Environment Effect on Transportation Planning

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ABSTRACT

The development of transportation network shave played an important role in the development of economic and social activities of the countries. Transportation is one of the major consumption of petroleum and oil energy in the world. Transportation produce air pollution which is a significant element of global warming through mission of carbon dioxide. Road transport is major sources of production of green house gases which are subjected to brings problems and diseases. Other environmental impact of transportation are acid rain, noise pollution and climate changes. The aim of this paper is to study the environmental impacts of transport and the source of energy which is used on land transportation system on the world.

KeyWords*: Transportation, environmental impacts, threats.*

1. Introduction

Many developing countries are facing the apparently conflicting needs of transport policies. Transport facilitates access to jobs, education, markets, leisure and other services, and has a key role in the economy. On the other hand, concern is mounting about the detrimental impact on the environment of current transport policies, and many people question the policies' social sustainability. The issue of transportation and the environment is contradictory in nature. From one side, transportation activities support increasing mobility demands for passengers and freight, and this ranging from urban areas to international trade. On the other side, transport activities have resulted in growing levels of motorization and congestion. As a result, the transportation sector is becoming increasingly and imposes a serious environmental threat. With a technology relying heavily on the combustion of hydrocarbons, notably with the internal combustion engine, the impacts of transportation over environmental systems has increased with automobile industrialization. This has reached a point where transportation activities are a dominant factor behind the emission of most pollutants and thus their impacts on the environment. These impacts, like all environmental impacts, can fall within three categories:

- **Direct threats**

The immediate consequence of transport activities on the environment where the cause and effect relationship is generally clear and well understood.

- **Indirect threats**

The secondary (or tertiary) effects of transport activities on environmental systems. They are often of higher consequence than direct impacts, but the involved relationships are often misunderstood and difficult to establish.

- **Cumulative threats:**

The additive, multiplicative or synergetic consequences of transport activities. They take into account of the varied effects of direct and indirect impacts on an ecosystem, which are often unpredicted.

The complexities of the problems have led to much controversy in environmental policy and in the role of transportation. The transportation sector is often subsidized by the public sector, especially through the construction and maintenance of road infrastructure which tend to be free of access. Sometimes, public stakes in transport modes, terminals and infrastructure can be at odd with environmental issues. If the owner and the regulator are the same (different branches of the government), then there is a risk that regulations will not be effectively complied to. It can also lead to another extreme where compliance would lead to inefficient transport systems, but which costs are subsidized. Total costs incurred by transportation system, notably environmental damage, are generally not fully assumed by the users. The lack of consideration of the real costs of transportation could lead to several environmental problems. Yet, a complex hierarchy of costs is involved, ranging from internal (mostly operations), compliance (abiding to regulations), contingent (risk of an event such as a spill) to external (assumed by the society). For instance, external costs account on average for more than 30% of the estimated automobile costs. If environmental impact is not included in this appraisal, the usage of the motor vehicle is consequently subsidized by the society and costs accumulate as environmental pollution. This requires due consideration as the number of vehicles.

2. Background of Transport And Energy

Transportation and environment are two different words which have different meaning. Transportation and environment are different broad individual field of study, but these two different field of study have mutual relation to each other. The global transportation sector will face several exclusive challenges over the next four decades (2010through 2050). The world population is expected to increase by 2.2 billion, reaching 9.2 billion, with more than two-thirds(2/3), of the population living in cities compared to about half the population of today. In addition, the number of megacities is expected to increase from today's 22 to between 60 and 100 megacities by 2050. From other side, in2010, the global transportation sector consumed about2,200 million tons of oil equivalent Million Tons of Oil Equivalent (MTOE), constituting about 19% of global energy supplies. about 96% of this amount came from oil, while the rest was from natural gas, bio fuels, and electricity. More than 60% of the oil consumed globally (around 51 million barrels per day) goes to the transportation sector. As the figure-1 shows, road transport accounts for the bulk (around 76%) of the transportation energy consumption. The light-duty vehicles (LDVs),including light trucks, light commercial vehicles, and minibuses accounted for about 52%, while trucks, including medium and heavy-duty, accounted for 17%. The remaining share of road transport was covered by full-sized buses4% and two-three wheelers 3%. Air and marine each accounted for about 10% of total transport energy consumption, while the railways accounted for only 3% .Looking at these shares over a longer period of time.

