

<b>Forum:</b>	Sustainable Development Sub-Commission 2
<b>Issue:</b>	The question of food waste: awareness-raising and education on sustainable consumption and lifestyles
<b>Student Officer:</b>	Ian Florek
<b>Position:</b>	Deputy President

---

## Introduction

According to the Food and Agriculture Organisation of the United Nations (FAO), “One-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year”. This translates to roughly 1,179,340,162,000 kg of food, which would provide food for up to three billion people. This fact has become cause for concern for many who seek to reform the food and agriculture industry to make it more efficient and reduce waste. Specifically because, as of 2016 some 795 million people are suffering from chronic undernourishment in the world.

There is a common misconception that term food waste, is synonymous with food loss. This is a dangerous assumption as the two are very different. Food loss is considered food that was, at one point, fit for human consumption, but winds up unfits due to indirect circumstances. An example of this would be if a shipment of frozen meat was stored in a freezer that was malfunctioning and the food went bad. Food loss typically occurs during production and distribution ends of the food supply process, but can occur in other stages as well. On the other hand, food waste is typically food that is fit for human consumption that is left to spoil or rot by the direct action of humans. Food waste often occurs most commonly on the retail and consumption end of the process, but also can occur at other stages in the process as well.

Food is wasted throughout all stages of the supply chain (production, distribution, retail, consumption) and poses a number of significant threats and challenges. One of the largest issues posed by rising food waste levels is the impact on landfills and waste collection centers. It is important to differentiate where food is lost and where food is wasted in order to properly educate on sustainable consumption and lifestyles. Looking at the specific areas of food waste would allow for a deeper understanding of the issue to take place, and in turn allow for more meaningful solutions to be implemented in the future. For example, one of the issues in the production stage of the food supply chain, is the overproducing of a food product, as overproduced food may then be thrown out or discarded, wasting it.

The reduction of food waste is an important global issue as there are serious consequences that come from not dealing with it. One of the largest issues is the loss of resources for firms and potential revenue. If food waste could be reduced, there would be economic and long lasting societal and societal benefits. Additionally food waste is often brought to landfills where it

aids in the production of greenhouse gases which contribute to the accelerated rates of global warming seen today. Raising awareness, on sustainable levels of consumption and lifestyle, would be greatly beneficial to remedying the problem.

The twelfth United Nations Sustainable Development Goal pertains to sustainable consumption and production. Sustainable consumption and production is centered around promoting efficiency and stronger infrastructure.

## Definition of Key Terms

### Food Waste

According to the FAO, food waste refers to discarding or alternative (non-food) uses of food that is considered safe and nutritious for human consumption along the entire food supply chain.

### Food Loss

According to the FAO, food loss is defined as the decrease in quantity or quality of food. This can occur naturally, often times in the production of food product. For example, an apple farmer may be forced to discard apples that were contaminated by a fungus or parasite.

### Sustainability

The ability for something to be maintained at a certain rate or level. In the context of the question at hand, the word sustainable, pertains to the idea of a level that is maintainable in the long term. Specifically, in pertinence to food consumption, it refers to a level that would not lead to further food waste.

### Consumption

The action of using up a resource. In reference to the question, it relates to the level and pace at which humans eat and use a food product at.

### Food

Any nutritious substance that people or animals eat or drink or that plants absorb in order to maintain life and growth.

### Compost

Decayed organic material used as a fertilizer for growing plants. Discarded food can often contribute to compost and aid in the fertilization of plants.

## Background Information

In order to understand the question of food waste, it is important to understand what leads to the issue in the first place. As touched on previously, there is a distinct difference between food loss and food waste. Food waste is particularly a problem on the front end of the supply chain, meaning retail and consumption. With that being said it should also be noted that food wastage can occur at other stages along the food supply chain, and in an education sense it is important to keep in mind that all stages should be considered.

## Production

The production of food relates to the process in which the food is created and packaged. In agriculture, food waste can become an issue when farmers and produce growers overgrow their crops. This can take the form of farmers growing more of a product than they can sell. Due to the finite nature of much of the agricultural produce, if food goes unsold it can lead to said food being discarded. If large quantities of food are being wasted by producers, because they are unable to sell it, then the consequences of food waste are compounded. While this is largely an agricultural problem, the issue of producers overproducing can occur in other types of food production. A second issue that can arise during the production stage is status of the equipment being used in the production process. If equipment is being used that is faulty, then the food product being produced can be damaged and in turn wasted. The issue of equipment is one often of timing. If equipment is unable to harvest food, for example, in a fast enough time, the food may reach a point where it can no longer be sold. A third issue that can arise in the production phase is the demand for “perfect” or blemish free goods. This is an issue often seen in fruit production. Often consumers demand blemish free goods, often neglecting to purchase fruits that are blemished or less aesthetically pleasing. Because of this producers often end up just discarding said blemished goods, even though they often contain the same nutritional value.

## Distribution and Transportation

One specific issue that often comes about regarding the distribution and transportation of food products, is the length of time in which it takes to transport the goods from the producers to the retailers. In a world where international transport is relatively easy, it has become incredibly popular for food products to be transported across the world. However, delays in the supply chain and during the transportation process can lead to large amounts of food being spoiled. Additionally food during the transportation process becomes subject to potential harmful weather, infestations and mishandling. All of which contribute to the potential for food wastage. Human error can also lead to problems with the quality of the food. This can happen if food is improperly stored and or distributed.

## Retail

In retail the main issues are divided into two main sections, consumer based issues and retailer based issues. Consumer based issues are issues that are not the direct fault of the retailer and can include consumer behaviors such as not purchasing misshapen products. This is something that needs to be addressed in the retail section, but is not the fault of the retailer.

Retailer based issues are issues that are the direct fault of the retailers. Discarding unsold food, improper management of food product and the mislabeling of food product would fall under this category.

## Consumption

The way food product is managed can often lead to food waste. Consumers are often one of the main perpetrators of food waste, often unintentionally. Subconscious behaviors such as those mentioned previously are behaviors that lead to food waste, but can be combated. Additionally, it is the consumer's needs that typically determine what companies and large firms do, so ensuring the proper education of the consumers is vital

### *Domestic Consumption*

Domestic consumption relates to consumption by individuals in their homes. Food waste occurs when individuals buy more food than they need and end up throwing away excess. Food waste can also occur if consumers aren't utilizing all of the food they are buying, such as discarding the ends of loaves of bread. As a result of these problems many organisations have launched educational campaigns to try to raise more awareness of the problem. Additionally, as a result of the excess food, new companies have launched, such as Blue Apron, a company based in the United States, which offers its users pre-proportioned ingredients to make exactly enough food for the users. What this does is promote more sustainable lifestyles while again cutting down on food wastage.

### *Commercial Consumption*

Commercial consumption pertains to the consumption that occurs on a commercial level in large cafeteria's and restaurants. Food waste here can occur in a variety of ways, on being over sized portions. Restaurants, particularly in MEDC's (More Economically Developed Countries), can end up creating proportions that are too large and either result in food not being eaten or people over eating. The issue of over eating ties directly into sustainable consumption and lifestyles and is an item that needs to be addressed. Another issue found in commercial consumption is the over ordering of food product by restaurants, and the subsequent dumping that occurs. If a restaurant or cafeteria believes that they will sell more than they do, then the leftover food is wasted money for the business and food waste for the world.

## Major Countries and Organizations Involved

### Food and Agriculture Organisation of the United Nations (FAO)

The FAO is a large United Nations Organisation (UNO) whose primary goal is to ensure better food security. In reference to its work on food waste, and ensuring sustainable consumption and lifestyles the FAO has been integral in coordinating efforts at a global level some of the most effective initiatives. Specifically the FAO has worked on projects with other nations and

organisations to reduce food waste. In addition, it works with private corporations to help them reduce their own food wastage.

### Food Waste Reduction Alliance (FWRA)

The FWRA is a Non-Governmental Organisation (NGO) whose primary goal is to work with food industry leaders to better improve their practices in a way that reduces food waste. It works to do so in a variety of different ways. One of its main projects is to measure food waste levels in the United States that it can then distribute and use in its own research and other products. Another one of its tactics is to work with firms to help divert food waste from landfills and look for alternative means of disposal.

### Save Food Initiative

The Save the Food Initiative is a group similar to the aforementioned in that it also works with food industry leaders to reduce food waste. Additionally the group works to raise awareness about the consequences of food waste. One such method the group has utilized in the past is the use of exhibitions as a way to engage the public. The purpose of these exhibitions were to foremost be informative while at the same time entertaining, as a means of drawing people into the exhibitions.

## Timeline of Events

<b>Date</b>	<b>Description of event</b>
1830	John Deere introduces the steel plow. This is a massive advancement in terms of agricultural capabilities and allows for more rapid and expansive production.
1908	The invention of cellophane, plastic sheet used to package food product. The invention of this product allowed for new levels of food production to take place.
2011	The Save Food group displays the Save Food exhibition, an exhibition consisting of photos, films, information and more with the purpose of educating the public on the consequences of food waste.
2013	The World Resources Institute (WRI) introduces the Food Loss and Waste Protocol. This allows for higher quality information and statistics surrounding the problem to be collected and shared.
2015	The United Nations adopted a series of goals on sustainable development, The Sustainable Development Goals. The twelfth goal directly ties into the issue of food waste as it refers to responsible consumption.

2016                      The UN announces the implementation of the Food Loss and Waste Accounting and Reporting Standard. This put in place requirements for reporting food waste by individual nations.

## Relevant UN Treaties and Events

- United Nations General Assembly, Second Committee, (**GA/EF/3390**)
- United Nations Environment Assembly of the United Nations Environment Programme, Sustainable Consumption and Production, (**UNEP/EA.2/Res.8**)

## Previous Attempts to Solve the Issue

There have been several previous attempts to solve the issue at hand. One, somewhat successful solution has been the collection and sharing of research between third parties and food producers on the issue of food waste. The purpose of this research is often to show producers exactly how much is being wasted and what cost effective steps can be taken to prevent the issue in the future. For example, the non-governmental organisation (NGO) Wrap, in the United Kingdom works to educate business on how they can be more efficient and reduce food waste.

Another solution that has had some success is the education of consumers on sustainable lifestyles. Specifically campaigns that are designed to not only display sustainable consumption lifestyles, but healthy lifestyles tend to be more effective. According to the United Nations, two billion people globally are obese or overweight. This highlights the clear need for proper educational campaigns on sustainable and healthy consumption, as it is evident that many are over indulging.

A third solution that has been attempted previously is the introduction of posters and promotional material in food retailers reminding users to not be discouraged by disfigured or misshapen fruits or vegetables. As previously highlighted. Many consumers chose not to buy a product, based solely off the look of it. Because of this, many third party organisations have taken it upon themselves to properly educate the people on the issue to ensure that they are properly informed.

A fourth solution that has been attempted is the encouragement of social enterprises which work to promote sustainable consumptions and lifestyles. An example of this would be Instock, located in the Netherlands. Instock is a company that takes surplus food produce (blemished and misshapen) that wasn't being sold in retailers and turns them into much more attractive and healthy meals. At the same time the group is raising awareness about the issues of food waste.

## Possible Solutions

One solution could be the recommendation of further regulations of food distributors and retailers. One example of possible legislation could include the mandatory use of use by dates as opposed to, or in conjunction with, sell by dates. Use by dates, are dates put on food products recommending the latest date they be consumed by. Sell by dates are dates put on food products that inform the retailer of the date the product should be sold by. Unfortunately many consumers do not fully understand the implications of the labels and can result in them wasting food if they think the food has expired.

Another possible solution could be the increased awareness in food retail establishments. This could happen through the use of posters, and promotional materials inside of grocery stores, and similar establishments. They would be designed to educate consumers on proper food quantities and include important messages, such as that disfigured food does not make the food any less nutritious.

There could also be more encouragement of locally sourced food products. This solution aims to tackle some of the issues that arise in the transportation phase. If the distance the food has to travel is shorter, the potential for waste decreases. Additionally, as the time it would take to transport would decrease, the reliance on preservatives should hopefully decrease as well, in turn promoting healthier lifestyles.

Another solution could be the recommendation that food distributors and retailers donate food products that are unable to be sold to food banks and charity groups. This solution aims to reduce the amount of food waste that could end up in landfills and hopes to reallocate the potential waste to the members of societies that need it the most.

## Bibliography

"A History in Packaging - Advancements in Packaging Technologies." *GPI*, [www.graphicpkgeurope.com/know-how/packaging-history-timeline/#19](http://www.graphicpkgeurope.com/know-how/packaging-history-timeline/#19).

