

THE SUSTAINABLE WORKPLACES

NOKIA & Lindström as a case study

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Abstract <p>The main objective of this study was to Emphasis and Raise the significance, acceptability and practice of Sustainability in our daily routines during the office hours at workplaces. As most of people spent their day time in offices, it has become ideal place to teach them about environmental issues. The research has addressed three main aspects of Sustainability: Social, Economical and Environmental. Biggest companies in Finland: NOKIA and Lindström in the field of technology and services have been used as a case study.</p> <p>Research method used for thesis is Qualitative analysis. Interviews of two main officers from both the selected companies were conducted. Questionnaire was designed in such a way that very selective and focused questions should be asked in order to get adequate, compact yet sufficiently detailed and accurate information can be obtained on the benefits, problems and other issues related with the studies of Sustainability.</p> <p>The conclusion of this research is a list of definite rules which are mandatory for an organization to follow, if they want to be <i>Sustainable Workplace</i>. Different organizations may offer their own additional criteria in respect to culture and political differences. There is a need to implement them as a rule/law inside the organization in order to make it <i>must follow</i> activity for all employees regardless of their designation or other status.</p>		
Keywords Brutland Definition, Sustainable Workplaces, Process/Cycle of Sustainability, Greenality and Carbon Foot Prints		
Miscellaneous		

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1 INTRODUCTION

Our world consists of two basic systems: Natural and man-made. Humans are living on this planet for around 200 000 years with persistent evolution. Since the birth of mankind acquisition of survival has been biggest challenge for its existence and maintaining relationship between the two systems mentioned earlier. With the passage of time it has been getting crucial and critical to keep the balance and justice between environment and growing needs. For this purpose, the usage of natural resources started.

In the meanwhile, mankind has been changing its environment via direct or indirect means. The industrial revolution during 18th century took the nations by storm to acquire economic strength by overnight and leaving no stone unturned to announce themselves as “*Superpower*”. Consequently, after two centuries researchers found stunning and shocking results in the form of graphs, percentages and numbers; appeared after analyzing the studies on environment. This has been clear result and indication that how quickly we are losing our clean environment around us.

Last year, author had a golden opportunity to participate as a volunteer in conference focused on “*Environmental Issues*” being organized by University of Applied Science (*JAMK*) in collaboration with local entrepreneurs. The scale of education and focus during debates and discussions was very high, immense, meaningful by the participants/scholars. One of the speakers was Mr. Al Gore, former United States Vice President well known and famous for his documentary “*An Inconvenient Truth*” which was awarded 02 Academy Awards 2006 and gained adequate popularity globally.

Jacobson further adds about this movie that this movie adds value and voice to crisis and impacts strongly on all of us. We must share this message among our friends, family and relatives. Even our smallest steps can make huge changes in global warming. It is not a political issue rather a practical and realistic proposal. If we want our children to live on earth we need to start taking necessary steps from today (Jacobson, *An Inconvenient Truth*, 2006). After attending the conference author had a clear topic in mind for research: “*Sustainability*” and was convinced to carry it as thesis.

Besides, “*Sustainable Development*” had been an important course of study module of the author which became vital source of motivation to pursue environmental issues. For this purpose, author initiated search of the companies which are practicing sustainability for a longer period of time in their business so that they could be selected as case studies. While reading annual reports on the websites of NOKIA & Lindström it became clear that they have:-

- i. adequate material and right approach towards environmental aspects of modern world.
- ii. They are following legislation strictly in their offices globally and locally.
- iii. They emphasize employees to learn from internal communication system about the new updates on particular issues regarding sustainability.
- iv. Environmental systems are followed and updated on annual basis in their workplaces.

This research is an attempt to raise the significance of sustainability and environmental changes of world due to our own actions either directly or indirectly. While as, author is researching on improvement of environment at workplaces particularly. Recently, businesses are focusing on green and eco-friendly products, at the same time being globalized which brings contradiction in their acts. Because different parts of world are based on different cultures, therefore, challenges are much stronger than expected. In different continents, practices of businesses are different like in Africa and Asia where people are not familiar/educated with *Sustainability* might not follow/accept it. Sometimes, common people have notion that environmental friendly products have hidden prices. That is why big firms are facing many inner and outer challenges based on geographical and cultural factors.

The natural disasters occurred during last century brought great deal of motivation for researchers not only to prevent them in future, also focusing on their causes. Our societies are becoming modernized and technology friendly by adopting un-sustainable practices with severe impacts on environment. The concept of *Global Village* has brought its own advantages and challenges for countries. If companies wish to approach other markets with their *Environmental Friendly* products then threats of lesser buyers arise.

It is essential to mention that environment is not the only important issue; its stake holders like economy and society are equally significant.

2 Sustainability

The best definition quoted internationally for Sustainability is called “Bruntland Definition” was released in Report of the World Commission on Environment and Development, 1987:

Meeting the needs of the present without compromising the ability of future generations to meet their own needs.

During the twentieth century success and progress of mankind could be measured easily by analyzing its systems like Economics, Politics, Agriculture, Education, Culture, Science and Technology. At the same time field of study, emerging rapidly is “*human genetic sciences*”. We cannot deny the miracle of science by increasing life expectancy upto 20% around the world during the last century. In spite of this researchers, scientists, environmentalists and scholars criticized that our social, environmental and economic problems are increasing at a high pace and leading towards bad to worse scenarios.

People are dying from hunger, water, poverty and without any medical care. Earthquakes, tsunamis, hurricanes, glaciers meltdown, global warming, carbon foot prints and natural twisters all are visible and clear indicators of our environmental disasters being caused by human development. Usage of natural resources like fossil fuels, oils, mined minerals and metals are causing danger of environmental threats and damages of ecosystem.

Another very clear indicator could be vanishing and endangered species from planet that have been dying due to lack of natural resources for their existence in the natural system largely caused by human activity in the sphere of earth. The fourth report by the Inter-Governmental Panel on Climate Change (IPCC) stated that it was very likely that global warming was due to human activity (IPCC, 2007).

On the account of above mentioned reasons, World Commission on Environment and Development, United Nations, 1987 published an influential

report “*Our Common Future*” (well known as Brutland Report) under the Chairmanship of Norwegian Prime Minister Dr Gro Harlem Brutland. This report raised three essential factors which are soul of Sustainability: Society, Economy and Environment. After this historical step, all over the world discussions and campaigns blew out.

The arena to save our planet for upcoming generation was set out. On behalf of public, governments and authorities legislated rules in order to control productions, wastes and respective environmental issues. Futuristic approach in politics grew rapidly on the pressure of NGOs.

Author wanted to research particularly on *Workplaces* either they can be *Sustainable* or not and at the moment focus point is companies running small businesses within 40-50 number of employees. Since bigger companies have more vast area to cover under their businesses, their requirements also grow in same way.

Both the companies being selected for thesis were very much profound to elaborate their efforts and implementation through their products and law enforcement inside company. They have added their value in innovative concepts on environment by accepting them and launching meaningful changes in cycling and waste management processes. Their annual budgets and reports show us clear indications about spending on green or eco-friendly practices.