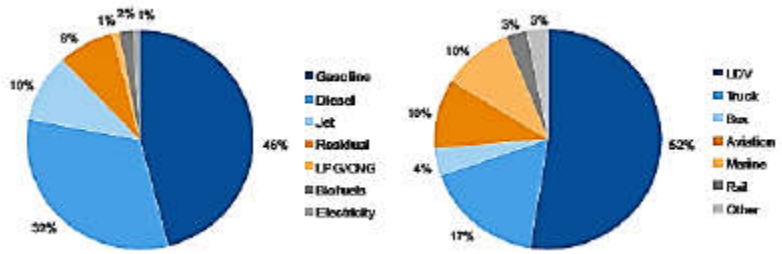

Figure. 1:- Source: WEF, Repowering Transport, 2011.

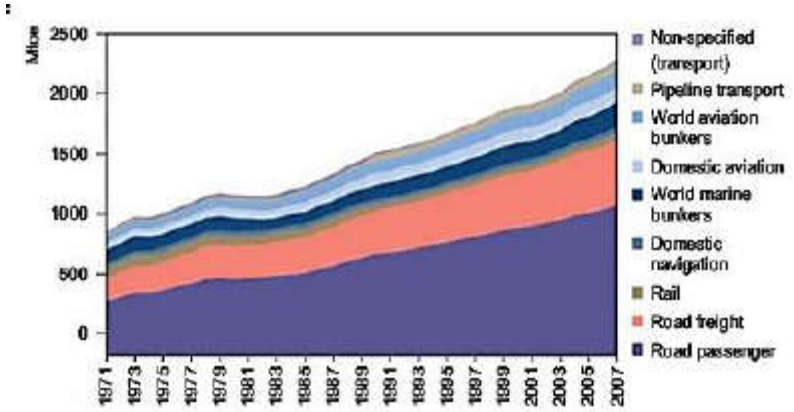

Figure. 2:-shows Global transport final energy use by mode (MTOE).

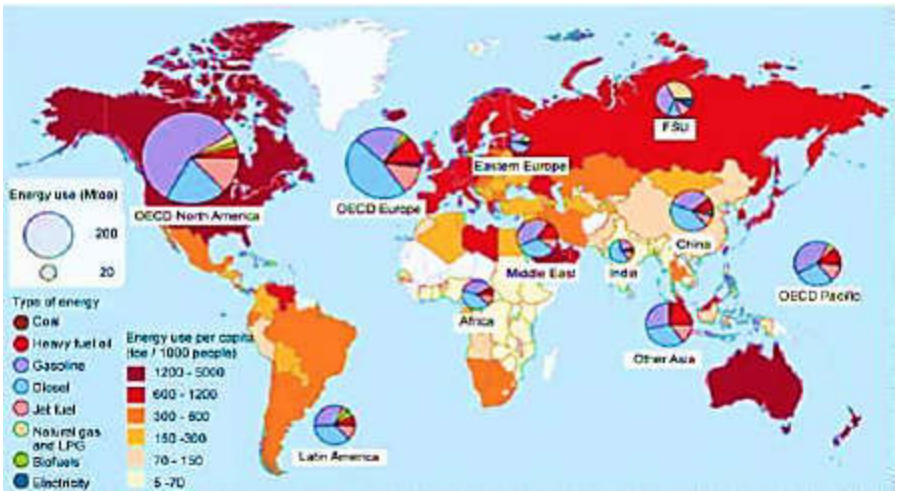

Figure3:-shows Global transport final energy use by region. (IEA, Energy Technology Perspectives, 2010.)

On the other hand shows the consumption of energy by the region the figure reports show the final energy(end use), including the relevant allocation of energy use by international shipping, international aviation and pipeline transport.

