systems. Also the compressed air is free of oil and other contaminants.

- **Variable frequency drives**: This technology enables to provide optimum use of energy at variable loads for equipment like Pumps, Compressors, Cooling towers, HVAC, etc.

- **Renewable Energy**: Under renewable energy various technological options are devised and implemented such as

- **Solar parabolic concentrators for Steam Generation**: Solar concentrators utilise solar energy for generation of steam. 8 parabolic solar concentrators has capacity to generate up to 400kg of steam per day. This steam is utilised for cooking food for around 2500 employees in central kitchen. Steam cooked food is much healthier and nutritious than conventional cooked food.

- **Solar Pumping Systems**: Solar pumps of 15 kW are used for pumping the harvested rain water to plant. Dedicated solar panels generate electricity which operates the pump which pumps 20 cubic metre of water per hour. This system has option of using MSEDCL electricity in hybrid mode which is utilised during rainy season.

- **Wind ball**: This is a small wind bill of 2.5kW capacity which generates electricity which is utilised for powering the streetlights.

- **Resource Conservation**: Under renewable energy various technological options are devised and implemented such as

- **Conversion of Old diesel forklifts to Electric forklifts**: The old 1.5T diesel forklift used for internal material movement converted to electric forklifts to conserve diesel. The converted forklift gets charged through solar panels.

- **Waterless urinals**: The existing urinals converted to waterless to conserve precious water resource.

- **Utilisation of water saver nozzles**: Water saver nozzles were installed to existing taps that delivers 70% less water.

- **Utilisation of harvested rain water**: Filtered harvested rainwater used in place of fresh water for various processes like cooling tower makeup, paint booth water curtain application etc.
- **Dramix flooring**: This type of flooring gives the same strength without reinforcing steel which in turn leads to resource conservation.

- **Returnable packaging**: Returnable metal skids opted for packaging of finished products to reduce wood and plastic consumption.

- **Corrugated boxes for packaging**: Corrugated boxes were selected for packaging to reduce on wood consumption.

- **Utilization of treated effluent**: Treated effluent tested at labs and utilised for gardening and toilet/urinal flushing. Further possibility to use the same for industrial processes is under study.

- **Vermicomposting**: Garden waste and food waste (unprocessable food waste at biogas plant) sent to vermicomposting. The final prepared compost is used for gardening.

- **Plastic to fuel plant**: The waste plastic received along with raw components and finished products is sent to plastic to fuel plant for conversion of waste plastic to fuel, which is then used for industrial processes.

- **Regenerative load cells**: For testing of final DG sets and engines regenerative load banks are opted which utilizes the waste energy from engine testing to generate electricity.

- **Use of AC condensate**: The condensate generated from HVAC is collected, stored and used for coolant preparation used for machining lines.

- **Waste heat recovery unit**: Waste heat from exhaust flue gas during testing is utilised for pre-heating of lube oil. Approximate 5% savings in fuel consumption is achieved from this initiative.

In addition to developing and implementing successful environment sustainability strategies, companies need to be able to communicate them adequately to all stakeholders, in order to ensure transparency and accountability. KOEL approach towards effective & eco-friendly technologies for environment protection is regarded to be best among the group companies, has been certified as “Green Co Gold Rated Unit” & “IGBC Platinum Certified Green Building”. While this comprehensive approach may not be applicable to all industries due to the nature of the activity, companies should view sustainability as part of their corporate strategy and implement well-defined policies which are tailored to their needs and resources, complement each other and collectively enable a positive impact on both the environment and the organization.

**Waste Recycling**

- **Biogas generator**: Kitchen waste processed at 30m³ capacity biogas plant and generated biogas is used for kitchen thermal applications and powering streetlights through KOEL make biogas generator.

- **Recycling of lube oil**: Lube oil used in the testing cycle is sent for recycling and same is again used for further testing cycles. Approximate more than 3Lakh litres of oil is recycled per annum.

- **Biodiversity**: Around 10000 plus species of naïve species are planted in the premises. This creates and enhances flora and fauna inside and nearby vicinity. This also enhances the work environment and create healthy atmosphere in the premises and nearby society.

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Sewage Recycle: Using Treated Domestic Sewerage for Industrial Reuse

Thermax helps the City of Udaipur rejuvenate lakes and contribute to conserving environment

Water has become a critical resource. Rapid increase in demand and contamination of natural water resources are responsible for shifting the country to water stressed zone. 70% of the total water consumption is drawn by Agriculture. Household and Industrial demands account for 10% & 20% respectively. Thus, recycle and reuse of the sewages coming from these sources are the most viable alternatives to reuse water. In India, only 35% of the total domestic water is treated. Industries could utilize this sewage as a source of raw water whichotherwise flow through the rivers. Recently, it has been observed that decentralized treatment systems are more successful than common effluent treatment facilities for industrial sewage treatments.

The city of lakes, Udaipur under the Smart City programme along with Hindustan Zinc Limited (HZL) has taken it upon themselves to treat and recycle the domestic sewage of the entire city and use it for industrial consumption (end-use application). ThermaxWater and waste water solution division after successful execution of 20MLD STP plant hassupplied 25 MLD plant which is being commissioned presently. The sewagefrom the city is treated using MBBR (Moving Bed Bioreactor) technology. Anoxic and aerobic unit processes working on the attached growth principle were used for the treatment.

Anoxic treatment is used for the reduction of nutrients like nitrogen from the sewage. Organic matter will get reduced in aerobic MBBR (Moving Bed Bioreactor)and bio-solids are removed in advanced sedimentation treatment unit called Klaritubesettler. MBBR and Klaritubesettler offered an advantage of lower operating cost and space requirement compared to other conventional available treatment schemes. Clarified sewage is further polished using rapid gravity sand filters ensuring the treated sewage quality as per latest disposal norms after the disinfection. The treated sewageis used by the client for end use applications.

A sludge handling system is also provided to reduce the water loss. The plant is designed for least manual interventions by providing mechanical motorized equipments. Thus the use of domestic sewage for industrial activities could reduce the withdrawal of water from natural water bodies. Significant volumes could be utilized for reuse such as make-up water and other process consumption. The plant is designed to treat 25000 m3/day of sewage, to deliver a BOD of ≤10 mg/l, with COD and TSS of ≤30 mg/l and ≤5 mg/l. The total nitrogen content is designed to meet 10 mg/l. Thus, use of technology in different approach for water management took HZL a step ahead for sustainability. With this sewage recycle we contribute to saving more than 90% of demand of the fresh water for sustainability use for industry.

Thermax Water and Waste Solutions offer “One-Stop Solution” to support industrial and commercial sectors to treat water, sewage and effluent sewage for their end applications to meet stringent pollution norms. Thermax also offers solutions in Sewage Recycle, Zero Liquid Discharge and Desalination, in addition to Comprehensive Solutions in Plant Management, Plant Upgrade & Improvement, Specialized Audits and Spare Parts Management, and Specialty Chemicals.

Nandan Prabhune, works in Technology Innovation group of Thermax Limited for Water and Waste Solutions.

Renuka Devmane works at Industrial Projects Group of Thermax Limited for Water and Waste Solutions.
Environment friendly technologies aimed at improving the Environment around us

PAINT SLUDGE REMOVAL

Nitin Vaidya

A process common to most of the industries is the painting process. It is necessary for the protection as well as for the aesthetic appeal of the products. It is also a well-known fact that this process has a substantial environmental impact.

Many technologies have evolved to restrict the impact on environment of spray painting. These technologies focus on restricting the pollution during painting, as well as on the collection & treatment of the post painting waste viz. paint sludge. This article talks about the new technology to effectively collect and treat the paint sludge in order to keep the environment clean, in the most cost effective manner.

Not many like to talk about paint sludge. It is still considered a menace and, at times, simply disregarded. Unfortunately, this does not solve the problem of removing the sludge effectively and disposing it in the best possible manner that has minimum impact on the environment.

Presently, the rules are getting stringent and it is the responsibility of the one who creates the sludge, to collect it and hand it over to government appointed agencies for an environment friendly disposal. This may sound simple, but the daily “collection” of a relatively difficult-to-handle sticky mass, in the most environment friendly and cost effective manner is surely a challenging task!

In order to understand the state-of-art technology and equipment developed for the paint sludge removal, it is important to list down the major considerations, based on which efficient sludge collection systems are designed.

a. Type of Paints Used:
A wide range of paints are used, based on the end application requirements. Both Solvent-based as well as Water-based paints are used in the industry. Major paint types include
Polyurethane (PU), Epoxy, TSA, Lacquers, etc. Understanding the type of paint is important in deciding the chemical treatment required to denature it and make it suitable for collection.

b. Quantity of Paint Sprayed:
   It is a very important criteria as both, the chemical dosing as well as the sludge removal system capacity is decided based on the max. paint sprayed per hour. More the paint, more are the chemicals & equipment capacities/accessories required for efficient separation & collection of the sludge from the water.

c. Transfer Efficiency of Paint Application:
   The transfer efficiency of the paint spraying is important in calculating the quantity of over sprayed paint. This depends on type of spray equipment, component configuration, operator skills, etc. For example, in paint shops using robots for painting, the paint transfer efficiency is very high and hence produces reduced quantity of sludge.

d. Type of Chemicals Used:
   The paint sludge formed is sticky in nature. It has to be broken down to make it non-sticky and easy for collection. Further to this, the broken down sludge has to be either settled down or to be floated, based on the choice of collection equipment. Typical chemicals used are Coagulants, Flocculants, Anti-Foam Agents, etc. The type of paints, including solvent based paints and water based paints, help in determining the chemicals required. Moreover, newly introduced fast acting paint booth chemicals also help in making the sludge removal systems compact.

e. Type & No. of Paint Booths:
   There are a vast number of design variants under what are loosely termed as Side Draft Booths, Down Draft Booths, Dry type Booths, Water Wash Booths and so on. The product, production, paint and quality parameters decide the type of paint booth required. The paint “killing” and sludge collection technique in each case may vary. Moreover, in case of water wash booths, the water holding capacity of the booths and the design & location of the booth water tank are important criteria. The total no. of paint booths in a paint shop and the individual paints handled by them are also important inputs.

f. Centralized Sludge Collection Tank Capacity & Design:
   In paint shops where a centralized paint sludge collection “sludge pit” is provided, paint sludge and water from the booths flow by gravity to these pits. The pits are constructed of various designs to hold back the separated sludge and return the clean water to the paint booths. Systems to remove sludge from these pits depend on the water capacity and design (shape) of the pits. Sludge pits for new paint shops are now being predesigned for the installation of state-of-art sludge removal systems. This combination ensures maximum sludge removal and water cleaning efficiency.

g. Amount of Water in Circulation:
   The total amount of water, recirculated in the paint booth system/pit, to be cleaned is very important. It decides the system water

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**Automatic Paint Sludge Removal System Schematic - HYDROFLOTY 4M**

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handling capacity. The efficiency of the sludge removal system is decided based on the cleanliness of the recycled water.

**h. Paint Shop Layout:**
The orientation of the paint booths in a paint shop and the distances between them keeps changing based on the process, production and space available. Sludge removal systems need to be configured to suit the booth orientation.

To understand the new sludge removal technology, let's list down the major objectives of the end-user.

**Objectives:**
1. Suppress the need to change water – zero discharge system – reduce load on ETP
2. Minimum water in circulation – save water and equipment cost
3. Dry sludge – reduce disposal costs
4. Limit concentration of solvents & noxious substances in air emissions
5. Reduce maintenance of paint booth – avoid scales & waste sludge build-up
6. Reduce cost on chemicals, cleaning & maintenance, power, labor, water and space

If we look at the evolution of paint sludge removal technology, it starts with manual sludge collection. The sludge, after collection, was either burnt or disposed in open. Subsequently, as the production increased and pollution norms became stringent, many sludge removal systems were introduced viz. filter press, centralized sludge collection pits, skimmers, scraper conveyors, desludgers, etc.

To meet the objectives listed above, there is a need to build the equipment after well-understanding the latest chemical technology and to link the two with proper system engineering. The fast acting chemicals make it possible to design more effective and compact sludge removal systems. The whole focus has now changed to minimize the water consumption (zero discharge), reduce running costs and to improve the water quality sent to the paint booths.

**Process of Operation:**
The HYDROFLOTY equipment acts on substances in suspension which are removed from the water by a coagulation process through absorption. It purifies continuously the water, which is thus put back in circulation, clean and neutral, thus avoiding clogging and blockages of the system. Thanks to the control system with simple and intuitive PLC, the operation is completely automatic.

**A. Denaturation**
The first step of the treatment consists in a very quick denaturation process of the small paint particles (“overspray”) captured by the water wall. Denaturation consists in transforming sticky paint into inert particles, similar to moist sand. This aims at preventing pipes and pumps from clogging and at avoiding the formation of scales. A suitable chemical viz. coagulant is completely mixed with water. Depending on tank/pit configuration, submerged mixers may be installed for efficient mixing.