2.1 Process/Cycle of Sustainability

According to Belz and Peattie (2009, 12) researchers divided Sustainability into two types:-

- i. Hard Sustainability (it focuses on preservation of environmental quality by protecting environment from economic activity)
- ii. Soft Sustainability (it focuses on ensuring that economic development could be maintained by keeping in within environmental and social limits).

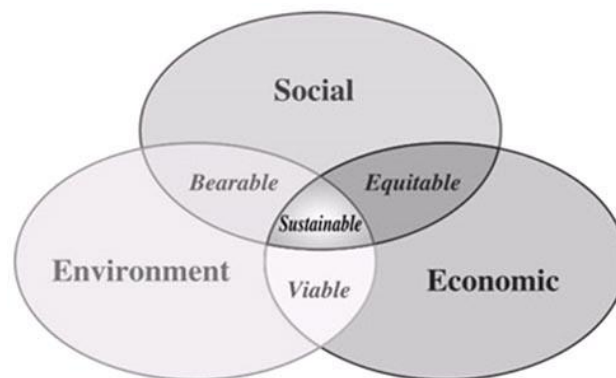


Figure 1 Interrelating life cycles. Adapted from A.J.G. Silvius, J.Van der Brink and A.Köhler, "Views on Sustainable project management".

Maltzman and Shirley (2011, 20) state that "perfect cycle of sustainability utilizes everything it produces and in effect has zero emissions, zero waste". Nature is our best teacher, if we analyze natural systems perfection seems being achieved. Even it has provided us examples of earthworms or birds and show us how they consume, make, produce or utilize natural resources without harming environment around them. On the other hand, there are hostile and complex examples available as well in the form of *man-made systems* focusing on increasing their productions with their harmful effects.

Therefore, it is vital aspect that we can reduce impacts and effects on environment by controlling our processes through hard and fast rules. The idea of creating zero emissions seems impossible at the moment only nature capability to achieve this target.

McDonald's has presented an exceptional example of their entire sustainable process describing their five focus areas of Nutrition and well-being, sustainable supply chain, environmental sustainability, employee experience and community (McDonald's, 2012).

Below picture describes their main processes:-

MCDONALD'S PRIORITIES: Achieving Sustainable Success


Figure 2 Mcdonald's Priorities: Achieving Successful Success.

2.2 Social Impacts

Recently, modern societies are becoming either polarized or globalized. That is why our needs are vital cause of change in our environment. According to a policy report on Social Sustainable Development by Vancouver city council On April 23, 2002 adopted following comprehensive definition:

“For a community to function and be sustainable, the basic needs of its residents must be met. A socially sustainable community must have the ability to maintain and build on its own resources and have the resiliency to prevent and/or address problems in the future”. City of Vancouver, 2002.

In particular, at the workplaces, there could be several factors for consideration. Below mentioned picture is clear view how social activities can be practiced in society. Its complexity shows the need of better understanding of sustainability among main stakeholders.

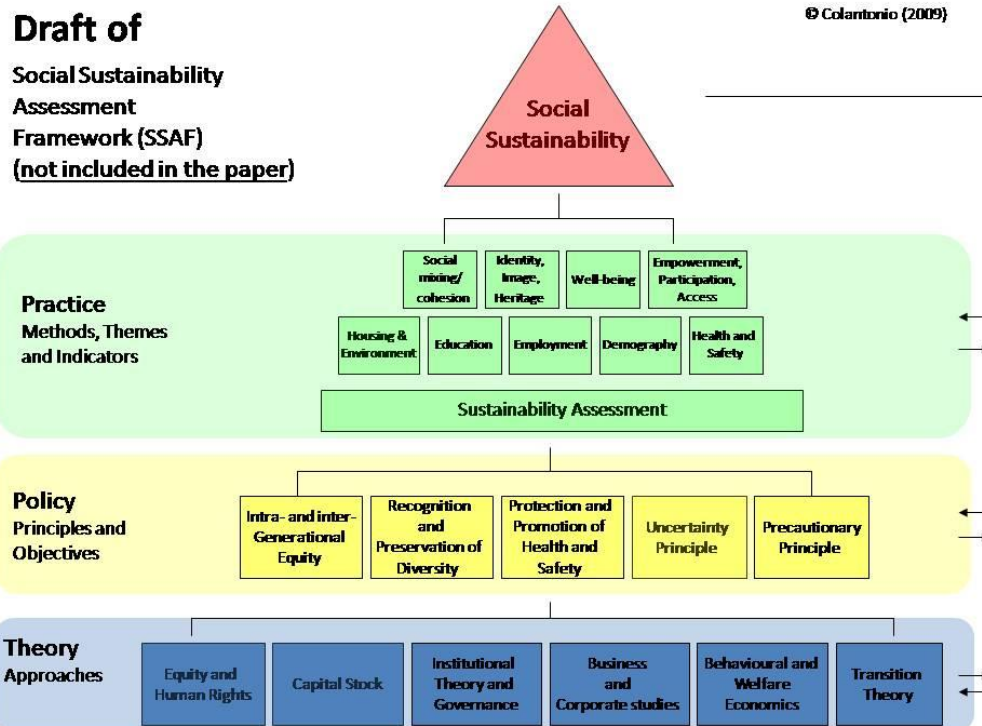


Figure 3 Social Sustainability Assessment Framework (SSAF) by Dr Andrea Colantonio (2009), Oxford Institute for Sustainable Development (OISD), Oxford Brookes University, United Kingdom

After analyzing above mentioned framework, we can further add that in order to take the next step to believing that we have the capacity to move to a sustainable way of living and working it is needed to analyze and understand its possibility. In the same way, it has already been done by others that helped them move from something worse to something better which should be followed by those who are still unfamiliar with it (Richard and Cooper et al. 2008, 39).

2.3 Environmental Factors

As research shows the major problem drivers and indicators towards the Environmental Pollution and distortion could be :-

- i. Climate Change
- ii. Population Increase
- iii. Rapidly Developing Nations and Resource Depletion
- iv. Environmental Degradation and Loss of Biodiversity

The Environmental Protection Agency (EPA) was established in 1970, in response to a growing concern about the need for cleaner water, land and air in USA. EPA's mission is "to protect human health and environment. Since 1970, EPA has been working for a cleaner, healthier environment for the American people". Prior to that wetlands were being filled at an alarming rate; air quality was unhealthy, rivers were contaminated with heavy metals, polyvinyl chloride and sewage wastes, endangering not only the rivers, streams, estuaries and oceans but drinking water supplies as well. In this effort EPA develops and enforces powers over legislation designed to protect the environment.

The European Environment Agency (EEA) is a collection of the :-

- i. European Union Countries (27)
- ii. Iceland, Liechtenstein, Norway, Switzerland and Turkey
- iii. Six West Balkan Countries (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Serbia are cooperating countries)

EEA works closely together with national focal points, typically national environment agencies or environment ministries (Maltzman and Shirley et al 2011, 11).

ISO 14000, also known as the Global Green Standards, is a set of standards developed by the International Organization for Standardization. "It gives the *generic requirements* for an environmental management systems". Most environmental management systems (EMSs) are built on the age-old plan-do-check-act cycle (see below Figure 5). Build into that philosophy is the principle that companies will continually improve their processes with regard to environmental impacts. (Maltzman and Shirley et al 2011, 09).

