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# Pro-Environmental Behaviour and Implementation of Environmental Interventions in Pakistan

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NTNU
Norwegian University of
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## THESIS TITEL:

# Pro-Environmental Behaviour and Implementation of Environmental Interventions in Pakistan

*Let's not stop dreaming about* "A Green Pakistan". *With endurance, a strong commitment and a flexibility in attitudes, this dream will come true.*


**Submitted by: Nazish** Shahid

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I DEDICATE THIS WORK TO

MY SUPERVISOR Prof. Christian A. Klöckner AS WITHOUT HIS SUPPORT IT WAS REALLY IMPOSSIBLE FOR ME TO ACCOMPLISH THIS TASK

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*Alone we can do so little; together we can do so much*
**Helen Keller**

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# ABSTRACT

In reaction to the swiftly growing global environmental complications, many call for changes in how individuals should deal with the environment. A vital aspect of moving towards an environmentally sustainable world is to encourage and promote pro-environmental behaviour. Environmental psychologists are studying the human aspect of environmental issues. Recently, focus on, how everyday behaviours of people can be a reason to environmental changes and how to inspire individuals to perform environmentally friendly behaviours has ever been increased. In recent times, the social and psychological features of individual environmental behaviours have been broadly investigated. The aim of this work is to debate the possible role of environmental psychology for environmental protection by encouraging responsible environmental behaviours in people of Pakistan. The main drive for this study is to conduct a literature review of different western based environmental models and evaluate their usefulness toward major environmental issues in a developing country like Pakistan. Social, cultural and psychological factors that could strongly influence environmental behaviour were also analysed in a Pakistani perspective. The outcome of this study suggests that willingness to act for the environment and a sense of concern for the environmental issues are significantly low in Pakistani people. It is also concluded that western based behaviour models cannot be applied directly in Pakistani society due to the difference in, lifestyle, cultural, social and religious norms of the people. It is also evaluated that mainly young and old people, rich and elite groups, very poor people from rural areas and people with no educational background are performing worse toward environmental issues in Pakistan. Furthermore, it is concluded that the general level of environmental behaviour and awareness is very low in Pakistan. This is attributed to a lack of infrastructure supporting environmental behaviour, lack of environmental value⁄culture and general education level in Pakistan. At the governmental level environmental rules and policies should be aimed at promoting pro-environmental behaviour among people and altering the discriminatory attitudes and values toward environment. Environmental laws in Pakistan should be custom-made for specific population segments of the country.

# BACKGROUND

Psychology as a discipline is captured by the elitist group in most developing countries and academic studies of psychology have an air of unreality about them in the third world (Carr & Schumaker, 1996). Environmental psychology discovers the inter-relationship amongst environments and human behaviour and, precisely, analyses how environments may be used to provoke certain behaviour pattern. Asian Culture is much different from Western Culture so westerners in Asia had difficulties in extending psychology beyond the bond of their culture and they could not accept other philosophical positions. Yet the contemporary notion of self-actualization can be traced to pre-Christian Indian Vedic thinkers (Carr & Schumaker, 1996). Hamnett, Porter, Singh, and Kumar, (1984) found that there is an issue how to conduct psychological research in developing countries which arises from broad processes known as the internationalization of social science (Carr & Schumaker, 1996). Shweder (2000) description of cultural psychology is the most compelling for the people of developing countries. In 1992 the UN Earth Summit established that the environmental issues of the world with growing urban population need urgent attention. Global temperature increased with 0.6 degree Celsius since 1866 and 271 billion tons of carbon was added to the atmosphere through the burning of fossil fuels (Latmann, 1994). Today 1.1 billion people do not have the necessary food for living; 1.2 billion do not have clean water for drinking (Schmuck & Schultz, 2002). Environmental problems caused by humans can be solved if the impact of human activity is equal or less to the rate in which environment can equilibrate itself to original. For this purpose it is necessary to review and modify principles that regulate social life. Sustainability in any society is connected with social, economic and environmental sustainability (Schmuck & Schultz, 2002).

# INTRODUCTION

Without any doubt, environmental issues are one of the major concerns for humanity in the twenty-first century. Climate changes, lack of natural resources, deforestation, damage of biodiversity, overpopulation, and environmental contaminations are some of the major challenges of the world today. These environmental issues are upsetting the current generation in many ways, and degradation of environment is expected to grow further. Millions of individuals are facing severe water scarcities, air contamination is one of the major reasons of death worldwide, flood disasters might spread as a result of climate change, and people are being forced to migrate to safer places (Oskamp, 2000). Individual and combined human activities are predominately responsible for the hazardous changes occurring in the environment, and some of these changes are "permanent" in nature (Moran, 2010). Throughout the history, people have developed new approaches to cope with their environmental circumstances (Stern, 2000). Before the industrial age, humans never changed their environment to a degree that the environment could not reinstate itself to its original. However, humans have made exceptional changes in the environment since the beginning of the industrial revolution (Rasool, 2013).

There is no difference in the scientific community that the existing environmental catastrophe is a result of human deeds and activities (Rasool, 2013). Many individuals believe that soon technological developments will find an answer to solving all of the existing environmental problems (Rasool, 2013). However, many environmental issues have arisen not only because of technological insufficiencies but as a result of human activities and requirements. In order to tackle these issues, number of social scientists, technologists, organizations and environmental activists around the world call for serious and vital changes in human behaviour and the employment of environmentally friendly technologies worldwide. While clean technologies are recognized as critical in resolving many of today's environmental issues, academics and policy makers agree that implementation of pro-environmental behaviours in the society also have a major role to play in coming years (Jackson & Michaelis, 2003).

***Consequently, one common question that requires to be answered is "How can pro-environmental behaviour and a 'green culture' to be promoted worldwide?"***

In last few decades, environmental psychologists have become more and more focused on evaluating human dimension of environmental issues. In start, industrial and transport segments of life get much consideration in environmental psychology. Steadily, the importance of

everyday individual activities and behaviours e.g. energy conservation, recycling, water management, and purchasing environmentally friendly products have been recognized important in protecting the environment. As a customer, people have an influence to put pressure on industries to control their environmental impacts, and as individuals can influence governmental strategies about environmental problems. By the combination of rules, guidelines, tax motivations, benefits, and social marketing methods, resulting strategies have proven more effective in attaining behavioural alteration in people compared to information movements and regulations alone. This could be due to the fact that such inclusive programs have deep impressions on the values and behaviours/attitudes of the populations toward environmental friendly behaviours.

As an example, the United Kingdom government has developed a guideline based on social psychology models. It targets at accomplishing cultural change in order to stimulate pro-social and pro-environmental behaviours (United Kingdom Government, 2008). In recent years, most of the environmental behavioural studies have focused on western countries, and fewer studies have been conducted in Pakistan that will be the main focus of this study.

The main objective of this thesis is to highlight the necessity for investigations of Pakistani people's environmental behaviours. Pakistan is facing several environmental problems according to Pakistan Environmental Protection Agency (PEPA, 2005). In this thesis, it is discussed that there is a need for more studies on environmental behaviours in Pakistan. It needs to be recognized, that through qualitative and quantitative studies; what social and psychological issues affect environmental behaviours in Pakistani people. This knowledge could be helpful in scheming programs and policies/rules that inspire environmental friendly behaviours and sponsor responsible environmental citizenship in Pakistan.

The thesis is arranged as follow, in the first section of the thesis; some of the major environmental issues of Pakistan and their impacts on environment is discussed. Section two of the thesis, discusses the definition of environmental behaviour, models to explain environmental behaviour, and barriers to pro-environmental behaviours. The third section discusses the environmental behaviour of Pakistani people with examples from daily life and application of western models in these situations. In the fourth section of thesis application of psychological models and their possible modification in Pakistani context has been discussed and work is concluded.

# Primary Objective of the Thesis:

The major objective of the thesis is to study how people in under developed countries such as Pakistan could be encouraged to adapt pro- environmental behaviour by environmental intervention techniques. Informational and structural interventions approaches are analysed for this purpose. This is a good reason to analyse lifestyle, resources, knowledge, norms, attitude and circumstances of people from developing countries towards pro-environmental behaviour. For this study, I have analysed Pakistani people lifestyle, norms, knowledge, attitude, circumstances towards pro-environmental behaviour.

The following research question were being tried to answer in this work

1. ***What are the major environmental challenges in Pakistan?***
2. ***What is Pakistani people's lifestyle, norms, knowledge, attitude, circumstances and behaviour towards environmental issues?***
3. ***What will be the potential environmental interventions in Pakistan to alter people behaviour?***
4. ***Which factors affects the acceptability of environmental policies in Pakistan?***
5. ***Are environmental psychological models developed in western societies capable of explaining environmental behaviour in Pakistan, and if not, what has to be changed?***

# Section 1

# Major Environmental Issues in Pakistan

Pakistan is an independent nation in South Asia with a population exceeding 207 million people and income of 460 US$ per capita. It is the sixth most congested country in the world in terms of population. Pakistan is the 36$^{th}$ biggest country in the world in terms of area covering 796,095 km$^2$. Pakistan has a 1046-km coastline along the Arabian Sea and the Gulf of Oman in the south. It is bordered by Afghanistan to the west, India to the east, Iran to the southwest, and China in the northeast making it important country in the region due to its strategic location (Pakistan http://en.wikipedia.org/wiki/Pakistan). Map of Pakistan is shown in figure 1.