American Biogas Council. "American Biogas Council." *American Biogas Council*, [www.americanbiogascouncil.org/biogas\\_what.asp](http://www.americanbiogascouncil.org/biogas_what.asp).

*Blue Apron: Fresh Ingredients, Original Recipes, Delivered to You*, [www.blueapron.com](http://www.blueapron.com).

"Compost | Definition of Compost in English by Oxford Dictionaries." *Oxford Dictionaries | English*, [en.oxforddictionaries.com/definition/compost](http://en.oxforddictionaries.com/definition/compost).

"Consumption | Definition of Consumption in English by Oxford Dictionaries." *Oxford Dictionaries | English*, [en.oxforddictionaries.com/definition/consumption](http://en.oxforddictionaries.com/definition/consumption).

"Definition of Food Loss and Waste." *Think.Eat.Save. Reduce Your Footprint Campaign*. Think.Eat.Save., 2014. Web. 28 Nov. 2016. <<http://www.thinkeatsave.org/index.php/be-informed/definition-of-food-loss-and-waste>>.

"Food | Definition of Food in English by Oxford Dictionaries." *Oxford Dictionaries | English*, [en.oxforddictionaries.com/definition/food](http://en.oxforddictionaries.com/definition/food).

"Food Loss and Food Waste." *Food and Agriculture Organization of the United Nations*, [www.fao.org/food-loss-and-food-waste/en/](http://www.fao.org/food-loss-and-food-waste/en/).

"Food Waste Reduction | WRAP Cymru." *WRAP - Circular Economy & Resource Efficiency Experts*, [www.wrap.org.uk/food-waste-reduction](http://www.wrap.org.uk/food-waste-reduction).

"Food Waste | Technical Platform on the Measurement and Reduction of Food Loss and Waste | Food and Agriculture Organization of the United Nations." *Food and Agriculture Organization of the United Nations*, [www.fao.org/platform-food-loss-waste/food-waste/definition/en/](http://www.fao.org/platform-food-loss-waste/food-waste/definition/en/).

*FWRA - Food Waste Reduction Alliance*, [www.foodwastealliance.org/](http://www.foodwastealliance.org/).

"Instock Turns Food Surplus into Delicious Meals." *Instock*, [www.instock.nl/en/](http://www.instock.nl/en/).

"Mission." *Home -- SAVE FOOD*, [www.save-food.org/cgi-bin/md\\_interpack/lib/pub/tt.cgi/Mission.html?oid=54538&lang=2&ticket=g\\_u\\_e\\_s\\_t](http://www.save-food.org/cgi-bin/md_interpack/lib/pub/tt.cgi/Mission.html?oid=54538&lang=2&ticket=g_u_e_s_t).

"One-Third of Food Is Lost or Wasted: What Can Be Done." *Latest Stories*, 13 Oct. 2014, [news.nationalgeographic.com/news/2014/10/141013-food-waste-national-security-environment-science-ngfood/](http://news.nationalgeographic.com/news/2014/10/141013-food-waste-national-security-environment-science-ngfood/).

"Second Committee Approves 7 Draft Resolutions Including Text on Reducing Postharvest Food Losses, Waste | Meetings Coverage and Press Releases." *Welcome to the United Nations*, [www.un.org/press/en/2013/gaef3390.doc.htm](http://www.un.org/press/en/2013/gaef3390.doc.htm).

"Sustainable Consumption and Production." *United Nations Sustainable Development*, [www.un.org/sustainabledevelopment/sustainable-consumption-production/](http://www.un.org/sustainabledevelopment/sustainable-consumption-production/).

"Sustainable | Definition of Sustainable in English by Oxford Dictionaries." *Oxford Dictionaries | English*, [en.oxforddictionaries.com/definition/sustainable](http://en.oxforddictionaries.com/definition/sustainable).

"World Hunger, Poverty Facts, Statistics 2016." *World Hunger News*, [www.worldhunger.org/2015-world-hunger-and-poverty-facts-and-statistics/](http://www.worldhunger.org/2015-world-hunger-and-poverty-facts-and-statistics/).

## Appendix or Appendices

- I. "Filter the Timeline | The Right to Food Timeline | Food and Agriculture Organization of the United Nations." *Home | Food and Agriculture Organization of the United Nations*, [www.fao.org/right-to-food-timeline/filter-the-timeline/en/](http://www.fao.org/right-to-food-timeline/filter-the-timeline/en/).
- II. "Transforming Our World: the 2030 Agenda for Sustainable Development ... Sustainable Development Knowledge Platform." *Home ... Sustainable Development Knowledge Platform*, [sustainabledevelopment.un.org/post2015/transformingourworld](http://sustainabledevelopment.un.org/post2015/transformingourworld).

<b>Forum:</b>	Sustainable Development Sub-Commission 2
<b>Issue:</b>	Promoting the development and dissemination of affordable technological solutions to achieve sustainability
<b>Student Officer:</b>	Aykan Akyıldırım
<b>Position:</b>	Deputy President

---

## Introduction

Sustainable development is denoted as “development that meets the need of present without compromising the ability of future to meet their own”. Sustainability has three inseparable pillars which are social, economic, and environmental sustainability. Today, sustainability and sustainable development lay the “foundation for international cooperation”. The 2030 Agenda for Sustainable Development and Sustainable Development Goals cement the role of sustainability on an international level. Sustainable Development Goals apply to every government. Sustainability should set standards for every development project for long-term achievements. In addition, every individual as well as the government should embrace the principles of sustainability in order to have sustainable communities. Sustainability is not simply a moral challenge; it is a matter of long-term objectives and vision. For all these reasons, sustainable development should consider the environmental, economic, and social impacts of technology.

The use of technology has had negative effects on the environment; however, sustainability is only possible with new, integrated technological solutions. In order to divert the unsustainable direction of our future, we must develop and disseminate affordable technological solutions and technical assistance. A sustainable society could only function through the utilization of these sustainable and affordable technological solutions. There only remain the questions of how to promote the development of these technologies and if, how, when to disseminate these technologies.

## Definition of Key Terms

### Commercialization

Commercialization is defined as “to exploit for profit”. While commercialization might potentially lower the prices for certain technologies, this could also hinder the process of knowledge dissemination and transfer between nations as it prioritizes profit over sustainable commerce.

### Dissemination

Dissemination is defined as “the act of spreading widely”. Under this context, dissemination involves “making the results and deliverables available to the wider audience”.

### Open Source Appropriate Technology (OSAT)

Open source appropriate technology (OSAT) is technology which is convenient for the “local” economic and social conditions; OSATs are easy to obtain and utilize for community purposes. The uptake of OSAT assists sustainability.

### Renewable Energy Technologies (RETs)

According to the Renewable Energy Association, “RETs are energy-providing technologies that utilize energy sources in ways that do not deplete the Earth’s natural resources and are as environmentally benign as possible”. Solar Panels, hydroelectric generating plants, wind turbine generators, biomass generating plants are some of the examples for RETs. RETs are tools for ensuring environmental sustainability.

### Sustainable Development Goals (SDG)

Sustainable Development Goals have been formed by the United Nations Conference on Sustainable Development in 2012. They outline particular economic, social, and environmental objectives. SDGs replace Millennium Development Goals whereby global attention had been drawn to education, health, and poverty-related issues. SDGs consist of 17 goals which interconnect.

## Background Information

Innovation and development processes for sustainability require particular capital resources, opportunities, and government encouragement. These should be followed by dissemination of information as to how to innovate, promoting the technology, and standardization of the innovation.

Economic policies of governments as well as policies on the protection of intellectual property paves the way for innovation and long-run economic growth. Innovation is supported by conveniently stable economic environments. In addition, abundant capital and labor resources as well as “effective regulatory processes” boost research and development. In some cases, especially in the case of promoting dissemination, the widespread of intellectual property results with underinvestment in research and development. For this reason, governments intervene in the research and development of new technologies to fulfill the gaps in the industry. Governments should foster research and development in order to foster innovation. Some of the gadgets governments could implement include directly funding government research centers, funding private-sector, grants to university researches, and tax incentives.

The governments should focus on the financial support they can provide development programs with and inclusively answer the question of intellectual property. As for the core of the

issue, it could be examined under two levels: development of technological solutions and dissemination of technologies.

## Development

Governments should find ways to promote technological solutions to achieve sustainability. However, this encouragement to research and development will only work if the communities can adapt to these technologies. Some communities possess different social and economic structures, and therefore, those communities would have a different, perhaps more difficult, adaptation process for certain technologies.

Environmental, economic, and social aspects of communities should be considered during the development of certain technologies. Appropriate technologies and their standardization is elemental in achieving sustainability. Despite their apparent economic suitability, there are certain barriers for the promotion and public standardization of appropriate technologies. These barriers include social opinion towards these technologies, transferability issues, and problems of stable funding. These technologies require tremendous encouragement and funding; they require extensive social analysis of the environment; they are seen as “inferior” technologies by certain social classes.

One of the major barriers for appropriate technologies is the necessity to establish more collaboration and communication. Also, the public appeal on these technologies is a major barrier. The complexity of dissemination and the integration process for the appropriate technologies are some other barriers. The development and dissemination of technologies, especially ATs, require stable funding which negatively affects the response to the entry of ATs into the appropriate regions. Funding is needed for technical support, preliminary studies of regions, and development.

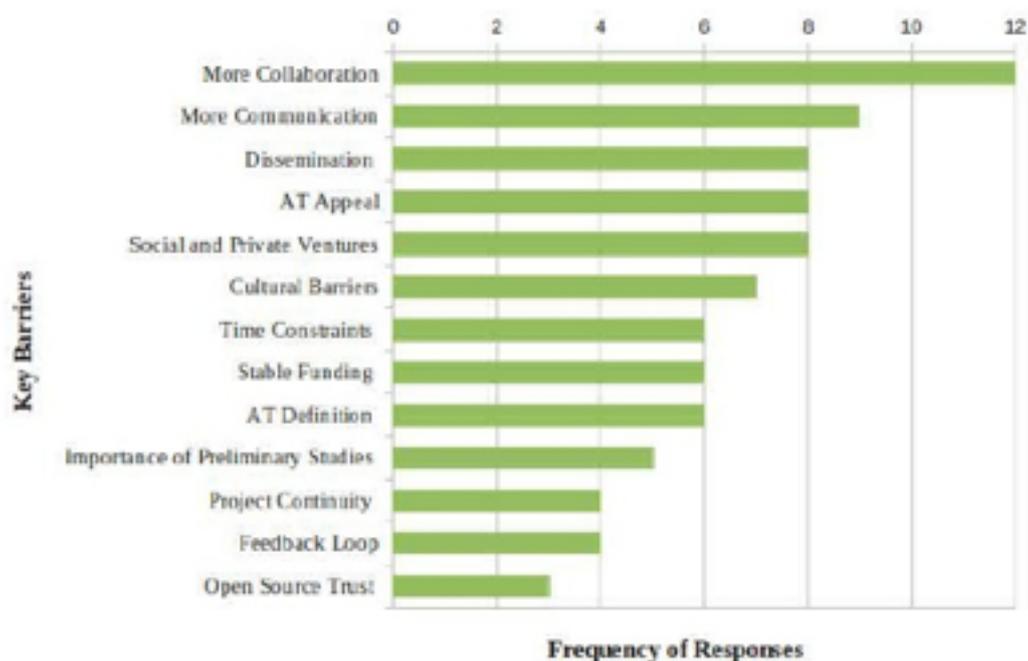


Figure 1. Frequency of responses to key OSAT barriers

These barriers could be overcome through better collection and transmission of data and intense emphasis on crowd-sourcing and cooperation. Such measures would improve appropriate technology efficiency and facilitate its promotion. For easier adaptation of these technologies open source development could be encouraged. Individual and university-based involvement would be viable for the development of open sourced and appropriate technologies to achieve sustainability.

As for the question of absolute sustainability in development, such a concept is only possible with investment in renewable energy technologies (RETs), notably solar energy. The involvement of non-renewable energies on the integration of sustainable development projects results with “unsustainable polluting linear flow”. In order to achieve complete sustainability with technological solutions, sustainable flow economies where no emission is present should be aimed. The promotion of RETs would promote the development of further projects and the development of technological solutions.

Overall, promoting the development of affordable technological solutions largely depend on the emphasis of (OS) ATs and RETs.

### Dissemination of technologies

The issue of dissemination of technologies is a highly controversial matter involving various elements and possible methods. However, the dissemination of technologies is vital for global acceleration of sustainable development. It has been brought up as a core principle for various documents by organizations such as United Nations Framework Conference on Climate Change.