**B. Particle Separation**
The second step consists in separating the denatured particles, which are transformed into large flakes that can easily float, with the help of flocculent. The paint sludge slurry to be treated is continuously taken from the tank/pit and delivered to the system by a special pump.

Paint sludge & water flow is delivered to the flotation unit through a static mixer and coiled pipe. The flocculent is dosed prior to the static mixer. The coiled pipe is specially designed to optimize the treatment effects. Inside the tank, flowing water is enriched with minute air bubbles, which adhere to the surface of the paint particles, thus enhancing surface (flotation) and allowing them to be easily transferred through pusher arm movement. Clarified water is then returned to the booths/pit by means of the redelivery pump/gravity. It should be noted that the dosing of the chemicals, in the right proportion with respect to the quantity of overspray paint, is very important. As such, very precise dosing systems are used. An in-built “auto-cycle” feature allows removal of residual paint sludge, collected in the booths/pit, even after the paint shop stops operation.

Paint shops with such state-of-art sludge removal systems not only meet the above mentioned objectives but are also proud to exhibit an extended “new” look of their paint booths.
Batteries are something we all know about and use. In fact we are surrounded by batteries, be it Mobile Battery, TV Remote battery, we have self-starter bikes working on Battery, same for Cars, heavy vehicles etc. We run on batteries now days.

So, what do we do when our battery is not working? It's simple we replace it with a new one. Not thinking to recover it!! Small Batteries are not cost effective to recover but what about batteries that can be recovered and are also cost effective. Is it possible for us to recover any battery which has stopped working due to non-maintenance or after some time period? Answer is Yes! we can recover and this is also cost effective.

How battery works?

In simple words we convert
Chemical energy to Electrical Energy and for charging the battery we convert Electrical Energy to Chemical Energy.

Battery is made up of a plastic case containing six cells. Each cell is made up of a set of positive and negative plates immersed in a dilute sulfuric acid solution known as electrolyte, and each cell has a voltage of around 2.1 volts when fully charged. The six cells are connected together to produce a fully charged battery of about 12.6 volts.

That's great, but how does sticking lead plates into sulfuric acid produce electricity? A battery uses an electrochemical reaction to convert chemical energy into electrical energy. Let's have a look. Each cell contains plates resembling tiny square tennis rackets made either of lead antimony or lead calcium. A paste of what's referred to as "active material" is then bonded to the plates; sponge lead for the negative plates, and lead dioxide for the positive. This active material is where the chemical reaction with the sulfuric acid takes place when an electrical load is placed across the battery terminals.

When Battery is being Charged, it converts the electrical energy of the charger into chemical energy. Remember, a battery does not store electricity; it stores the chemical energy necessary to produce electricity.

How Long will battery Last? There are many things that can cause a battery to fail or drastically shorten its life. One of those things is allowing a battery to remain in a partially discharged state. We talked about sulfate forming on the surface of the battery's plates during discharge, and the sulfate also forms as a result of self-discharge. Sulfate also forms quickly if the electrolyte level is allowed to drop to the point that the plates are exposed. If this sulfate is allowed to remain on the plates, the crystals will grow larger and harden till they become impossible to remove through charging. Therefore, the amount of available surface area for the chemical reaction will be permanently reduced. This condition is known as "sulfation," and it permanently reduces the battery's capacity. A 60-amp hour battery may start performing like a 40-amp hour (or smaller) battery, losing voltage rapidly under load.

Deep discharging is another battery killer. Each time the battery is deeply discharged, some of the active material drops off of the plates and falls to the bottom of the battery case. Naturally, this leaves less of the stuff to conduct the chemical reaction. If enough of this material accumulates in the bottom of the case, it'll short the plates together and kill the battery.
Overcharging and undercharging also damages your battery life.

Soare Dead Batteries are harmful to our Surroundings and our Planet Earth’s Environment?

There are different kinds of batteries, and they’re made using a variety of materials. What makes batteries dangerous to the environment are the chemicals used to make them.

Apart from mining these resources – which has a detrimental effect on Nature – a battery contains one or more of the following metals: cadmium, lead, zinc, manganese, nickel, silver, mercury, and lithium, as well as acids.

These chemicals are extremely toxic – to us and the environment.

Air Pollution: Batteries undergo a photochemical reaction as they decompose in landfills. This causes emissions of greenhouse gases. The greenhouse effect results in global warming / climate change.

Water Pollution: The harmful chemicals found in batteries can also find their way into the local water supply, killing plants and animals which negatively affect the ecosystems of streams, lakes, and rivers. Ultimately, the health of people who drink contaminated water is also at risk. The same can be said when it comes to eating fish found in polluted waters.

Soil Pollution: I already mentioned that most batteries end up in landfills instead of being recycled or disposed of properly. The danger lies in the fact that these batteries contain toxic chemicals that are absorbed by the soil. Once they leak into the surrounding areas, that’s where the deleterious effects take place.

Why Batteries are Harmful to Humans

Humans suffer because of these chemicals:

Lead: Inorganic lead dust is the most significant health hazard when it comes to batteries. Lead can be absorbed into the body through inhalation and ingestion, both of which are equally dangerous. People working in the manufacture of batteries are prone to lead dust inhalation and ingestion. The areas surrounding a landfill where batteries are thrown are also sources of lead. Children and foetuses are most vulnerable since their bodies are still developing. High levels of lead exposure can affect a child’s growth, cause brain damage, impair hearing, harm kidneys, and induce behavioral problems.

Adults are also affected negatively by lead. Exposure can cause memory loss and decrease the ability to concentrate; it can even harm the reproductive system.

Sulfuric acid: Found in lead-acid batteries (commonly used in cars), sulfuric acid is highly corrosive. It can cause permanent blindness if it comes into contact with your eyes. Ingestion of this acid can fatally damage internal organs. The good news is that the presence of sulfuric acid in the environment doesn’t always lead to exposure. Direct contact with it is what you should avoid.
**Cadmium:** This is used in nickel-cadmium batteries and is considered to be even more harmful than lead when ingested. The International Agency for Research on Cancer (IARC) has classified cadmium as a carcinogen to humans. It can be absorbed through the skin by touching a battery that has split open and leaked. When these batteries end up in landfills, they can contaminate the soil and the surrounding areas. Eating crops that were grown from cadmium-contaminated soil can damage or destroy the kidneys.

What is The World is doing to reduce such kind of pollution? We cannot reduce battery uses in Banking sector, Hospitals, Mobile Towers or in our day to day life as it is depending on various Vehicles.

Can we regenerate those batteries or can we extend life of battery? Is it possible?

**The answer is Yes. We can regenerate our batteries of Vehicles, UPS and etc.**

How the Regeneration process works? What are the precautions can be taken to extend Battery Life?

**Annual maintenance reduces capacity loss caused by battery sulfation**

When the capacity of a battery is reduced, it is probably due to sulfate crystals that have gradually built up on the electrodes. This prevents the battery from effectively delivering current, because the crystals ‘suffocate’ the battery.

Lead sulfate increases the internal resistance and decreases the electrolyte density. The process of sulfation build-up is unavoidable. Worse yet, after 3-4 years, the process substantially accelerates (hence the rapid fall of your battery's productivity). If your battery suffers from this type of sulfation, battery regenerator will be very effective.

If you service your battery once a year with battery regenerator, battery sulphation will never stand a chance!

Cleaning + analysis + battery repair

Prior to the battery desulfation process it is very important to make sure that the battery, the battery connections and battery box are free of defects. We also need to make sure that the battery surface is neutralized, so that sulphation build-up on the connectors doesn’t affect the battery performance. An untreated battery surface may cause leak currents which will have a negative effect on the battery life.

When all connections have been checked and the surface has been treated, we can continue with the regeneration process itself.

**Lead-acid battery regenerator**

The battery regenerator runs 2 cycles of charging, equalizing and discharging. During this process, lead sulfate is removed by the electrical high-frequency pulsation process of the battery regenerator. This has the following results:

- the specific gravity of the electrolyte will increase,
- internal resistance will be reduced,
- battery capacity (Ah) will increase and
- cell voltage will increase

When the battery desulfation process is finished the battery can be put back into use.

Battery regeneration can be done at any time. Normally it is realized when the battery has lost 30-40% of its capacity. Then it is usually possible to completely recover it. Although in some cases the full capacity can’t be achieved, these recoveries often show incredible results. Besides the sulfation, batteries are often damaged due to the natural aging process. Lost parts of the positive plates and severe corrosion can’t be recovered.

Battery regeneration technologies suited for several applications
Battery regeneration for forlifts
Battery regeneration for cars
Battery regeneration for trucks
Battery regeneration for golf carts
Battery regeneration for trains
Battery regeneration for busses
Battery regeneration for tractors
Battery regeneration for quads
Battery regeneration for telecom and many more areas where batteries are used.

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Identification of sources of air pollution using scientific tools and techniques for air quality management

Moqtik Bawase

Composition of ambient air

Air is a vital resource for humans, plants, animals and all other living organisms in the environment. Air not only supply oxygen for survival but also plays an important part in several essential bio-geo-chemical cycles and processes such as photosynthesis that make life on this planet possible. The air is a mixture of several different gases in differing amounts. Nitrogen accounts for 78% of the atmospheric air, oxygen 21% and argon 0.9% (Fig. 1). Gases like carbon dioxide, nitrous oxides, methane, and ozone are trace gases that account for about a tenth of one percent of the atmosphere.

Ambient air pollution

The gases and particles produced from different natural and anthropogenic activities lead to disturb the atmospheric composition of ideal air and cause pollution of air both outdoors and indoors. Particles ranging from a few micrometres (µm) down to nanometres (nm), oxides of nitrogen and sulphur, methane, and carbon dioxide are a just few examples of common air pollutants.

With its increasing concentrations, particulate matter has been at the focus of scientists, regulators and common public during recent days. Particulate matter contains microscopic solids or liquid droplets that are so tiny that they can be inhaled and cause serious health problems. Some particles less than 2.5 µm in diameter (commonly referred to as PM2.5) can get deep into human lungs and some may even get into the bloodstream and thereby pose the greatest health risk. The average human hair is about 70 µm in diameter making it 30 times larger than the largest fine particle i.e. 2.5 µm in diameter (Refer Fig. 2).
Ambient air pollution

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Fig. 1: Typical major constituents of dry air by volume

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Identification of sources of air pollution

Using scientific tools and techniques for air quality management

Moqtik Bawase

Fig. 3: Global PM2.5 distributions during the year 2016

Global population-weighted PM2.5 concentrations increased by 18% from 2010 (43.2 µg/m³) to 2016 (51.1 µg/m³). As the previous discussion on the most recent country data suggests, the global level of population-weighted PM2.5 is influenced strongly by the levels of air pollution in populous regions and countries. China’s air pollution exposures have stabilized and even begun to decline slightly; Pakistan, Bangladesh, and India, in contrast, have experienced the steepest increases in air pollution levels since 2010.

Fig. 3: Global PM2.5 distributions during the year 2016

From where do these air pollutants come from?

Air pollution has sources of both natural as well as anthropogenic origin. Natural sources include wind-blown dust, wildfires, and volcanoes while anthropogenic sources include power plants, oil refineries, industrial facilities, vehicles, agricultural areas, cities, and wood burning fireplaces, and many more (Fig. 5).

Fig. 5: Sources of air pollution includes: Mobile, stationary, area, and natural sources

(Source: National Park Service, USA)

Mobile sources are one of the major contributors to air pollution in urban areas of India. Stationary sources, like power plants, emit large amounts of pollution from a single location and are termed as point sources of pollution. Area sources are made up of a number of smaller pollution sources and together make a huge impact on air quality. Natural sources such as wildfires can sometimes be significant but do not usually create continuous air pollution problems.

Pollution from anthropogenic and natural sources often originates in one place and transported through the air. Sometimes chemical reactions in the atmosphere change pollutants before they are deposited (Fig. 6).

Fig. 6: Atmospheric processes governing fate of the pollutants

Once the pollutants are emitted into the atmosphere, their fate is governed by the different atmospheric processes such as transport, chemical transformations and removals. The transport of pollutants is dependent mainly upon the winds which can move pollutants short to very long distances before they cause harmful impacts. Chemical transformation of primary pollutants (emitted by the sources) to secondary pollutants is the most complicated atmospheric process.
Ozone, sulfate aerosols, nitrates, are examples of secondary pollutants formed due to chemical reactions among different pollutants. Pollutants both primary and secondary are removed from the atmosphere by wet and dry deposition processes taking place in the atmosphere.