**Figure 1: Map of Pakistan (http://i.infoplease.com/images/mpakist.gif).**

Though the pollution is a global issue these days but in Pakistan situation is very threatening. Pakistan is one of those countries whose economy (about 21 %) is predominantly based on agriculture production; however, facing irrigation water shortage because the average rainfall in country is less than 240 mm a year (Azizullah, Khattak, Richter, & Hader, 2011). The 90 % cultivation of land in the country is mainly through irrigation using the available river-water, and this cultivation contributes to over 80 % of agricultural yield of the country (Azizullah et al., 2011). The high population growth 3 % and altering climate has put great pressure and consequences on the ways of agricultural production and irrigation water requirements, which are now insufficient for increasing population of Pakistan (Economy Watch, 2011). Pakistan is ranked at 10$^{th}$ position (see Figure 2) in most influenced countries by consequences of climate on climate risk index 1994-2013 (Kreft, 2014). Pakistan is susceptible to the influences of climate changes because of its geographical locality, extreme levels of air and water contamination, poor technological and resource standing, varying rainfall pattern and intense weather changes that lead to floods, droughts, cyclones and landslides are very few examples among many. Environmentalists consider it is now due time to work on these challenges because of climate change, and it is a reality that must be faced globally. Pakistan's forests are diminishing quickly at a frightening speed of 0.2 and 0.4 per cent per annum (Pakistan only have 4.6 % of its total area covered with forests). This deforestation causes soil erosion and a big reason for landslides. Changes in the environment pose a serious urge at multiple geographic and governance levels in Pakistan to cope the rising environmental challenges. These climate issues cannot be explained and resolved by natural science or technology alone. Pakistan needs the full depth of traditional expertise connected with, people behaviour improvements, new approaches and technologies to tackle with environmental challenges affecting the masses.

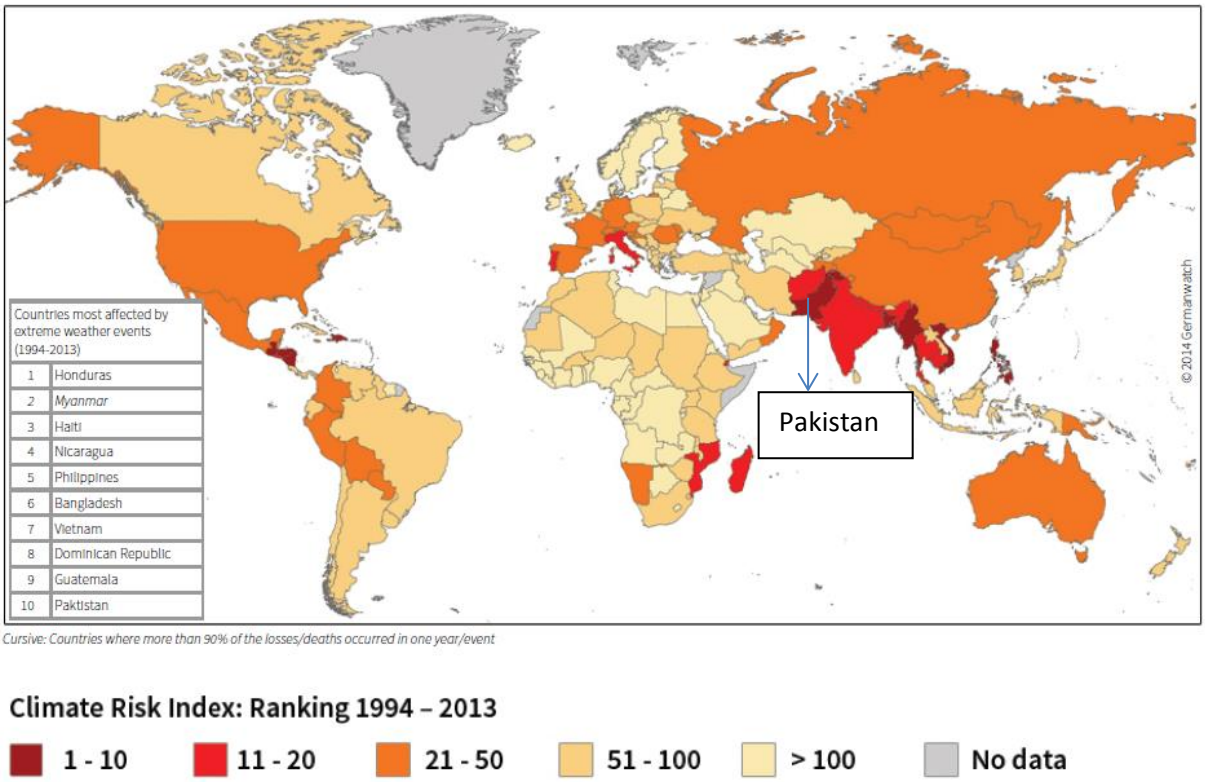



**Figure 2: The map of Global Climate Risk Index 1994-2013 (Kreft, 2014).**

Continuously worsening environment poses a big threat to all the big and small cities/town/villages of Pakistan. There are a few people and environmental organizations that are worried and seriously concerned about environmental degradation in Pakistan. Consequently, the problem is accumulating up day by day. There are many environmental problems faced by Pakistan, like decline in air quality in cities, increasing population, soil erosion, water shortage, inadequate sanitation facilities, sea pollution and poor waste control and disposal (ADB, 2008; PEPA, 2005).

There is a strong connection between environmental deprivation and poverty in Pakistan. Around 80 % of people in Pakistan live in villages and towns, out of which 40 % live below the poverty line. Poor masses in Pakistan are most influenced by the decay in the environment both in urban and rural places. The deprived people from rural parts of the country do not have any proper source of earnings, and they are mainly dependent on agriculture and natural resources for their livings. Fishing, livestock, and forestry products are their major source of income in rural Pakistan. Rangelands are down in their productivity due to environmental degradation, and poor people rely on them to feed livestock (ADB, 2008). The dilemma of poor makes them helpless to the health dangers associated with environmental contamination. Due to the circumstances people are inclined to drink impure water and respire in heavily contaminated air. As an

outcome, they suffer from waterborne and respiratory diseases and they do not have the economic means needed for proper medical treatment (World Bank, 2006). There are three main origins of pollution in Pakistan; Water, Air and Land pollution. All the three are very dangerous and masses in Pakistan are victim of their affects.

## 1.1 Air Pollution in Pakistan

Air pollution is a speedily growing environmental challenge in Pakistan. Pakistan Environmental Protection Agency (PEPA) states that, air contamination levels for the main Pakistani cities have been documented seven times higher than those prescribed by the World Health Organization (WHO) (Purohit Munrib, & Rafaja, 2013). Highly in-effective energy use, growth in automobile number and vehicle kilometres travelled without adequate check and control, increase in industrial activity without adequate air pollution control management, and open burning of solid waste including plastic are some of the vital reasons for declining air quality in Pakistan. At the same time, the growth of industrial activities is also big concern in terms of greenhouse gases (GHGs) emissions. Consequently, it is critical to reduce the increase or even limit the emissions of air pollutants that worsen air quality in Pakistan, while also emissions of GHGs should be kept at a minimum possible level (Ali & Athar, 2008).

World Bank strongly urges government of Pakistan to put focus on air quality improvement and it should be one of the priority issues in the country's environmental policy agenda (World Bank, 2006). This issue has got no consideration despite strong evidence signifying urgent need to reduce pollution in major cities. Present development trends in industrialization, urbanization and developments in transport sector, suggest that the air quality in Pakistan will only deteriorate with time if specific interventions will not be ready for implementation in the short, medium and long-term basis. In addition to this, the technical and personal force of establishments accountable for air quality management system in Pakistan should be supported at local and international level. Outdoor air pollution alone is the cause for around 80,000 hospitalizations per year in Pakistan; roughly 8,000 cases of chronic bronchitis, and around five million cases of low respiratory problems in children under the age of five (Ahmed, 2014).

The air gets contaminated by the fumes of various vehicles on the road. There is no control in Pakistan to check the condition of the vehicle before they come on to the roads like EU controls in many European countries. Pakistan is far away from the stage that one can think about the use of environmental friendly cars like hybrid and electric ones. The only solution to challenge these problems is that people should be encouraged to use public transport and bicycles by giving them

the examples of so many European countries, where use of bikes has been increased in recent past. Awareness for the use of bicycle or public transport should be increased and promoted, as it is not a second-rate thing, and it will not hurt the status of rich and upper middle class people in Pakistan who are much status conscious. The example of worst environmental conditions in two big cities of Pakistan due to air pollution is shown in figure 3.

