

Three levels analysis of sustainability's environmental dimension in México

EJE TEMÁTICO: SUSTENTABILIDA

Resumen

El nuevo orden mundial ha incrementado la necesidad de encontrar una forma sustentable para vivir. En una sociedad contaminante es necesario estructurar una estrategia de coexistencia que dé al planeta la oportunidad de un crecimiento sustentable. Debido a las necesidades actuales de la población, la dinámica de producción, el estilo de vida de la sociedad, inconciencia ambiental, cultura y educación en el mundo, la contaminación ambiental se ha incrementado hasta niveles alarmantes. La contaminación ambiental, inequidad social y los problemas económicos son una realidad en todos los países, es por ello que cada país debe trabajar en estrategias para mitigar los problemas de sustentabilidad. El presente documento muestra un análisis de tres niveles que destaca como se está trabajando en el cuidado del ambiente.

Palabras clave: Ciudad verde, Dimensión ambiental, Negocio verde, Producto verde, Sustentabilidad.

Abstract

New world order had increased the necessity to find a sustainable way to live. In a polluting society it is necessary to structure a coexisting strategy which gives to world the opportunity of a sustainable grow up. Due to actual population needs, production dynamic, society life style, unconsciousness, culture and education in the world, environmental pollution has been increased to alarming levels. Environment pollution, social unequally and economic problems are also a fact in every country, so that each country must work on strategies to mitigate sustainable problems. Present document shows a three levels analysis to realize about what we are working out to take care about the environmental scope of sustainability.

Keywords: Environmental dimension, Greener product, Greener business, Greener city, Sustainability.

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I INTRODUCTION

As mentioned at IPCC (2013), human activity has added important changes in world global environment and tendencies, with its actual life style human been will provoke irreversible changes on the world surface. In Mexico, it is possible to see the negative influence of population over environment. Long time ago, in the country, it was likely to visit wonderful natural landscapes, where there not exist evidence of men activity. Now a days, we find garbage and mankind evidence at almost everywhere in the country. Moreover than affect in a bad way our environment, humankind must to change its lifestyle to get a sustainable symbiosis with global environment.

There exist some theoretical paths (concepts or variables) in the environmental context which references our global environmental behavior. We as a society have surpassed some planetary boundaries like: atmospheric aerosol loading, chemicals dispersion, and ocean acidification. And we also have crossed other planetary boundaries like: biodiversity, climate change, land system change, nitrogen input to the biosphere and oceans, phosphorus input to the biosphere and oceans, and stratospheric ozone layer (Tab. 1; Fig. 1).

| Variable or theoretical path | Status |
|--|-----------|
| Atmospheric aerosol loading | Surpassed |
| Chemicals dispersion | Surpassed |
| Ocean acidification | Surpassed |
| Biodiversity | Crossed |
| Climate change | Crossed |
| Land system change | Crossed |
| Nitrogen input to the biosphere and oceans | Crossed |
| Phosphorus input to the biosphere and oceans | Crossed |
| Stratospheric ozone layer | Crossed |

Tab. 1: Variables or theoretical paths surpassed/crossed classification. Source: self-made based on literature review.