**Reliable information on source contributions is the key for controlling pollution**

Accurate, reliable and quantitative information on pollution sources is essential for the implementation of the regulatory and control actions and is a key element in the effective air quality management in any city or area. The practice of deriving information about pollution sources and the amount they contribute to ambient air pollution levels is termed Source Apportionment (SA). Identification of pollution sources provide significant inputs for various actions for air quality management as shown in Fig. 7.

![Fig. 7: Significance of correct identification of contributing sources](image)

**Scientific Tools and Techniques to identify the sources of air pollution**

Two fundamental scientific approaches are currently being used to identify and quantify the sources of particulate matter: (A) top-down or receptor models based approach and (B) bottom-up or dispersion model based approach.

The **bottom-up approach** includes identification of air pollution sources and their emission strengths using activity data and available emission factors (Fig. 8). These emissions are then used as input to dispersion models such as AERMOD, WRF-Chem etc. along with meteorological parameters and land use characteristics to predict pollutant concentrations over space and time.

![Fig. 8: Bottom-up approach for Particulate Matter Source Apportionment](image)

- This is a widely used approach in air quality management as it is mainly data driven and requires minimal laboratory analysis and instrumentation and can be applied over different spatial scales starting from street, local, urban, regional and global.

- Although, this approach requires minimum resources it requires huge amount of data such as accurate emissions, meteorological observations, terrain elevations, land use characteristics, etc. in order to predict the pollutant concentrations.

The **top-down approach** on the other hand include sampling air at identified receptor locations and deducing the potential air pollution sources by correlating common physical and chemical characteristics between the sources and collected samples (Fig. 9).

- The most critical part of the top-down approach is the sampling and chemical analysis which requires huge resources in terms of laboratory infrastructure, trained personnel, etc.

- The samples are collected on specially designed filter papers using air quality monitors and then these filters undergo a thorough laboratory analysis (Fig. 10) to determine the different constituents including carbon fractions (e.g. organic and elemental), ions (e.g. NO3-, SO42-, NH4+, etc.), trace elements (e.g. Al, Si, Fe, Cu, Sb, etc.). Table 1 shows typical marker chemical constituents for various sources.

- The analysed data is then used as input to receptor models such as CMB, PMF, etc. which focuses on the characteristics of the ambient air at the receptor and use statistical techniques to determine the relative contributions of the different sources of air pollution.

![Fig. 9: Top-down approach for Particulate Matter Source Apportionment](image)
Control interventions and action plan
The air quality management not only aims at identifying and quantifying the sources but actually reducing the emissions from these sources. Different control measures are identified suitable for each area and its economic activities and a control scenario consisting of multiple effective and practical control measures is designed and evaluated. The emissions are calculated for future years considering the effectiveness of each control measure. A few examples of control interventions for control of particulate matter are listed below:
- Complete phase out of biomass use by enhanced LPG penetration in rural households
- Use of agricultural residues in power plants and other industries to replace high ash coal and open burning in fields
- Introduction of gaseous fuels and enforcement of new and stringent SO2/NOx/PM10 standards for industries using solid fuels
- Improvement and strengthening of inspection and maintenance system for vehicles
- Fleet modernisation and retro-fitment programs with control devices
- Enhanced penetration of electric and hybrid vehicles
- Reducing real world emissions by congestion management
- Stricter enforcement of standards in large industries through continuous monitoring
- Full enforcement of Zig-Zag brick technology in brick kilns
- Vacuum cleaning and wall-to-wall paving of roads
- Control of dust from construction activities using enclosures, fogging machines and barriers
- Elimination of DG set usage by provision of 24x7 electricity

Conclusions
- Identification of sources of air pollution and its contribution is the first and foremost step in air quality management.
- Reliable information on the contributing sources can be obtained by using scientific tools and techniques.
- Two complementary approaches viz. bottom-up (emission inventory-dispersion modelling) and top down (ambient monitoring-chemical characterization – receptor modelling) are utilised for identification of sources.
- Outcome of these two approaches gives insight into the quality of data/ measurement.
- Robustness of the data and methodology is ensured if the results obtained by these two approaches are corroborated.
- Future scenario with and without control interventions can be generated with such robust data and effective action plan for air quality management can be prepared.

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1. Introduction:

“The supreme reality of our time the vulnerability of our Planet.”- John F. Kennedy

It has taken more than 4,600 billion years to evolve and get to the current position of life as it is present in the current times. However it has taken three centuries of the Industrial Revolution, to destruct the natural resources with the faster rate than the formation rate of the resources. It is because of this truth it has become clear that humankind should look at changing their equation it has developed with the environment and develop an attitude of humility towards the environment. In short, humanity must move away from the prevailing worldview that makes them think that they are unique from nature. It is important to look at environment as a collection of resources so as to utilize and take advantage thereof. This should be done with a view that all living things have a complex relationship, including humans, and this is fundamental for sustaining life on Earth. We need a paradigm shift to sustainability, which is a matter of fine-tuning our day-to-day activities with an self-evaluation and knowing our place inside the systems of life. Today’s everybody is taking about being green. From Retail giants to major IT companies, everybody is speaking about how green their tactics, packaging, or approaches are. However green business is really in its early stages and the imminence of being green will no doubt define real and definable goals and practices to be adopted by people and organizations. Environmentalism is a comprehensive doctrine where societal programs regarding apprehensions for environmental conservation and improvement of the natural state of the environment is brought forward. Environmentalism and environmental worries are often characterized by the color green. Pollution, climate change resulting in global warming, is also called as a Green House Effect. The heating effect of few specific man-made gas emissions such as carbon-dioxide, methane, nitrous oxide and hydro-fluro carbon have been resulting in the climate changes. The fast alterations in climate will perhaps lead to different eco systems to suitably adapt, since the changes have direct impact on bio diversity, agriculture, forestry, dry land, water resources and human health. However, this apathy towards awareness on the above issues will lead to something more detrimental to human race and hence there is a crucial need to encourage imperative methods for sustainable growth and corporate social responsibility. This philosophy of going green is gaining momentum through corporate social responsibility. From IT giants to deluxe hotels, from Cars to planes, from Mutual Funds to Banks businesses in India are touching greener initiatives. Jeff Immelt, Chairman and CEO of General Electric (GE) has commented “Environment and the business were no longer a zero-sum game. Things that are good for the environment are also good for business.” Individual Citizens, Corporates and governments have to act responsibly in ensuring that their country leads in economic and developmental activities through greener approach and applications.
both in terms of its duties and opportunities.

2. Genesis of sustainability: Where have the concepts arrived from:

The concept of 'sustainability' arrived in the books of economics around 30 years ago through a the popular Brundtland Report in the year 1987 also titled as 'Our Common Future' released by World Commission on Environment and Development (WCED) where 21 countries unanimously decided to follow sustainable development. The countries through the UN General Assembly recognized substantial worsening of the environment and natural resources had already taken place and to counter this UN established the Brundtland Commission. Gro Harlem Brundtland, former Prime Minister of Norway was nominated to officially work on creating the Brundtland Report, whereby globally shared sustainability goals were created keeping in mind the problems internationally, educating about the environmental hazards and giving sustainable solutions. The 1st volume report named “Our Common Future,” powerfully swayed the path for the Earth Conference in Rio de Janeiro, Brazil, in 1992 and the third UN Symposium on Environment and Development in Johannesburg, South Africa, in 2002. The Brundtland Report is widely endorsed for giving the most popular explanation of the term sustainability as written below:

“Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. It contains two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to whom overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs."

The global arrangement and the multidisciplinary approach adopted in the Brundtland Commission gave manifold problems like deforestation and ozone depletion affecting the mother earth a holistic approach which needed to be resolved at the earliest. The fundamental concept of sustainable development comprise of economic growth, environmental protection, and social equality. Though all the three ideas contribute to the overall idea of sustainability, it was found that most of the countries put economic development at the forefront making the other two redundant. It also called for a global meet so as to create concrete goals which was further held at Rio where Agenda 21 was planned out. Agenda 21 was the 4 point action plan comprising of 4 sections viz Social and Economic Scope of Measurement, Preservation and Management of Natural Resources for Growth, Participative Role of stakeholders of society at large and finally Implementation and Applicability of sustainable Methods.

3. Key ideas of Sustainability:

The key principle of sustainable development is based on bringing together environmental, social, and economic concerns of organization. The understanding of these three concepts leads to sustainable development. A comprehensive world created keeping in mind the respect for environment, universal human rights, commercial justice, with a peaceful environment. It is also a way of evolving and providing responses to the challenges shaped due to existing commercial and social status quo.
4. Why going green is the only option left with humans (Why sustainability)

Time and again the existing state of the world affairs echo the essential need for a diverse solution to environmental challenges. This has led to few of the people with too much of everything, while many left with very little. Around the entire world global disparity has reached where most of the rich are in control of the development and distribution of the world’s resources. Also it is important to note that subjects associated with sustainability viz climate change, water shortage, and poverty—need a global perspective through global participative decision-making mechanism. Ecological challenges like the depletion of natural resources such as water and petroleum, global warming, uneven food supply chain, and usage and dumping of toxic materials is the failure of the society. This needs to be addressed and understood at the right time and space so that the result of such a failure of balancing long-term costs will work against short-term benefits.

Corporations encounter these challenges these problems on a regular basis. Here are certain live examples:

- Freeport-McMoRan’s copper, gold, and silver extraction – Country - Indonesia: It was a complete letdown by the company of not recognizing the external threats. Freeport-McMoRan controls the Grasberg mine, the largest gold mine of the world where mine processes have caused a major controversy due to their discarded material dumping methods in the seas and rivers around their mines also the nefarious activities have had a significant impact on the ecosystem. This has resulted in company nearing closure due to lower sharing of profit margins with the local residents, with high corruption and misrepresentation of facts.

- McDonald’s Contribution to Rain Forest Devastation – Country –Brazil:

  In 2006, McDonald’s created a working group to develop a more sustainable supply chain for its sprawling, global food requirements.

  Europe limits usage of genetically modified (GM) foods like soybeans in its raw materials. (Note: Soybeans is an ingredient in chicken feed for Chicken McNuggets. Now in the US 90% of soybean crop is genetically modified and the major McDonald’s suppliers like Cargill, had to source for large quantities of non-GM soybeans from desolated Amazon land in Brazil. Now environmental groups like Greenpeace shunned McDonald’s eateries in Europe. This brought a civic pressure for transformation resulting in McDonald’s looking at identifying methods of greener supply chain partners.

  Hence the journey has begun towards adopting such practices by engaging and creating platforms for public, government and corporations to address these challenges collectively.

5. How is sustainability taking shape:

  Now the time has come where “Save the planet, and make it green has moved from being an ambiguous goal to
a planned strategy through enhanced internal procedures, valuation and assessment tools to improve the delivery and end result. The corporate houses can no longer just claim that “the business of business is business.”. Now the general society at large assumes and makes sure that the corporate houses are made accountable with greater transparency and integrity. The corporate houses need to relook at the product structures and markets. With mechanisms like cradle-to-cradle design, decreasing waste during manufacture and using recycled products, restructuring the supply chain and assessment tools for sustainability through Global Reporting Initiative, Carbon Disclosure Project, carbon footprinting and water footprinting have gained momentum.

Andy Savitz, Principal Consultant at Sustainable Business Strategies, author of The Triple Bottom Line, with his commendable spirit as a frontrunner in PwC’s global sustainability practice says that “the sustainability is a sweet spot: the place where the pursuit of profit blends seamlessly with the pursuit of the common good.”

It is a known fact that the requirements of individuals remain to be enhanced health care institutions and services, accommodation and support for the elderly population, wholesome food, monetary security, fresh air and abundant water etc with the list getting endless, the corporate houses can restructure pioneering inventive products and services so as to create supply chains to deliver products to customers in an ecofriendly manner and encourage customers to include these products into their routine in a sustainable manner. Also intervention by state regulation agencies can act as a positive force for change.

6. What India can teach the world:
India is a nation filled of multiplicity and incongruities and inconsistencies. Although India is the 3rd largest economy in the world, it has more people living below the I poverty line. Because of its total size and swift growth, sustainability is a big challenge, however as in spite of this India is a conscious contender, towards its commitment to sustainable goals. Sustainability has been a fundamental philosophy in the Indian culture. Its beliefs and values system have been imbibed in every Indian as a way of life. For example: the Jain principle of aparigraha, of being non-attached to worldly belongings, or having a harmonious relationship with Mother Nature has supported biodiversity preservation campaigns. Example: Bishnoi community of Jodhpur, Rajasthan state in India revere wildlife being a part of their faith. Environmentally conscious approaches and mindsets are deep rooted in the lifestyle choices and culture either through methods like non usage items like newspapers and books, or utensils, is sold to a scrap dealers for reusage or through saving water practices like Bucket baths, sun-drying clothes, and hand-washing dishes. Traditionally, also there is abhorrence for wasting food. Greendex, global index on sustainable living has ranked India on the top spot.