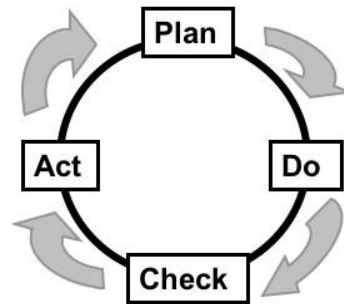


Figure 4 PDCA Cycle.

2.4 Financial Aspects

Most of the businesses have intention that accepting changes in their laws for environmental issues could cause deficits in annual accountability in the form of extra expenditures. That is why avoidance of new challenges happens and it is seen as a major hurdle in recent times. In large organizations key figure managers or decision makers must not be belonging to group of *conservatives* as they might not think about future aspects. Ultimately it is a goal which can be achieved by analyzing past and sacrificing for future generations.

The most challenging questions refer to welfare impacts of the environment in the future. Some decisions are based on present preferences despite the fact that they will affect future generations of consumers whose preferences are not known. For instance, land use decisions, particularly those that determine proportions between built-up areas and natural ecosystems, are made without knowledge of whether they are consistent with the future generation's preferences.

Economists ponder whether the environment is a luxury good, that is, a good for which demand grows faster than consumer's income.

There is some evidence indicating that indeed this might be the case. Nevertheless, a fully satisfactory and universal answer will remain unknown because we cannot predict the preferences of future generations (Hák, Moldan, Dahl. et al 2007, 100).

3 SUSTAINABILITY AT WORKPLACES

In the world of today economies are turning their businesses into technological formats (*IT systems*). This approach has reduced the amount of manual workers in industries and entire work has been handed over to knowledge workers (*experts, specialists and professionals*). Therefore, any company pursuing to reduce their environmental effects will surely look inside their own structure and processes that might require necessary actions for improvement. Most of the times general processes could be energy consumption, ICT requirements, paper usages, recycling, cleaning and waste managemetns (Calder, Alan. et al 2009, 01).

We must accept that safety and security with perfect working environment adds value to both company and its employees. Inside the premises any unpleasant incidence happens can change the image of company in the minds of people. Therefore, there is no room for taking it unseriously (Norsk Hydro Pvt. Ltd, 2012).

Fortunately, the home is not a place where sustainable behavior can be discussed and performed. Mostly, people are spending waking time in offices and it is a valuable opportunity for improving attitudes and opinions about the environment and social matters. It would be practical approach if people are trained at office and they can practice environmental matters in homes as well. Once trained employees can move to other organization and can bring ultimate changes in different workplaces with their settled behavior for sustainability. In this process, employees must always be welcomed with their own ideas that can make effective changes. If company instructs its staff to do things in a certain way, they generally will do it, even if they might conduct it in different ways at home. (Bichard and Cooper et al. 2008, 104).

It will be serious threat if organization's culture is denying sustainability and environmental changes it means thoughts and approach of employees is not having serious attitude or might belong to conservative group of employees. According to Ajzen and Fishbein (1980) attitudes do matter, if they are shared, encouraged and confirmed by others they often result in positive actions and strengthens the relationship between attitudes and behavior. The better way

of engaging people to consider change is to present both sides of the story (Hovland et al, 1949). Cialdini (RSA, 2007) advises that often decision makers focus too much on financial and economic factors when trying to motivate others.

People always have different notions, habits and life styles; No one can change instantly, it is rather a continuous process. All the activities we do at homes are not practiced in same way during office timings. It is therefore an important issue to educate and train employees about something which is not in their routines for example sustainable activities. This may require additional resources and allocation of senior staff members.

3.1 NOKIA

Nokia is a leading innovative company in mobile technology over the last two decades in world, besides, Finland's most renowned and huge firm with operations/sales in more than 160 countries around the globe. Daily, 1.3 Billion users are engaged with their devices either to communicate, share pictures or videos and utilize innovation and technology for the smooth and steady business routines.

Besides, Nokia has strong environmental brand equity, especially amongst Nokia owners, suggesting potential for further initiatives. Energy efficiency is the most appealing environmentally friendly attribute in a mobile phone, followed by being fully recyclable and being made with environmentally friendly materials.

United Nation's Environmental Programme has confirmed that E-waste is the fastest growing waste in world and 50 million tons is generated annually. Therefore, re-cycling of mobile devices has become an integral part of businesses although people are not aware that mobiles can be recycled. Nokia has more than 6,000 collection points in 100 countries where they mobile phones of all brands and send them to approved recyclers according to safer and sustainable manner. This campaign makes NOKIA as world's largest voluntary take-back program driver. With the purchase of green

electricity since 2006 Nokia was successful to reduce CO₂ emission by 54, 500 tons.

NOKIA has been very prominent in 2011 sustainability rankings:-

Organization	Ranking in 2011
2011 DOW JONES SUSTAINABILITY INDEXES	Among 5 best scoring companies in Communications Technology category
GREENPEACE GUIDE TO GREENER ELECTRONICS	#3 for leading electronics manufacturers and #1 for mobile device manufacturers
CARBON DISCLOSURE PROJECT	One of the top IT sector companies in both performance (#5) and disclosure (#8)
FORBES WORLD'S MOST SUSTAINABLE COMPANIES	#4 most sustainable out of 100 publicly traded companies
NEWSWEEK GREEN RANKINGS	#21 out of 500 largest companies in the world
TWO TOMORROWS	#2 in Information and Communications Technology category
OEKOM INDUSTRY REPORT FOR IT COMMUNICATIONS EQUIPMENT	Oekom Prime Status (absolute best-in-class approach). A report assessing a company's social, cultural and environmental Sustainability
ENOUGH PROJECT RANKING	Among the top 5 electronics companies for progress on conflict minerals (12/2010)
FTSE4GOOD INDEX	Included since 2001

(Nokia Sustainability Report, NOKIA, 2011)

3.2 Lindström

Lindström as a Family- owned company was found in 1848 and now having operations in 21 Countries including Europe, Asia having 68 offices with approximately 2500 employees but headquarters is located in Helsinki, Finland. It achieved milestones like: 90 percent of work wear fabrics and hotel textiles with Öko-Tex 100 label, 262 million euro in consolidated turnover, 72 kWh of energy per kilo washed, 72 percent of all textile waste reused through

energy production or recycling and 5 laundries in Finland and Sweden hygiene-device textile services hold the Nordic Swan Ecolabel.

Sustainability is not a challenge but an opportunity. Their three major goals in business; Profitable growth, long term customer relationship, Responsibility and Enthusiasm and joy of learning make them distinguish and unique in the business field. Since 1991, they have ICC Business Charter for Sustainable Development, thus are committed to observe their operations towards environmental issues. Principles of the Universal Declaration of Human Rights and the Convention on the Rights of the Child by the United Nations are also adhered by Lindström. Laundry works are watched by the EN-SFS 14065 hygiene standards for hygiene and microbiological cleanliness.

Lindström without compromising its vision towards sustainability is expanding its business with their diverse areas of services. Their strategy of developing business in smaller towns results into regional development and livelihood along with spreading environmental awareness to new areas. Energy and water consumption at their operating centers has direct effect on turnovers, but debates on environmental impacts and legislation has set restrictions. In future, prices of energy, detergents, wastes, emissions and water may rise which will ultimately increase costs for services, therefore, Lindström is developing strategies to maintain its cost-efficient image.