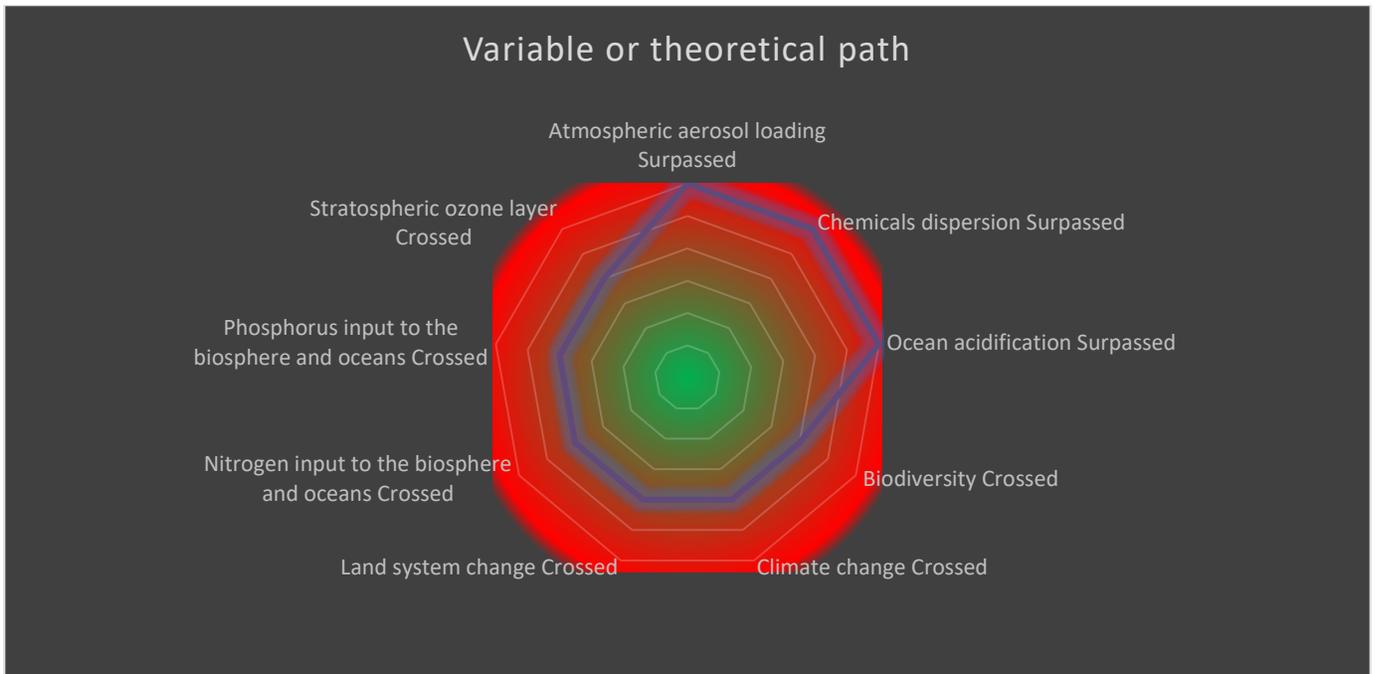


Fig. 1: Graphical representation of planetary boundaries, from the center (homeostatic stage on green) to the outside (surpassed stage on red). Source: self-made based on literature review.

In IPCC (2014) is shown that human influence on the climate system is clear, and recent anthropogenic emissions of greenhouse gases are the highest in history, it is also mentioned that recent climate changes have had widespread impacts on human and natural systems. And when data are analyzed, it is possible to find that human activity has and has had influence on global environmental decrease.

In the case of globally averaged combined land and ocean surface temperature anomaly, it can be observed that temperature has increased at around 0.9 Celsius from 1850 and 2010 (Fig. 2).