7. Conclusion:
Consciousness alone is the first stage of a sustainable world. Lao Tzu, 6th century B.C Chinese philosopher, has a famous quote “The journey of a thousand miles begins with one step.” Every journey is on step closer to
addressing a gap amongst mindfulness and action. It is a cumbersome mission with multiple stage interventions by different stakeholders. It is possible by firstly becoming an environmentally-conscious life-style decision maker secondly by inspiring collective action through family, friends, peers, coworkers for societal causes, thirdly as an member of a corporate house (present, former, or future), to recognize, scrutinize and execute business processes in an ecofriendly manner and lastly, as a resident in your local community,

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Industry's Contribution in Environment Protection

Dr. Shweta Bapat

Businesses are in existence for the society and because of society. While fulfilling the increasing and diverse demands of consumers some of the business actions like consumption of scares natural resources, carbon emission during various processes of Business, liquid and solid wastes generated during production process are considered as environmental disregards of businesses. Air Emissions, Waste Water, Land Pollution, solid waste, marine and costal pollution, radiation, noise pollution are some of the effects of business actions that are degrading our environment. In fact these actions are not only giving a rise to the questions related to environmental protection but also about the business sustainability. Therefore businesses cannot escape themselves from their responsibility of environmental protection for ensuring their own existence for a longer period of time.

Along with 'Social commitments' businesses are also bound with their 'Environmental commitments' to have business sustainability. Industry is trying its best to contribute towards environmental protection. Businesses are taking various initiatives to follow this commitment of protecting environment. Some of these initiatives are

- Adopting New Technology: - As a response to the environmental concerns Businesses are learning about the alternative technologies and even they are showing readiness to research and develop newer and environmental friendly technology to reduce the negative impacts of existing technology.

- Review and changes in material used: - most of the businesses have shown keen interest in reviewing the material used by them not only for manufacturing the product but also for the packaging of the product. The environmental friendly ingredients are replacing the conventional ingredients in many cases.

- Evaluating Internal processes: - In some of the industries conventional production formulas or processes are
proving harmful to the environment. Alert businesses are now evaluating these formulas as well as processes and adopting new processes that are based on three R’s Reduce, Reuse, and Recycle.

- **Consumer Education**: Businesses need to educate consumers for being responsible towards environment. Various businesses where there is no scope for replacement of material, technology or processes are educating their customers for the careful use of their products at the same time they are making them responsible for their actions.

- **Travel and Transportation Policies**: Most of the businesses are having their travel policies supportive to the environment. Avoiding unnecessary travel of executives, providing and promoting environmental friendly commuting options etc. some of the effective initiatives in this regard.

- **Waste Prevention**: Rather than processing the wastes of any type businesses are keen on not creating the waste. It is always a burdensome costly affair to treating the waste. Again it is also not possible to treat it and make it zero without any negative effect on the environment therefore the business are focusing more on waste prevention that treatment.

- **Having environmental friendly supply chain**: Big business houses are now insisting on environmental friendly supply chain for their businesses. It automatically makes the small businesses responsible towards environment. Businesses are sharing their sustainability practices with their supply chain to make them environmental friendly and responsible.

- **Corporate Social Responsibility (CSR)**: CSR includes not only the responsibility towards society but also towards environment. Currently in India CSR spending is made mandatory to some of businesses fitting in to a particular criteria. But the business to whom CSR spending is not made mandatory are also willingly doing it to ensure environmental protection.

- **Sustainability Audits**: Though very few in number but some responsible businesses are undergoing sustainability audits. The process of audit reviews the policies and procedures and find out the areas in where there is a scope of improvements to operate sustainably. This helps in preparing realistic sustainability plans for the businesses.

Overall industry is genuinely taking efforts to contribute towards environmental protection and to reduce their negative effect on the environment in various manner. Though these efforts of businesses are not enough and there is a huge scope and need to do lot more, efforts are definitely appreciable.

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Industry's Contribution in Environment Protection

Amit Deokule

While coaching different people, I raise questions about the right attitude. While talking about environment it is important to raise questions about the right attitude in the industry to protect the natural essence where environmental conditions and its preservation with the right perspective will matter a lot, right?

There is a hue and cry about industrial pollution and its avoidance by curbing it completely or minimizing it to a certain level which will not affect the environment! Also, another important thing is that if the industry is to take care of stress levels disturbing the environment and its implication where there are few uncontrollable things getting extended by human beings who are polluting the atmosphere because of his/her mind level barriers which are due to high competition and comparison.

As a coach, when I am visiting different small sector manufacturing companies or even service sector companies, I get disturbed by aspects related to human values which are getting deprived and it will have serious impact in coming years. And in coming days/months/years it will be important to see how different industrial plans are helping environment and its protection. I am able to project five aspects in this regard which will be related to the industry's contribution to protect environment visibly and at the other end human values preserving environmental conditions which are invisible but can be observed only after experiencing the same.

1. Correct use of CSR activity to protect the environment
2. Preserving energetic environment inside the organizations
3. Taking the ownership of working conditions to maintain stress free environment
4. Keeping the premises green by nurturing right attitude mindfully
5. Increasing production with unlimited vision but by restricting unnecessary expansion

1. Correct use of CSR activity to protect the environment- Since the time our honorable prime minister Narendraji Modi has declared Swacch Bharat...
Abhiyaan, we all have been taking initiative to keep the environment clean but majorly it will be a professional responsibility of various industries to make it happen in reality and it can be done through CSR (Corporate Social Responsibility) which government has made it mandatory.

2. Preserving energetic environment inside organizations- It has become vital for every company to keep the internal environment healthy and mindful by opting out such measures because of which right motivation among stakeholders will remain intact & energetic and their potential abilities will be given a justice through the right framework. Values of the company will have a core importance here. With mindful preservation, internal energy will remain positive and external environment will be healthy within the organization.

3. Taking the ownership of working conditions to maintain stress free environment- Apart from the company maintaining the energetic environment, it is the integral responsibility of every stakeholder working inside to take the onus of every action where awareness about the behavioral aspect comes into picture. Since we never know how the calamity will fall because of natural occurrences the way Fani affected the environmental conditions of Odisha and the citizens confronted one of the most dangerous disasters ever after many years. Can we relate the same incident to the nature of the human being and its maintenance? It is a must!

4. Keeping the premises green by nurturing right attitude mindfully- Since the industrial revolution is happening day by day because of the technological advancement, we never know how robotics will start playing its roles in the organization. In spite of the said scenario, will there be a scenario when everyone will require to start keeping the environment more greener so that the greenery inside the mind will have its own impact externally??

5. Increasing production with unlimited vision but by restricting unnecessary expansion- This might be daunting but look at the farmer’s situation at one side and on the other side, consider the story where cement jungle is proliferating in an expansive mode which is far affecting the environment. So, to arrive at some fructifying solution we should not restrict ourselves to expand industrially but having unlimited vision and stopping unlimited expansion can be a solution or not? Here the meaning of unconditional can be understood properly but it has been misused based upon enriching economical elements at times.

Hence it can be briefed as follows-
At present IIP came down and so has the environment….!
Let us cherish mindfulness to protect valuable sentiment!
Enhancement of industry contribution to protect environment!
Nurturing right human values to avoid every impediment!

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Development has brought with itself destruction of natural resources resulting into several environmental changes which were unprecedented a few decades ago. Today, with increasing issues like global warming and pollution, protecting the environment has become imperative.

Countries across the globe are thus taking concentrated efforts in formulating ways which would help have minimum impact on environment. The main objective of all such efforts is mainly to conserve natural resources and to repair damage caused to the environment by reverting trends.

International environmental agreements

Rapid industrialisation and overconsumption has been depleting many of the earth’s natural resources. This environment degradation and its impact is no more limited to certain areas but is being felt globally. Understanding this, in recent past, countries started developing agreements which were signed by multiple governments to prevent damage or manage the impacts of human activity on natural resources. These included agreements on issues like climate change, oceans, rivers and air pollution. Apart from this, The United Nations founded its Environment Program UNEP (United Nations Environmental Program) in 1972. This gave way to several environmental agreements starting with The Montreal Protocol on Substances that Deplete the Ozone Layer. Many conventions such as the Framework Convention on Climate Change, the Convention on Biological Diversity, the Kyoto Protocol, the Convention on International Trade in Endangered Species, the Basel Convention on the Control of Transboundary Movements of Hazardous Waste and the Stockholm Convention on Persistent Organic Pollutants have been held focussing on environment.

India’s efforts towards environment protection

Since the 1980s, the Supreme Court of India has been pro-actively engaged in addressing India’s environmental issues. It has laid down new principles to protect the environment, re-interpreted environmental laws, created new institutions and structures, and conferred additional powers on the existing ones through a series of directions and judgments. India has several laws which aim at protecting the environment which include Indian Forest Act, 1927, The Wildlife Protection Act, 1972, Forest (Conservation) Act,
1980 (with Amendments Made in 1988) among many others.

The Environment ministry is responsible for planning, promoting, coordinating, and overseeing the implementation of environment and forestry programmes in the country. The main activities undertaken by the ministry include conservation and survey of the flora of India and fauna of India, forests and other wilderness areas; prevention and control of pollution; afforestation, and land degradation mitigation. It is responsible for the administration of the national parks of India. Apart from this Central Pollution Control Board (CPCB) works under the Air (Prevention and Control of Pollution) Act, 1981. It provides technical services to the Ministry of Environment and Forests of the provisions of the Environment (Protection) Act, 1986.

Maharashtra's Efforts towards Environment Protection

In recent times, Maharashtra is facing serious issues of pollution, water shortages, frequent droughts and heat wave conditions in various parts of the state during summer. This has since long resulted in several efforts to stop environment degradation and to conserve the natural resources. Maharashtra Pollution Control Board (MPCB) has been implementing various environmental legislations including Water (Prevention and Control of Pollution) Act, 1974, Air (Prevention and Control of Pollution) Act, 1981, Water (Cess) Act, 1977 and some of the provisions under Environmental (Protection) Act, 1986 and the rules framed like, Biomedical Waste (M&H) Rules, 1998, Hazardous Waste (M&H) Rules, 2000, Municipal Solid Waste Rules, 2000 etc. MPCB is functioning under the administrative control of Environment Department of Government of Maharashtra.

In 2017, the cabinet also gave its nod to the climate change policy in Maharashtra. The policy focuses on making villages and cities environment friendly. Pune’s efforts towards environment protection.

Pune city has been in the forefront when it comes to saving its natural environment. Many NGOs are actively working in the area of environment protection helping the city remain green. Pune Municipal Corporation and the Pune Forest Department too have been taking active steps towards environment protection. PMC has in place a Tree Authority and an Environment cell to address issues pertaining to environment degradation. The Tree authority, had planned to conduct a geo-enabled Tree census survey and plot the same on city map. The forest department too has been studying ways to help protect the natural areas around Pune. Many interactions are held between the experts and the citizens to promote environment conservation in the city.

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Environment conservation and branding

Nandita Khaire

Brand image building for any company, institution, NGO, products and services is critical in today’s environment. Consumer all around the world prefer to buy products and services called green brands that have an eco-label. Companies want a brand image as being environment friendly. They communicate continuously emphasizing their environment conservation efforts. Non profit organisations also need branding to build credibility and enhance their image amongst the public. Some of the non profit organisations hire professionals to advise them. Governments have also become aware about the need for branding their programs that are meant for the welfare of its people. In India, the central government has consciously adopted branding strategies for their programs.

Branding of environment conservation can be seen from the following perspectives:

1. Non profit organisations in the environment/ ecology/ conservation domain - WWF, BAIF Research Foundation, Bombay Natural History Society (BNHS) etc.
2. Green brands or companies that consumers associate with environment conservation and sustainable business practices. They use eco labels to build credibility and trust.
3. Sustainability brands are products and services that are branded to signify a special added value in terms of environmental and social benefits to the customer and thus enable the differentiation from competitors.
4. Government initiatives that need to have a positive impact and credibility amongst the citizens and stakeholders.

Non profit organisations / institutions in the environment conservation domain

Non profit organisations need branding as an integral part of their strategy. Branding helps them to build a formidable reputation, enlist volunteers, raise funds, attract good quality talent, engage with civil society, governments and provide clout. The general public is always influenced by the opinion of ‘branded’ non profit organisations.

World Wide Fund (WWF)

Everybody is familiar with this logo. It epitomises and conveys what World Wide Fund stands for. Founded in 1961, WWF works in the field of the wilderness preservation and reduction of human impact on the environment. It is the largest conservation organization with over five million supporters worldwide, working in more than 100 countries, supporting around 1,300 conservation and environmental projects.

Some of their branding objectives are: (a) to build a future where people live in harmony with nature. (b) Create a powerful network globally, that is devoted to conservation of nature. (c) Ability to engage in constructive dialogue and non confrontational action. (d) Have an integrated approach across all programs policies, campaigns. (e) Engage, mobilise and inspire millions of people, have partnerships with civil society, governments and public institutions and private sector. (f) Nurture talent and develop high performing people ensuring diversity of culture and gender. (g) Build transparency and accountability in all that they do.