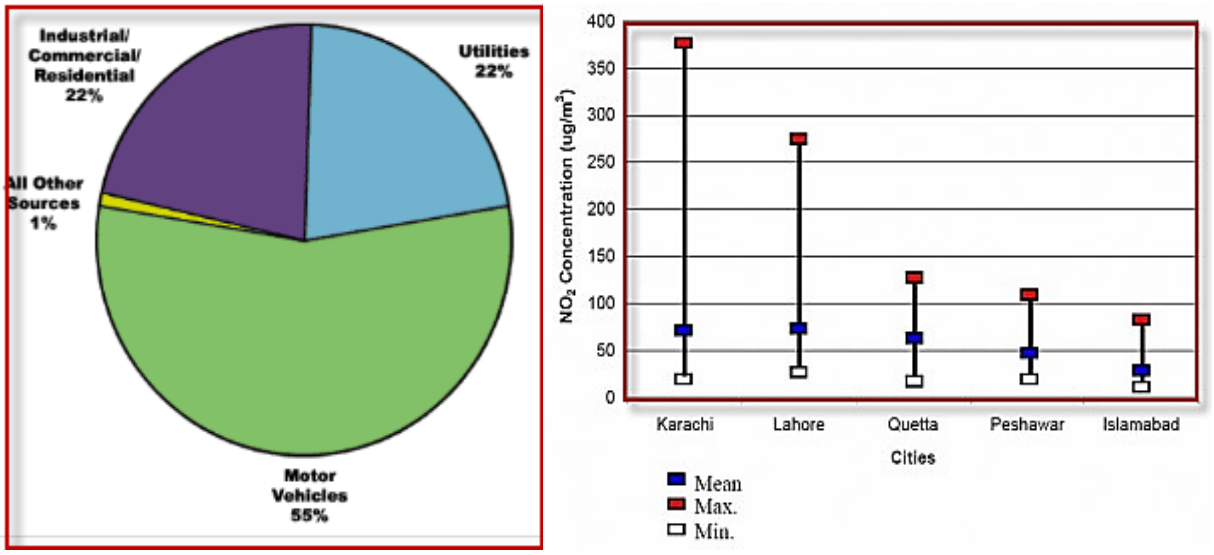
**a) Lahore.**

**b) Karachi.**

**Figure 3: Illustration of un-controlled air contamination from two major cities in Pakistan (Zuberi, 2007).**

Various industries in big cities such as Karachi and Lahore give out toxic contaminants such as sulphur dioxide and carbon monoxide. The government and the local establishments show no concern about such kind of industries. In Pakistani cities, there is a high level of $NO_2$ (much higher than excepted level of 100 $\mu g/m^3$) which is very toxic gas and is present in all major

cities. The figure 4 shows the level of $NO_2$ in all major cities of Pakistan and its main source is attributed to transport and industrial sector.




**a)** **b)**

**Figure 4: a) $NO_2$ sources and b) its concentration in major Pakistani cities (Zuberi, 2007).**

It is not only the outdoor air pollution that threats the air quality, indoor air contamination is an equally major problem for human health especially in rural areas of Pakistan. Still many families (especially in rural areas) use biomass fuel for cooking and heating in Pakistan. In the rural area of Pakistan one of the main contributors of pollution is rural stove (see Figure 5) using biomass bars (from animals), fuel wood and rubbish as a cooking fuel. In Pakistani villages it is normal to use such stoves (Chullahs in local language) every day, 2–3 times and it is the main cause of air contaminations in rural areas.

**Figure 5: Woman making food on traditional stove in a village in Pakistan (Adam, 1985).**

## 1.2 Water Pollution in Pakistan

In Pakistan, water shortage and contaminations are one of the main fears for the public health. Available water assets are basically exhausted and it is likely to have a water shortage in the near future (WWF, 2007). The rainfall rate is lower than the evaporation rate in the country, and this causes a constant decrease in water quantity in its lakes, rivers, and reducing the ground water as well (Azizullah et al., 2011). Drinking water quality is badly controlled and checked. Drinking water reservoirs are contaminated with coliforms, toxic metals and pesticides throughout the country. Several drinking water quality parameters set by World Health Organization (WHO), are often violated (Azizullah et al., 2011). Human activities like in-adequate removal of municipal and industrial wastes and un-selective applications of agro chemicals in agriculture are the main causes for to the worsening of water quality in Pakistan. In Pakistan drinking water have a fluoride content ranging from 5.26 to 26.32 milligrams per litter, and this is extremely high as standard of 0.6 to 1.7 milligram per litter set by WHO (Rizvi, 2000).

In the present situation due to industrialization and increased population, the drains of Pakistan carry the industrial and municipal wastes that eventually carry the polluted water to the canals and rivers (see Figure 6 as an example). The un-treated industrial and municipal wastes have created multiple environmental hazards for mankind, irrigation, drinking and sustenance of marine life in Pakistan.


**Figure 6: Addition of waste water into river, canal, open land causes pollution of surface and groundwater (a) municipal waste water is discharged in the drain without any pre-treatment (b) industrial waste water is drained into a canal without any prior treatment (c) effects of sewage application on soil (d) community waste water is used for agriculture (Azizullah et al., 2011).**

There is no proper sewerage system in Pakistan especially in the rural and poorly managed areas of the city and waste water is often flooded into streets. This caused not only health issues but extreme difficulties for the women and children in passing through such areas (see Figure 7).


**Figures 7: Sewerage water into streets causing difficulties for women and children. (Pakistan photography, 2012).**

An additional serious issue for Pakistanis is Risk of water shortage. PEPA (2005) suggests that, it is expected that per capita accessibility of water will be less than one thousand cubic meters from 2010 (see Table 1). This brands Pakistan a water-shortage country, and intensifies the value of developing a good water management structure and encourage water preservation behaviour among the people of Pakistan.

A report by UNEP (2002), investigated the water scarcity confronted by nations around the globe. It is established that Pakistan experienced the most serious water shortages today (Figure 8).

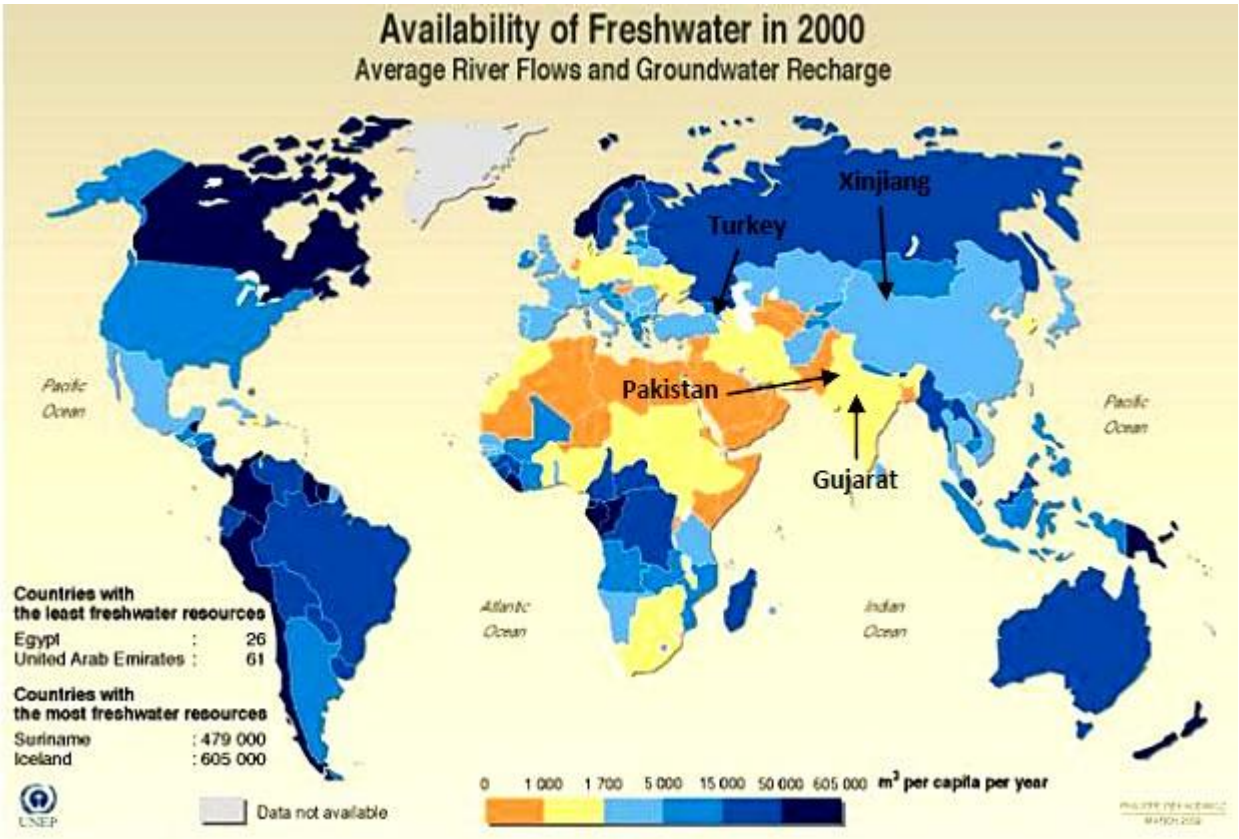



**Figure 8: Availability of freshwater around the world expressed in $m^3$ per capita per year (UNEP, 2002).**

**Tabel 1: Per Capita availbility of water in Pakistan (Rassol, 2013).**

| Year | Population (in millions) | Per capita availbility of water (meter cube) |
|---|---|---|
| 1951 | 34 | 5300 |
| 1961 | 46 | 3950 |
| 1971 | 65 | 2700 |
| 1981 | 84 | 2100 |
| 1991 | 115 | 1600 |
| 2001 | 148 | 1200 |
| 2013 | 207 | 850 |
| 2014 | 267 | 659 |

In the rural area of Pakistan, people and especially females have to travel long distances for the search of water for their daily use as shown in figure 9.