Lesser usage of chemicals and energy increases significant financial benefits along with minor load on environment. Therefore, it is vital to measure consumptions per unit. Since, they have developed service centers at an arm's length to customers, ultimately the cost of logistics decreases at an astonishing rate (Sustainability Report, Lindström, 2011).

4 CORPORATE SOCIAL RESPONSIBILITY

Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large (WBCSD Stakeholder Dialogue on CSR, The Netherlands, Sept 6-8, 1998).

The phenomenon of CSR is sometimes interchanged with Corporate Responsibility, Corporate Citizenship, Business in society, Corporate ethics, Strategic Philanthropy and many other concepts. It is closely related with Sustainable Development as principally they have generated the idea of Sustainable Growth. There can be clear link among all these terms as are focusing on social and community well-being and environment. Now, business are not interested in numbers of their empire, attention has been transferred into “*Care for Climate*”. That is why we need to create mutual manuscripts to agree upon to reduce our footprints. Therefore, besides making profits, companies should have an eye on impacts from their side on our planet. There should be mutual understanding between business and society. They both can grow in an equal manner in real life manner. In upcoming centuries one (economy) cannot exist without the other (Environment). Every country must have initiatives for the persistent growth of necessary measures. (Polášek et al, 2010, 4-8)

For the companies there is no need to go far beyond legislations and follow hard and fast rules, only investing into human capital, environment and managing properly with other stakeholders is enough effort. When investment is made for environment it enhances competitiveness with direct effect on productivity. It is important to legislate rules in countries where still CRS is not practiced, to construct strong pathway for the sustainable practices. In many small size companies community involvement can gather attention easily, in multinational or bigger companies proper allocation of staff members can be required. Different activities for workers in the form of cooperative and participations schemes, as well as continuous participation of other stakeholders can guarantee successful implementation of a CSR System internally (EU Legislations, 2005).

In recent times, diverse group of companies have shown their highest attention for CSR with annual reports to show how they much they are interested into environmental matters. For instance, 64% of the 250 largest multi-national corporations published CSR reports in 2005, either within their annual reports or separately (Frank-Martin Belz and Ken Peattie et al.2008, 35).

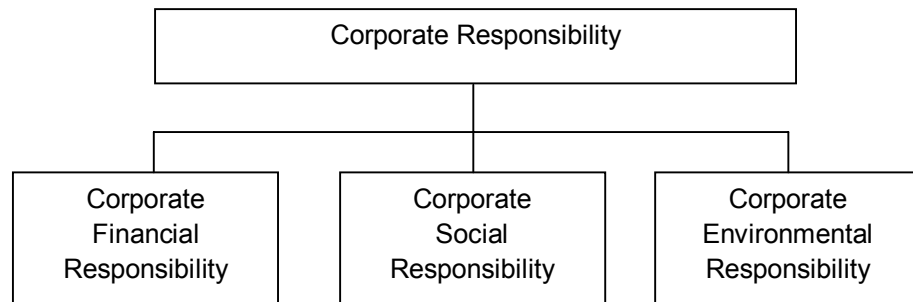


Figure 5: Corporate Responsibility, World Business Council for Sustainable Development (1999) CSR, Geneva: Switzerland, p.3.

4.1 Internal and External Dimensions of CSR

According to EU legislation inside the company Internal factors could be investment in human capital, health and safety and management of change. Management of natural resources for production to ensure practices of environmental processes comes under the same streamline. On the other hand, companies are depending externally on their communities, in respect of providing jobs, wages, services and tax revenues. This shows us CRS is dealing with dozens of stakeholders directly and indirectly from partners, suppliers, consumers, NGOs, legislative bodies and of course environment. (EU Legislations, 2005)

Further discussion on internal and external dimensions sheds light on the concepts like now a days, it is hard job for enterprises to find hard working, skilled and highly motivated people. It is the same case for people in the fields of managers and other administrative tasks. Employees have become demanding therefore companies are supposed to introduce loyalty programs by focusing on worker's learning, family, entertainment, equal opportunities and transparent flow of information for them. Concerns over health and safety are rising day by day as enterprises are now out-sourcing their employees. Therefore, they need to have higher levels of occupational health system. In the same way, when we discuss about environmental impacts if companies reduce their emissions and wastes it ultimately decreases pollution. Regular practices of CSR can help to achieve compatiability with profitability. The biggest concern rises here could be how locals react or effect from new systems (change). Mostly companies are laying off temporarily or down sizing

to meet their financial needs which reduces employee's interest rate and motivation.

Communities play very vital role of an external dimension as they define how businesses could adjust through them because they provide labor and workforce and enterprises exchange wages, taxes and jobs. Activities of workplace like noise, light and water pollution, emissions, contaminated materials and water, wastes and other environmental problems are social responsibilities for business in local market. The well-being of community is essential for organizations. Then competitiveness of employer as social actor with care for its workers creates good image for prospective workforce.

(Polášek et al, 2010, 56-64)

Below mentioned picture is comprehensive explanation for a firm and its relationship with relevant stakeholders.

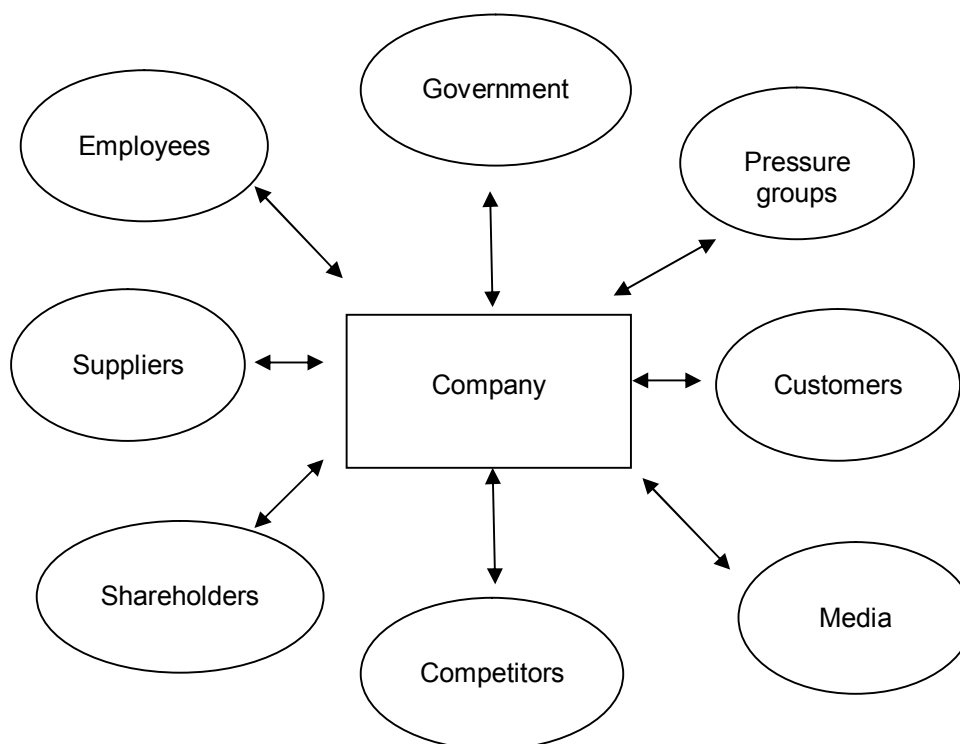


Figure 6: Freeman, R.E. (1984) Strategic Management, A Stakeholder Approach, Boston: Pitman Publishing