Green brands

Green brands are those brands that consumers associate with environmental conservation and sustainable business practices. Green brands are chosen by consumers who are concerned with environment conservation. There is trend for ‘green luxury’ where consumers prefer benefits of living green, particularly the millennials. An international study by consumer goods giant Unilever reveals that at least 33% of consumers are now choosing to buy brands that are doing social and environmental good. Consumer research has also revealed that consumers feel more comforted and have a more positive attitude towards environment friendly brands.

Eco-labelling is a voluntary method of environmental performance certification and labelling that is practised around the world. An eco-label identifies products or services proven environmentally preferable overall, within a specific product or service category.

Some of the eco labels used are Ecomark is the Indian government operated seal of approval program for environmentally preferable consumer products. The criteria follow a cradle-to-grave approach, i.e. from raw material extraction, to manufacturing, and to disposal. The Ecomark label is awarded to consumer goods that meet the specified environmental criteria and the quality requirements of Indian Standards.

Eco cert is a certification body for sustainable development. It is an inspection and certification body established in France by agronomists aware of the need to develop environmentally friendly agriculture and of the importance of offering some form of recognition to those committed to this method of production.

The Energy Star logo identifies the most energy efficient equipment for a variety of types of products to guide consumers when they are making purchases.

India Organic is a certification mark for organically farmed food products manufactured in India. It certifies that an organic food product or the raw materials used in the product were...
Companies are gradually incorporating SDGs into their own business interests. Companies are development in an ongoing and sector. The SDGs have the potential to interlinked targets. Attainment of SDGs (SDGs), covering 17 goals and 169 sustainable development goals. Tata Chemicals Ltd, Ambuja Cements Ltd, Infosys Ltd, Mahindra & Mahindra Ltd, Tata Motors Ltd, Tata Power Company Ltd, Bharat Petroleum Corporation Ltd, ITC Ltd, Hindustan Zinc Ltd and Indian Oil Corporation Ltd.

GreenPro is a product certification granted by the CII that aims at helping environmentally conscious customers to make a greener choice. The certification follows a complete lifecycle approach for certifying products. The focus of GreenPro certification is green building products and industrial equipment.

These labels on the products add credibility to environment conservation.

Sustainability brands
Sustainability branding is the process of creating and maintaining an identity of a specific product, service, or business that reflects special added value in terms of environmental and social benefits. Green brands mainly focus on environment friendly business practices, while sustainability brands add a social dimension like health and safety issues, conditions under which products are produced, supply chain and adhere to triple bottom line - environment, social and financial sustainability.

In 2017, the United Nations set out an ambitious programme called sustainable development goals (SDGs), covering 17 goals and 169 interlinked targets. Attainment of SDGs requires significant effort from both the governments as well as the private sector. The SDGs have the potential to provide a framework for mobilizing companies to invest in sustainable development in an ongoing and scalable way, while also pursuing their own business interests. Companies are gradually incorporating SDGs into their responsible business actions.

The top ten leading companies are Tata Chemicals Ltd, Ambuja Cements Ltd, Infosys Ltd, Mahindra & Mahindra Ltd, Tata Motors Ltd, Tata Power Company Ltd, Bharat Petroleum Corporation Ltd, ITC Ltd, Hindustan Zinc Ltd and Indian Oil Corporation Ltd.

Green tech start-ups need to make branding a part of their business strategy during the early stage of development. Branding helps to create an image of a socially responsible and credible company. It helps them to be perceived as a valued firm to potential investors. Here are some examples of Indian green tech companies that have effectively used branding as part of their strategy.

HelpUs Green was founded with the sole aim of saving the Ganges by collecting the waste strewn in and around the mosques and temples of Uttar Pradesh. They recycle and reuse the collected waste and has helped 1,200 rural families and has worked to prevent close to 1,000 kg of toxic pesticides, insecticides and chemical waste from filtering and festering in the Ganges.

Husk is one of the world’s leading off-grid utilities. They provide reliable power to rural communities and businesses, entirely from renewable energy sources.

Chakra Innovation has developed a proprietary hardware technology to curb pollution. Chakra Shieltdakes diesel soot from generators and converts it into inks and paints. Running at 35 different sites, it has been able to capture more than 300 kg of particulate matter in the past 1 year, which would have otherwise polluted 1,500 billion litres of air.

Government initiatives
Governments also use branding as a strategic tool for many of its services and programs. These services and programs are meant for the benefit of its citizens. The objective for branding is to build trust and credibility while reaching out to a vast diverse set of people in a country like India, create awareness among the citizens and to simplify messaging while working with multiple stakeholders.

The first steps of branding are creating the vision, mission and core values. The next step is creating the visual identity i.e. the name and logo. In the past government schemes did not have a visual identity. They had acronyms like MNREGA, JNNURM etc. Acronyms do not convey the essence of the program. One cannot pronounce them. Neither are they motivating or inspiring. However in the past few years the central government has avoided acronyms and used powerful names that consist of simple words that convey the mission. Programs like ‘Swachh Bharat Abhiyan, or Make in India are simple and easily understood.

NamamiGange
In the area of environment conservation the initiative to clean the river Ganga has been aptly named as NamamiGange. It is a flagship programme by the central government to reduce pollution, conservation and rejuvenation of the river Ganga. More importantly, the branding has not stopped at a logo creation. There is continued effort on part of the government to create awareness and involve the citizens as well.

At the start a logo competition was announced by the government. Further, there have been efforts to involve and motivate citizens to be a part of the program. Volunteers can register and participate in various activities like cleaning the ghats, tree plantation. Companies can partner in solid waste management, bioremediation of nallas and drains etc as part of their CSR programs. https://nmcg.nic.in/csr/csrindex.aspx. The National Mission for Clean Ganga (NMCG) was awarded the distinction of “Public Water Agency of the Year” by Global Water Intelligence at the Global Water Summit in London on April 9 2019.

There is emphasis on communications as well. NamamiGange is active on social media that provides constant updates about the progress of the mission.

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Last year around this time, Cape Town was in news for severe water crisis. Day Zero - April 12, 2018, was to be the date of the largest drought-induced municipal water failure in modern history. The fear of the crisis had spread across South Africa. With a bucketful of measures, the crisis was averted but it underlined the need to manage water more efficiently. Rural areas still do not have adequate water supply leading to declining sanitation and hygiene standards. But, necessity is the mother of invention 'Eco Sanitation Limited' based in South Africa, produces, distributes, and markets the EcoSan waterless toilet, a sanitation system that converts human waste into de-hydrated, compostable material. The waste can then be used as compost or disposed of as a traditional waste. The EcoSan requires neither water nor sewer access to function. It eliminates the cost and infrastructural barriers associated with the installation of sewer and water systems, while removing the negative health and environmental effects of open defecation. It is particularly relevant to improving sanitation in rural communities. The bowl and seat are practically un-breakable, unlike toilets made of porcelain. (The system cannot handle large quantities of water as this interrupts the dehydration process.) The toilets are patent protected and are considered to be a boon to rural areas.

Cape Town's plight intensified the discussions about environment deterioration and its fatal effects. However, awareness about environment deterioration and efforts for sustainable environment can be traced to latter half of 20th century. A major assessment of the global environment published in 1999, the UNEP (United Nations Environment Programme) Global Environment Outlook 2000 report drew attention to deteriorating environment and its effects on human life. The awareness has picked up momentum in the past decade. Many factors like Climate change, Stratospheric ozone depletion, Degraded air quality, Degraded water quality Scarcity of fresh water...
Deforestation, Biodiversity loss have triggered the interest in sustainable environment leading to new terms like Green Engineering, Green Technology, Green Computing and Green Patenting. Green Patents refer to the patents related to the sustainability of the environment and aim to combat climate change—alternative energy, water management (improving quality and stocks of water), waste management, air and water pollution control etc. The patents lead to either decreased energy consumption or otherwise benefit the environment.

According WIPO paper on 'Innovation, Protection and Transfer of Green Technologies' Green Patents are different from patents in other sectors in some ways—

- No single patent can block an entire technology
- Basic technology has been off patent for years if not decades
- Patented technology provides only incremental improvements
- For most clean products—cost is in labor & materials (not IP)

Trends in Green Patenting- In the last twenty years a boost can be seen in Green patenting. Industries linked to building constructions, transports, renewable energy, etc., have started to work exclusively with the cutting-edge green technology. According to World Intellectual Property Organisation (WIPO) report on 'IP trends in the renewable energy landscape' patenting activity increased in four technology sectors—biofuels, solar thermal, solar PV and wind. Innovation and patent filing rates in these technology sectors grew by 24% annually between 2006 and 2011 and outpaced the 6% global average increase in patent filings. Green energy technology patents were highly concentrated in four countries—Japan, the U.S. A, Germany and China.

Another field for green patenting is desalination of water technology. According to Patent landscape report on renewable energy desalination technologies in 2011 there were 4,551 patent families related to desalination of water, of which more than 20% represented the combination of desalination technologies with the use of renewable energy. For 80% of the RET, integration occurred with solar thermal energy.

According to UK-based commercial law firm EMW, patents filed for solar power, wind energy, biofuels, hydropower, geothermal energy and waste-generated energy have nearly doubled over the last five years. More than 14,800 renewable energy patents were filed globally in the year 2017, an increase of 43% in comparison to the previous year's figure of 10,500. China dominates the scene for solar power followed by USA. Companies in China filed 76 per cent (11,300) of the renewable energy patents in 2017, while the US, in second place, filed 10 per cent (1500). China is currently the biggest manufacturer of solar panel technology and has invested more than $44bn in clean energy projects in 2017. In third place was Australia, followed by India, Canada, Russia. The UK, Japan and Germany had been at the forefront of overall green patenting. Japan files the highest number of CCMT (Climate Change Mitigation Technology) patents in Asia and is one of top three low carbon leaders in the field of Green technology. China, South Africa and the US are focusing on patents in the field of Green technology. China, South Africa and the US are focusing on patents in the field of Green technology.
Energy Efficient Technology

Change Mitigation Technology) patents in Asia and is one of top three low carbon innovators in the world. Germany is the leader in waste management and recycling technology patents in Europe with more than 1260 patents. China has established itself as the world’s leading exporter of affordable photovoltaic cells, Europe is innovating in wind and Japan and the US are focusing on patents in electric vehicles. Of late, the focus has shifted from alternate energy to environment friendly vehicles, household equipment and other products like Panasonic’s outdoor green cooler. The green technology field is dynamic. Countries that remain focused on fossil fuel would be losing market.

The Green Race- The green prefix finds its place in two emerging concepts- Green Economy and Green Race. Some countries had sensed the environmental deterioration much earlier and predicted increasing demand for sustainable environmental technology. They invested sustainably in the development of such technologies and had the advantage of early entry in this market and huge export potential. In the sixties, Japan focussed on Waste water and air pollution related patents and post oil crisis focus shifted to R&D and patenting in energy related and electric industry. Some focussed on certain segments of technology like Germany with intensified R&D on such technologies, incentives to business sectors and a progressive and supportive legal framework has become world leader in waste management and recycling markets. In 2016, the German waste management and recycling markets totalled approximately EUR 20 billion. Number of international agreements and United Nations Sustainable Development Goals (SDG) have encouraged other countries in the field of Green technology. China, South Korea and India have also become significant players in the field, making the field competitive. According to a report of ‘Global Commission on the Geopolitics of Energy Transformation ‘China has taken a lead in renewable energy and is now the world’s largest producer, exporter and installer of solar panels, wind turbines, batteries and electric vehicles. China also has a clear lead in terms of the underlying technology, with over 150,000 renewable energy patents in 2016, 29% of the global total. The next closest country is the U.S., which had a little over 100,000 patents, with Japan and the E.U. having closer to 75,000 patents each. China has become renewable energy superpower and has huge competitive advantage over other countries. Major oil exporters such as Russia, Indonesia and Saudi Arabia had negligible numbers of renewable energy patents. The report has expressed a fear that the states of the Middle East and North Africa, together with Russia and other countries in the Commonwealth of Independent States are most exposed to a reduction in fossil fuel revenues and need action plan to face the challenges. UAE has developed vast solar energy parks and Saudi Arabia has unveiled plans to develop 59GW of renewable energy by 2030.