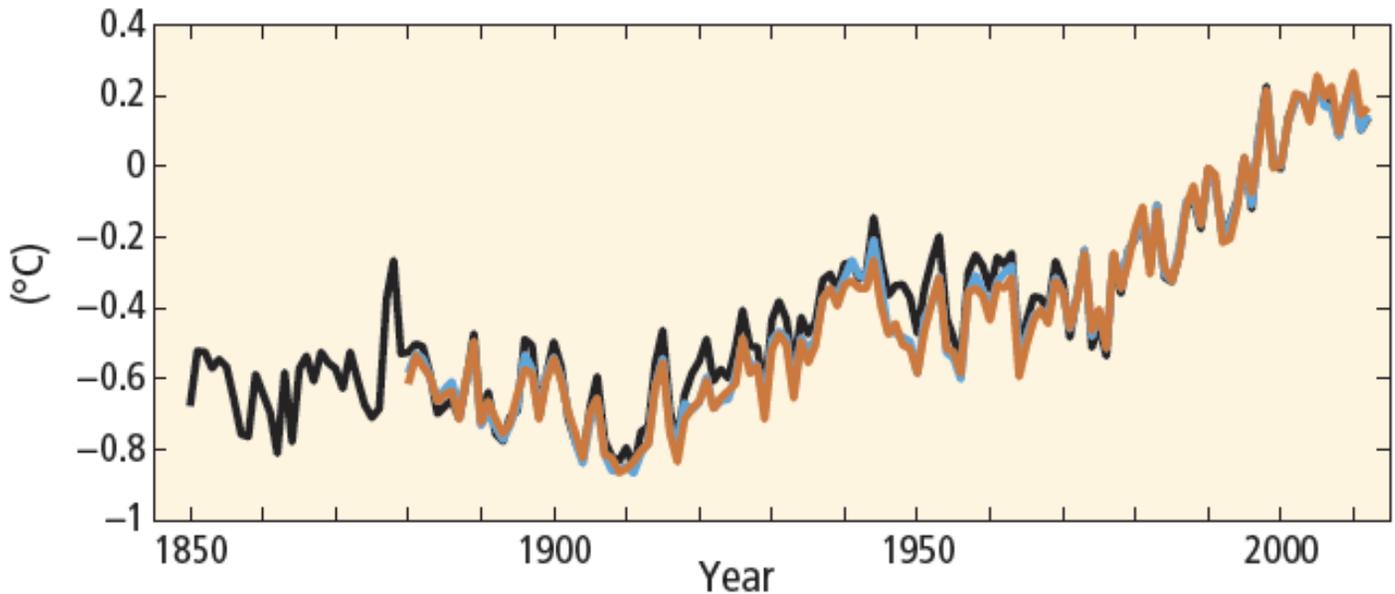


Fig. 2: Annually and globally averaged combined land and ocean surface temperature anomalies relative to the average over the period 1986 to 2005. Colours indicate different data sets. Source: IPCC (2014).

When we talk about globally averaged sea level change, it is possible to see that sea level average has changed around 0.2 meters from 1900 to 2010 (Fig. 3).