4.2 Ecological Indicators

Signals and signs are always to help humans for the understanding of information which is out of attention for a while. They can also reveal information about status, changes and trends. General examples could be speed meters, gauges on fuel tanks shows amount of fuel available, writings on home electrical appliances and so on list continuous. It helps reader to know if there is need of necessary changes and actions, the best implementation of action can result into perfect consequences. Therefore, indicators have significant importance to guide us in right direction. If we implement this phenomenon into our climate, we are not able to measure or count every possible change. Researchers and Scientists are depending on signals received from environmental factors. In the future, Governments are supposed to legislate in accordance with environmental dynamics and systems to function smoothly. (Washing, D.C. 2000, 18-19)

“The mirrors of the gigantic shadows which futurity casts upon the present”.
Percy Shelley

The spread of technology in the form of sprays on fields, nuclear bombs and automobile industry has turned our climate into new direction or might be towards end of world. Ecology thoughts force us to think forward, it is just beginning, still our world can be saved. It should be clear here that climate and weather are both different things, we can see weather but not climate. Even most powerful computers cannot model our climate. It cannot pointed out where is climate but it exists. It seems unbelievable to accept responsibility for something that we cannot see, that is why it is considered as ethical behavior for environment. Therefore, it always makes you feel better if you care for your living planet. This can be dark thought but not dangerous. Waking up in an ecological thought of darkness is better than losing life and planet forever. (Timothy et al 2010, 98-101).

4.3 Foot Prints

The best defined statement for this phenomenon could be “It is the residue left behind when using carbon-based fuels, analogous to the footprint you leave

behind when walking across the sandy beach”. Usually carbon foot print is made of two components:-

- i. Direct Components (e.g Home Heating, Ventilation, air conditioning and gas mileage of car)
- ii. Indirect Components (e.g transportation for grocery, energy taken to manufacture products)

You may not think you have much control over the indirect component of your carbon footprint, but you do (Maltzman, Shirley et al 2011, 17).

The Footprint framework enables us to address the problem in a comprehensive way, one that does not simply shift the burden from one natural system to another. The Footprint framework also shows climate change in a greater context; one which unites all of all the ecological threats we face today.

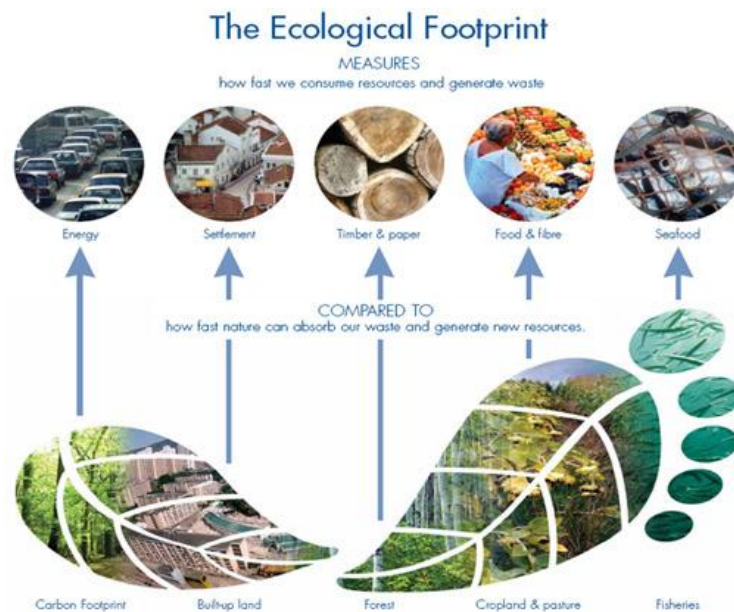


Figure 5 The Ecological Footprint. Foot Print Science, 2012.

Climate change, deforestation, overgrazing, fisheries collapse, food insecurity and the rapid extinction of species are all part of a single, over-arching problem: Humanity is simply demanding more from the Earth than it can provide. By focusing on the single issue, we can address all of its symptoms, rather than solving one problem at the cost of another. (Global Footprint Network, 2011)

4.4 Ecological Rucksack

The European Environment Agency has defined very descriptive definition :-

“The material input of a product (service) minus the weight of the product itself. The material input is defined as the life cycle wide total quantity (in kg) of natural material moved (physically displaced) by humans in order to generate a good”. (EEA, 1999).

After reviewing the definition precisely it is evident to derive (calculate) these rucksacks through following formula:-

$$ER = W - MI$$

where ER represents ecological rucksacks, W is for weight of product and MI for material intensity. MI can be further elaborated as:-

$$MI = \text{SUM} (Mi \times Ri)$$

Now again MI is for weight of product (in Kgs) and Ri is Rucksack factor. The ecological rucksack changes for many material with time to time during their products because of their extraction from natural materials. This helps to improve the life cycle of product with its lesser impacts on the environment. (Srinivas. 2012)

4.5 MIPS

“MIPS is the material intensity per unit service or per unit function with respect to the entire product life”. (The Takeda Foundation, 2002)

The value can be calculated with following formula:-

$$MIPS = MI / S$$

Where S represents service number and MI for ecological rucksack.

MIPS is covering the entire energy consumed during the whole life cycle of product from manufacturing, transportation until its consumption. Different processes require various levels of energy for manufacturing, cleaning, transporting, repairing, re-using, collecting, sorting and even disposing.

Transportation plays a link between many steps or processes. In the example of washing machine, graph of MIPS falls slowly because water, energy and detergent are used more frequently during every wash cycle. As the machine becomes older, usage of water and energy rises causing maximum MIPS curve level and might need repairing for machine. There is a relationship between efficiency or productivity of resource and MIPS and it is called eco-efficiency of product. MIPS helping to improve ecological measurements of products in same units as of processes (material and energy). This concept can be used to design Life cycle analysis of product and screening of procedures. The ideology of MIPS improves the design of products to make them environmentally friendly. It can be considered as technical term for sustainable economy. (The Takeda Foundation, 2002)

4.6 Life Cycle Analysis (LCA)

During the late 1960s all the methodologies for LCA were based on energy and raw material's impact on processes. Later on, other factors were added like emission to air, water and solid waste. The Society for Environmental Toxicology and Chemistry (SETAC) suggested three basic phases for the assessment of life cycle:-

- i. Inventory phase
- ii. Interpretation phase
- iii. Improvement phase

LCA assesses the environmental impact of the energy and material and provide opportunities to evaluate further improvements. It analyzes whole process from start of extraction of raw materials, manufacturing, logistics, distribution, reuse, maintenance, recycling and disposal. LCA's process is usually divided into following steps:-

- i. Classification

In this step focus is entirely on emissions of gases during manufacturing and their impacts on environment, ozone layer depletion and greenhouse system.