The Sustainable Development Goals (SGD-goals declared by United Nations for sustainable development), increasing markets as well as competition for sustainable energy technology has prompted many countries to speed up the green inventions patenting process. Green applications are applications in which the invention described helps to improve the environment, by preventing the causes of global warming, reducing air or water pollution and those relating to alternative energy sources. The objective is to reduce the time needed to obtain a patent from several years to just a few months. The type of technology for which accelerated examination can be requested differs widely across patent offices. In Australia, Canada and the UK, all
environmentally-friendly inventions are eligible. Brazil, China, Japan and the US place some restrictions on the technologies permitted. For example, only energy-saving and carbon-saving technologies are allowed in Japan. Australia, Israel, South Korea and China also have accelerated examination programmes. Realising the urgency to promote, protect and diffuse the green technology WIPO has taken certain initiatives. **IP Green Inventory** developed by the IPC Committee of Experts, facilitates searches for patent information relating to Environmentally Sound Technologies (ESTs), as listed by the United Nations Framework Convention on Climate Change (UNFCCC). **WIPO GREEN**, an interactive marketplace that connects technology and service providers with those seeking innovative solutions, was established by the World Intellectual Property Organization (WIPO) in 2013. WIPO GREEN consists of an online database and network that brings together a wide range of players and resources in the green technology innovation value chain, connects owners of new technologies with individuals or companies who might be looking to commercialize, license or otherwise distribute a green technology. By Jan. 2019 there were more than 3000 entries in the on-line market place. WIPO GREEN users include Japanese ICT company Fujitsu, German manufacturing firm Siemens, and China’s electronics and home appliance company Haier, among others. There is also Inventor Assistance Program (IAP), which matches developing-country inventors with patent attorneys who give them free legal advice on patenting. There are other greenpatent databases also like US Patent and Trademark Office, European Patent Office, Patent offices from Japan and China.

**Green Patents and business strategy**- There is a school of thought which believes that environment related technologies should be free from patenting. Green technology is capital intensive and when it comes from private sector, patents provide the much needed incentive for the investment and attract additional investment. Micron Waste Technologies (“MWM:CSE”) is a leading organic waste technology company based in Canada. Micron’s patented on-site treatment system turns organic waste into clean water, with solutions to handle specialized organic waste generated by cannabis cultivators, food producers, food operators, hotels etc. The award of Canadian and US patents led to rise in its stock prices.

Patenting also facilitates licensing or assigning technology which can lead to effective technology transfer. Also existing patent databases can inspire further inventions. Green patents as a strategy can be used in two ways-developing and patenting environment friendly technology and products as a core business activity and secondly using green patents in other businesses. Many companies make strategic use of green patents for product development, market expansion and increasing revenue through licensing. They also change their focus on developing technology so as to tune it to the changing demand pattern for sustainable technology. The focus has been shifting from waste water management to air pollution to alternate energy to waste disposal. It is also observed that focus keeps on shifting from process innovations to product innovations. Let us see few examples of use of green patents in the business strategy.

GE, Siemens Gamesa and Vestas lead the wind energy IP ownership. US companies have collectively spent over USD 188 million (EUR 177m) on IP protection with over 9,331 individual patent filings. The top 10 wind turbine manufacturers have increased their control on the industry with more than 59% of all wind patent filings, as well as over 75% of the patents which are broadly applicable to the entire industry. GE has steadily directed its efforts to use of wind energy replacing traditional
energy use for digital tech and data analytics for wind farm operations. GE has two third market share in the wind turbines and installed capacity in America. GE’s strategy is to aggressively protect its markets and patents through infringement suits. GE had successfully sued Mitsubishi Heavy Industries in the past and now is in war with Vestas Wind Systems. The latter also has vast patent portfolio and the lawsuit underlines the intense competition in the wind energy sector. Toyota expects Hydrogen Fuel Cell Vehicle Market will flourish in future and has more than seven hundred patents. Toyota will offer free access to its hybrid-vehicle patents to expand use of the lower-emission technology. The company is allowing free access to its patents second time. The strategic move is to counter the challenge of all-battery electric vehicles. Interestingly, Tesla had also opened up its patents to accelerate the electrification of transport! In 2014 it had opened up patents to companies making electric cars, so that ‘the world would all benefit from a common, rapidly-evolving technology platform.’ (Elon Musk).

Apple Incorporation has been developing products run on solar energy and securing patent protection for its inventions. Eg patents for using sunlight to light up a laptop’s screen, methods of mounting integrated circuits including solar cells to a substrate, wireless devices run on solar cells.

NanoFlex Power Corporation a company from the USA is a leading developer of advanced photovoltaic technologies and intellectual property. Founded in 1994, the US Company has exclusive license rights to more than 750 issued and pending patents worldwide. These proprietary technologies relate to materials, architectures, and fabrication processes for organic and inorganic flexible, thin-film photovoltaic technologies and reflect its product development strategy. The Company’s inorganic technologies enable low-cost production of high-performance Gallium Arsenide (GaAs) solar cells. Its organic photovoltaic (OPV) technology aims to redefine the solar market, enabling mobile, semi-transparent, lightweight, flexible, and inexpensive solar power applications. In 2017 the company entered into a license agreement with SolAero Technologies Corporation, a global leader in high performance photovoltaics for space and terrestrial applications. This move aimed at commercially competitive costs in these application.

A very welcome trend is that Start-ups in various countries are focusing on green technology and patenting. They are into improving wind turbines, generating energy using kites, kinetic energy from vehicles on roads, energy from waste, energy from sea waves. They are inventing into safe energy, using microorganisms to feed and fuel the planet, turning plastic to fuel. They have protected their technology through patents.

India and green patenting. In India there is a huge market for green technology and green patenting. Given the environmental deterioration, deforestation, water scarcity and
problems of waste management there is urgent need for accelerating green technology and green patents. Only 13% of the country's high-value patents are related to green tech—in line with the world average. There seems to be concentration on green buildings, carbon capture and storage, climate change mitigation technologies related to production and processing goods, and water-related adaptation technologies. There are big organisations like TATA Power Solar, Suzlon, ReNew power Limited and start-ups like PolyCycl (engaged in converting plastic into fuel), Chakr Innovation (inks and paints by converting diesel soot from generators) have secured patents for processes and products. However on the whole we are far behind China and world leaders in green technology and patenting. Sustainable Environment technology needs are diverse and dynamic. The ever growing market will require huge investment and open up business opportunities. As per the estimates of The secretariat UNFCCC an additional $200 billion in global investment and financial flows will be required annually by 2030 just to return GHG emissions to current levels. The global waste management market size is expected to reach $530.0 billion by 2025, where as, India's waste management sector is expected to be worth US$13.62 billion with an annual growth rate of 7.17 percent. Currently the Indian renewable energy sector is the fourth most attractive renewable energy market in the world as per the Renewable Energy Attractiveness Index 2018. The green patenting trend reveals that countries opt for particular segments of technology considering sustainability norms, domestic requirements, availability of resources and export potential. There is no dearth of innovative talent, and labour in India. With a SWOT analysis of country's capabilities in green technology, effective implementation of legislation and targeted investment in green technology segments and patents, India can be a big player in domestic and international market for sustainable technology.

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Businesses are influenced by environmental, social and governance factors

Chetankumar Sangole

Abstract:
This article provides case study of one of the company and shows how their strategic approach helped them in significant outcome with respect to environmental, social and governance aspect of sustainable development. This article also shares insights of roadmap adopted for the assessment and improvement of industry indicators for sustainable future and triple bottom line improvement. Also, it shares insights on how their risks management and performance linked with positive as well as negative impact, and with respect to the bottom line and global goals (SDG-12: Sustainable Consumption and Production and SDG-13: Climate Action).

Background:
Collaborative efforts and actions will contribute to the overall objective of maintaining the rise in global level atmospheric temperature limited by 1.5 to 2 °C. Majority of government departments, businesses and individuals are conscious and making extra efforts to contribute to environmental protection. But certainly more efforts and proactive actions are required to strengthen the response to global threat of climate change impacts.

IMD (India Meteorological Department) indicated highest temperature levels of 48.3 °C in Rajasthan and Vidharbha in Maharashtra, and duration of summer is extended over a last two decades.

The global average surface temperature levels between 1880 and 2018 increased by 0.6 °C. In India's case, it was 0.8 °C, according to an April El Dorado Weather report. This shows the globe has been warming at a much faster rate than what climate scientists
Climate change is a real risk and will impact on markets, trades and ultimately on economic trends. Hence, our current and future collaborative actions are crucial to mitigate climate change risks for sustainable development in line with environmental, social and economic aspects.

**Climate change risks**
Climate change is a real risk and will impact on markets, trades and ultimately on economic trends.

The impacts of global warming on the Earth’s system are the risks associated with environment, society and economic growth, and applicable to any nation, government, businesses and individuals. Means no one can escape from the climate impacts.

Broadly, let us look at some risks listed below:
- Environmental –
  - Rise in average global surface temperature,
  - Heavy rains, floods in some regions,
  - Drought situation in some regions,
  - Migration from vulnerable areas for example rise in sea level will disturb coastal society,
  - Water scarcity, etc.
- Economic growth –
  - Global trends in economic will make impact on trades, regulations, businesses, etc
  - Impact on markets that you are into in. This is due to inflation, natural disaster and so on
  - Risks associated with positive and negative impacts on revenues, profits and loss
  - Cost of resources like energy, water, raw materials etc.
  - Cost or implications due to several numbers of certifications/ regulations locally, nationally and globally
  - Market value of products/services you are into in
  - Global competition due change in technological innovation, financing innovation and economic transformation etc.
- Society –
  - Health risk due to air pollution,
  - Vector born diseases due air and water pollution,
  - Food security due to increase in population and/or less agriculture productivity because of un-usual rainfall pattern, soil infertility, etc.
  - Extreme poverty due to unemployment, inflation, global economic transformation,
  - Disturbed urban ecology due to urbanisation, etc.

In future, higher concentrations of tCO$_2$ will cause further climate change risks and shall be indentified proactively before its to late and difficult to manage it later.

This requires proactive actions and strategic approach to make sustainable future for our businesses, nation and our next generation.

**Case study : Strategic Approach by one of the companies**

For emission reduction and associated cost savings, one of the organisations assessed their operations current, potential, positive and negative impacts in line with the environmental topics, social aspects and economic benefits.

They came up with their sustainability indicators for environmental aspects and realised that they are adding value to global goals of sustainable development.

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Specific energy consumption</td>
<td>Energy conservation and efficiency</td>
<td></td>
</tr>
<tr>
<td>% efficiency and loading factor</td>
<td>Energy efficiency</td>
<td></td>
</tr>
<tr>
<td>Solar energy factor</td>
<td>Renewable energy generation through roof top PV system</td>
<td></td>
</tr>
<tr>
<td>Waste management factor</td>
<td>Extended Producer Responsibility, Responsible management of chemicals and waste</td>
<td></td>
</tr>
<tr>
<td>Commitment</td>
<td>Policy framework for sustainable consumption and production</td>
<td></td>
</tr>
<tr>
<td>Water conservation, fuel conservation (per unit of product)</td>
<td>Optimization of use of natural resources like water, fuel</td>
<td></td>
</tr>
<tr>
<td>MIS for bottom line monitoring</td>
<td>Develop and Implement tools to monitor sustainability actions</td>
<td></td>
</tr>
<tr>
<td>Carbon footprint – tCO$_2$/e per unit of product</td>
<td>GHG accounting as per Scope-1, Scope-2 and Scope-3</td>
<td></td>
</tr>
<tr>
<td>Product lifecycle impact</td>
<td>Sustainable product – quality, durability, reliability and longer lifecycle value</td>
<td></td>
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- Food security due to increase in population and/or less agriculture productivity because of unusual rainfall pattern, soil infertility, etc.
- Disturbed urban ecology due to urbanisation, etc.
- Water scarcity, etc.
- Climate change risks

And, surely, we all are witnessing and experiencing the global warming threat, and how day by day it is becoming a 'climate change risk' for sustainability of our society, globe and business.

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They came up with their sustainability indicators for environmental aspects and realised that they are adding value to global goals of sustainable development.

POSITIVE IMPACT AFTER ADOPTING SUSTAINABILITY ACTIONS

- 13% Energy cost savings per unit of product/sales
- 21% Landed energy price reduction through PV system
- 26% Reduction in packaging material cost through efficient packaging and waste management
- Better working environment through improvement in air quality on shop floor
- 50% Electricity savings in lighting by harnessing natural light during day time
- 31% Reduction in carbon footprint – tCO₂e
- 100% Recycling of food waste from canteen
- 0% reduction 1 year extended product lifecycle provide extended warranty to customers
- Allocation of funds and Contribution to GHG impact
- Contributing to reduction in Global temperature by bio-diversity projects

NEGATIVE IMPACTS IN BUSINESS AS USUAL SCENARIO

- High energy consumption leading to increase in energy cost/production cost
- Impact on bottom line balance
- Unsafe working conditions on shop floor
- Impact on health of staff
- High waste generation leading to high landfill,
- Contributing to depleting natural resources due to high consumption
- Contributing to global warming, Increase in temperature
- Increase in Green House Gas effect
- Lack of benefits of natural resources to coming generations

Government initiatives

There are several initiatives taken by Government with respect industry indicators to provide opportunity and also build capacity required for the benefit of various stakeholders.