**a) People collecting water from nearby spring in KPK province in Pakistan.**

**b) Women and children have to wait in queue for clean water.**

**Figure 9 a) and b): Situation of people due to water shortage (Pakistan photography, 2012).**

# 1.3 Land Pollution in Pakistan

Insufficient control of solid and harmful waste is also a huge environmental issue of Pakistan as it is not a rich country. In Pakistan around 48,000 tons of solid waste is created every day (ADB, 2008; PEPA, 2005). In general collection and disposal of waste is not being done in environmentally friendly manner in Pakistan. As a consequence lot of effort is misused in this cause, and in-appropriate management of waste fallouts results in health issues and the polluted

environment. With the growth of population, the amount of solid waste generated is also escalating.

PEPA (2005) reported that, the domestic waste produced in Pakistan by per capita is 0.283 kg to 0.613 kg/day and by per house is 1.896 kg to 4.29 kg/day. In big cities like Karachi the waste contains 8.41 % paper, 8.11 % cardboard, 6.20 % plastic, 5.21 % glass, 4.08 % metal and 8.93 % textiles, together they all contribute nearly 41 % of total household waste. In the absence of any waste recycling system, most of the waste dumped to landfills and dumped in grounds where it is burned to cut the volume that contributes to air pollution and greenhouse effect (Chandio, 2012).

In Pakistan, it is also quite normal to throw waste in streets and on roadsides. In the non-existence of appropriate waste collecting system, at times the waste coming from hospitals also gets mixed with the other forms of solid waste from homes. The industrial units in Pakistan are answerable for throwing contaminants like un-treated chemicals and heavy metals into land and water (Chandio, 2012). Some of the industrial pollutants can slowly destroy Pakistan's natural resources such as rivers, lakes and fresh ground water which are already at risk. Un-processed waste lying in open places is a common source of health problems as it attracts flies and insects. Presence of waste on streets of Karachi and the way how waste is usually dumped and burned in open grounds in Pakistan is shown in figure 10.

**a) Waste thrown in the streets of Karachi.**

**b) Burning of trash is common method for waste disposal in Pakistan**

**Figure 10: Normal Waste Management System in Pakistan (Chandio, 2012).**

Pakistan also faces a serious challenge in terms of recycling of electronic waste. The map in figure 11 shows where all the rejected electrical and electronic products of the world go for e-waste recycling. These e-waste recycling hubs are also the ones with uppermost poverty levels, water pollution and water shortages levels, and other critical statistics in terms of poverty. E-waste recycling brings livelihood and some income in these regions but leaves permanent environmental destruction in the process.


**Figure 11: Map showing hub of recycling (://www.kizee.com/e-waste-recycling-regions-ppt-world-map).**

Pakistan is confronting another scary challenge of providing toilet facilities to millions of people who still carry out open air defecation. According to Indian Sanitation Portal (ISP), Pakistan is among the top nations of the world who lack basic sanitation facilities and nearly 48 million people in Pakistan do not have basic toilet facilities (ISP, 2014), as shown in figure 12.

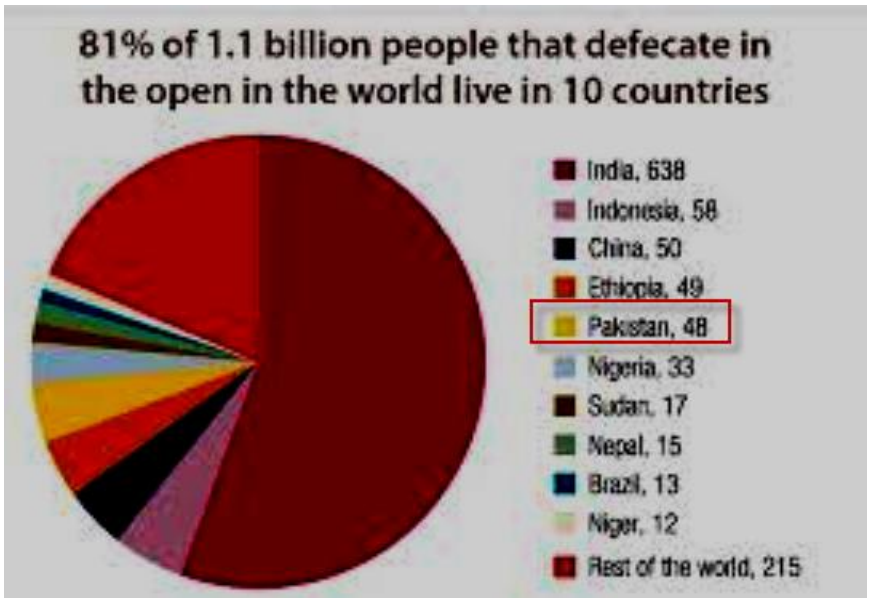



**Figure 12: Worst countries in world in terms of basic toilet facilities (ISP, 2014).**

The consequences of this distressing problem are wide-ranging from environmental challenges to health issues and cultural implications. From an economic point of view, the absence of satisfactory sanitation is assessed to cause a loss of over 370 billion Pakistan Rupees (1US$ is roughly 100 Pakistani rupees), nearly 4 % of Pakistan's annual GDP (WSP, 2014). This financial loss is estimated on the basis of costs associated with illness as well as education loss, time lost due to lack of access to acceptable toilet locations. Toilets facilities are only good across wealthy urban areas in Pakistan, and simple latrine services remain limited in rural and free urban slums. Many poor persons are so enforced to make use of wild, river and canal banks, lakes or cultivated fields. In packed villages and slum locations across towns and in urban areas around the big cities, women and girls have to walk extensively to locate proper spaces to discharge themselves. This leads to the lot of health complications, and intestine and kidney failures are quite common among females (WSP, 2014).

In big cities of Pakistan main common places like shopping areas, bazaars, bus stands and parks lack toilet facilities. Therefore visitors at public places are forced to off-load at 'open toilets' along walls although inscribed with the direction as shown in figure 13 "Yahan paishaab karma mana hai" (it is prohibited to urinate along wall) which leads to environmental destruction

(Malik, 2014). Only those who manage and control to keep their relief are then on the hunt for a mosque. But females face tremendous problems as they do not have any of the two choices in Pakistan as women do not go to Mosques like men in Pakistan.

**a)**


**b)**

**Figure 13 a) and b): People defecate openly in spite of clear instructions due to lack of toilet facilities (Malik, 2014).**

# Section 2

# Environmental Behaviour

Environmental behaviour is a quite broad expression for all types of individual or collective human performances that make a direct or indirect impression on the environment. Concern for the environment and pro-environment behaviours can be assessed in a wide arrange of situations, ranging from water or energy savings to buying organic fruits or participating in environmental organizations (Melgar, 2012). In some situations, the term environmental behaviour has been applied to refer the influences of the biophysical environment on human behaviour e.g. effect of architecture on the human behaviours. Though, in the psychology discipline, environmental behaviour refers to the prior meanings of the expression. Stern (2000) defines environmentally important behaviour as "behaviours that changes the obtain ability of materials or energy from the environment or modifies the organization and dynamics of ecosystems". Environmental behaviours do not refer, only to one set of behaviours; there are dissimilar kinds of environmental behaviours. According to Stern (2000) environmental behaviours can be separated in the following discrete groups:

Environmental Activism, for example, taking part in protest and environmental citizenships.
Non-Activist behaviours in the public domain, for example, stating approval of environmental friendly regulations, rules and guidelines.
Private-Domain Environmental Behaviours for example, everyday domestic behaviours that have environmental impacts like recycling, water preservations, minimizing waste creation and saving energy, and green consumerism for example, buying items that are environmentally friendly.

The attention in human-induced environmental changes grew after the publication of Rachel Carson's widely cited book 'Silent Spring' (Rassol, 2013). In her book, Carson spotted the influence of pesticide usage on birds. The book, Silent Spring helped in increasing the awareness that humans need to defend and save the environment. In the periods 1960s and 1970s industrial and transportation sectors were acknowledged as segments where alterations were required to reduce the environmental degradation. More recently, the significance of everyday individual environmental behaviours has also been realized (Benders, Kok, Moll, Wiersma, & Noorman, 2006). Each individual reflects environmental impressions of his activities insignificant, but

when thousands and thousands of people lead to living with this similar kind of behaviour, the danger of environmental devastation rises tremendously.

# Theories of Environmental Behaviours

Different theories have been developed to understand the human behaviours that have significant impact on the environmental issues. The theories mainly aim at defining the intervention techniques to change the particular behaviours. Human behaviours, for example dumping the household wastes, cause direct changes to the environment. Some of the indirect behaviours that can be the choices like preferences of recycled material to the non-recyclable materials have impact on the environmental issues. The by-product of human desires has an indirect impact on the environment in different ways. Now a day the concern for the environmental protection is increased and forced to make environmental protection policies at the highest possible level in the governmental hierarchies.