The numerous elements of dissemination consist primarily of purpose, strategy, and stakeholders. The stakeholders provide the object, which in this case are the technological solutions, and the purpose is to achieve sustainability. The question is the strategy. The overall process involves dissemination object which is intellectual property, dissemination agent, transfer mechanisms, recipients, originators, and demand.

There exists a knowledge dissemination object- technologies- which initially belongs to a knowledge originator. Recognizing a demand environment for dissemination, originator transfers the dissemination object to transfer recipients through dissemination agents which utilize transfer mechanisms. The dissemination agents engage in relationship management to ensure transparency for the knowledge originator and any other stakeholders.

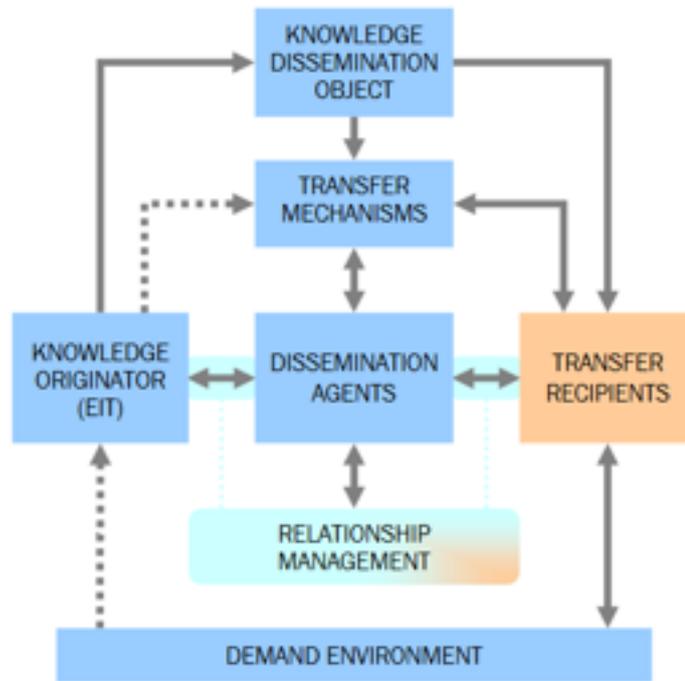


Figure 2. A framework of the dissemination scheme

The main issue with the dissemination of technologies is the issue of intellectual property. Most governments and private institutions remain reluctant on the process for commercial purposes. There is a polarized view on the matter; while developing countries consider the issue of intellectual property rights a barrier for global sustainability, developed countries and private institutions believe that the reservation of intellectual property rights actually incentivize innovation and the research and development of technological solutions to sustainability.

## Major Countries and Organizations Involved

### European Union

European Union is a political and economic union of 28 European states. Starting as an economic community, European Economic Community (EEC), the European Union has expanded into one of the world's largest political unions. Its executive branch is the European Commission. European Commission aims to "formulate climate policies and strategies" and "promote low-carbon technologies and adaptation measures". Directorate-General for Climate Action (DG CLIMA) supervises the steps taken against climate change. European Commission has set a "2050 low-carbon economy" target and other sub-targets under 2020 energy package and 2030 energy framework. European Commission works to promote the uptake of new technologies through technology commercialization. EU initiatives such as NER 300 Funding Programme and Global Energy Efficiency and Renewable Energy Fund (GEEREF) have been used as a development and deployment tool for sustainable technologies.

## United States of America

With the largest economy in the world in terms of GDP, 18.569 trillion US dollars in 2016, the United States also leads the world in carbon emissions. In fact, the CO<sub>2</sub> emission has been recorded to be an estimated 16.464 metric tons per capita in 2014 according to World Bank. Although The United States leads the world in terms economic expenditure and carbon emissions, The United States President Trump has announced US withdrawal from the Paris Agreement. Due to legal provisions of the agreement, this withdrawal cannot take place until November 4, 2020. Regardless of their plans to withdraw from the agreement, the United States have pledged various commitments to global environmental funds and international partnerships. The United States is a part of the Open SDG Engagement Platform in collaboration with organizations and countries such as The World Bank, Kenya, and The Sustainable Development Solutions Network. Additionally, The United States is a partner of the SEED: Supporting Entrepreneurs for Sustainable Development Initiative. As for technology development, 2.788 percent of the GDP of the USA is spent annually for research and development programs.

## United Nations Development Programme

Founded in 1966, The United Nations Development Programme (UNDP) focuses on progress towards sustainable development, democratic governance and peacebuilding, and climate and disaster resilience as well as gender equality, crisis response, and development impact. The UNDP currently envisions a future shaped by the ideals of the Sustainable Development Goals. As of January 2016, The UNDP is guided by the principles of these goal; The UNDP also helps the implementation of these goals in over 170 countries. It aims to accelerate the global development process so as to reach the goals by 2030. The UNDP works with both private sector and governments to assist development policy-making and implementation.

## Russian Federation

The Russian Federation assumes a key role in the world as one of the main energy providers in terms of gas, electricity, and coal. According to the report provided by the Interagency Work Group of Russia which analyzed its sustainable development, the Russian Federation still lacks an integrated approach on environment and economic growth. According to World Bank, Russia had a GDP of 1.283 trillion US dollars in 2016, and it was responsible for 11.858 metric tons of CO<sub>2</sub> emissions per capita in 2014. According to OECD data, 1.132 percent of Russia's GDP flows into research and development programs. However, Russia is slowly moving towards sustainable development principles. The Russian Federation is a partner of the Climate and Clean Air Coalition along with 110 other partners and 45 NGOs.

## People's Republic of China

With its vast population of 1.38 billion people, China presents huge potential in a variety of aspects. China is slowly becoming a research hub on various subjects. The investment on research and development in China has increased tremendously over the years. While only 0.56 percent of GDP in China would go to research and development in 1996, 2.07 percent of China's GDP went to research and development expenditures in 2015. Currently, China leads the world in coal energy and a sustainable economic approach has to be integrated with the economy. China's GDP was reported as 11.199 trillion US dollars in 2016, and the carbon emission was reported as 7.54 metric tons of CO<sub>2</sub> emission per capita. In the most recent five-year plan, the focus of development in China was shaped; in the coming years, development in China will be "innovative, coordinated, green, open, and shared".

### The Technology Mechanism

Established in 2010, after the United Nations Framework Convention on Climate Change, the Technology Mechanism serves to facilitate the development and transfer of technological solutions. It consists of two branches: Technology Executive Committee (TEC) and the Climate Technology Centre and Network (CTCN). CTCN is the implementation branch of the mechanism and aims to provide technical assistance and access to information. Additionally, the Technology Mechanism has been commissioned to serve particular provisions of the Paris Agreement such as Article 10.

### Timeline of Events

<b>Date</b>	<b>Description of event</b>
1 January, 1966	United Nations Development Programme comes into formal existence.
5-16 June, 1972	United Nations Conference on Human Environment is held in Stockholm. Subsequently, the Report of the United Nations Conference on Human Environment is published. "Sustainable development" has been used as a term for the first time.
June, 1987	Brundtland Report, "Our Common Vision", has been annexed on resolution A/42/427 and adopted by the United Nations.
3-14 June, 1992	United Nations Conference on Environment and Development (UNCED), also known as Earth Summit, is held in Rio de Janeiro. The outcome document is known as Agenda 21.
December, 1993	UN Resolution A/RES/48/190: Dissemination of the Principals of the Rio Declaration on Environment and Development is adopted.

23-27 June, 1997	Special Session of the GA to Review and Appraise the Implementation of Agenda 21 is held.
29 June, 2000	The Earth Charter is finalized in the Hague, the Netherlands.
4 September, 2002	United Nations World Summit on Sustainable Development has been held in Johannesburg, South Africa. Johannesburg Declaration on Sustainable Development is presented consequently.
31 May- 11 June, 2010	United Nations Framework Convention on Climate Change (UNFCCC) is held in Bonn, Germany.
13 September, 2010	UN General Assembly adopts Resolution A/RES/64/299.
20-22 June, 2012	The United Nations Conference on Sustainable Development, also known as Rio+20, has been held. It has been the largest UN conference to date.
27 July, 2015	United Nations General Assembly adopts resolution A/RES/69/313 whereby Addis Ababa Action Agenda of the Third Conference on Financing for Development is endorsed.
25 September, 2015	United Nations General Assembly adopts resolution A/70/1, Transforming our world: the 2030 Agenda for Sustainable Development.
January, 2016	Sustainable Development Goals come into effect.
4 November, 2016	The Paris Agreement enters into force.

## Relevant UN Treaties and Events

- Report of the World Commission on Environment and Development, 4 August 1987 (**A/42/427**)
- Plan of Implementation of the World Summit on Sustainable Development, 4 September 2002 (**A/CONF.199/20**)
- Draft outcome document of the High-level Plenary Meeting of the General Assembly on the Millennium Development Goals, 13 September 2010 (**A/RES/64/299**)
- Addis Ababa Action Agenda of the Third International Conference on Financing for Development, 17 August 2015 (**A/RES/69/313**)
- The Future We Want
- The Paris Agreement, 4 November 2016

## Previous Attempts to Solve the Issue

There has not been an attempt on the matter on a global scale. The development and dissemination of technologies seek to assist the achieving of Sustainable Development Goals by 2030 and achieve sustainability in general. Ideally, any solution attempt will have shown solid results before 2030, and there has not been a concrete indication for any global measures to be labelled as “failed solution attempt” yet.

The Paris Agreement strongly encourages the dissemination of technologies to achieve sustainability; this encouragement could be deemed an attempt to recognize the issue and ensure global recognition of the matter and its importance. On November 4, 2016, the agreement went into force. So far, 170 of the 196 signatories have ratified the agreement. Some of the provisions of the agreement are legally binding. The agreement realizes the importance of “technology development and transfer” in hopes to improve sustainability and global resilience to climate change. On the 10th Article, the role of technology deployment and dissemination is emphasized; the Technology Mechanism is commissioned to serve the article; “accelerating, encouraging and enabling innovation” is called for; technological and financial support to “developing Parties” are ensured.

A/RES/69/313 is a United Nations resolution; Addis Ababa Action Agenda was transmitted as an Annex to this document. Adopted in 27 July, 2015, the resolution decides to “establish a technology facilitation mechanism” under the provisions of the Agenda in paragraph 123. A/RES/64/299 is a United Nations General Assembly resolution which addresses and presents the outcome document of High-level Plenary Meeting of the General Assembly on the Millennium Development Goals. The outcome document outlines the essential steps to be taken towards achieving Millennium Development Goals. The resolution links adopting macroeconomic policies with the promotion of sustainable development. It also connects accelerated progress with sustainable development. The resolution emphasizes the importance of “regional and sub-regional cooperation for strategy implementation”.

Future We Want is the “outcome document” of the UN Conference on Sustainable Development. The document outlines a “common vision” of the states and governments. At the 3rd clause of the “common vision”, it is directly acknowledged that to “further mainstream sustainable development” is essential in achieving sustainable development at all dimensions. Through the document, UN recognizes the necessity of promoting “sustainable patterns of consumption and production and protecting and managing the natural resource base of economic and social development”. Future We Want also reminds the importance of global commitment and “international cooperation” on tackling challenges ahead. The document should be taken into consideration while drafting any proposal on the issue of promoting sustainable development since it has a strong emphasis on the matter.

EU has commissioned a directorate to executively supervise several projects and funding programs on the matter. Although these attempts have not been sufficient to solve the issue of the

development and dissemination of technologies, they certainly stand as exemplary figures for what could be done and what could be improved on the existing systems and mechanisms.

## Possible Solutions

There are various aspects to promoting the development and disseminating the developed technological solutions. Some of these aspects could be addressed by global funding initiatives. The economic flexibility would encourage further research development for certain subjects. In addition, enhanced intergovernmental dialogue is encouraged. Such dialogue could help implement common strategies on dissemination plans. Governments should also enhance their dialogue with private sector and stakeholders to achieve facilitated cooperation on research and development. Further studies on OSATs are crucial to achieve sustainable technologies; technological solutions should be economically, socially, and environmentally appropriate to achieve complete sustainability. Last but not least, a “Technology Dissemination” commission could be established under the Technology Mechanism by the Parties of UNFCCC, for The Technology Mechanism is ultimately a “technology” mechanism, and although it provides technical assistance, it does not specialize on dissemination of technologies.

## Bibliography

Bernanke, Ben. “The Government's Role in Promoting R&D | Real Clear Politics.” *Real Clear Politics - Opinion, News, Analysis, Video and Polls*, 16 May 2011,

[https://www.realclearpolitics.com/articles/2011/05/16/the\\_governments\\_role\\_in\\_promoting\\_rd\\_109873.html](https://www.realclearpolitics.com/articles/2011/05/16/the_governments_role_in_promoting_rd_109873.html)

Borgen Project. “UN Millennium Development Goals.” *The Borgen Project*. 18 November 2017. Web.