3. The Impact of Transport and Environment

Transportation system support increasing mobility demands for passengers and freight, notably in urban areas. But transport system has resulted in growing levels of motorization and congestion. As a result, the transportation sector is becoming increasingly associated to environmental problems). The most important effects of transportation on the environment relate to climate change, air quality, noise, water quality, soil quality, biodiversity and land take: • Climate change: The activities of the transport industry release several million tons of gases each year into the atmosphere. These include lead (Pb), carbon monoxide (CO), carbon dioxide (CO2; not a pollutant), methane (CH4), nitrogen oxides (NOx), nitrous oxide (N2O), chlorofluorocarbons (CFCs), per-fluorocarbons (PFCs), silicon tetraflouride (SF6), benzene and volatile components, heavy metals (zinc, chrome, copper and cadmium) and particulate matters (ash, dust). There is an ongoing debate to what extent these emissions may be linked to climate change and the role of anthropogenic factors. Some of these gases, particularly nitrous oxide, also participate in depleting the stratospheric ozone (O3) layer which naturally screens the earth's surface from ultraviolet radiation.

3.1 **Air pollution**

The ways in which we travel have changed a lot over the last few centuries. Transport has become faster, easier and sometimes cheaper. But the developments in technology have not always been good for the environment. Steam trains were indeed faster than wagons, and steam ships faster and stronger than sailing ships. But the smoke they sent into the air polluted the air. Then diesel and electric trains came, and they were somewhat cleaner. However, to make the electricity that trains use; large amounts of coal have to be burned. The smoke also causes air pollution. Cars are also bad for the environment. The exhaust fumes that come from cars contain poisonous gases and pollute the air. The most dangerous gas that comes from cars (and planes) is carbon dioxide (CO2), which is a greenhouse gas. All of the pollution, particularly the greenhouse gases, that is being released into the air is resulting in 'Global Warming'.

- **Greenhouse-gas emissions of the transport sector**

The worldwide greenhouse emissions of all sectors together show a steady growth. Despite policy interventions like the Kyoto protocol, this growth tends to continue. However, there are big differences between sectors. Looks to for more details fig.

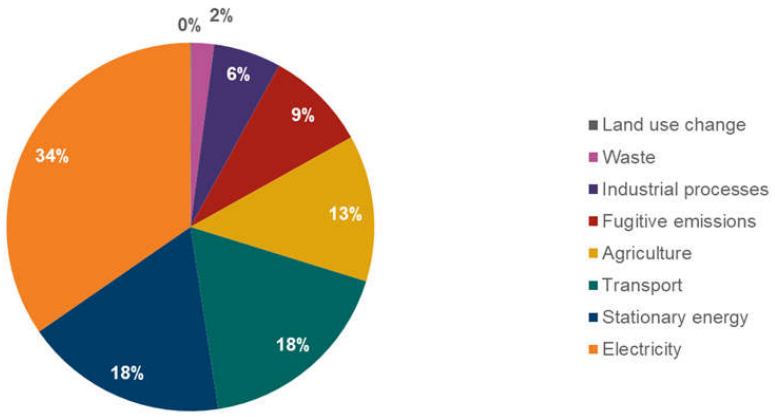

Figure:-4 From Google production of greenhouse gases

While greenhouse gas emissions of many other sectors stabilized or even decreased over the last decades, the CO2

emissions of the transport sector keep on growing. Together with the energy sector, transport is the onlysector with still strongly increasing CO2 emissions. The share of transport increases from about one sixth in the early 1980s to now almost one fourth (23%). In the OECD countries this share is even higher (about 29%, ECMT,2007).

- **Health impacts**

Impacts on human health due to the aspiration of fine particles (PM2.5/PM10, other air pollutants). Exhaust emission particles are hereby considered as the most important pollutant. In addition, Ozone(O3) has impacts on human health. The main health impacts are increased health problems for people who suffer aspiration diseases and a higher risk for anyone to get such a disease.

- **Building and material damages.**

Impacts on buildings and materials from air pollutants. Mainly two effects are ofi mportance: soiling of building surfaces/facades primarily through particles and the second more important impact on facades and materials is the degradation through processes, due to acid air pollutants like NOx and SO2