Numerous people all over our globe are facing environmental problems, for example, global warming, unclean water for drinking and air pollution. Most of these problems are caused by human behaviour and can be solved by changing the relevant behaviour (Steg, Bolderdijk, Keizer, & Perlaviciute, 2014). Since 1980s environmental psychology has given considerable worth to propose and test the theories that help to predict and identify the changes in environment and application of intervention techniques to change human behaviour. In this field, many schools of thoughts have proposed the variety of models/theories and variables that are effective for promoting pro-environmental behaviour. Klöckner and Blöbaum (2010) argued that by reducing the complexity of the environmental theories it is helpful to integrate them into a more generalized theories which add assumption that how, different variables related to each other across different models and traditions.

There are number of different proposed theories by researchers and large varieties of interacting and impacting variables in the environmentally relevant behaviours. It is, therefore, necessary to reduce the complexity of theories on environmental psychology to incorporate the variables of different models and form the more tailor made theories which might be applicable to different situations and cultures. In the following text I will discuss, the separate theories and integrating variables that could be best possibly explained by these theories.

# 2.1 Norm Activation Theory (NAT)

Norm Activation Theory (NAT) was originally developed by the Schwartz (1977) in the context of altruistic behaviour. Personal norms form the core of this model. Schwartz (1977) explains that these norms are experienced ‘‘as feelings of moral obligation, not as intentions’’. NAT was established to describe altruistic behaviours. According to Schwartz, particular behaviours are accomplished when situations are helpful to the activation of these values and norms. The norm activation model suggests that people are more likely to display altruistic helping behaviours, when people are aware of the consequences of their actions and when they ascribe responsibility for these consequences to themselves. When these two conditions are met, people feel a moral obligation to act in ways that benefit others as well. The environmental behaviour can be classified as one type of altruistic behaviours; which has been applied by researchers in investigating environmental behaviours (Rasool, 2013). NAT postulates that behaviour is affected by three variables as shown in figure 14. The first variable is Personal norm which states that moral commitment of whether to accomplish or not a given behaviour (De Groot & Steg, 2009), for example, to make a worthy effort to preserve water so others may not face consequences for water scarcity. The second of the variable is Awareness of consequences which states that the awareness of individual about the negative bearings of his activities on the things that he values, for example, awareness of person that if he is not vigilant in use of water, its shortage may be confronted to other people. The third variable, Ascription of responsibility refers to feeling accountable for the deleterious influences of not taking an action, for example, feeling responsible for the water dearth faced by others. Use of NAT is demonstrated beneficial in clarifying pro-environmental behaviours that are not very difficult to perform. The NAT variables have been used by Stern and co-workers to develop further in the form of value-belief-norm theory.

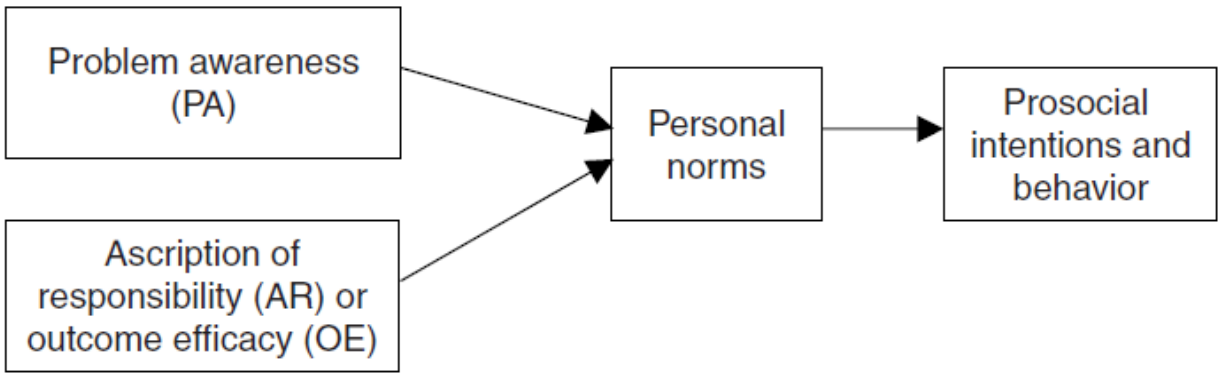



**Figure 14: Norm Activation Theory for Environmental Behaviour (Schwartz, 1977).**

## 2.2 Value-Belief-Norm Theory (VBN)

Value-Belief-Norm Theory (VBN) developed by Stern (Stern, 2000) is one of the most quoted models for clarifying pro-environmental behaviour. The model links value theory, the New Environmental (or Ecological) Paradigm (NEP) outlook and NAT through a connecting chain of five variables controlling the behaviour as shown in figure 15 (Stern, 2000).

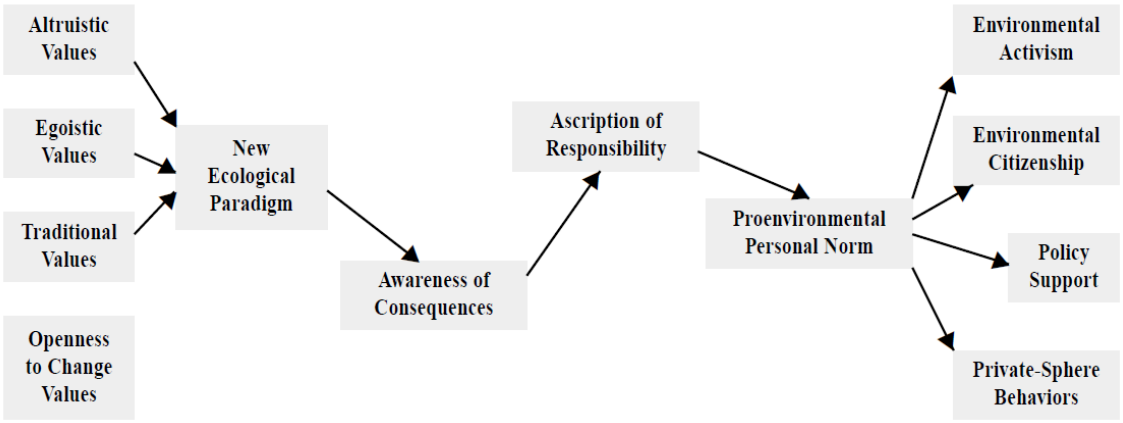



**Figure 15: Value-Belief-Norm Theory (Stern, 2000).**

Value-Belief-Norm (VBN) theory connects the individual's opinion about the human-environment associations and individual value alignment with the NAT. A prevalent gauge to assess individual belief about the link of human-environment is the New Ecological Paradigm scale (NEP) (Dunlap, Van Liere, Mertig, & Jones, 2000). In VBN theory, three types of principles/values, namely, egoistic, altruistic and biospheric are recognized (Abrahamse, Steg, Velk, & Rothengatter, 2005). People who have Egoistic value are primarily worried about their personal welfare and accept pro-environmental activities only when it is in their benefit. Individuals who have an Altruistic value emphasis are anxious about the welfare of other persons as well. They are expected to perform pro-environmental behaviour not only for themselves but the advantage of others also. Individuals who have a Biospheric value orientation are not only concerned about their own and other people's welfare, but they are also worried about other things in nature such as plants and animals. These people feel happy to accomplish pro-environmental activities to benefit all humans, plants and animals. Like the NAT, VBN theory also suggests that the personal norm is the vital forecaster of behaviour. The personal norm is dependent on understanding the results and acknowledgment of responsibility. VBN theory generalizes the NAT by hypothesizing that knowledge of individual actions and ascription of responsibility are manipulated by beliefs of a person about the link of humans with the environment and person own character (Stern, 2000).

In the VBN theory acceptance of the NEP links to the NAT because it would lead to an awareness of consequences of certain behaviour which in turn leads to an ascription of responsibility of one's actions. Once a person has realized that, he/she has a certain responsibility to adopt or to cease a behaviour there is a probability that they will act accordingly.

VBN Theory shows environmentalist personal norms and the predisposition to pro-environmental behaviour can be influenced by information that shapes these beliefs (Stern, 2000). For example, environmentalism can be affected by the findings of environmental science (about consequences), publicity and commentary about those findings, and the actual and perceived openness of the political system to public influence (Stern, 2000). While this model has proven to be one of the best fitting models for explaining pro-environmental behaviour, research shows that it can only predict actual behaviour between 19 % and 35 % of the time (Kaiser, Hubner, & Bogner, 2005). For this reason, Stern (2000) stresses that pro-environmental values and attitudes are crucial, but other factors that influence behaviour must have to be taken into account. These factors will be discussed in the following sections.

## 2.3 Theory of Reasoned Actions (TRA)

Originated from the social psychology, the Theory of Reasoned Action (TRA) was suggested by Fishbein and Ajzen (1975). The elements of TRA as shown in figure 16 are three general concepts: Behavioural intention (BI), Attitude (A), and Subjective norm (SN). TRA proposes that a person's behavioural intention depends on the person's attitude towards the behaviour and subjective norms ($BI = A + SN$). If a person aims to do behaviour then it is likely that the person will do it.

The TRA holds that one's beliefs about behavioural outcomes and ones evaluation of those outcomes determine attitudes toward the behaviour. The TRA then bridges the gap between attitudes and behavioural outcomes by inserting the construct of 'intentions', the TRA holds that intentions directly lead to behaviour. However, other factors than attitudes also impact on intentions ('subjective norms' in the case of the TRA).