<https://borgenproject.org/un-millennium-development-goals/>

“Disseminate.” *Dictionary*, Dictionary.com. 18 November 2017. Web.

<http://www.dictionary.com/browse/disseminate>

European Commission. “Managing projects.” *Chafea Managing Grant Agreements & Contracts - Disseminating Project Result - European Commission*, European Union. 18 November 2017. Web.

[http://ec.europa.eu/chafea/management/Fact\\_sheet\\_2010\\_10.html](http://ec.europa.eu/chafea/management/Fact_sheet_2010_10.html)

European Commission. “Climate strategies & targets.” *Climate Action - European Commission*, European Union, 23 Nov. 2016. 18 November 2017.

[https://ec.europa.eu/clima/policies/strategies\\_en](https://ec.europa.eu/clima/policies/strategies_en)

European Commission. “What we do.” *Climate Action - European Commission*,

European Union, 23 Nov. 2016. 18 November 2017. Web.

[https://ec.europa.eu/clima/about-us/mission\\_en](https://ec.europa.eu/clima/about-us/mission_en)

Georgopoulos, Giorgos. "Knowledge Dissemination from the European Institute of Innovation and Technology." *Centre for Economics and Policy (CEP)*, University Of Cambridge, June 2008. 19 November 2017. Web.

<https://www.ifm.eng.cam.ac.uk/uploads/Research/CIG/WorkingPaper2.pdf>

Global Economy. "China R&D (Research and development) expenditure - data, chart." *TheGlobalEconomy.com*. 19 November 2017. Web.

[http://www.theglobaleconomy.com/China/Research\\_and\\_development/](http://www.theglobaleconomy.com/China/Research_and_development/)

"Hinder." *Merriam-Webster*, Merriam-Webster. 18 November 2017. Web.

<https://www.merriam-webster.com/dictionary/hinder>

Interagency Working Group, and A Bedritskiy. *REPORT ON IMPLEMENTING THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT IN THE RUSSIAN FEDERATION. RUSSIAN OUTLOOK ON THE NEW PARADIGM FOR SUSTAINABLE DEVELOPMENT. PREPARING FOR "RIO 20"*. United Nations, *REPORT ON IMPLEMENTING THE PRINCIPLES OF SUSTAINABLE DEVELOPMENT IN THE RUSSIAN FEDERATION. RUSSIAN OUTLOOK ON THE NEW PARADIGM FOR SUSTAINABLE DEVELOPMENT. PREPARING FOR "RIO 20"*, 2012. 19 November 2017. Web.

<https://sustainabledevelopment.un.org/content/documents/1043natrepeng.pdf>

International Centre for Trade and Sustainable Development. "The Climate Technology Mechanism: Issues and challenges." *The Climate Technology Mechanism: Issues and challenges | International Centre for Trade and Sustainable Development*, International Centre for Trade and Sustainable Development, 28 Nov. 2011. 19 November 2017. Web

<https://www.ictsd.org/bridges-news/biores/news/the-climate-technology-mechanism-issues-and-challenges>

International Institute for Sustainable Development. "Sustainable Development." *International Institute for Sustainable Development*, International Institute for Sustainable Development. 19 November 2017. Web.

<https://www.iisd.org/topic/sustainable-development>

Sustainable Development Knowledge Platform. "China: Sustainable Development Knowledge Platform." *United Nations*, United Nations. 19 November 2017. Web.

<https://sustainabledevelopment.un.org/memberstates/china>

Sustainable Development Knowledge Platform. "Technology: Sustainable Development Knowledge Platform." *United Nations*, United Nations. 19 November 2017. Web.

<https://sustainabledevelopment.un.org/topics/technology#>

"Technology and Sustainability." *ITA: Technology and Sustainability*, Institute of Technology Assessment. 19 November 2017. Web.

<https://www.oeaw.ac.at/ita/index.php?id=235&L=1>

United Nations Commission on Sustainable Development. "Framing Sustainable Development the Brundtland Report – 20 Years On." *Backgrounder- Brundtland Report*, United Nations, Apr. 2007.

[http://www.un.org/esa/sustdev/csd/csd15/media/backgrounder\\_brundtland.pdf](http://www.un.org/esa/sustdev/csd/csd15/media/backgrounder_brundtland.pdf)

United Nations Conference on Sustainable Development, and United Nations General Assembly. "Future We Want - Outcome document." *Sustainable Development Knowledge Platform*, United Nations, 14 November 2017.

<https://sustainabledevelopment.un.org/index.php?menu=1298>

United Nations Conference on Trade and Development. "Renewable Energy Technologies for Rural Development." *UNCTAD*, United Nations, Apr. 2009.

[unctad.org/en/docs/dtlstict20094\\_en.pdf](http://unctad.org/en/docs/dtlstict20094_en.pdf)

United Nations Development Programme. "Background of the Sustainable Development Goals." *UNDP*, United Nations. Na. 16 Nov. 2017. Web

<http://www.undp.org/content/undp/en/home/sustainable-development-goals/background/>

United Nations Framework Convention on Climate Change. "Paris Agreement: Sustainable Development Knowledge Platform." *United Nations*, United Nations. 17 November 2017. Web.

<https://sustainabledevelopment.un.org/frameworks/parisagreement>

United Nations Framework Convention on Climate Change. "Technology Mechanism." *TT: CLEAR*, United Nations. 18 November 2017. Web.

<http://unfccc.int/ttclear/support/technology-mechanism.html>

United Nations General Assembly. "Resolution adopted by the General Assembly on 13 September 2010." *United Nations Official Document*, United Nations, 8 October 2010.

[http://www.un.org/en/ga/search/view\\_doc.asp?symbol=A/RES/64/299](http://www.un.org/en/ga/search/view_doc.asp?symbol=A/RES/64/299)

World Bank. "Data for United States, China, Russian Federation." *Data for United States, China, Russian Federation* | *Data*, the World Bank Group. 19 November 2017. Web

<https://data.worldbank.org/?locations=US-CN-RU>

World Commission on Environment and Development. "Report of the World Commission on Environment and Development: Our Common Future." *Our Common Future, Chapter 3: The Role of the International Economy - A/42/427 Annex, Chapter 3 - UN Documents: Gathering a body of global agreements*, Sept. 2002. 16 November 2017. Web.

<http://www.un-documents.net/wced-ocf.htm>

Zelenika, I, and J M Pearce. "Innovation through collaboration: scaling up solutions for sustainable development." *Academia*, Academia, 27 Mar. 2014.

[http://www.academia.edu/9013667/Innovation\\_Through\\_Collaboration\\_Scaling\\_up\\_Technological\\_Solutions\\_for\\_Sustainable\\_Development](http://www.academia.edu/9013667/Innovation_Through_Collaboration_Scaling_up_Technological_Solutions_for_Sustainable_Development)

## Appendix or Appendices

- I. European Union Report on Country Case Studies from the EU-NGOs Project, "Promoting Sustainable Development Through More Effective Civil Society Participation in Environmental Governance": [http://ec.europa.eu/environment/international\\_issues/pdf/EU\\_NGOs\\_publication\\_20161219.pdf](http://ec.europa.eu/environment/international_issues/pdf/EU_NGOs_publication_20161219.pdf)
- II. Report of the United Nations Conference on Human Environment: <http://www.un-documents.net/aconf48-14r1.pdf>
- III. United Nations GA Economic and Social Council, Report of the Secretary-General on "Mainstreaming of three dimensions of sustainable development throughout the United Nations system": [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/71/76&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/71/76&Lang=E)
- IV. United Nations GA Economic and Social Council, Report of the Secretary-General on "Progress towards the Sustainable Development Goals": [http://www.un.org/ga/search/view\\_doc.asp?symbol=E/2016/75&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=E/2016/75&Lang=E)

- V. United Nations GA Report of the Secretary-General on “Promotion of new and renewable sources of energy”: [http://www.un.org/ga/search/view\\_doc.asp?symbol=A/71/220&Lang=E](http://www.un.org/ga/search/view_doc.asp?symbol=A/71/220&Lang=E)

**Forum:** Sustainable Development Sub-Commission 2

**Issue:** The role of green energy in the eradication of poverty

**Student Officer:** Naz Kayın

**Position:** President

## Introduction

The role of green energy in the eradication poverty RETs (Renewable Energy Technologies) are energy-providing technologies that use energy sources without depleting the Earth's natural resources. These sources are sustainable which means they can be used indefinitely without harming or damaging the environment. That is why many countries like India uses Renewable Energy Technologies to meet the energy needs of rural communities and to eradicate poverty by supplying electricity to the villages in need.

The nature of Renewable Energy Technologies does not require continuous technical assistance or additional resources once it is built so it can supply needs of different rural areas in need. It is also vital to know that electricity is not the only thing RET's are used for. Using these resources for cooking or heating is also very common in some cultures; these are called the domestic uses. This is the reason why using RET's on domestic use and electricity is important for the eradication of extreme poverty in rural areas.

## Definition of Key Terms

### Green Energy

Green energy is the energy that is collected from renewable resources, meaning the resources which are naturally renewed. Renewable energy is collected from sources such as wind, sunlight, rain and geothermal heat. These sources are non-polluting and eco-friendly energy sources and they have a small impact on the environment. There are many types of Green Energy including solar power, hydropower, wind power and biofuels.

### Green Growth

Green growth is using sustainable and renewable natural resources for efficient economic growth that minimizes environmental impacts. It is seen essential for achieving sustainable development as it is mentioned in the Millenium Development Goals. After November 2010, at the G20 summit in Seoul many governments and leaders accepted Green Growth as a fundamental part of sustainable development.

### Absolute Poverty

Absolute poverty is the level of poverty in which an individual can't obtain its basic requirements such as food, water, healthcare or shelter. This level is same in every country and it does not change over time. According to the World Bank, there were more than 1.3 billion people in absolute and extreme poverty as of 2013.

### Relative Poverty

Relative poverty is the minimum living standard of an individual in a society which means it can differ between countries and time.

### Poverty lines

Poverty lines are cut-off points that separate those who live in poverty from those who don't. The extreme poverty line currently stands at \$1.25 which is defined by the World Bank.

### Social deprivation

Social deprivation is the lack of social interaction between an individual and the society, which occurs when there is inadequate access to social amenities like education, health, sanitation, water, shelter and security.

### Environmental deprivation

Environmental deprivation means the lack clean air, water, parks (the sources which supports the wellbeing of the people living in those cities or neighborhoods. It severely affects the health conditions of individuals in certain areas. It is mostly seen in the cities with extreme poverty. Over-industrialization is also one of the biggest cause of environmental deprivation.

### Natural resource decoupling

Natural resource decoupling is reducing the resource consumption for economic output or industrial growth. The consumption of natural resources are rapidly rising throughout the world due to the increase of population and the increase of energy demand. Decoupling natural resource use is necessary for sustainable green growth.

## Background Information

### Benefits of Green Energy

Access to RET's for domestic use and electricity will gravely change the conditions in rural areas. It can also improve the health conditions caused by environmental deprivation by reducing infections caused by water or air pollution. Using these technologies in an affordable way will also improve the house economy. With RET's, houses will not need to use expensive traditional fuels. People will have a chance to use this time and money on other things.

Access to electricity is necessary in the 21st century. Without electricity it is extremely hard to run a house. For example, in order to have clean water, a house should have electric water pumps. Refrigeration of food or even vaccines in rural hospitals are very crucial and necessary to have a healthy environment. In this century, access to television or telephone, which allows people to communicate with the outside world, is a necessity. Electricity provides health, security and all other human needs.

The RETs have a great potential to generate local economic activity in rural areas and supply power to the local industry. For example, supplying energy to the radio services by using the RET's can give vital information about the weather or the crop prices to the farmers in a village. Applications like these can lead to job increase and improved the life conditions, which are important for the eradication of poverty in rural areas.

### A Guideline to the Green Economy

The definition of a green economy has been as established as follows by UNEP: “[A green economy is] one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. In its simplest expression, a green economy can be thought of as one which is low carbon, resource efficient and socially inclusive.

Economic policies can transform a polluting industrial economy to a green economy. The European Union changed their own economic policies to start this process. The legislations passed by the European Council guided companies and the consumers to transform towards a green sustainable economy. These policies will help to protect the environment and encourage leaders of the companies to make business in an environmentally friendly way.