- ii. Characterisation

After calculating the emissions of substances their total weightage is evaluated in this step by adding whole values of gases during each process. (O'Neill, T. J. et al 2003. 14-16)

5 Environmental Management Systems/Schemes

According to International Organization of Standardization, "ISO 14001:2004 gives the *generic requirements* for an environmental system". It does not guarantee or satisfy or assure company is sustainable, but following it may bring worthy changes in it. Through continuous improvement in the processes and adherence with quality of standards is enough to qualify for ISO certification for a company. These guidelines are revised annually based on their needs and requirements in different businesses and to make them more *User Friendly* for environmental management systems.

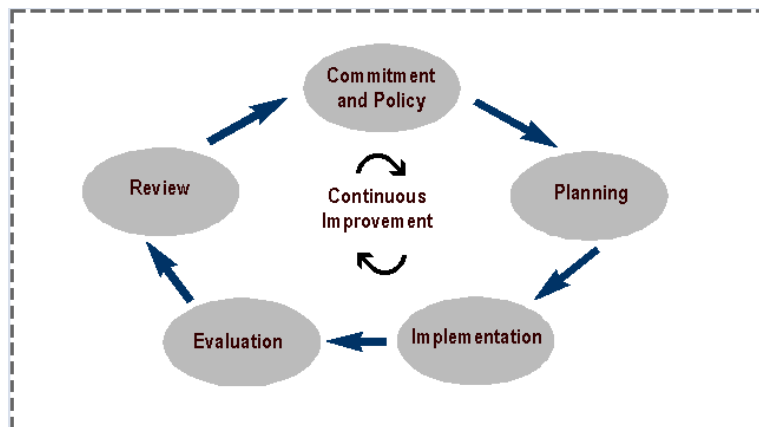


Figure 6 The continuous improvement cycle, EMS Under ISO 14001, EPA, USA.

In Japan, United Nations Framework Convention on climate change has binded an international agreement called *Kyoto Protocol* adopted in Kyoto, Japan on December 11, 1997 and implemented on February 16, 2005. It focuses on the control of greenhouse gases in European countries and 37 or industrial states. This protocol commits participant countries for their full assurity on signed agreement for environmental protections. There are 184 ratified parties in this agreement and United States is still under observation to ratify it although they have agreement already.

In the several western U.S. states and Canadian provinces there is commitment called *Western Climate Initiative Partnership*. It is controlling emission of greenhouse gases in the member states.

The *Eastern states standard* of U.S included eleven states works on low fuel standards for environmental protection. More focus is given on the usage of vehicles with hydrogen fuel cells, electricity, bio diesel and concepts like solar and wind power energy (Maltzman, Shirley et al 2011, 9-13).

The Nordic Ecolabel is an official Ecolabel for Nordic countries which was established in 1989 as a volunteer activity towards sustainable consumption and environmental label scheme. The name *Swan* comes from an old logo for the Nordic Council of Ministers. Its purpose was to be practical tool for users who are interested to choose environmental sound products. This label is internationally well established and known among 94 percent Nordic countries who recognize it as trademark. It is also recognized as one of world's most successful ecolabels. Each Nordic country has special office from Administrative body to take responsibility for licensing, marketing, audits and criteria developments. Environmental Issues which are considered important under Nordic Ecolabel are: water usage, packaging, waste, use of chemicals, climate aspects, source of raw materials, use of chemicals and hazardous effluents (Nordic Eco Labeling, 2012).

The European Eco Label is a well-known system throughout Europe, it is defining products for consumers which are highly recommended for their lesser environmental effects. In our daily life we are in a rush and cannot spend time to analyse if products are greener at the time we buying them, this problem is handled by eco-labels. Therefore, these products are observed during their life cycles, usage and disposal by authorities. In order to acquire EU Ecolabel products must undergo strict regulations which are made by stakeholders, organizations, consumers and industry experts. This label consists on a range of products from furniture, soaps, shampoos, varnishes, baby cloths, paints and even hotels and other service sectors (EU Ecolabel, 2012).

5.1 Green Office

The word of “*Green*” is all about our health issue. Whatever we do it should not have negative impact on us. That is why cleaning methods and air quality became pioneer issues (Richmond, The definition of green, 2011).

This concept is primarily based on the *healthy office* and issues inside the buildings which are resulting because of poor indoor air quality. During the cleaning process in buildings, many fumes are transferred into air which can be a cause of air pollution. In the same way, buildings can contain materials, paints, furniture and carpets which are continuously consuming fresh air of the environment. Research shows they introduce large volume of gases in air. Therefore, these items must be changed on regular basis so that their harmfulness can be reduced. Now even research shows that new paints and varnishes contain Volatile Organic Compounds (VOCs) which show their effect after a long time since a person in a good health may not notice them initially.

In offices now people are using papers with latest form of carbon in inks. Copies of different papers can absorb dust and moist that increases in darker rooms very instantly. Some cleaning materials are harmful like window sprays, waxing and finishing on floors contain amount of zinc that is another strong metal.

It is a serious threat to sustainability at workplaces, managing all the resources properly can be good way to survive from this hazard. Green management systems are suggesting usage of green products, microfiber cloths and HEPA vacuums. Mold can never be ignored or left untreated, its effects on health that can indulge workers in serious illnesses (Richmond, Ezine Articles, 2007).

5.2 Criteria of the Green Office

Green office is not just for the health of people but also for reducing negative effects on environment. In accordance with the criteria mentioned and designed by WWF a green office should fulfill following requirements:-

- i. Improved energy efficiency system for lesser emission of gases
- ii. Waste and recycling must be done according to laws
- iii. Green issues should be handled during procurement
- iv. Full training to personnel on Green office practices
- v. Continuous upgrading of environmental programs
- vi. Very strong check and balance on the fulfillment of objectives
- vii. Proper reporting to WWF annually

(Criteria of Green office, WWF, 2012).

6 IMPLEMENTATIONS

This research was supposed to bring out important factors or elements which are necessary for environmental protections/precautions at workplaces. That is why interviews with two different persons belonging to highly sophisticated and advanced fields of businesses were conducted and prime concern was to extract in depth information about sustainable methodologies. Both the interviews were done in different offices on different days but with same questionnaire. Officials from NOKIA and Lindström responded quite positively and opened their thoughts towards highly demanded topic of Sustainability, furthermore, they described all the possible solutions, knowledge and information they could have in their mind at that point of time. It took author 01 hour for each person to interview them. For further details of questionnaire can be found in appendix at the end of this document.

Sustainable workplaces is a concept of unique challenge. In every organization bringing something new and against the flow of ongoing routines becomes greatest hurdle. Most of the times, changes are not accepted by conservatives who are available in different forms of hostile phases. Yet, another suitable consequence could be constructing absolutely new structure of building where things are in accordance with sustainable models and every employee is bound to follow given instructions by the authorities in order to support system.

According to Head of Workplace Sustainability Operations “*Feedback system for workplaces is very important. Sometimes useful ideas can come from*

workers that can be implemented and it makes easier to compare different ideas which can or not be practiced in the firm. Usually, it keeps people involved and busy with environmental discussion” (Varpasuo, Nokia, 2012).

During the whole process of research on selected topic author focused on the three main sources of information like interviews of executives (02 persons), study of books and other relevant material from library. Therefore, the results mentioned below are an extraction from the material being studied for the acquisition of desired results. As the author proceeds towards implementations, below mentioned are the essential steps to be abide by every firm towards the acquisition of the title “Sustainable Workplaces”:-

6.1 Sustainable Practices

It is a reality accepted worldwide that only humans along their actions can change their environment. The intention of understanding our current needs have been prevailing force for the acquisition of technological advancement that we live in around us. As human population increased with time and let them not to think about the impacts of using natural resource at a high pace.