Behavioural intention measures a person's relative strength of intention to perform behaviour. Attitude consists of beliefs about the consequences of performing the behaviour multiplied by his or her evaluation of these consequences (Fishbein & Ajzen, 1975). Subjective norm is seen as a

combination of perceived expectations from relevant individuals or groups along with intentions to comply with these expectations. In other words, "the person's perceptions that people who are important to him or her think that he should or should not perform the behaviour in question" (Fishbein & Ajzen, 1975).

To put the definition into simple terms we get a definition: a person's voluntary behaviour is predicted by attitude toward that behaviour and how one thinks that other people would view if he or she performed that particular behaviour. A person's attitude, combined with subjective norms, forms his behavioural intention.

Fishbein and Ajzen (1975) suggest, however, that attitudes and norms are not weighted equally in predicting behaviour. "Indeed, depending on the individual and the situation, these factors might have different influences on behavioural intention; thus a weight is associated with each of these factors in the predictive formula of the theory. For example, one might be the type of person who cares little for what others think. If this is the case, the subjective norms would carry little weight in predicting behaviour" (Miller, 2005).

Hale, Householder, and Greene (2002) accounts for certain exceptions to the TRA theory when it says "The objective of the TRA is to clarify volitional behaviours. Its scope excludes a broad range of behaviours such as those that are spontaneous, irresponsible, habitual, the result of desires, or simply scripted or mindless. Such behaviours are excluded because their performance might not be voluntary or involment in the behaviours might not contain a sensible choice on the part of the actor."

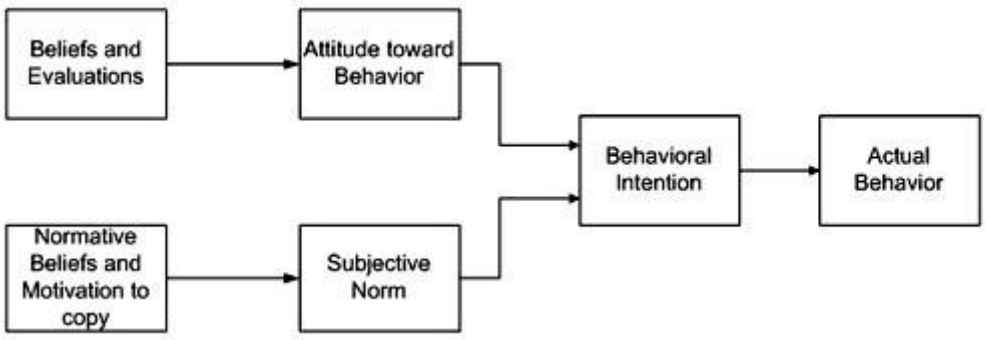



**Figure 16: Fishbein and Ajzen's Theory of Reasoned Action (Fishbein &Ajzen, 1975).**

# 2.4 Theory of Planned Behaviour (TPB)

TRA was criticised for neglecting the importance of social factors that in real life could be a determinant of individual behaviour (Grandon & Mykytyn, 2004; Werner, 2004). Social factors mean all the influences of the environment surrounding the individual (such as norms) which may change the individual behaviour (Ajzen, 1991; Sheppard, Hartwick, & Warshaw, 1998). To overcome TRA's limitations, Ajzen (1991) suggested an additional variable in determining individual own behaviour in TPB (Figure 17), which is Perceived Behavioural Control. Perceived behavioural control is an individual awareness on how easily a particular behaviour could be performed (Ajzen, 1991). Perceived behavioural control might indirectly influence behaviour of an individual.

The TPB is an extensively used social psychological theory that has been used to forecast pro-environmental behaviour . As shown in figure 17, the model is built on three elements on individual's intent to behave in a definite way. The first element is Attitude; an attitude concerning behaviour is pushed by the views about the outcomes of the person's particular behaviour and the assessments of those results. The second factor is the Subjective norm, is the individuals view that people who are central to him think he should or should not accomplish the behaviour in question (Fishbein & Ajzen, 1981). The third inspiration is Perceived behavioural control. Ajzen (1991) has accepted the fact that the ability to perform in a certain way has a vital impression on actual behaviour.

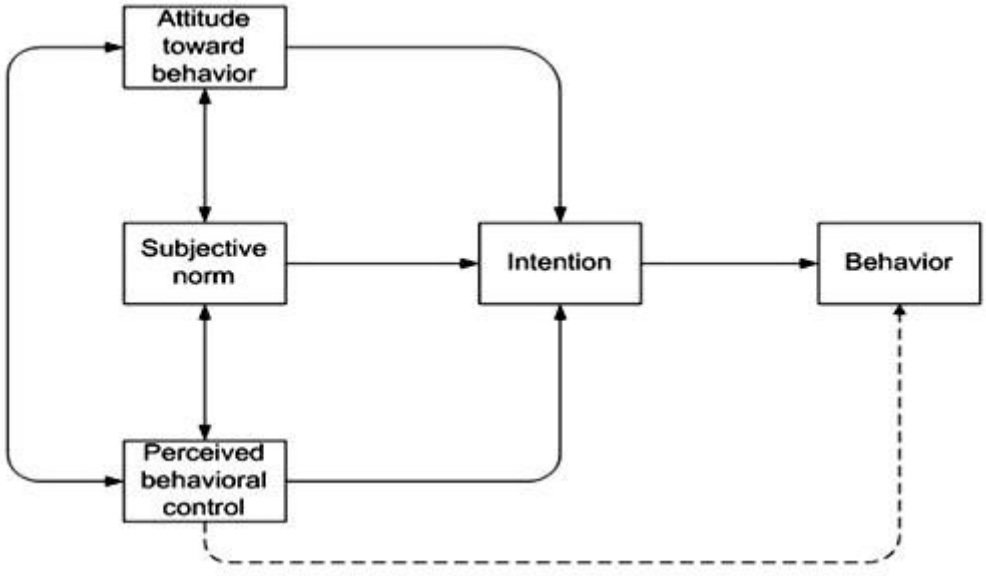



**Figure 17: Theory of planned behaviour proposed by Ajzen (Ajzen, 1991).**

Optimistic approach towards the behaviour, presence of subjective norms and sense of control to accomplish behaviour goes towards to the behavioural intent which lastly outcomes in positive behaviour being performed. Equally, destructive approach is concerning the behaviour and a feeling of low control to execute behaviour might outcome in behavioural intent that may not develop toward particular behaviour and consequently behaviour being not performed.

One application of the theory of planned behaviour is in the field of environmental psychology. Generally speaking, actions that are environmentally friendly carry a positive normative belief. That is to say, sustainable behaviours are widely promoted as positive behaviours. However, although there may be a behavioural intention to practice such behaviours, perceived behavioural control can be impeded by restrictions such as a belief that one's behaviour will not have any Impact (Stern, 2005).

As an example even if individual likes to behave in an environmentally friendly way but there is a lack of nearby recycling infrastructure, perceived behavioural control in this case is weak, as constraints on pro-environmental behaviour are high, so the behaviour in question might not occur. Relating the theory of planned behaviour in these kinds of situation might help in clarifying contradictions between sustainable attitude and unsustainable behaviour.

As Werner (2004) suggested, that TPB has some limitations in predicting behaviour. The first weakness is that intention determinants are not limited to attitudes, subjective norms, and perceived behavioural control (Ajzen, 1991). Empirical studies (Ajzen, 1991; Werner, 2004) showed that only 40 % of the behaviour change could be described by using TPB. The second weakness is that there might be a significant gap of time between assessment of behaviour intent and when the actual behaviour being evaluated (Werner, 2004). In that time gap, the intent of an individual might alter. The third weakness is that both TRA and TPB are prediction models that guess a person's certain action built on some criteria. However, persons do not always perform as predicted by those standards (Werner, 2004).

## 2.4 Habits and Situation Factors

The above mentioned models have been shown to predict behaviour quite well in many circumstances, but there is one significant shortcoming in most of them – the fact that they assume that decisions are always made intentionally (Aarts & Knippenberg, 1998). This is not always the case, particularly in the case of habits. Depending on the type of behaviour, habits play a significant role and should be targeted by models/policies aimed at altering behaviours (Willuweit, 2009).

One of the weakness of the theories explains above is the inability to incorporate the repeated behaviours. The intention becomes weaker if the repeated behaviours are performed but at the same time influence of habits exhilarate for the behavioural pattern triggered by context clues. The duration of behaviour frequency affect the behavioural outcome, e.g. annual or biannual intention had a strong influence while the daily or weekly performance decreased the influence (Ouellette & Wood, 1998). There has been debate where the habit strength is to be placed as the predictor of behaviours. Verplanken and Aarts (1999) pointed that the habit strength should be one of the predictor of behaviours in TPB, while studies done by Klöckner, Matthies, and Hunecke (2003) and Klöckner and Matthies (2004) suggested the habit should be one of the predictor of the behaviours in NAT, determining the inverse relationship between the habits and the personal norms and behaviours.

The habits to perform behaviours have a direct relation to the frequency of occurrence of the behaviours that are actually to be performed. Taking single person and analyzing the habit strength has been greatly debated for viability of different variables. Habit strength is the measure of the spontaneous nature of behaviours for a particular situation. Repetition of the same behaviours results in the habits that are geared toward the reward or punishment. Habit strength is measured by Response Frequency Measure (Verplanken, Aarts, & Knippenberg, 1994) and Self-Report Habit Index (Verplanken & Orbell, 2003). Theoretically the degree of habituation is computed based on two categories 1) Deterministic and relativity of characteristic of behaviours, frequency and stability. 2) Personal characteristics, degree to which the person is habituated to situation compared to another person in the same situation.