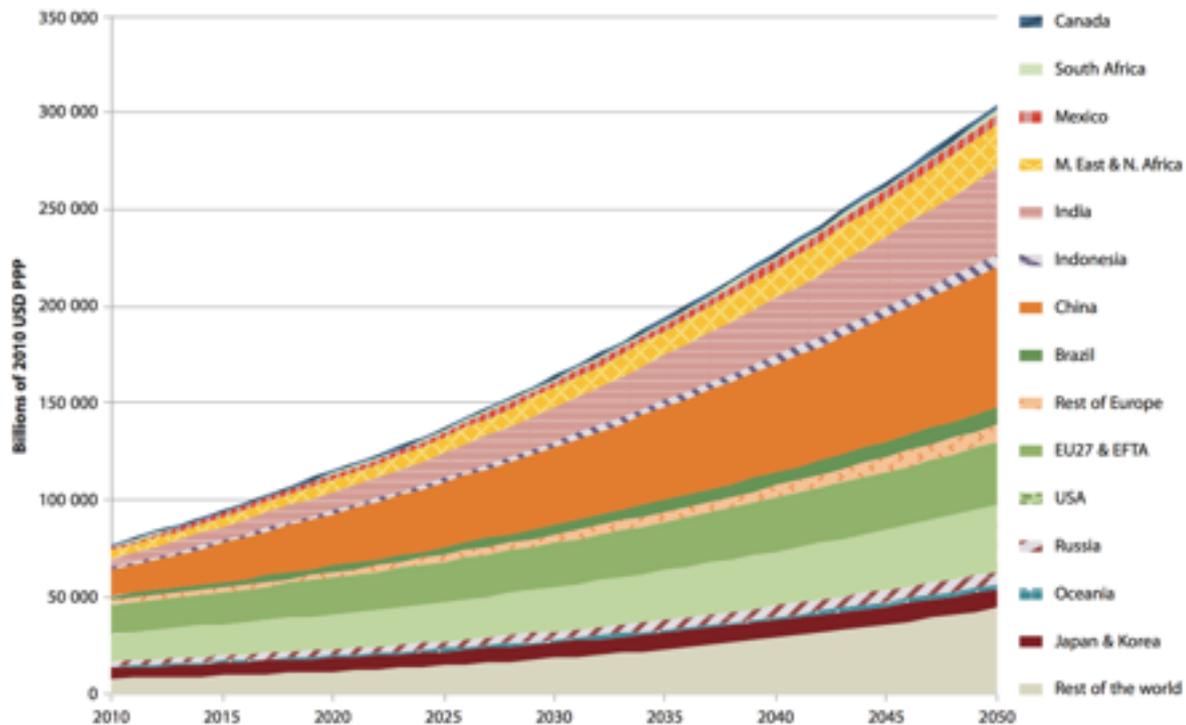
Without careful economic planning these industries can't transform into environmental and sustainable economy. It's important to state that without encouraging the people to adopt this economic style, it's impossible to have a true green economy. Encouraging the politicians and economic leaders with legislations will not be enough. These legislations should be well thought and it should be different for each country to be efficient.

### Developing Countries and Green Growth

Developing countries are the most fundamental intermediary for achieving global green growth. The economic and social effects of environmental corruption are particularly severe in developing countries because they are extremely vulnerable for environmental threats as they are dependent on the exploitation of natural resources. Additionally, they confront with premature deaths caused by pollution, unsanitary water and diseases due to climate change. The development of the labor supply and an extreme demand for commodities (fossil fuels) has definitely helped with the growth.

Developing countries are grouped into three various clusters as follow: “fuel exporters, non-fuel commodity exporters, and manufacturing exporters”. Growth in these countries are generally directed towards fuel and extractive industries and this further exposes them to the threats of climate change which will cause social, economic and health consequences. According to the predictions of the OECD, there will be a substantial growth in emerging countries as long as they

embrace the policies that would help them progress. Additional benefits would be developing agriculture and natural resources, create jobs, and eventually eliminate poverty.



\* All monetary values are expressed in real terms, in constant 2010 USD PPP, unless otherwise indicated.

Source: Chateau *et al.* (2011).

**Figure 1: Trend in real gross domestic product (GDP) valued at constant PPP prices by region**

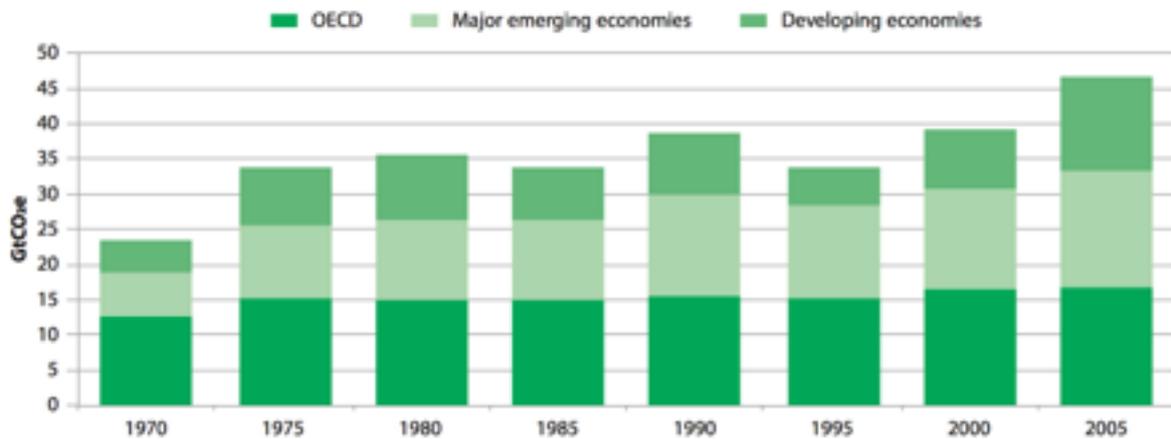
Considering the growth trajectory measured in terms of CO<sub>2</sub> intensity, the developing countries are the following: South Africa, Brazil, Colombia, Costa Rica and Dominican Republic.

### Economic Aspect of the Issue

Many political figures have argued that green growth either has a negative or positive impact on the economy. The first thing that should be analyzed when searching the economic aspect of green growth is employment opportunities. Jobs that are associated with environmental objectives and policies are called as “green jobs”. The Bureau of Labor Statistics (BLS) in the United States defines green jobs as “jobs in businesses that produce goods and provide services that benefit the environment or conserve natural resources.” In 2007, European Commission announced that green jobs accounted for 1.7% of the jobs in Europe which is a very significant percentage. The main argument that many environmental organizations use is that green policies create more jobs. United Nations Environment (UNEP) claims that green policies create decent jobs with job security and fair wages.

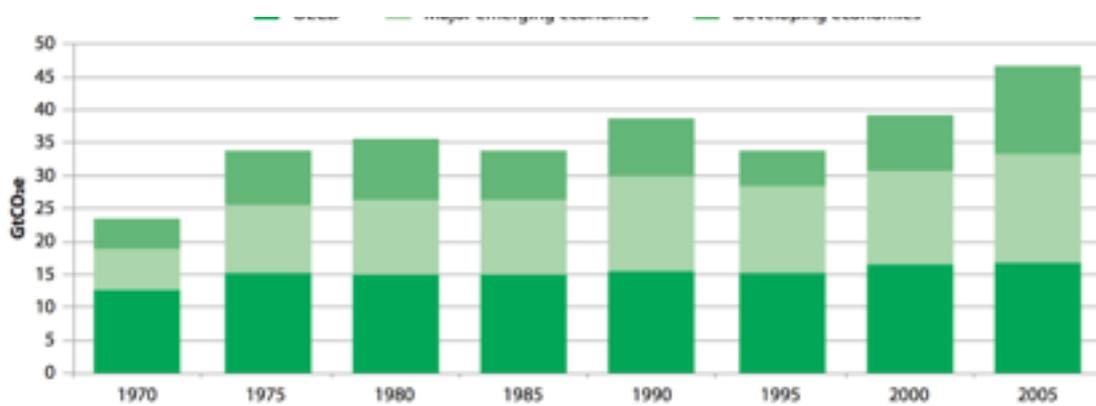
While there are many reports showing that green policies create jobs, it can also severely decrease the number of “brown jobs” in polluting industries. The problems that green policies create should not be ignored. Some reports claim that green policies will not have a significant

change in terms of employment. Converting energy sectors to low-carbon technologies will require more investment and many underdeveloped countries are unable to provide these resources.



GtCO<sub>2</sub>e = Giga tonnes of CO<sub>2</sub> equivalent.

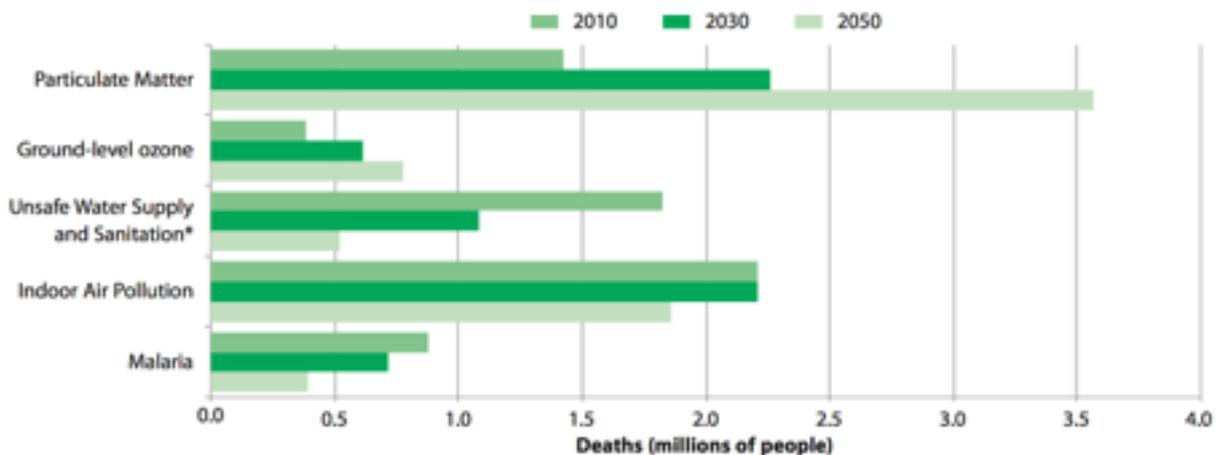
Source: OECD Environmental Outlook Baseline; output from ENV-Linkages.



GtCO<sub>2</sub>e = Giga tonnes of CO<sub>2</sub> equivalent.

Source: OECD Environmental Outlook Baseline; output from ENV-Linkages.

Figure 3 GHG emissions by region: 2010-2050



\* Child mortality only.

Source: OECD Environmental Outlook Baseline; output from IMAGE (PBL).

Figure 4 Global premature deaths from selected environmental risks: 2010 to 2050

## Major Countries and Parties Involved:

### Indonesia

Indonesia is the largest country in the region and it has the world's fourth largest population with a rapidly increasing economy that accounts for 40% of the energy consumption in Southeast Asia. It has started to restructure its coal and petroleum based energy production to green energy. In 2013, the government has started the SERIG (Sustainable Energy for Remote Indonesian Grids) project which aims to boost the electricity production in rural areas. The government is trying to supply electricity to villages that didn't have electricity at all by constructing renewable energy facilities all around the country. Indonesia can be seen as the best example for the eradication of poverty by using green energy.

### European Union

For years the European Council passed numerous environmental legislations to reduce air, water pollution. After these actions the environmental issues in Europe significantly decreased. In 3 March 2010, the European Commission adopted the 7th Environment Action Programme (EAP) to ensure sustainable development in European economy and overcome the economic problems by green growth. This strategy will guide European policy until 2020 and it has many objectives about employment, development, climate change, education and poverty. The European Commission is continuing to back governments, businesses and consumers who contribute for a green, low-carbon economy for the eradication of poverty. European Commission's legislations encouraged many companies in Europe to invest in green energy and a similar approach can help other economies around the world

### People's Republic of China

People's Republic of China's high urbanization and rapid industrialization has brought many environmental concerns. The air pollution in certain cities have forced the Chinese authorities to act immediately. Now, Chinese government is more committed to achieving a green economy than any other government in the world. Still, China has high energy demand. It has been trying to decrease its demands by investing on renewable energies. With this strategy, China aims to create millions of job opportunities. The 11th Five-Year Plan (2006-2010) and 12th Five-Year Plan (2011-2015) which China adopted aimed to achieve green economy as well as sustainable development. These measures can be seen strict but it significantly increased the environmental investment.