Following table provides list of some of the initiatives by Government departments:

<table>
<thead>
<tr>
<th>Government actions</th>
<th>Industry indicator</th>
<th>Sustainability Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provides opportunity to gain benefits and/or penalties</td>
<td>Number of Employees Capacity Building</td>
<td>Participation in Training Programs, Conferences, Events, Clean Technology Exhibitions on environmental topics</td>
</tr>
<tr>
<td>List of some of the initiatives by India with respect to industry indicators</td>
<td>Reduction of tCO₂e – year-on-year</td>
<td>Use of electric transport for goods and raw materials, Fuel substitution measures</td>
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Following table provides overview of United Nations Sustainable Development Goals (SDG-12 and SDG-13) along with targets for the world to achieve.

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<thead>
<tr>
<th>UN’s Sustainable Development Goals (SDG): Global goals</th>
<th>SDG-12: Sustainable Consumption and Production: Ensure sustainable consumption and production patterns</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDG 12: Sustainable Consumption and Production</td>
<td>12.1 Implement the 10-year framework of programmes on sustainable consumption and production, all countries taking action, with developed countries taking the lead, taking into account the development and capabilities of developing countries</td>
</tr>
<tr>
<td></td>
<td>12.2 By 2030, achieve the sustainable management and efficient use of natural resources</td>
</tr>
<tr>
<td></td>
<td>12.3 By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production, supply chain, including post-harvest losses.</td>
</tr>
<tr>
<td></td>
<td>12.4 By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment</td>
</tr>
<tr>
<td></td>
<td>12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse</td>
</tr>
<tr>
<td></td>
<td>12.6 Encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle</td>
</tr>
<tr>
<td></td>
<td>12.7 Promote public procurement practices that are sustainable, in accordance with national policies and priorities</td>
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<tr>
<td></td>
<td>12.8 By 2030, ensure that people everywhere have the relevant information and awareness for sustainable development and lifestyles in harmony with nature</td>
</tr>
<tr>
<td></td>
<td>12.9 Support developing countries to strengthen their scientific and technological capacity to move towards more sustainable patterns of consumption and production</td>
</tr>
<tr>
<td></td>
<td>12.10 Develop and implement tools to monitor sustainable development impacts for sustainable tourism that creates jobs and promotes local culture and products</td>
</tr>
<tr>
<td></td>
<td>12.11 Rationalize inefficient fossil-fuel subsidies that encourage wasteful consumption by removing market distortions, in accordance with national circumstances, including by restructuring taxation and phasing out those harmful subsidies, where they exist, to reflect their environmental impacts, taking fully into account the specific needs and conditions of developing countries and minimizing the possible adverse impacts on their development in a manner that protects the poor and the affected communities</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
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<th>SDG 13-Climate action: Take urgent action to combat climate change and its impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.1</td>
<td>Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries</td>
</tr>
<tr>
<td>13.2</td>
<td>Integrate climate change measures into national policies, strategies and planning</td>
</tr>
<tr>
<td>13.3</td>
<td>Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning</td>
</tr>
<tr>
<td>13.4</td>
<td>Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly $100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalise the Green Climate Fund through its capitalization as soon as possible</td>
</tr>
<tr>
<td>13.5</td>
<td>Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities</td>
</tr>
</tbody>
</table>
Overview of UN’s SDG-12 and SDG-13

Following table provides overview of United Nations Sustainable Development Goals (SDG-12 and SDG-13) along with targets for the world to achieve.

| Government departments shall develop and promote incentive schemes with respect to performance of those businesses who are voluntarily participating in disclosures of their environmental, social and governance indicators |
| Businesses shall voluntarily capture and disclose their performance on environmental, social and governance aspects. Businesses shall develop actions and build their teams/stakeholders capacities to achieve those actions and to balance positive and negative impacts on their balance sheet. |

Conclusion:

Individuals shall strive hard to become champions and agents of change to add value the sustainable development of their employers and Nation at large.

Think, Strategise, Measure and Improve your performance indicators for the benefit of all.

Chetankumar Sangole
Head – Sustainability Desk, MCCIA
+91 20 2570 9241
chetankumars@mcciapune.com

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Experience of a ZED Certified Member of MCCIA

Ms. Manasi Bidkar
-Director, Melux Control Gears Pvt. Ltd.

1) BACKGROUND : My organization Melux Control Gears Pvt. Ltd. is engaged in design development and manufacturing of LED drivers, SMPS under our registered brand ‘MELCON’. Since 2005, our organization is ISO certified. As I am associated with MCCIA, during some interaction I had got some information on ZED certification scheme and related benefits. Then I visited the ZED site, registered and secured details. This scheme is launched by Govt. of India in 2016, targeting 22,222 MSME’s in first phase. This certification is for Manufacturing NIC sector to develop and implement ‘Z’ culture. ZED is Zero Defect Zero Effect i.e Zero defect – Focus to customer, zero waste. Zero Effect – Focus on society, environment, air pollution, liquid, solid waste, zero waste of natural recourses.

2) ZED Flow : After completion of login & registration I started searching more information & studied various related parameters. We can write down them in flow chart as below :-
   1) Online Registration : This is simple online user registration.
   2) Online Self-Assessment (OSA): Here our application will be self-assessed by existing state of system & process of manufacturing unit on ZED scale through online module. Nominal payment after registration done.
   3) Desktop Assessment (DA): Online self-assessment done by applicant with evidences will be evaluated by DA who will advise us to move further for site assessment.Here we have to pay fees now it is subsidized for smms.
   4) Site Assessment (SA): This is physical site assessment of our manufacturing unit by certified ZED assessor. Total 2 auditors and 2 day’s audit span.
   5) Rating – Certification – Depending on level we had achieved ,we get the rating & certification.
   6) Gap Analysis : We get detail report for each main & sub parameter with gap analysis after site assessment.
   7) Re assessment: Re-assessment is done after 2 years. Again we have to select parameters then online assessment and site assessment.
   3) Parameters : There are 50 parameters for assessment & rating, out of which 20 are compulsory & minimum 10 are from optional. There are Sub question in each main parameters with 5 Levels. Parameters touch each & every section in our manufacturing unit like manufacturing capability, Design capability, quality, environmental, safety assurance, people training, development, standardization, measurement system for quality, improvement plan, legal compliances, vendor development, evaluation rating, customer satisfaction, on time delivery, inventory control, production target plans etc.Expected statistical data for all parameters.

   4) Audit : We have shown evidences for each and every parameter at the time of audit. There were total 4 auditors out of which 2 were main auditors and 2 were observers from QCI to ensure whether audit processes are in line. Audit span was for 2 days. Auditors taken photocopy of each & every evidence we showed at the time of audit and they upload it immediately. So process is not only fact finding, but also recording and instant uploading. Process is little bit tough. They check all data, statistical data for last 3 years. After audit and parameter evaluation they put this data for rating and certification committee.

5) Rating & Certificate : Rating is based on weighted and average level. We get detailed DA report per parameter rated audit is taken by auditor keeping in front DA report. After site assessment all data is forwarded to rating committee. According to level & whatever audit finding for each parameters we get rating for each parameter & average rating.

   Rating Range : 2.2-2.5 Bronze, 2.5-3 Silver, 3.5-4.0 Diamond, 4-5 Platinum. We get result after 15-20 days after site audit.

6) Benefits : We have subsidies in bank interest rate, state govt. gives some subsidies to ZED certified companies. Internal benefits are – reducing effect on environment, global competitiveness, visibility and brand recognition.

7) State wise : Till now there are total 211 ZED certified companies in India. As audit process & checking is very stringent many companies go for re-auditing so list of ZED certified companies is small. State wise count of ZED certified msme is as follows:
   Andhara pradesh - 3
   Tripura 4
   Uttar pradesh 9
   Maharashatra 36
   Haryana 21
   Rajasthan 4
   J and K 3
   Goa 2
   MP 4
   Gujar 36
   Maharashtra 36
   Punjab 17
   Himachal 5
   Telangana 2
   Tamilnadu 29
   Jharkhand 2

We have completed this process within two months as we have basic system established and implemented in our company. It may take more time for implementation. Audit experience was very different than ISO audit experience. Here they check each and every parameter, its level of implementation. The auditors simply upload this data, so we have to keep all data ready. They take each function audit including operators on production line.

During this journey we learnt many things like 7 type of wastes, Control plan, FMEA, PFMEA, SPC chart, Dash Board, MTTR ,MTBF process Cp&Cpk, graphs & analysis. Auditors are totally focused on audit they don’t even waste single minute in other activity. In this whole journey Dr. Sanjeevani Gogawale our ZED master trainer guided us and supported us. In this process we came to know the extent of waste, scrap, rejection. Our people also put the graphs in PPM level, total mindset of people gets changed because of ZED.

Our team is also motivated by the training and all Processes. After 15 days of the audit, we come to know that our organization is ZED certified & listed in ZED certified MSME.

To conclude let me quote the feedback from our Zed master trainer Dr.Sanjeevani Gogawale

“I will appreciate the timely planning, leadership drive and commitment of both of you as a success factors for the achievement.”

So thanks to our team, buyers, suppliers, and master trainers and MCCIA for great support.

Manasi Bidkar
Email : manasi@melconindia.com
Zero Defect Zero Effect (ZED) - Roadmap towards global competitiveness

Dr. Sanjeevani Gogawale & Sacchidanand

As an Engineering student I was told to go to small scale industries to learn. Logically the most innovative, effective engineering and management is learnt from MSMEs. I owe the learning opportunities since 1982 till date I got from MSMEs, in India and Globally not only during my internships, but also when I did trainings & audits with DNV, and thereafter as a QCI registered trainer, assessor, auditor, consultant till date. MSME capacity building is my humble contribution back to society. ZED is the most effective scheme and method I have ever used.

Is ZED only for MSMEs? No, it is for all. MSME are supported for capacity building, while Large Scale Industries can minimise their audits and appraisal costs as well as supplier development efforts and costs, by getting their supplier base registered for ZED. Organisations like Mahindra have started their supplier sensitisation and other OEMs are taking up this initiative step by step. The supplier chain development is a major & most effective way of economic engine development through MSME, along with schemes benefits. The indirect control of QES, like incoming goods and services impacts the end product, so most of the Large setup, conduct supplier, subcontractors audits. The number of customers demanding number of certifications and their protocols, create lot of confusions and repetition, so even for such MSME and large organisation ZED can be a much-awaited solution.

The major problem in MSME is non-effectiveness and nonefficiency as the try and struggle for survival against all odds. The contribution in economic development is hampered due to uncontrolled wastages. If any effectiveness and efficiency drive is implemented on ZED guidelines this would result in employment generation and economic development for sure, so all of us should take this drive seriously. India with their young manpower has all the potential to be global manufacturing hub, if the reliability and quality is taken care of. At the same time, we should aim at sustainable development, with energy and environment and safety in focus. Means enhance the competitiveness of Indian MSMEs and to ensure Zero Defect practices in their manufacturing and also ensure Zero Effect on the environment while manufacturing This Model. Also enjoys benefits of the new scheme viz. “Financial Support to MSMEs in ZED Certification. ZED is a unique & holistic certification model for MSMEs, that will assess, rate and handhold them, based on 50 well defined parameters of Production, Design, Quality, Safety,
Environment etc., with special focus on the Defence sector. The tangible ladder of moveMSME up in ZED Certification (Bronze-Silver-Gold-Diamond-Platinum) makes it very interesting. Although based on elements of the best standards and practices like ISO 9001, ISO 14001, Lean Management, SS, Kaizen, Six Sigma, IPR, Energy Management, Supply Chain Management etc. ZED is carefully developed taking care of MSME environment in Min. Thus, The ZED maturity assessment model is one of the most comprehensive assessment models for MSME. The limitation in standardising the certification process, the professional skills and deployment variations are controlled in ZED end to end use of technology for the entire process of ZED assessment and hardholding. The site assessment is conducted by the assessors using a secured ‘ZED app’ on their mobile phones which has embedded features like ‘geo-tagging & geo-stamping’ making the process transparent and fool-proof.

The assessment provides a detailed report on every parameter on which the assessment is made thereby providing an opportunity to the enterprise to identify strengths and gaps for focused improvement to move up the ladder in the journey to become world class.

Some of my clients fully agree with ZED deployment they have achieved, Superior quality, reduced rejections & higher revenues through step by step focused planning & monitoring & improvisations. Organisations like BEL and Mahindra consider ZED as tool for credible vendor database for large enterprises, without multiple certification pressures. The promotion cost and effectiveness with existing media and methods like exhibition participation has limited impact, whereas, ZED has enhanced visibility and brand recognition, being on the ZED web page of QCI, making it visible as preferred associate globally. The capacity building and employee development drives synchronised with the best practices using e learning portal & newsletters and knowledge sharing forums through ZED is additional bonus for MSMEs. All this with responsive care and Reduced negative impact on environment, by Goal Zero commitment, ensures ZED is the ultimate choice.