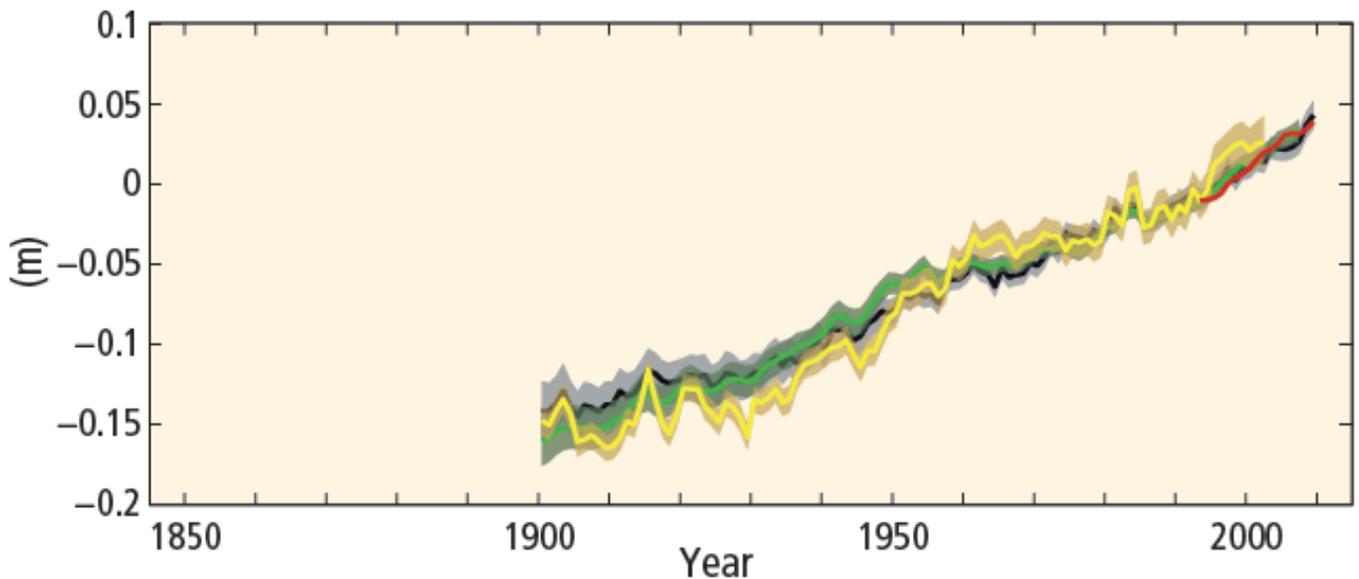


Fig. 3: Annually and globally averaged sea level change relative to the average over the period 1986 to 2005 in the longest-running dataset. Colours indicate different data sets. All datasets are aligned to have the same value in 1993, the first year of satellite altimetry data (red). Where assessed, uncertainties are indicated by coloured shading. Source: IPCC (2014).

At globally averaged greenhouse gas concentrations case, data shows that concentration of CO₂ (carbon dioxide) grew from around 290 to 390 parts per million (ppm) from 1850 to 2010; while concentration of CH₄ (methane) grew from around 805 to 1790 parts per billion (ppb) in the same period; and concentration of N₂O (nitrous oxide) grew from around 270 to 320 ppb in the mentioned period (Fig. 4).