### The Pacific Alliance

The Pacific Alliance is considered as one of the most important emerging-economic group from Latin America. They are nearly the first one to attempt a regional market while also constructing a gateway to Asian markets. The Pacific Alliance has renewable energy sources such as hydro power which is known as one of the biggest electricity sources of the member countries. Solar and wind power are potentially emerging as well, which will most likely turn the Pacific Alliance into a principle of affordable, renewable energy sources. In February 2016, a member state Peru's authorities has announced a government energy auction (it is the 4th one since 2009), including wind, solar, biomass, and hydro-projects.

<http://www.chinagoabroad.com/en/event/growing-economies-pacific-alliance-energy-forum>

### The Partnership for Action on Green Economy (PAGE)

The Partnership for Action on Green Economy (PAGE) is an organization for countries that wish to achieve a greener growth that was launched in 2013, after the call at Rio+20. PAGE aims to achieve sustainable systems of economic policies and practices that would eventually succeed the 2030 Agenda for Sustainable Development, leading to economic growth, creation of jobs and eliminating poverty and inequality. 5 UN agencies are coordinated by PAGE, UN Industrial Development Organization, International Labor Organization, UN Institute for Training and Research, UN Development Programme and UN Environment. These organizations expertise on helping countries on green economy. PAGE is a mechanism which will help countries achieve the SDGs, especially SDG 8.

### Relevant Treaties and UN Resolutions

- Implementation of Agenda 21, the Programme for the Further Implementation of Agenda 21 and the outcomes of the World Summit on Sustainable Development, 31 March 2010, **(A/RES/64/236)**
- Cooperative measures to assess and increase awareness of environmental effects related to waste originating from chemical munitions dumped at sea, 3 February 2017, **(A/RES/71/220)**
- World Summit on International Development

### Possible Solutions

The potential asset of adopting green policies is the creation of jobs. The creation of jobs with job security and adequate wages is essential in the eradication of poverty. Delegates are expected to take actions in accordance with their countries policies. While promoting green growth, delegates should also consider the effects of green growth to the non-environmental sectors.

The model in Indonesia is one of the best example of using green energy to provide electricity to the villages in need. To eradicate the environmental deprivation in countries which cause health issues, governments should adopt green policies in over-industrialized areas. However converting these industries into eco-friendly systems won't be cheap. LEDC's can ask for

help from private investors and Non Governmental Organizations such as the Organisation for Economic Co-operation and Development (OECD), World Bank, UN Environment (UNEP), United Nations Department of Economic and Social Affairs (UNDESA), Green Growth Knowledge Platform (GGKP) for both technical and economic support.

## Bibliography

Bardi, U. (2011). The Seneca effect: why decline is faster than growth. [Blog] Cassandra's Legacy. Available at: <http://cassandraleadership.blogspot.de/2011/08/seneca-effect-origins-of-collapse.html?m=1> [Accessed 3 Dec. 2015].

Handwerk, B. (2013). Six Stealthy Energy Hogs: Are They Lurking in Your Home?. [online] News.nationalgeographic.com. Available at: <http://news.nationalgeographic.com/news/energy/2013/08/130826-six-stealthy-household-energy-hogs/> [Accessed 4 Dec. 2015].

Howarth, R. (2012). Sustainability, Well-being, and Economic Growth. Minding Nature, [online] 5(2). Available at: [http://www.humansandnature.org/filebin/pdf/minding\\_nature/Sept-2012\\_Sustainability\\_WellBeing.pdf](http://www.humansandnature.org/filebin/pdf/minding_nature/Sept-2012_Sustainability_WellBeing.pdf) [Accessed 4 Dec. 2015].

Human Rights Council, U. (2014). World Refugee Day: Global forced displacement tops 50 million for first time in post-World War II era. UN Refugee Agency. [online] Available at: <http://www.unhcr.org/53a155bc6.html> [Accessed 4 Dec. 2015].

Murphy, T. (2011). Can Economic Growth Last?. [Blog] Do the Math. Available at: <http://physics.ucsd.edu/do-the-math/2011/07/can-economic-growth-last/> [Accessed 4 Dec. 2015].

Poschen, P. (2015). Decent work, green jobs and the sustainable economy. Sheffield: Greenleaf Publishing UK, Introduction.

Post 2015. (2015). Note #6 Eradicating Poverty through an Exclusive Green Economy. UNEP. Available at: [http://www.unep.org/post2015/Portals/50240/Documents/unep\\_post\\_2015\\_note\\_6.pdf](http://www.unep.org/post2015/Portals/50240/Documents/unep_post_2015_note_6.pdf) [Accessed 4 Dec. 2015].

Simon, J. (1996). The ultimate resource 2. Princeton, N.J.: Princeton University Press.

UNEP, (2011). Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication. [online] Nairobi: UNEP. Available at: [http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger\\_final\\_dec\\_2011/Green\\_EconomyReport\\_Final\\_Dec2011.pdf](http://www.unep.org/greeneconomy/Portals/88/documents/ger/ger_final_dec_2011/Green_EconomyReport_Final_Dec2011.pdf) [Accessed 4 Dec. 2015].

United Nations Environmental Programme, (2008). UNEP Engages with Strategic Partners & Countries to Deliver on Rio + 20. Nairobi: UNEP.

Way, C. (2015). The Millennium Development Goals Report 2015. UNDP. Available at: [http://www.undp.org/content/dam/undp/library/MDG/english/UNDP\\_MDG\\_Report\\_2015.pdf](http://www.undp.org/content/dam/undp/library/MDG/english/UNDP_MDG_Report_2015.pdf) [Accessed 4 Dec. 2015].

World Trade Organisation, (2009). Green Economy: A Transformation to Address Multiple Crises - An Interagency Statement of the United Nations System. [online] Available at: [https://www.wto.org/english/news\\_e/news09\\_e/igo\\_30jun09\\_e.htm](https://www.wto.org/english/news_e/news09_e/igo_30jun09_e.htm) [Accessed 4 Dec. 2015].

General Assembly Resolution 70/1 (2015). Transforming our world: the 2030 Agenda for Sustainable Development, A/RES/70/1 (21 October 2015), available from [undocs.org/A/RES/70/1](http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf). [http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A\\_RES\\_70\\_1\\_E.pdf](http://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_70_1_E.pdf)

Hepburn, C. and Bowen, A., 2013. Prosperity with growth: Economic growth, climate change and environmental limits. Handbook of Energy and Climate Change, Cheltenham: Edward Elgar Publishing, pp.617-38.  
[https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=2575804](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2575804)

Sabha, N. et al., (2015). Uncovering Pathways towards an Inclusive Green Economy. United Nations Environmental Programme, pp 1-40. <http://web.unep.org/greeneconomy/resources/uncovering-pathways-towards-inclusive-green-economy-summary-leaders>

United Nations, Department of Economic and Social Affairs, Population Division (2006). World Urbanization Prospects: The 2005 Revision. Working Paper No. ESA/P/WP/200. [http://www.un.org/esa/population/publications/WUP2005/2005WUPHighlights\\_Final\\_Report.pdf](http://www.un.org/esa/population/publications/WUP2005/2005WUPHighlights_Final_Report.pdf)

UNEP (2011) Decoupling natural resource use and environmental impacts from economic growth, A Report of the Working Group on Decoupling to the International Resource Panel. Fischer-Kowalski, M., Swilling, et al. [http://www.gci.org.uk/Documents/Decoupling\\_Report\\_English.pdf](http://www.gci.org.uk/Documents/Decoupling_Report_English.pdf)

Kuralbayeva, Karlygash . *Looking for green jobs: the impact of green growth on employment*. [www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/03/Looking-for-green-jobs\\_the-impact-of-green-growth-on-employment.pdf](http://www.lse.ac.uk/GranthamInstitute/wp-content/uploads/2015/03/Looking-for-green-jobs_the-impact-of-green-growth-on-employment.pdf)

"Green Growth and Developing Countries A Summary for Policy Makers." *OECD*, June 2012, [www.oecd.org/dac/50526354.pdf](http://www.oecd.org/dac/50526354.pdf). Accessed 18 Dec. 2017. Map.

<b>Forum:</b>	Sustainable Development Sub-Commission 2
<b>Issue:</b>	Promoting sustainable development to meet the challenge of rapidly growing cities
<b>Student Officer:</b>	Martin Kononov
<b>Position:</b>	Deputy President

---

## Introduction

Today, most of the world's population lives in urban areas. There are already more than 28 metropolises with populations in excess of 10-20 million; thus, the biggest population growth will occur in smaller and medium-sized settlements. Yet, as more people cluster closer and closer together, the demand for resources increases tremendously, and as the total global population is expected to grow to over 9.5 billion by 2050, the demand for natural resources to build and run cities will nearly double. Simply put, without proper planning and preparation, this is not sustainable for an economy or for the environment in the long run.

The growth of cities calls into question the concerns associated with their expansion into the surroundings; as a result, taking away precious land for farming. It can be consequently concluded that continued urbanization in its current form could threaten global food supplies. Although the density of urban settlements has seen a 2% annual decrease, the area covered by these settlements is expected to increase to over 3 million sq. km. by 2050, from just under 1 million sq. km. in 2010. In comparison, the area of the contiguous United States is just over 8 million sq. km.

As populations and, consequently, cities grow around the world, developing cities, especially those in Less Economically Developed Countries (LEDCs) are finding that their capacity to plan and build infrastructure to accommodate these changes is being outpaced by such advancements. Economic growth and development are hindered by inabilities to cope with the health and environmental sectors of an urban area, which are not well adapted in order to implement methods of dealing with the issues that come with urbanization at a quick and constant pace.

The biggest problems cities face, as a result of rapid urbanization, are heavy tolls on public expenditures, traffic, the environment, and population health and social issues. Necessary improvements to existing infrastructure or the creation of new infrastructure, altogether, to accommodate the new population, increase living costs and the long-term nature of road construction means that current roadways will begin to become heavily congested as more inhabitants travel for work. Environmental concerns, such as the displacement of wildlife, become concerns as cities struggle to meet demands of their residents. Finally, stressed and over-

demanded resources play into the increase in health and social issues over time. In order to prevent such issues from arising, governments must work towards preparing their cities to be sustainable in light of foreseeable future changes that will lead to economic, political, and social deterioration if not addressed effectively.

## Definition of Key Terms

### Metropolis

A relatively large, important city and generally the center of some economic, political, or social activity. A metropolis is usually the capital city of a country, state, or region and has a much larger population than its surroundings. Metropolises tend to be large hubs for economic and political connections.

### Sustainability

As defined by the United Nations World Commission on Environment and Development in 1987 and reiterated by the United Nations General Assembly in its resolution [42/187](#) of the 96<sup>th</sup> plenary meeting on December 11, 1987 sustainability, through sustainable development, is “development that meets the needs of the present without comprising the ability of future generations to meet their own needs.” Although it is generally used in the context of environmental preservation, sustainability is by far not only limited to climate change. Rather, it is the establishment of systems, infrastructure, and entities, which, in turn, help harness the prolonged or ‘sustained’ development of society through generations.

### Urbanization

An observed trend in the influx of the population of urban areas, or cities, as opposed to that of rural ones. The trend is considered to have begun during the industrial revolution, as employment in the agricultural industry became less common, working-class families moved to manufacturing centers in major cities.

### Urban sprawl

The typically unplanned movement of settlements from an urban area of relatively high density into the surrounding areas, which are of lower density and usually un- or underdeveloped. The most common causes of such migration are to escape congestion, higher land prices, better infrastructure, and a rise in overall live standards.

### Carrying Capacity

In terms of sustainability, carrying capacity is the population within a system which can support itself indefinitely based on the available resources.