Along with, technical, marketing and financial benefits, ZED is a most effective methodology for cultural change and motivating the employees.

All other certifications are like go -and differed go gauges (never - no go) so, auditee does not know where organisation stands and what next. The subjectivity, professionalism, auditing skills hamper the learning and improvement processes.

In ZED the assessors are trained and calibrated to follow technology driven rating process, so the subjectivity is minimised. When I personally got involved in this model, I thought it is simplified IORS – a dedicated excellence model by DRDV. Soon I realised this is beyond quality, it not only includes all aspect of enablers and results but also all critical parameters for capacity building in a methodical way. It is a simple 4 step model with first two steps free registration, and free self-assessment, after that desk top review and Site assessment, to get the awarded.

I am asked - In spite of so many incentives and benefits of the scheme, why this is not popular? and till date why only 100 and odd organisations have gone for award? When I started discussing it with some known contacts, I got various responses such as – My MR is working on it… since past two years… I tried for it, but it is too much of paperwork, we have given up… We will take it up by 2020… Maharashtra state has no benefits … If it is mandatory like ISO 9001 for tenders and otherwise only then we will do it, why spend money and efforts otherwise… We are financially strong independent organisation, why spend time for one more audit, globally QES is adequate…

I am sure some of them are correct but on wrong assumptions. MR is not the right authority to know and work for your cultural fine tuning… Sparing 2-3 hours and getting it done is easy- Do it yourself, do not delegate. The owner and all decision makers sitting for 2 hours can complete first three steps, it does not take years, I have many examples where in we have along with the owner completed the same, in 2-3 hours. It needs no paper work, but is evidence driven, even audio and video works instructions and soft records are acceptable in the digitised form. Delaying an opportunity is delaying your success. May be even you end up in losing it permanently as only first 22222 MSME are getting subsidised payment benefits.

Individuals working for schemes are penny wise. The point is if we start any change the schemes may facilitate and help it, but the commitment cannot substitute the benefits. With or without state benefits, we should work. Implementation is entirely the owners or top management’s commitment. Process implementation is the benefit beyond any external benefit. One micro organisation with size of 7 individual and the top man, who is a technocrat, visionary and committed, told me, he cannot afford the 1,65,000/- hardholding / consultancy charges, but if there is a way out for subsidized need driven support like specific training he wants to go for it. This is a rational approach, instead of saying the problem is too big, find a way out. Sort out what you need, then it may not appear so terrifying. Organisations that are certified will assure you, it is not very difficult.

Typical excuses are - I have substandard team, lot of operational issues and so do not have time for ZED. If one has substandard people, all the more reason one needs a strong system. The top management has to select appropriate 30 elements, for which any one of us or even I will extend support, then make 30 folders and start filling up all by the documents and records organisation already has, and soon almost 60-90 percent problem is solved. Allocate the 30 folders to the process owners to sustain and focus on remaining gaps, makes it simple. Almost any 9001-certified organisation easily reaches bronze level.

For remaining, either go to e learning portal or google it, or hire a trainer, it is focused and not very costly as anticipated. No matter whether Maharashtra State is offering any benefits, or it is mandatory for tenders or you are required no external funds, for sure implementation means a direction setting for your organisation which is SWOT driven, for achieving the global competitiveness.

It helps to be systematic, it means little extra efforts, it is like setting a system driven culture of sharpening and validating your tools, you may have to spend time on it, but it saves lot of non-effective, non-efficient wasteful efforts.

Dr. Sanjeevani S. Gogawale  
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Research Intern  
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A Stakeholder Consultation on RCEP - Regional Comprehensive Economic Partnership

MCCIA, MVIRDC World Trade Center Mumbai, Indian Council for Research on International Economic Relations (ICRIER), New Delhi and World Trade Center Pune had jointly organised a ‘Stakeholder Consultation on RCEP’ with companies having business interest in Regional Comprehensive Economic Partnership (RCEP) countries.

About RCEP
RCEP is a Free Trade Agreement (FTA) being negotiated involving 16 countries namely ten countries of ASEAN (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam) and their six FTA partners i.e. Australia, China, India, Japan, New Zealand and South Korea. The negotiations cover sectors such as agriculture, industrial products, raw materials, intermediates, financial services, professional services and IT services. The purpose of this consultation was to provide inputs to the Department of Commerce for their ongoing RCEP negotiations in goods and services.

Mr. Ajay Mehta, Senior Member of MCCIA’s Executive Committee addressed the participants and shared his perspectives about the imperatives of Agreements such as RCEP. He stated that there could be certain sectors within manufacturing in India which require some level of Government Protection for a few years after the Agreement comes into force. In terms of Agriculture, greater opening up of the export markets and understanding of international standards would benefit the sector. Some of the work needs to be at our infrastructure levels such as developing capacities for storage, handling, processing etc. In terms of domestic manufacturing the segment currently attracts higher level of input costs such as power to subsidise costs of agriculture power tariff due to socio economic and other considerations. In terms of Services sector, India’s competence in IT and other services hold greater opportunities in RCEP Countries. However the real gains from RCEP could come when our Agriculture sector and Industry segments (Manufacturing and Services) utilizes the Agreement diligently to explore opportunities for using domestic / imported inputs and utilizing the already developed capabilities for increasing our share in international markets.

On this occasion, Mr. Sudhanwa Kopardekar-Director, MCCIA welcomed the Speakers and participants. Mr. Anil Velde-Deputy Director, MVIRDC-World Trade Centre-Mumbai made the Opening Remarks. Dr. Saon Ray-Senior Fellow, Indian Council for Research on International Economic Relations (ICRIER) presented the Overview of the RCEP, its importance, learnings from past trade agreements. Mr. Anand Mohgaonkar- Group Head, Customs and Trade Compliance – Cummins and Dr. Shrikant Kamat - Leader - Customs & International Trade, IP Protection Laws, Partner Indirect Tax, BDO India LLP also made presentations about the key concerns relating to RCEP in Indian context. Several participants expressed their views on this occasion about the need to guard against possible flood in imports post RCEP implementation. Dr. Saon Ray summed up the discussions. Mr. Nikhil Oswal, representing World Trade Centre-Pune proposed a Vote of Thanks.

Re-inventing Organization

Maharatta Chamber of Commerce, Industries and Agriculture (MCCIA) jointly with Initiatives of Change for Business (ICB) had organised a one day program on “Reinventing Organizations” on 25th May 2019. The objective of this program was to raise awareness among the MSME sector on topics that have a greater impact on sustaining their business, beyond profitability.

Mr. Pradeep Bhargava, President, MCCIA delivered the Keynote Address on this occasion. According to him, what is most important for sustainability was a business endowed with Competence, yet balanced with the Character as espoused in a Values and Ethics Mindset. He spoke about how Self Awareness and treating human beings with dignity and respect were essential to develop a change of Mindset. He highlighted that focus on CHANGE was very important –

Change of thought process, change in the way we treat and relate to the people who work for and with us. He stressed the idea of this program was to understand the approach of ICB towards Values, Ethics and Integrity in today’s businesses, however small they may be.
Mr. Deepak Karandikar-Vice President, MCCIA stated that one of the most significant challenges which businesses in the MSME sector face is managing Human Resources effectively. His opinion was that the human resource function in businesses was ignored by design, rather than by default hence sub-optimally leveraged.

Dr. Ravindra Rao, the residential Director of Asia Plateau, Panchgani, Trustee and Executive Council member of IoFC then addressed the audience. He introduced delegates to the ideology and philosophy of Initiatives of Change, its genesis, history, objectives & its activities. In short he stated that IoFC had involved itself in the business of making this world a better place. He mentioned how important it is to start changing ‘oneself’ before expecting anything or anybody around us to change. He highlighted the importance of building the habit of listening to one’s “Inner Voice” and committing to the will of cleaning up one’s life based on four absolute Moral Standards – Purity, Honestly, Unselfishness and Love (P.H.U.L).

Mr. Mohan Nair, Chairman of the ICB, Pune chapter conducted a case study based discussion with the participants. Mr. Sudhir Gogate, Executive Director of IofC, also a Trustee of IoFC then made a presentation on the topic of ‘Reinventing Organizations’. His talk was based on the key lessons for business from the book authored by Frederic Laloux, bearing the same title. He spoke on the concepts of Self Management, Wholeness (Humanisation) and Evolutionary purpose. He introduced everyone to the concept of a TEAL Organization (self-managed, optimally humanised, purpose oriented & evolutionary) and its marvelous benefits. He mentioned that in TEAL organizations, a team member is motivated to perform; being trusted, nurtured, enabled, empowered and complimented. He further explained that the environment is ‘happy’ environment where people feel safe, secure, excited, rewarded, accomplished, self driven and unafraid of failing because there is always a safety net for genuine efforts. He explained ‘Why’ it was necessary for any business to aspire to develop into a TEAL organization & ‘How’ to achieve this goal.

In the concluding session, Mr. Bhargava informed all the participants that MCCIA is exploring the possibility of providing support and hand-holding to interested MSMEs in adopting the TEAL Model in collaboration with ICB.

Interaction with Bank of Maharashtra Officials at Program on Finance for MSME

We had organised an Interactive Session on 29th May 2019 with Mr. Shashikant Mukim-Chief Manager, Chaturshringi Branch-Bank of Maharashtra to inform MSMEs about the various financing schemes which are offered by Bank of Maharashtra. Fifteen participants benefitted from the session. On this occasion Ms. Manjari Desai-Director, MCCIA welcomed the participants and briefed about the Chamber’s Innovation Facilitation Centre set up for promotion of financing schemes of various Banks for the benefit of MSMEs. Mr. Shankar Kumar, Technical Advisor-GIZ explained about the collaboration between MCCIA and GIZ in promotion of Finance for MSMEs.

Mr. Shashikant Mukim briefed about various schemes offered by Bank of Maharashtra for the MSMEs. He said that they have a mandate for 40% lending to the priority sector which includes MSMEs. He explained that no collaterals are asked for proposals upto Rs. 2 crores under all schemes. Following are the schemes presented by Mr. Mukim-

a. Project Loan Scheme
b. Machinery/Equipment Loan
c. Professional Loan for Doctors for purchase of Clinical equipments.
d. Loan for Transport Operators
e. Cash Credit Scheme
f. GST Loan

On this occasion, Ms. Sheetal Are, from DeAsra Foundation made a presentation on their services and the online tool developed by DeAsra to assess the business health which could help in increasing the profits.

Interactive session on EMF Radiations from Mobile Towers: Myths and Reality

17th May is celebrated every year across the globe as World Telecom & Information Society Day. On this occasion, Electronics Committee of MCCIA, jointly with DEMA and HAMs Pune organised an interactive session. We had invited Mr. Vineet Mathur, Deputy Director General (Compliance), Department of Telecom, Ministry of Communications to speak on the myths and realities associated with EMF radiation from mobile towers. Mr. Kendurkar spoke about the topic from compliance perspective. Also on the panel were Dr. Ranjit Deshmukh, Neurosurgeon (Sahyadari Hospital) and Dr. Sanjay MH, Radio Oncologist (Sahyadari Hospital & Ruby Hall). Both the medical experts busted the myths and unscientific information about radiation from mobile towers which unduly alarms the general public. 38 industry representatives participated in this session.
Unselfishness and Love (P.H.U.L).

expecting anything or anybody around us to change it is important to start changing ‘oneself’ before short he stated that IofC had involved itself in the business of Change, its genesis, history, objectives & its activities. In delegates to the ideology and philosophy of Initiatives of Plateau, Panchgani, Trustee and Executive Council member hence sub-optimally leveraged.

in businesses was ignored by design, rather than by default in the MSME sector face is managing Human Resources that one of the most significant challenges which businesses representatives participated in this session.

they have a mandate for 40% lending to the priority sector offered by Bank of Maharashtra for the MSMEs. He said that GIZ explained about the collaboration between MCCIA and benefit of MSMEs. Mr. Shankar Kumar, Technical Advisor-

Hall). Both the medical experts busted the myths and 38 industry unscientific information about radiation from mobile towers. Mr. Kendurkar spoke about the myths associated with EMF and realities Mr.Vineet Mathur, Deputy Director General (Compliance),

Sanjay MH, Radio Oncologist (Sahyadari Hospital & Ruby Ranjit Deshmukh, Neurosurgeon (Sahyadari Hospital) and Dr topic from compliance perspective. Also on the panel were Dr panel.

Radiation from mobile towers. Mr. Kendurkar spoke about the myths associated with EMF and realities Mr. Vineet Mathur, Deputy Director General (Compliance),

MCCIA Members

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