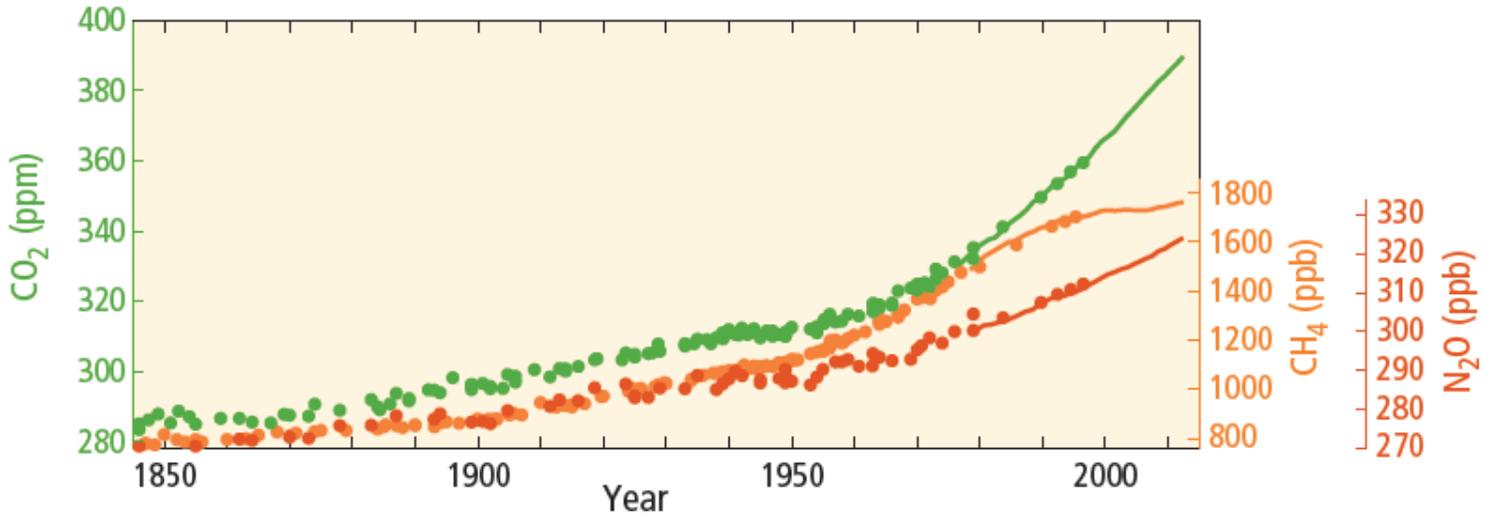


Fig. 4: Atmospheric concentrations of the greenhouse gases carbon dioxide (CO₂, green), methane (CH₄, orange) and nitrous oxide (N₂O, red) determined from ice core data (dots) and from direct atmospheric measurements (lines). Source: IPCC (2014).

In global anthropogenic CO₂ emissions, the amount of gigatonne of emitted CO₂ to atmosphere each year has increase from around 2.5 gigatonne of CO₂ per year (GtCO₂/yr) in 1850 to around 38 GtCO₂/yr in 2010 (Fig. 5).

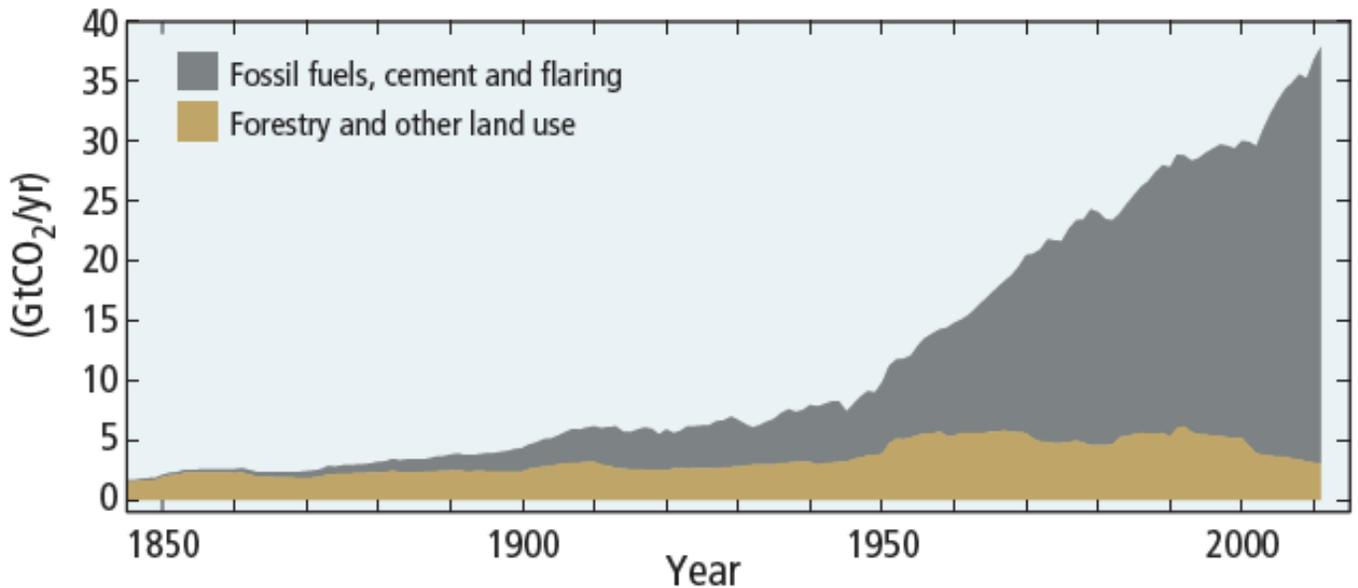


Fig. 5: Global anthropogenic CO₂ emissions from forestry and other land use as well as from burning of fossil fuel, cement production and flaring. Source: IPCC (2014).