## Gentrification

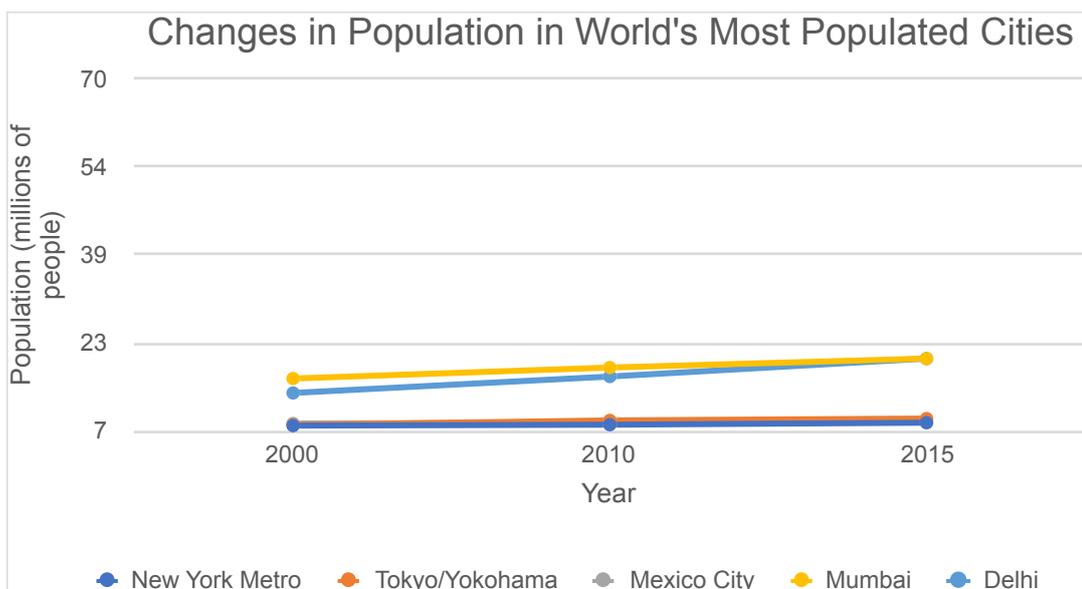
Gentrification, as it relates to sustainability, refers to the increase in prices for property around eco-friendly and sustainable urban centers. These areas tend to make it hard for current residents to maintain their quality of life due to an increase in the costs of living. In New York City, the High Line was started, a project that began in 2006 to transform a previously industrial area into attractive new neighborhoods through environmentally inspired initiatives.

## Background Information

The sustainability of growing urban areas has always been of interest and concern when developing and constructing large settlements. In the Roman Empire, cities were connected by millions of kilometers of aqueducts, to support populations with access to useable water. In the Byzantine empire, 'Hagia Sophia,' a Greek Orthodox Christian basilica, was converted to an Islamic mosque and still stands to this day. And the impressive ancient Roman Library of Celsus, now a UNESCO World Heritage site, reveals the architectural prowess of the day. These are prime examples of the ability and forethinking of sustainability that allowed empires and structures to remain strong throughout centuries. Now, however, with the new age of rapidly developing technologies and movement of people into urban areas, the challenge of building and recreating metropolises to be more flexible and, thus, more susceptible to change and be sustained for future generations to come.

## Population changes

As more and more of the world's population begins to enter the middle class, and therefore, increasingly tend to find employment opportunities in urban centers, the densities of urban areas around the world have grown significantly over the past 15 years.



As cities have grown, the simple lack of resources and initial urban planning have fallen victim to the new migration paradigm. Furthermore, the vast inability of metropolis governments to institute advanced provisions for sustainable growth in anticipation could potentially hurt a city's ability to cope with the dilemma. A sustainably developed city should, in turn, have easily expandable infrastructure, such as buildings, power sources, waste management, and transportation links, as well as effective urban planning that would facilitate the building of new housing and business developments, and scalable social service systems as cities expand. All of these systems should be able to have a relatively high carrying capacity. The major problems countries are starting to face, or have already faced, are related to how to ensure sustainable urbanization. In theory, this sustainable urbanization will be able to handle the rapid expansion in areas not yet affected by provisioned urban sprawl and promote expedited transformations of areas already facing these issues as a result of changes in population. Many urban areas are already starting to feel the effects and taking measures to adapt to them.

### Modernization

In order to be able to keep with population changes and subsist an economy and social life of a metropolis, modernization of many systems and provisions must be taken into account as part of proper planning measures.

### Employment

Although employment is usually the driving force of attraction to most urban areas and is one of the main factors of rapid urbanization, the promotion of local employment through the support of infrastructures, such as buildings and roads, helps encourage long-term economic growth. Employment, from an economic point of view, drives an economy and its development; it provides consumers with buying power which helps to circulate money throughout to other firms, and, thus, their employees as well. Furthermore, gentrification will result in rise of costs of living. An urban area's development largely depends on economic growth, as a more mature economy would be able to support more improvements to a city's long-term sustainability, as well as increase carrying capacity.

### Landscape Transformation

A transformation is the physical landscape of an urban area will change in response to a rise in population levels. A common result of such expansions is urban sprawl. Without proper provisions, such as preliminary zoning of certain areas to host future developments, urban sprawl will erode the wildlife and greenery of an area. Moreover, the simple establishment of greenbelts is simply not enough, as urban sprawl usually tends to grow past these areas and into natural parks and wildlife reserves. In order to facilitate sustainable, long-term urbanization plans must be made for such sceneries.

### Social Services

What becomes apparent quickly is that the growth in a city's population also means an increased demand of every service from advanced ones, such as healthcare, police and firefighting equipment, and education, to basic provisions, such as parking space, vehicle traffic management systems, and electricity access. Without proper planning, a city's ability to grow controllably is greatly reduced and results in the lack of such social services for inhabitants. In other words, economic productivity will be greatly reduced in the short-term and lead to less economic growth in the long-term.

## Case Study Examples

Whenever looking at future development plans, it is important to look at current implementation of solutions. Singapore and Dubai are both cities which are faced with issues resulting from rapid urban growth. Although they have different approaches to these problems and, consequently, differing results, their attempts are helpful to understand what measures can and should be taken to make metropolises more sustainable.

### *Singapore*

In the past 25 years, Singapore has almost doubled in its population, reaching over five million inhabitants. The result is a rapid increase in plants and green areas from about a third of the city's area to nearly a half of it. This all comes from the result of the attraction of knowledgeable workers into knowledge-based industries. In an effort to keep these booming new firms put, Singapore had to not only make the city orderly and efficient, but also sustainable; improving livability, excitement, and biodiversity. The New York Times reports that, "close to 10 percent of the total land area in Singapore is set aside for parks and nature reserves, and the government plans to add more park space over the next 10 years to 15 years." As a result, Singapore continues to draw in more economic growth year-by-year.

### *Dubai*

Dubai has experienced the effects of ineffective sustainable development. Although business opportunities were the driving force of such growth, impacts on Dubai's future to sustain itself in an environmentally friendly manner is becoming increasingly difficult. One major problem has become water – or rather the lack of it. It is estimated that the United Arab Emirates desalinates over 4 billion bottles of water per day resulting in an increase of the Arabian Gulf's salinity levels rising to over 47,000 ppm (parts per million) from just under 30,000, 30 years ago. This, experts say, is enough to threaten the region's marine life. Another issue is the underdevelopment of over-demanded sewage systems. In August of 2010, the system processed some 480,000 cubic meters of sewage every day – more than twice the amount it was designed for. As the skyline continues to expand, skyscrapers are built with little consideration for their impacts on basic infrastructure. Moreover, the industrial processes which help to build materials for such projects are adding to the

already-heavy energy usage. Recently the government has begun implementing Western-based standards for environmental protection, the energy needs greatly exceed those of one of the most oil-rich nations in the world. As a consequence, the country has little left but to choose renewable power options, such as nuclear, solar, and wind.

## Major Countries and Organizations Involved

### United Nations Educational, Scientific, and Cultural Organization (UNESCO)

Founded in 1945, UNESCO is an international organization, with its headquarters in Paris, functioning under the United Nations. The organization is working with countries in the fields of “education, science, culture, and communication.” In the context of sustainability, UNESCO’s work is important in supporting educational and cultural development in large urban areas. Furthermore, their resources in science can help countries better analyze the effects of and solutions for rapidly urbanizing cities.

### United Nations Environmental Program (UN-Environment)

Founded in 1972 in Stockholm, UN-Environment is the most involved and consequentially body in the sphere of environmental sustainability. It focuses its work on leadership and encouraging the implementation of United Nations goals for development and is usually considered the authority on issues facing the global environment.

### United Nations Human Settlements Program (UN-Habitat)

The United Nations Human Settlements Program deals with helping countries prepare, in terms of urban planning, for large demographic, environmental, economic, and social changes and issues. In 1978, the General Assembly mandated the organization to address the issue of urbanization and the urban development process. Shortly thereafter, UN-Habitat began working in settlements of many different sizes to help them build a better urban future. Capitalizing on its experience over many years, UN-Habitat continues to work with partners and drive forward visions of inclusiveness, economic growth and social development.

### People’s Republic of China (PRC)

With the largest population and highest urban density in the world, and an emerging middle class, the People’s Republic of China is a key player in the debate regarding the future of sustainable urban development. Although the country has had and continues to have many projects of constructing ‘environmentally-friendly’ cities, its inability to work on a human scale and efficient urban planning has greatly limited its advancement on the topic.

## Timeline of Events

<b>Date</b>	<b>Description of event</b>
November 22, 1965	Founding of the United Nations Development Program to help to develop countries and LEDCs (Less Economically Development Countries) improve their economic, political, and social circumstances.
June 5-16, 1972	The United Nations Conference on the Human Environment was held in Stockholm. The result was a Declaration which, for the first time, that sustainable development become an international concern. The UNEP was created.
December 16, 1974	United Nations General Assembly resolution 29/3327 mandated the establishment of UN-Habitat (United Nations Human Settlements Program)
June 14, 1992	Earth Summit (United Nations Conference on Environment and Development) held in Rio de Janeiro. Established international consensus on sustainable development and recognized the three pillars of sustainable development.
June 13-22, 2012	Earth Summit 2012 (United Nations Conference on Environment and Development) held in Rio de Janeiro. Reiteration of the United Nation's ambitions on the future of economic, social, and environmental sustainability. Resulted in the adoption of 'The Future We Want', a framework for the years following 2015.
September 25, 2015	Adoption of the United Nations Sustainable Development Goals in United Nations Resolution A/RES/70/1. Goals are set for 2030 and built off of ideas from the 'The Future We Want' of 2012.

## Relevant UN Treaties and Events

- United Nations Sustainable Development Goals (I)
- Human settlements, 27 July 2011 (E/2011/21)

- Economic & Social Affairs - World Urbanization Prospects: The 2011 Revision (II)
- Implementation of the outcome of the United Nations Conference on Human Settlements (Habitat II) and strengthening of the United Nations Human Settlements Program (UN-Habitat), 15 December 2015 (A/70/473)
- Chair's Summary Special Side Event at the 7<sup>th</sup> Open Working Group on Sustainable Development Goals, 6 January 2014 (III)
- Decision and resolution adopted by the Governing Council of the United Nations Settlements Program at its twenty-fourth session (IV)
- Future We Want, September 11, 2012 (A/RES/66/288)

## Previous Attempts to Solve the Issue

There have been quite a few attempts to improve sustainability and curb detrimental outcomes of growing urban areas around the world, through both the actions of country and city government.

The World Bank estimates that the next 25 years will see China's metropolises and urban areas grow by 350 million residents. As a result, the country's government has rapidly started devising plans to create sustainable solutions. With the collaboration of Singapore, the Chinese government created an 'eco-city' in Tianjin as a successful model for future developments throughout the country. In 2013, the country expected that they would have built over 100 such cities, by 2015. Despite the fact that those ambitious goals were far from the met, Tianjin was built to the strictest energy-efficiency standards and the model city has received a lot of criticism for its the gigantic building complexes, wide roads, narrow bike paths, and lack of local renewable sources of energy. Despite a poor urban plan, the city is a model for 'retrofitting' technologies in other cities throughout China.

The United Nations Human Settlements Programs has had many programs which help cities become more sustainable. One of their more recent initiatives, known as the 'Cities and Climate Change Initiative', is geared towards helping countries and cities create and effectively implement sustainable policies and methods of dealing with climate change. The program also supports government leaders better address the impacts of climate change in order to reduce greenhouse gas emission. Although this initiative is relatively new, it is finding great challenge in meeting the many demands of rapidly urbanizing centers.

In July 2015, Mayors gathering in the Vatican signed a commitment to the implementation of the urban Sustainable Development Goals, effectively launching a global urban climate change alliance. This effort has been fueled by the integral relationship between climate change, migration,

and urban development. Furthermore, leaders continued to emphasize that many social issues continue to pose threats: "...the UN and leaders in all sectors of society must take into account extreme forms of social exclusion, such as the new forms of slavery, in terms of human trafficking, forced labor, prostitution, and organ trafficking." Thus, in order to effectively tackle issues associated with building sustainable cities, these new meetings have started looking at issues beyond simply those of urbanization.

## Possible Solutions

Although there have been many attempts by local and state governments to work on helping growing cities sustainability urbanize, there are many possible short and long-term solutions that may help to improve or positively alter the current situation.

Public-private partnerships, or simply the collaborative efforts between the public and private sectors of an economy, may help drive down costs for sustainable solutions. In lieu of spending more of taxpayers money on development and testing of different solutions to congestion, city expansion, and transportation, it would be greatly beneficial to partner and/or subsidize private companies, which in turn, may be able to do so faster and with more efficiency. Furthermore, there are incentives for private companies to make a profit in the long-term by continually being involved in the implementation of their projects.