Now in modern time, where humans have become almost machines in offices, firms or organizations due to their run either for money or status in society. In particular, our offices are very safe heaven to educate or teach people about *Sustainable Practices*. Here, organizations need to be highly sophisticated with their selection of processes deemed for the betterment and quality of environment inside workplaces.

Author has researched and described main processes which are necessary to be evaluated in every firm to ensure safer work environment.

6.2 Cost Reductions

EPA (Environment Protection Agency) developed a principle:-

Environment + Price + Performance

= *Environmentally Preferable Purchasing*

Therefore, we are in total agreement with EPA when they say that “environmental considerations should become part of normal purchasing

practice, consistent with such traditional factors as product safety, price, performance and availability” (Maltzman & Shirley. et al 2011, 212).

In many cases the price paid by consumers in the shop is just a fraction of the real. The current price system fails to cover the external costs of the social and natural environments. Thus many products available on the market are unreasonably cheap. This leads to a biased competition mechanism in favour of unsustainable products (Belz & Peattie. et al 2011, 218).

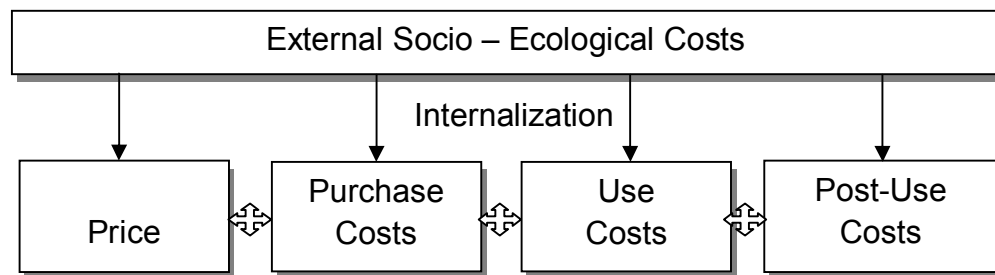


Figure 7 Total Customer cost – the external perspective

In the personal observation and experience of author companies spent very minor attention towards safety hazards at workplaces especially in offices where technical (*machinery*) works are not performed. Recently, we have seen people are even working at homes. Besides, in any kind of office it is important to follow safety precaution as per laws and regulation by the authentic regulatory bodies.

Most of the times, employees have no knowledge about the fire alarms and usage of equipment which can be used to extinguish fire. Therefore, there is need of clarifications/indications for the safety sign and every staff members should be able to use them in case of emergency. On the other hand, safety issues are also concerned of one’s personal security in the time of violence with other colleagues. This does not happen in most of the times, it is more like a cultural attitude that how people behave towards each other. If we look at the bigger picture, we must consider every point attached to safety.

Now, most of the buildings are checked for earthquake hazards which is furthermore an additional approach towards safer environment. Big companies have bigger premises for their business and separate parking places are provided as well. Now a days, with the help of CCTV cameras, it

has been very easy to control security issues inside and outside workplaces to ensure safety of assets belonging to employees and firms.

Problems of short circuits while using electric appliances is one of the safety hazards which are un-noticed besides they can create huge losses if occurred. Therefore, it is recommended to use cables/wires with fire resistance coding in order to prevent accidental occurring. Availability of fire extinguishers nearby kitchen, labs and expected *fire alarming* places is necessary.

6.3 Health Issues

One of the main objectives towards the achievement of *Sustainable Workplace* could be health of the employees. Most of the times, in industrial firms, there are no precautionary sign or instructions available for the workers. As a consequences, long term diseases are discovered with the passage of times. Therefore, it is essential to have database on the health history of employees. If necessary companies should have extra medication available in connection with common diseases among employees.

Most of the times, firms make sure the availability of *First Aid Box* which is useful in the times of emergency. In the same way some employees might have breath or heart problems, therefore, designing of workplaces must be modified by keeping in mind the health issues. Now a days, one of the burning question for the management teams is how they can force people not to smoke inside the working premises? As most of smokers are addicted to work while smoking. Situation is entirely different if it becomes hard and fast rule by the company, it can save those from it who are even annoyed by the smoke of cigarettes. Although, smoking has turned into fashion among young generation.

Author has observed that new buildings are designing in such a way that even disabled people can feel free for their movements. Places like stairs and elevators are sensitive areas where possibility of huge crowd during rush hours is expected. Therefore they are needed to be manufactured by analyzing number of people that may exit during the time of emergency like fire or any other hazard. There must be different pathways for disable people as they cannot move swiftly as others. The existence of special *Exit* rooms is

increasing in big buildings like Cinema theatres, Cultural Halls and conference rooms.

6.4 Greenality

This phenomenon is divided as Green + Quality = Greenality. Researchers have declared that most of the products manufactured in modern age are bought at a higher prices because of the un-necessary processes they passed through. If life cycle of a product is analyzed time to time, it can help to reduce costs and customer satisfaction, although, in this case *Quality is free*. In this way, extra costs like rework, scrap or maintenance expenditures are saved. In workplaces, same technic can be implemented. For example, company is introducing new machines for manufacturing purposes which will help to increase production. While as, their environmental and internal emissions are needed to be noticed, if they will raise budget on annual basis. In that case, more money will be spent in order to keep cycle at a moving pace.

6.5 Risks (Threats and Opportunities)

The biggest threat could be the mindset of employees. Especially, people who are defined as “*Conservatives*” by researchers. They play role of resisting stone in the path of sustainability. Workers who have been doing their jobs for more than 20 or 30 years most likely stand into this category and find difficult to adopt new things since their approach to new ideas is always slow and passive. Therefore, companies are required to propose and organize frequent workshops where employees are familiarized with new compaigns/ideas in an easy and understandable manner by taking examples from daily life.

Employees are required to have in depth knowledge about the benefits of *sustainable practices*. So that they may not only play their vital roles but also spread it like a wild fire with the help of phenomenon called *word of mouth*. Nowadays sufficient marketing is very essential towards the success of any project/product. As far as, people share their own experience with their fellows either via direct communication or social media, it creates bigger and stronger impact.

7 RESULTS

Sir Isaac Newton presented his 03 Laws of Motion which helped mankind to resolve numberless problem. His third law says "*For Every action there is an equal and opposite Reaction*". Our nature is bound to follow its rules and never found against them. The way we have been treating our environment was inevitable and extremely harmful for our future generation, therefore, now time has arrived not only raise these issues globally but rather do practical things in our daily routines. As most of the people spent their day times in Offices or Workplaces, author has concluded following rules/guidelines which if practiced can assure a micro-level office as "*Sustainable Workplaces*". These guidelines are extracted from the reference books/material and interviews done during the research. Most of the companies who are practicing sustainability have designed systems for the achievement of environmental betterment.