It is possible to see that cumulative CO₂ emissions has increased more than 900 GtCO₂ between 1750 and 1970; and more than 2000 GtCO₂ from 1750 to 2011 (Fig. 6)

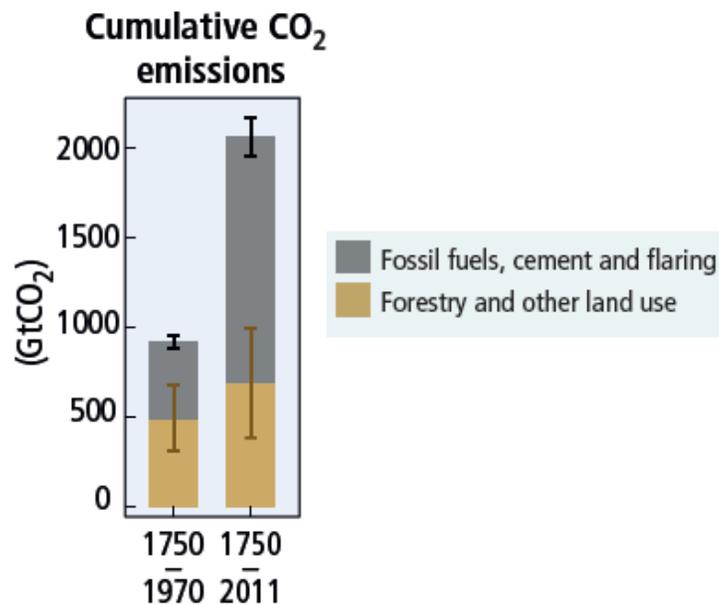


Fig. 6: Cumulative emissions of CO₂ from from forestry and other land use as well as from burning of fossil fuel sources and their uncertainties are shown as bars and whiskers, respectively, on the right hand side. Source: IPCC (2014).

In figure 7 is shown a more detailed spectrum about the total annual anthropogenic GHG emissions by gases between 1970 and 2010.