## 2.5 Social Context

Cialdini (1993) establish that people look at the other individuals in their locality in order to choose that, how to act in a given circumstances. As an example, if an individual lives in a municipal where large number of people sort out waste, then that individual is likely to sort waste than a person living in a municipal where no one do that. Two issues play an important role in social content. Primarily, Descriptive norms, which identify what is typically being done in a given circumstances; second factor, Injunctive norms, that states what are commonly accepted practices in the society. To demonstrate this hypothesis Cialdini (2003) steered an investigation in the Petrified Forrest in the USA, where folks used to take large quantities of wood illegally. Two dissimilar signs were put up at different times at the arrival point of the forest. The first one state that 'Many past visitors have removed wood from the Park, altering the natural state of the Forest', and the other one states 'In order to keep the natural state of the Forest, please do not snip wood from the Park'. It was revealed that five times more people took wood from the forest in the first case than in the second case.

In a similar investigation carried by Goldstein, Cialdini, and Griskevicius (2008) three dissimilar messages for hotel guests regarding re-use of towels in order to help the environment protection were put in hotel rooms. The notes read as the following:

'Help Saving the Environment. You can show your admiration for nature and help save the environment by reusing your towels during your stay at our.'
'Join your Fellow Guests in Help to save the Environment. In a campaign conducted in fall 2003, 75% of the guests joined in our new resource management program by using their towels more than once. You can join your fellow guests in this campaign to help save the environment by reusing your towels during your stay at our hotel.'
'Join your Fellow Guest in helping to save the Environment. In a campaign conducted in fall 2003, 75% of the guests who stayed in this room (#xxx) joined in our new resource savings program by using their towels more than once. You can join your fellow guests in this campaign to help save the environment by reusing your towels during your stay at our hotel.'

It was found that in hotel rooms with the first message 37.2 % of the hotel guests reused their towels at least once, in the second case 44 %, and in the third case 49.7 %. This makes it clear how vital the role of social context in encouraging certain behaviour.

## 2.6 Goal Forming Theory

Lindenberg and Steg (2007, 2013) suggest three types of motivational goals (hedonic, gain and normative) that govern the pro-environmental behaviour in their goal forming theory. These goals are influential in collecting the knowledge about the people behaviour in a specific situation. Hedonic goals allow the person to concentrate on how to improve their feelings in a participial situation such as seeking direct pleasure. Gain goal lead people to be sensitive to change or improve their personal resources such as status and/or money. Normative goals such as social norms, culture tradition, family customs influence promote individuals to focus on proper actions and think what they prefer, such as how to contribute to a clean environment. Strongest goals have influence on decision making or thought processes and rest of the goals decrease or increase the influence of main goal (Steg et al., 2014).

Many pro-environmental behaviour involve a conflict between normative goals and hedonic and/or gain goals. People whole want to do right things for pro-environmental behaviour strengthen their normative goals and fade the strength of hedonic and gain goals. This approach will make people focus on environmental friendly behaviour choices. This strategy will encourage people to act pro-environmentally by making hedonic or gain goal less prominent by reducing the value of hedonic and gain consequence of behaviour (Lindenberg & Steg, 2007).

Intervention goals like choosing environmental friendly products could be attractive if one place subsidies, making environmental action fun and convenient, or by putting taxes and fines on harmful environmental acts. These interventions have goal to change people behaviours through change in cost and benefits. According to Thøgersen and Crompton (2009) if we slowly target the hedonic and gain goal, people will adopt the view that environmental friendly products are sensible and an economical choice. Then they may start to engage in other pro-environmental behaviours that may be financially un-attractive. Another aspect is that people like to act and behave environmentally if they get pleasure and profit in that action.

Values also effects on hedonic, gain and normative goals in a given situation and determine the particular goal for the given situation. Values are desirable goals that vary in their importance and serve as a guiding principle in the life of people. The values are believed to surpass situations and effect on norms, attitudes, beliefs, behaviours, intentions and they are relatively stable over time (Steg et al., 2014). Values evaluate which goals are most important in the life of

people and consequently goal reflects what motivate people in a giving situation. According to Steg et.al. (2014) there are two types of values are self-enhancement (hedonic and egoistic values) and self-transcendent values (altruistic and biospheric values that influence on normative goals) that helps to understand the environmental actions and beliefs.

## 2.7 The Comprehensive Action Determination Model(CDAM)

Klöckner and Blöbaum (2010) proposed a model by integrating the above-mentioned models and individual habit strength. They avoid the weaknesses of the single models and simultaneously providing a general model framework that could possibly be applied in a larger variety of situations. They referred this model as "Comprehensive Action Determination Model" (CADM) and shown schematically in figure 18.

The model assumes that individual environmentally relevant behaviour is determined directly by intentions and perceived behavioural control which is in line with the TPB. CDAM integrates habit strength as a third direct predictor of behaviour. Habit strength is expected to moderate the relation between intention and behaviour, which means that the intention-behaviour link is weakened if habits are strong (Klöckner, 2013). Intentions typically integrate the influence of attitudes, subjective norms and perceived behavioural control as they are referred in the TPB, but furthermore CDAM also include the impacts of personal norms. Personal norms have repeatedly been shown to have only an indirect impact on behaviour if intentions are included in CDAM (Klöckner, 2013). Personal norms are in line with the NAT as it assumed to be predicted by awareness of consequences and ascription of responsibility, perceived behavioural control, and social norms. Likewise, VBN theory's assumption that general values and the ecological worldview have an additional impact on personal norms is also applied in this model. NEP as a measure of the general ecological worldview is not used as an attitude measure. Attitudes in contrast are included as specific evaluations of the respective behaviour. In this model habit strength is theoretically not linked to the any other model variables as according to Klöckner and Matthies (2012) habits are generated by repeated action in stable contexts.

The main assumption for measuring the habit strength is the element of the behaviour that is constant over time. When behaviour is computed for initial times, the main determining factors are intentions and perceived behaviour control. When the same behaviour repeated over time, the

habits are dominant over the above mentioned determining factors. If the explanatory factors like intentions, personal norms are un-affected over certain period of time, then they would be correlated with the habit strength.

The CADM is a general model and it can be applied in a variety of global environmental situation as it unites attitudes, personal norms, perceived behavioural control, habits and social norms, which jointly formed the behavioural intent. It is an important model which combines the strengths of theories explained above for designing the environmental intervention strategies to tackle particular environmental challenges of today.

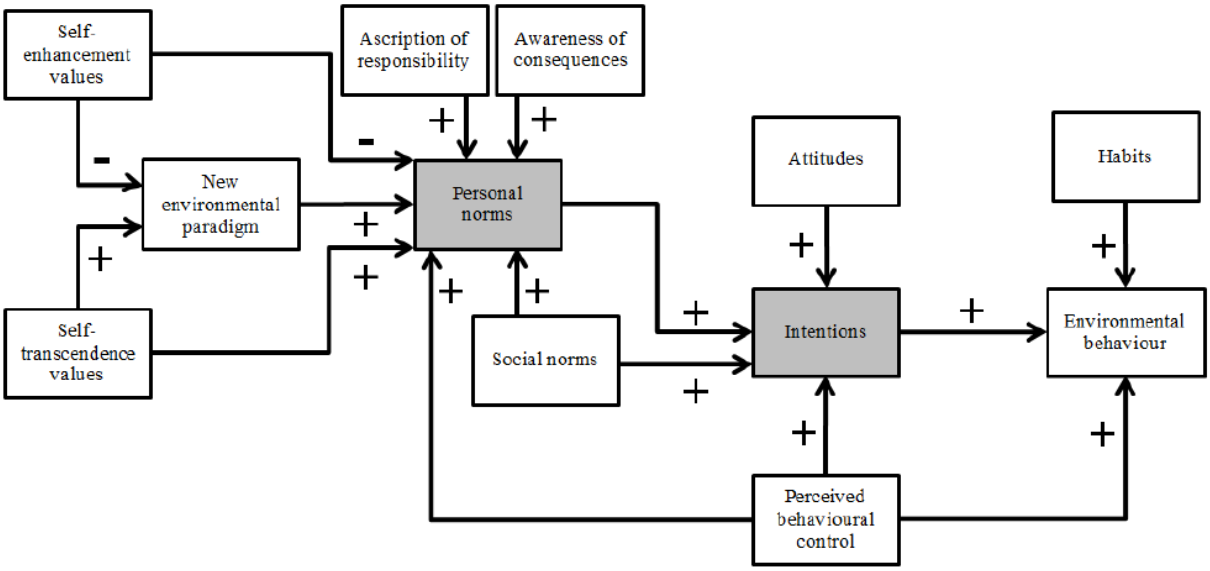



**Figure 18: Comprehensive action determination model (Klöckner, 2013).**

## 2.8 Cultural Theories

With an opinion to overcome the weakness of mainstream psychological explanations of human behaviour and decision-making the cultural theory was proposed to emphasize social organization and norms over individual psyche (Douglas & Widavsky, 1982; Shweder & Haidth, 2000). The theory accepts that social structure generates views toward the world, which in turn up-hold the social structure. Cultural theory proposes that worldviews are the products of socio-cultural processes. Perception of environmental problems and its risk, for example, is socially constructed in terms of inter-linked domains like, the form of social relationship people maintain gives cultural biases (worldviews) and preferred behavioural strategies (Ignatow, 2006). In fact, cultural biases or worldviews are product of social relationship and in turn maintain the