During the two interviews conducted by author with the selected interviewees, they added huge value in the acquisition of below results through their experience and suggestions. Varpasuo, NOKIA very clearly added that *NOKIA is creating full awareness on sustainability through its applications and products that we provide. Even we have green channel available on certain phone models, the idea behind is to advocate in this new field of education. When it comes to main factors of Environmental Sustainability, first one could be energy and carbon emissions, secondly waste and recycling, water. Budgeting and business idea always reflects the relevant competitorship for any project. NOKIA is always considering triple bottom line theory by thinking about people, plant and profit in order to make every move sensible for environment. Sustainability has now become a science, even small companies can achieve it, it is like a low hanging fruit. It can even add more numbers into savings of company. Only investment is based on risk, after that firms can easily can get benefit from it and further you go it can be more expansive to not be sustainable. Therefore, educating people is very necessary and besides having automative systems in office can help to save a lot as well. Possibilities of re-using resources inside the company is also very useful, there can be example of Excess heat from Air-conditioning system.*

On the other hand Hautanen, Lindström also added very important solutions and suggestions by saying that *people are accepting sustainability in their private lives and values and they do not want to restrict it up to offices. In this regard, educating people is an important weapon which can make huge changes in an overnight time. In the business of Lindström, water, energy are important and we are guiding our employees with reasons to save them intentionally or un-intentionally. If we are able to make people aware with issues, almost half of the problem is solved.*

Following is the list of important guidelines which can be followed by administration in an organization (*by keeping in mind three elements of Sustainability*) to achieve a healthy work environment:-

- i. Easy access and availability of adequate and enough material to educate people about their responsibilities towards environment. This material can be available in the form on electronic documents or paper forms. In addition, regular updating information with the consultation of the regulatory bodies so that any material used inside the office area must not mislead/misguide.
- ii. If possible, there should be rewarding programs for those who have been providing extra-ordinary effort to ensure things are in done in accordance with the said instructions by management.
- iii. Usage of Eco-Friendly cleaning methods and ensuring that if company has outsourced services then cleaning company must have certification from a recognized authority and should be following environmental friendly methods. If chemicals or detergents are used in negligence of environment they can cause harmful respiratory infections and long lasting skin or breathing problems.
- iv. Practices of alternative methods to achieve the desired amount of energy have become very popular nowadays. Firms should advice their employees to use recyclable and rechargeable batteries and other electronic accessories. They leave very lesser impact on our surroundings (UMICORE, 2012).
- v. Waste management should be practiced properly. In developing countries most of their pollution increases due to non-availability of dumping their wastes. It is causing a huge threat to our environmental system.

- vi. Firms should arrange possible facilities in order to make them self-dependant for their energy needs. Like usage of own solar grids to generate power or electricity, usage of Water Drainage System in order to store rain water for future.
- vii. Strict instructions on smoking prohibition inside office areas. Allocation of reserved rooms is necessary for this.
- viii. Installation of devices which control system of switching on and off for electronic devices when they are needed/not needed in order to save adequate amount of energy rather than its wastage.
- ix. The control of water consumption is very necessary, especially while washing hands or shower, it should be off when not needed (HOAS, 2012).
- x. During the selection of LEDs it is important to notice their Energy Efficiency and Brightness Level, color rendering index (CRI), durability, compatibility, thermal monitoring and warranty (7 Factors, FM Magazine, 2012).
- xi. Air circulation is very important issue, it has direct effect on health of employees. Therefore, proper quality checking process must be followed once in a while depending on the pollution in air and number of people consuming it off and on.
- xii. In Kitchen more focus should be towards consuming Fair trade products like Coffee, Fruits and vegetables which are produced with healthy farming techniques. Usage of composite product is essential as well which can be recycled easily like plates, cups, fruit bowls, spoons and glasses. They are easily available from markets at very cheap rates (BPI, 2012).
- xiii. All the furniture must be made of "*Fire Resistant*" wood. It ensures safety in the times of hazardous situations.
- xiv. The ideal workplace is where all the employees have their own personal space irrespective of their designation or duties and responsibilities. There should be any interference in the path of creativity in terms of one's personal opinions and comments.
- xv. Materials like eco-friendly and fire protected must be used for curtains, matto, carpets and pillows (if required in separate rooms like guest room or living room).

8 DISCUSSION

The achievement of *Sustainability* requires strong motivation, focused people, political and social movements at micro and macro levels. As it is not benefit of a single person, it effects our environment globally which means those who are not depleting natural resources must face consequences being created by others. Eventually, it is referred as *A Global Issue* rather than local/private dilemma.

At workplaces situation can be changed more rapidly as people under one roof are more focused and united. Ultimately, if companies design research programs where they investigate changing demands of employees and then chalk out *compatible sustainable rules* for them. Then in a long run, the gap of understanding will diminish between two parties discussed above.

After evaluating entire research author brought out an important question into light for the prospective researchers on the topic of Sustainability which is “*Either Sustainability is an achievable reality or just a Myth?*”. Now, every multi-national company is focusing to be environmentally friendly either for employees or via their products which is a great sign of change.

According to Project Manager “in future targets to promote sustainability could be well-being of employees, decreasing accident frequency, low personnel turn over, comparable system for supply chain monitoring and reporting, quality consumption of detergents and chemicals, less energy and water consumption with excellent customer satisfaction (Hautanen, Lindström, 2012).

It might take a decade to reach a point where every literate person knows how they are effecting their environment. But, our workplaces can be outstanding platform to testify how people react to it and then adopt it in their general life’s practices.

As we know in modern times humans have reached even Mars and managing environmental sciences at earth are somehow not top priority for the countries. Countries like China, Brazil, India, Russia and South Africa which are new in the race of Industrial States are nevertheless compromising on the environmental cleanliness of their cities. Recently, author has gone through a documentary where industrial city in India has a huge threat of harmful

diseases because of contaminated water and non-hygienic disposal of industrial waste. Huge amount of sea life is available for business in above mentioned countries which is suffering due to polluted wasted water being added to sea.

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APPENDICES

Appendix 1 Questionnaires

The questions being asked by interviewer to Ms. Marja Hautanen, Project Manager, on 10th April, 2012 in the premises of Lindström, Vaajakoski and Ms. Laura Varpasuo, Head of Workplace Resources Sustainability, Nokia Sustainability Operations, on 12th April, 2012 in the office of NOKIA, Espoo.

1. Why are we emphasizing on sustainability at workplace and not at homes?
2. Which are the main factors to achieve or oppose true Sustainability (Environmental Impacts)?
3. What environmental Legislation available for NOKIA/Lindström?
4. Are there any “Green Taxes”? How far is it true?
5. Can it be a cause of “Economic Threat”?
6. Which is the most attractive feature out of three major headlines (Economic, social and environmental) aspects?
7. Can particular thoughts, habits, attitudes and notions can be changed in favor of Sustainability via workplaces?
8. Is there any feedback system available in NOKIA/Lindström in order to keep system updated?
9. If, reaction of Foreigners (Especially from Developing Countries)?
10. The cost of recycling for un-sustainable products is higher. Your comments or opinions?
11. At work places, cleaning material does effect on environment?
12. How far has NOKIA been in future planning?
13. Are there any outer promotional activities carried out for sustainability?
14. As NOKIA/Lindström is ISO Certified, how do they implement in daily activities?
15. What is situation towards sustained practices in your off-shore offices?
16. Can there be any “Ideal Sustainable Company”? or whom did you find good practitioner of sustainability so far?