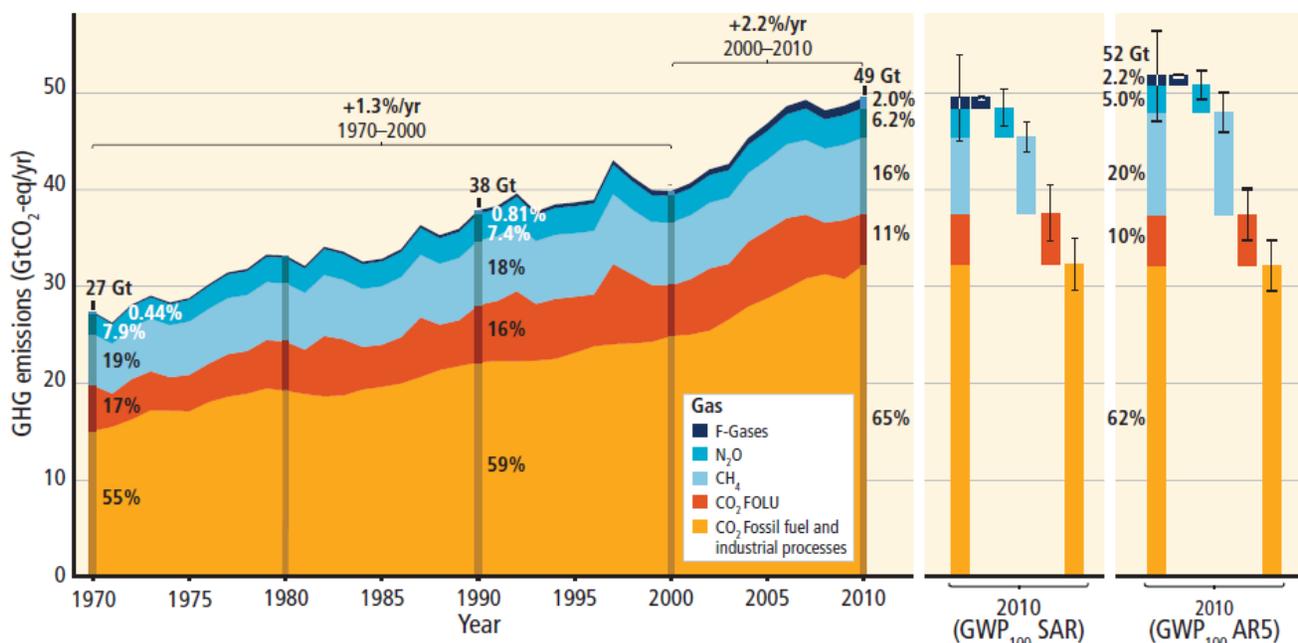


Fig. 7: Total annual anthropogenic greenhouse gas (GHG) emissions (gigatonne of CO₂-equivalent per year, GtCO₂-eq/yr) for the period 1970 to 2010 by gases: CO₂ from fossil fuel combustion and industrial processes; CO₂ from Forestry and Other Land Use (FOLU); methane (CH₄); nitrous oxide (N₂O); fluorinated gases covered under the Kyoto Protocol (F-gases). Right hand side shows 2010 emissions, using alternatively CO₂-equivalent emission weightings based on IPCC Second Assessment Report (SAR) and AR5 values. Unless otherwise stated, CO₂-equivalent emissions in this report include the basket of Kyoto gases (CO₂, CH₄, N₂O as well as F-gases) calculated based on 100-year Global Warming Potential (GWP₁₀₀) values from the SAR (see Glossary). Using the most recent GWP₁₀₀ values from the AR5 (right-hand bars) would result in higher total annual GHG emissions (52 GtCO₂-eq/yr) from an increased contribution of methane, but does not change the long-term trend significantly. Source: IPCC (2014).

II ENVIRONMENTAL SCOPE

Although, environmental care is not just labor of governments and transnational enterprises (Peña Nieto, 2010), also this high hierarchical level organizations are the main responsible to achieve sustainability goals, which main objective is to reach homeostasis in its three dimensions (environmental, economic and social). Mexico holds the potential for a disastrous confrontation or a constructive breakthrough regarding sustainable development (Goldrich & Carruthers, 1992). It is important for social actors to change its policies and strategies to a greener way, in order to reach better levels of sustainability, not only in a local scope but in a global one.

A characteristic of modern society is the growing emission of polluting substances to environment, particularly those from industrial activities, mining, agriculture, handmade and domestics (Delgadillo-López et al., 2011). All of us made a contribution to harm our common home; taking care of our planet is a shared responsibility which started in the habits change to the adoption of pertinent and daring public policies (Camacho Quiroz, 2010).

The aspects that most contribute to environmental impact on household level are: (1) housing, which means the use of energy like butane and electricity (mainly), to hold house activities and functionality; (2) food, e.g. consumption of meat of farm animals, cereals, fruits and vegetables, among other sub-products of animals and plants; and, (3) mobility, as transportation to center's works, educative centers, business centers, and leisure activities.

Greener products are made in a fairly acceptable way during the production process, and have lesser impact to the environment (Pickett-Baker & Ozaki, 2008). It is possible to say that a greener product is also that product which reuses some resources considered waste or garbage, and that helps lessen the environmental impact. There are several factors that influence our decisions towards pro-environmental behavior (Kollmuss & Agyeman, 2002). As mentioned in Mohamad Azizan & Mohd Suki (2014), there exist four dimensions related with consumers' intention to purchase greener product: Health consciousness, Environmental attitude, Eco-labeling and environmental knowledge.

In business point of view there exist five principal environmental strategies that can be used, eco-branding, lean and green production processes, going beyond legal requirements, eco-efficiency and environmental leadership. In Orsato (2006) it is proposed a generic competitive environmental strategies that can be used as a framework to business that want to go greener (Fig. 8).



Fig. 8: Generic competitive environmental strategies. Source: Orsato (2006).