Increasing the rates of transition to more public based transportation systems in developing nations would not only be of a direct benefit to the environment of the planet but also to the reduction of congestion in growing urban areas. Since one of the problems of rapidly growing cities is the limited ability to expand roads quickly, congestion and the lack of productivity that results, is something which greatly impacts employees, companies, and the economy. Working with private corporations or providing incentives for their efforts to build a better and more expandable and adaptable public transit networks in anticipation of future demand will help lower the toll on worker productivity and, thus, improve the longevity of a successful economy.

Creating more jobs is another essential part of helping cities become more sustainable. Jobs are one of the main driving forces in an economy and are necessary to help cities grow. However, unemployment, or an absence of workers in the sectors concerned with improving a city's sustainable nature, will lead to an inability to cope with demand as the city continues to grow. It is vital to ensure that local governments work with companies or federal programs to improve job growth in key industries which help improve sustainability. Moreover, simply the continued effort to create more jobs will, to an extent, make a country more resistant to any economic problems which may arise from rapid city growth.

One of the core issues of urban sustainability are the environmental implications of rapid city growth and expansion. In order to mitigate these issues, the instigation of stricter pollution control measures such as cracking down on old, inefficient vehicles and putting limits on energy and water usage, all together. Although these may sound a little bizarre to some, actually limiting

energy and water usage would, in turn, lead to a slowdown in energy generation and water filtration, which are usually done at the expense of harmful fossil fuels. Additionally, with the improvement of electricity generation and water purification technologies, there is little need, especially for MEDCs, to have massive reserves on hand. Cutting down on pollution in any way, shape, or form will reduce a city's carbon footprint.

Another, usually overlooked, facet of sustainable cities is the sustainability of essential services such as healthcare, social services, and infrastructure. As cities grow and expand, the stress on these services goes up due to an increase in their demand. A city must ensure that they meet the healthcare and social service requirements of all of their residents, and then some. Therefore, national governments should take into account the anticipated future demands for these systems and plan their expansions, accordingly. Furthermore, infrastructure, in general, must be able to accommodate a large number of new residents and commuters in order for a city to function. Future infrastructure expansion project efforts must be done in anticipation to accommodate a new, constantly increasing demand.

Finally, although difficult, building cities which will remain sustainable through the growth, from the onset, is the most effective way to deal with this issue. Today, most of the world's population resides in urban areas, making the expansion of cities more vital than the creation of new ones. However, investing in the creation of entirely new metropolises, which are designed for sustainable expansion from the ground up for future generations, would be a less costly alternative to recreating existing cities. Due to higher costs and its relativity unnecessary nature, this option would be only viable for MEDCs.

## Bibliography

"A Brief History of Sustainable Development." *UN Sustainable Development Goals*, United Nations, [web.unep.org/post\\_2015/history.php](http://web.unep.org/post_2015/history.php).

"About UN Environment." *About UN Environment*, United Nations Environment Program, [http://www.unenvironment.org/about-un-environment?\\_ga=2.267943559.827667833.1510402936-161749225.1510402936](http://www.unenvironment.org/about-un-environment?_ga=2.267943559.827667833.1510402936-161749225.1510402936).

Alderman, Liz. "Dubai Faces Environmental Problems After Growth." *The New York Times*, The New York Times, 27 Oct. 2010, <http://www.nytimes.com/2010/10/28/business/energy-environment/28dubai.html>.

Barringer, Felicity. "The Human as Bigfoot." *The New York Times*, The New York Times, 13 Oct. 2010, [green.blogs.nytimes.com/2010/10/13/ecologically-an-overdrawn-bank-account/](http://green.blogs.nytimes.com/2010/10/13/ecologically-an-overdrawn-bank-account/).

Bowerman, Mary. "The Census Bureau Shows the Fastest-Growing Cities in the U.S. Are ..." *USA Today*, Gannett Satellite Information Network, 26 May 2017, <http://www.usatoday.com/story/money/nation-now/2017/05/25/census-bureau-shows-fastest-growing-cities-u-s/344945001/>.

"Case Studies of Healthy, Sustainable Cities." *World Health Organization*, World Health Organization, <http://www.who.int/sustainable-development/cities/case-studies/en/>.

“Causes and Effects of Urban Sprawl.” *Conserve Energy Future*, 24 Dec. 2016, <http://www.conserve-energy-future.com/causes-and-effects-of-urban-sprawl.php>.

“Cities and Climate Change Initiative.” *UN-Habitat*, United Nations Human Settlements Program, [unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-initiative/](http://unhabitat.org/urban-initiatives/initiatives-programmes/cities-and-climate-change-initiative/).

“CITY POPULATION.” *City Population - Population Statistics in Maps and Charts for Cities, Agglomerations and Administrative Divisions of all Countries of the World*, City Population, <http://www.citypopulation.de/>.

Flisrand, Janne K. “Define ‘Sustainability.’ Please.” *Marketplace*, The Greenwash Brigade, 10 Jan. 2008, 3:01 A.M., <http://www.marketplace.org/2008/01/10/sustainability/greenwash-brigade/define-sustainability-please>.

“Goal 11: Sustainable Cities and Communities.” *UNDP*, United Nations, <http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-11-sustainable-cities-and-communities.html>.

“Goal 11: Sustainable Cities and Communities.” *UNDP*, United Nations, <http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-11-sustainable-cities-and-communities.html>.

“Green Belt.” *Criticism and Disadvantages of Green Belt Policy*, Green Belt UK Politics, <http://www.politics-greenbelt.org.uk/criticism-and-disadvantages-of-green-belt-policy.html>.

“Green Belt in Geography Topic.” *Green Belt | Definition from the Geography Topic | Geography*, <http://www.ideoonline.com/Geography-topic/green-belt>.

“Growing Cities: An Atlantic Forum on Sustainable Urbanization.” *The Atlantic*, Atlantic Media Company, 16 Feb. 2016, <http://www.theatlantic.com/live/events/growing-cities-an-atlantic-forum/2016/>.

Haffner, Jeanne. “The Dangers of Eco-Gentrification: What's the Best Way to Make a City Greener?” *The Guardian*, Guardian News and Media, 6 May 2015, <http://www.theguardian.com/cities/2015/may/06/dangers-ecogentrification-best-way-make-city-greener>.

“History of the Statement – United Nations Environment – Finance Initiative.” *UNEP FI*, United Nations Environmental Program, <http://www.unepfi.org/about/unep-fi-statement/history-of-the-statement/>.

“Introducing UNESCO.” *Introducing UNESCO*, United Nations Educational, Scientific, and Cultural Organization, 10 Oct. 2017, [en.unesco.org/about-us/introducing-unesco](http://en.unesco.org/about-us/introducing-unesco).

Joe Myers, Formative Content. “These Are the World's Most Sustainable Cities.” *World Economic Forum*, <http://www.weforum.org/agenda/2016/09/these-are-the-world-s-most-sustainable-cities/>.

Koch, Wendy. “World's 10 Most Sustainable Cities? Hint: Not Fast-Growing Jakarta or Delhi.” *The Great Energy Challenge Blog*, National Geographic, 10 Feb. 2015, [energyblog.nationalgeographic.com/2015/02/10/worlds-10-most-sustainable-cities-hint-not-fast-growing-jakarta-or-delhi/](http://energyblog.nationalgeographic.com/2015/02/10/worlds-10-most-sustainable-cities-hint-not-fast-growing-jakarta-or-delhi/).

Kolesnikov-jessop, Sonia. "Garden Project Sets New Green-Energy Standards." *The New York Times*, The New York Times, 28 July 2011, <http://www.nytimes.com/2011/07/29/business/global/garden-project-sets-new-green-energy-standards.html>.

Kolesnikov-jessop, Sonia. "An Urban Jungle for the 21st Century." *The New York Times*, The New York Times, 28 July 2011, <http://www.nytimes.com/2011/07/29/business/global/an-urban-jungle-for-the-21st-century.html>.

"Mayors Launch Urban Climate Change Alliance at Vatican Symposium." *UN-Habitat*, United Nations Human Settlement Program, 24 July 2015, [unhabitat.org/mayors-launch-urban-climate-change-alliance-at-vatican-symposium/](http://unhabitat.org/mayors-launch-urban-climate-change-alliance-at-vatican-symposium/).

"Metropolis." *Merriam-Webster*, Merriam-Webster, 2017, <http://www.merriam-webster.com/dictionary/metropolis>.

Pennington, Sue-Lin Wong and Clare. "Steep Challenges for a Chinese Eco-City." *The New York Times*, The New York Times, 13 Feb. 2013, [green.blogs.nytimes.com/2013/02/13/steep-challenges-for-a-chinese-eco-city/](http://green.blogs.nytimes.com/2013/02/13/steep-challenges-for-a-chinese-eco-city/).

Revkin, Andrew C. "In Urbanization Update, U.N. Sees Tokyo Atop Megacities List Until 2030." *The New York Times*, The New York Times, 10 July 2014, [dotearth.blogs.nytimes.com/2014/07/10/in-u-n-population-update-tokyo-still-tops-list-of-megacities/](http://dotearth.blogs.nytimes.com/2014/07/10/in-u-n-population-update-tokyo-still-tops-list-of-megacities/).

Richards, Candace, and Jessica Cargill Thompson. "We Think Sustainable Urban Planning Is New – but the Ancient Romans Were Recycling Buildings Millennia Ago." *CityMetric*, Centre for Cities, 30 Jan. 2017, <http://www.citymetric.com/fabric/we-think-sustainable-urban-planning-new-ancient-romans-were-recycling-buildings-millennia-ago>.

Staff, Investopedia. "Metropolitan Statistical Area - MSA." *Investopedia*, 21 May 2008, <http://www.investopedia.com/terms/m/msa.asp>.

Staff, Investopedia. "Redlining." *Investopedia*, 6 Apr. 2006, [www.investopedia.com/terms/r/redlining.asp](http://www.investopedia.com/terms/r/redlining.asp).

Sung, Hyun. "Sustainable Development." *General Assembly of the United Nations*, United Nations, <http://www.un.org/en/ga/president/65/issues/sustdev.shtml>.

"Sustainable Cities and Human Settlements ∴ Sustainable Development Knowledge Platform." *United Nations*, United Nations, [sustainabledevelopment.un.org/topics/sustainablecities](http://sustainabledevelopment.un.org/topics/sustainablecities).

"Sustainable Development and Population Dynamics: Placing People at the Centre." *United Nations Population Fund*, United Nations, 19 June 2013, <http://www.unfpa.org/press/sustainable-development-and-population-dynamics-placing-people-centre>.

Swilling, Mark. "The Curse of Urban Sprawl: How Cities Grow, and Why This Has to Change." *The Guardian*, Guardian News and Media, 12 July 2016, <http://www.theguardian.com/cities/2016/jul/12/urban-sprawl-how-cities-grow-change-sustainability-urban-age>.

"UN-Habitat at a Glance." *UN-Habitat at a Glance*, United Nations Human Settlements Program, [unhabitat.org/un-habitat-at-a-glance/](http://unhabitat.org/un-habitat-at-a-glance/).

"Urbanization." *BusinessDictionary.com*, WebFinance Inc., 2017, <http://www.businessdictionary.com/definition/urbanization.html>.

“What Is Urban Renewal? Definition and Meaning.” *BusinessDictionary*, WebFinance, Inc., [www.businessdictionary.com/definition/urban-renewal.html](http://www.businessdictionary.com/definition/urban-renewal.html).

## Appendix or Appendices

I. The United Nations Sustainable Development Goals <http://www.un.org/sustainabledevelopment/sustainable-development-goals/>

II. Economic & Social Report: World Urbanization Prospects (The 2011 Revision).

A helpful document which provides details on projections for urbanization growth in order to better understand how urban populations will change in the future. [http://www.un.org/en/development/desa/population/publications/pdf/urbanization/WUP2011\\_Report.pdf](http://www.un.org/en/development/desa/population/publications/pdf/urbanization/WUP2011_Report.pdf)

III. Chair’s Summary: Special Side Event at the 7<sup>th</sup> Open Working Group on Sustainable Development Goals “Sustainable Future Cities We Want”. <https://sustainabledevelopment.un.org/content/documents/2948chairsummaryside2.pdf>

IV. Decisions and resolutions adopted by the Governing Council of the United Nations Human Settlement Programme at its twenty-fourth session.

A useful document which lists and contains all resolutions adopted by UN Habitat in April 2013.

<https://unhabitat.org/wp-content/uploads/2014/12/Decisions-and-resolution-GC-24th-session.pdf>