3.2 Water Pollution

Transport activities have an impact on hydrological conditions. Fuel, chemical and other hazardous particulates discarded from aircraft, cars, trucks and trains or from port and airport terminal operations, such as deicing, can contaminate rivers, lakes, wetlands and oceans. Globally, world seaborne trade grew from 2.6 billion tons of loaded goods in 1970 to 5.9 billion tons in 2002 (UNCTAD, 2003). Because demand for shipping services is increasing, marine transport emissions represent the most important segment of water quality inventory of the transportation sector. The main effects of marine transport operations on water quality predominantly arise from dredging, waste, ballast waters and oil spills. Dredging is the process of deepening harbor channels by removing sediments from the bed of a body of water. Dredging is essential to create and maintain sufficient water depth for shipping operations and port accessibility. Dredging activities have a two-fold negative impact on the marine environment. They modify the hydrology by creating turbidity that can affect the marine biological diversity. The contaminated sediments and water raised by dredging require spoil disposal sites and decontamination techniques. Waste generated by the operations of vessels at sea or at ports causes serious environmental problems, since it can contain a very high level of bacteria that can be hazardous for public health as well as marine ecosystems when discharged in waters. Besides, various types of garbage containing metals and plastic are not easily biodegradable. They can persist on the sea surface for long periods of time and can be a serious impediment for maritime navigation in inland waterways and at sea, also affecting berthing operations. Ballast waters are required to control ships. stability and draught and to modify their center of gravity in relation to cargo carried and the variance in weight distribution. Ballast waters acquired in a region may contain invasive aquatic species that, when discharged in another region, may thrive in a new marine environment and disrupt the natural marine ecosystem. There are about100 non-indigenous species recorded in the Baltic Sea. Invasive species have resulted in major changes

3.3 Ground pollution

Metal used to make cars, trains and planes and the left over petrol products from cars can contaminate the land and storm water. Contaminated storm water can make water unsafe to swim in or drink. A tanker is a very big ship that transports liquid, usually oil. When a tanker breaks on the sea, the oil can spill into the water. This creates huge problems for the sea animals and birds, because the oil makes it difficult for them to swim, fly and breathe. The oil then washes out on beaches, creating more pollution on land. Also to build roads and parking lots we need space, so sometimes forests, farm lands etc get destroyed in the process.

3.4 Noise pollution

Another way in which modern forms of transport are bad for the environment is through noise pollution. Cars, trucks, trains and especially planes can create a lot of noise that disturbs humans and animals. This will not necessarily affect nature itself, but it can make the environment we live in very unpleasant. Not all the effects on the environment are bad. You might think that ship wrecks, like car wrecks, cause pollution. It can indeed, because any chemicals and waste from the ships now go and lie at the bottom of the sea. But old shipwrecks can actually be good for the environment. They can become artificial coral reefs, where a lot of sea animals can live. In fact, research has been done on these artificial reefs. It was found that where corals are sometimes damaged and battle to grow, they grow easily on ship wrecks. The corals anchor themselves to certain parts of the wreck. In some places where corals have become endangered, experts have created fake wrecks to help the corals to grow. Wrecks also give hiding places to a lot of other sea creatures. Wreck diving has become a popular sport. One of the reasons is that you can see a lot of amazing sea life that you would not easily see anywhere else.

4. Mitigation of environment from transportation pollution

Like it is clear that always development of technology is not good for the people duo to development of technology has opposite effect on the environmental some of the important point which is play important role on the mitigation of environmental degradation is written bellow:

- Avoid using too old transportation vehicle which produces more carbon di oxide.
- Use best quality of oil and other energy source for the vehicles.
- Produced renewable energy vehicles by companies.
- Reduced travel distance of the passengers.
- Government should make policy to avid from used of more cars and increase tax on private car and vehicle.
- Government try to make opportunity for the use of public transport instead of private transport.
- Government make such a policy to build more and proper roads and transportation infrastructure for the use of people.

5. Conclusions

The most important environmental impacts from the transport sector are caused by emissions of air pollutants, CO2 and noise. International road and rail freight transport are responsible for a minor, but increasing, share of these transport emissions. Although it is impossible to protect environment from degradation due to it is effected by many factors but for the transportation we can consider the below directions. From the study of different research finely received that the producing of carbon dioxide by transport system is one of the opposite effected factors which is

mostly effect on the natural environment and caused of degradation of environment. Producing of carbon dioxide is not only has relationship with consumption of fuels but it is also relation with the quality of the fuels and quality of the engines of vehicle and the network of the road system which is used for the vehicle. To avoid from such problem the best way is used of renewable energy on the vehicle and other transportation system. And improved road network, control of the quality of energy source which is used on the transportation system. And also control of the old vehicle and number of the vehicle.

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