Environmental initiatives typically arise among all the supply chain. Each tier of the supply chain can arise environmental initiatives to reduce the environmental impact of a product or service. Green businesses play a central role by utilizing renewable energy technologies and employing green labor forces to provide clean energy services and goods (Yi, 2014). In UNEP (2012) is mentioned that businesses that actively promote more sustainable goods and services, backed up by consistently recognized standards and labels, will benefit from enhanced brand value and reputation. That value added arises when society recognize the brand as a green business and gets motivated because the perceived indirect benefits like lessen climate change or environmental impact.

In MacGregor-Fors *et al.* (2014) it is suggested that ecological studies of a city must to contain a multivariable approach.

There exist some main aspects that can help a sustainable urban transformation, which benefit cities and its inhabitants, like lifestyles and consumption, governance and planning and, innovation and green technology use.

III THREE LEVELS OF ENVIRONMENTAL SCOPE OF SUSTAINABILITY

Greener Product

As mentioned before, a greener product helps lessen the environmental impact, maybe because its friendly environmental production or because of the reuse of materials considered as waste or garbage. Now it is proposed the case of IMERLLANTA A3P.

IMPERLLANTA A3P is a recycled tire product, which function is to waterproof buildings. Its target market it the middle class and was created in 2007. IMPERLLANTA A3P is a product that helps lessen the environmental impact due to its recycling origin. As this product reuses the rubber in tires, it lessen the environmental impact at least for its 10 years of guaranty.

Traditional products uses a thermo-fusion method which uses around of one liter of butane gas (around 1.6 Kg of CO₂ to the atmosphere) by each 3 square meters. IMPERLLANTA A3P recycle one and a haft rubber tire by each 20 square meters whit no CO₂ emission to the environment.

Greener Business

Businesses can improve their efficiency by adhering to recognized standards and adopting cleaner technologies, both of which are conducive to more sustainable resource use UNEP (2012). Firms with new green business models seek to reduce costs, wastage, and environmental impacts, while also creating value with superior products and services (Nair & Paulose, 2014). Now it is suggested the case of CEMEX. CEMEX is a global concrete producer organization, it is a multinational organization which manage different trademarks around the world.

The organization is a green organization because of its management it process to better use every use of energy, materials and resources. For example in its production process it is recirculated the residual heat to be used in the drying stage. The process also has an intelligent control system to reduce at minimum the emissions to environment, and they also have a filter system which contributes to reduce that emissions. In the package stage they have a minimum waste policy which permits to reduce waste.

In CEMEX they also have some programs to community development, like garden center to make reforestation actions, donations of concrete to build sidewalks in poor communities, and academies to help education growing on poor communities. In its local logistics process CEMEX prefer local transportation, and in longer routes CEMEX rather ships and railway to transport its products. In CEMEX also have continuous training programs to care resources and environment.

Greener City

Some initiatives in cities can help lessen environmental impact. Now it is presented the case of San Juan del Río municipality.

San Juan del Río, Querétaro, México, is located in the center of México, in Queretaro's State. It was founded like an Indians village in 1531. During New Spain (now a days México) was divided in three "Feligresias". In 1855, industry and commerce had an important impulse. Between 1960 and 1970, San Juan del Río started its urban, economic and social transformation.

It is important to remark that waste water treatment is an important labor to take care about the environment. San Juan del Río is a greener city (in México), because it has 15 waste water treatment public plants and 46 waste water treatment private plants which processes around 375.6 liters per second, approximately 11 million 852 thousand annual cubic meters of waste water.

CONCLUSION

It is very important to hold society insight processes that help to take actions on environmental dimension of sustainability in order to going on generating strategies, initiatives and solutions which give to planet the chance of naturally recovers its homeostasis. Through green products, business and cities frameworks it is possible to help lessen environmental impact, due to better use or reuse of materials and resources, and also, due to the application of green policies which are oriented to hold a homeostatic relation with planet.

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