relationship through conventional practices. People interact with the nature and environment in order to maintain their worldviews, as well as social relationships. The cultural theory assumes that the societies can be characterized in terms of Group and Grid dimensions. The group dimension indicates the position of the social organization in terms of the degree of social commitments as distributed amongst the members of a society or community. The social groups may vary in terms of in-group out-group boundaries (Lima & Castro, 2005). The grid dimension points to the extent of constraints individuals find in their society. The society may provide ample opportunity to the people for carrying out their own projects or may restrict such opportunities. By way of crossing these two dimensions, culture theory formulated four worldviews. The fatalist worldview (low group-high grid) is characterized as having a neutral position on environmental issues. Individuals having this worldview take the life as lottery and environment as un-predictable. In their opinion, there is no particular environmental risk management strategy that can be considered as best. The hierarchic worldview (high group-high grid) accepts that only experts and scientists can solve environmental problems. Individuals believe in the social hierarchy and rules and regulations. The egalitarian worldview (high group-low grid) emphasizes in preservation of the environment and ethical relationship with nature. Individuals having this worldview seek public support to protest the policies if they are against environmental protection. They do not believe in the technological solutions of the environmental problems. The individualist worldview (low group-low grid) asserts that a primary value is freedom. The individualists prefer non-interventionist style of environmental management as in their opinion the nature is capable of restoring balance at its own (Lima & Castro, 2005).

It is defined by the Barnouw (1985), the culture as a group of attitudes, values, beliefs, and behaviours shared by a group of individuals that are transferred from one generation to the another generation. As an illustration, Johnson, Bowker, and Cordell (2006) discuss that diverse populations with definite social norms and cultural attributes are probable to have diverse values and position towards nature or toward the environmental issues. Value-Belief-Norm theory indicates values and attitudes influence on the environmental behaviour. Therefore, it looks sensible to incorporate a cultural aspect in the models that target at explaining pro-environmental behaviour. Numerous researchers have tried to link cultural and behaviour models to explain pro-environmental behaviour, but no decisive outcome has been developed (Willuweit, 2009). Cultural theories that integrate environmental behaviour framework include the modernism/post-modernism model individualism/collectivism, harmony/mastery cultural aspects, and purity of

nature (Inglehart, 1997). It looks that largest body of literature has devoted on the relationship between environmental attitudes and behaviour and Inglehart modernist and post-modernist model (Willuweit, 2009). A modernist culture is one in which material values shows the vital role. As an example, several developing countries put good effort on economic development on one hand and on keeping law and order situation in hand within the country. A post-modern culture, on the other hand, is one in which material richness has already been accomplished, and new objectives linked to the quality of life are practiced. As this embraces keeping the environment in better shape, it is more rational to accept that post-modern values are linked with pro-environmental behaviour (Willuweit, 2009). Modernist's people might be more anxious about instant safety (thus interests for local environmental issues only) while post-modernists might put more focus on future well-being comfort (thus interests for global environmental problems as well).

## 2.9 Demographic Background

Many studies have revealed that environmental attitudes varies between population groups for instant, difference in attitude among age groups, gender, education, income and country of origin and society they live in. These variables have significant impact when we consider the behaviour and attitude of people from developing countries toward environmental issues.

## 2.10 A Model of the Determinants Relevant to Pro-Environmental Behaviour

Patchen (2006) proposed a comprehensive theory as a framework to present and relate research outcomes regarding people's approaches and behavioural influences on the climate change. The model comprises a number of viable elements of behaviour and shows also how these elements linked to each other. Figure 19 signifies that an individual's behaviour towards environment at a given time is influenced by: a) his feelings (concern, anger, shame, etc.) about the state of the environment; b) the likely paybacks and/or costs of specific environmental actions; c) his ability to take specific types of measures toward environment; and d) his habits with respect to various actions.

These elements are likely to be influenced, in turn, by his individual assessment of the situation (the gravity of environmental issues, what others are doing, the efficiency of substitute actions, etc.). As an example, an individual who trust that environmental change will bring flooding to

his coastal city is likely to be feel bad about this prospect. Assessment of the situation may also directly affect environmental behaviour. As an example, an individual who feels that cutting the use of oil is a good way to combat global warming is more likely to purchase a hybrid or electric car than somebody who thinks that industry needs to do pollution controls by installation of equipment is the best possible solution to this problem.

An individual assessment of the situation is likely to be affected by personal qualities and by the social impacts to which one is exposed. As an example, one's knowledge about the environment issues may affect one's view on the gravity of environmental problems. The norms of persons with whom one have connections may effect individual obligation for helping to solve environmental problems. Demographic factors and geographic location also influence the environmental behaviour like; age may influence aptitude to take actions (e.g. to bicycle rather than drive to work); economic position may influence the tax returns of getting a solar heating system.

An individual personal norm and the social inspirations to which he or she is exposed may also have direct influences on his or her environmental behaviour. As an example, a person whose municipality offers a suitable recycling practice and whose fellow express their support of this process is likely to recycle than one for whom recycling is difficulty and whose neighbours overlook the issue.

Model in figure 19 shows that individual behaviour relevant to the environment is influenced directly by habit. As an example despite having known that riding the bus to work is inexpensive and less tense than driving, an individual who always drives the car to work may try to repeat this behaviour, almost without any assessment. Habits are formed by replication of the same behaviour times and again. Therefore, the same element (emotions, assessments) that influences behaviours will, in the long run, influences habits.

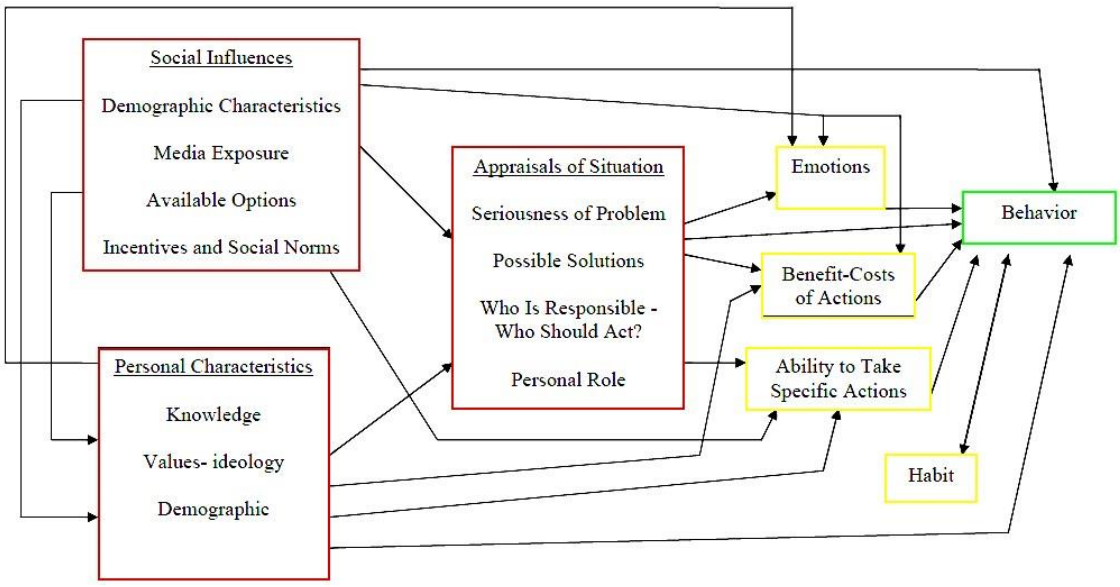



**Figure 19: Model of the Determinants Relevant to Pro-Environmental Behaviour (Patchen , 2006).**

# 2.11 Multi-Dimensional Pro-Environmental Behaviour Model

According to Jackson (2005), by considering all the appropriate theories, for the promotion of pro-environmental human behaviour would more like to have a multi-dimensional approach. Kollmuss and Agyeman (2002) have acknowledged the variables that are vital in pro-environmental behaviour and they divided into three man groups, i.e. demographics, external and internal factors (see Figure 20). Upon accepting that the subject is far too complicated for one model, Kollmuss and Agyeman assess positive and negative variables that have been recognized as dominating toward pro- environmental behaviour. They divided the influential factors affecting pro-environmental behaviour into two main categorizes, external and internal factors.

External aspects include infrastructure, economic, social and cultural norms. While, motivation, environmental knowledge, values, attitudes, environmental awareness and sense of control all come into the class of internal factors. Kollmuss and Agyeman explain environmental intelligence, values, and attitudes, jointly with emotional association as this makes whole picture complex and they termed this a 'pro-environmental realization'. This complex scenario, on the other hand, is rooted in broader personal values and surrounded by personal qualities and other internal as well as external variables. They put social and cultural features into the group of external factors. Kollmuss and Agyeman suggested that the higher the education, the more

oriented is the information about environmental problems but still high education does not essentially mean increased pro-environmental behaviour.

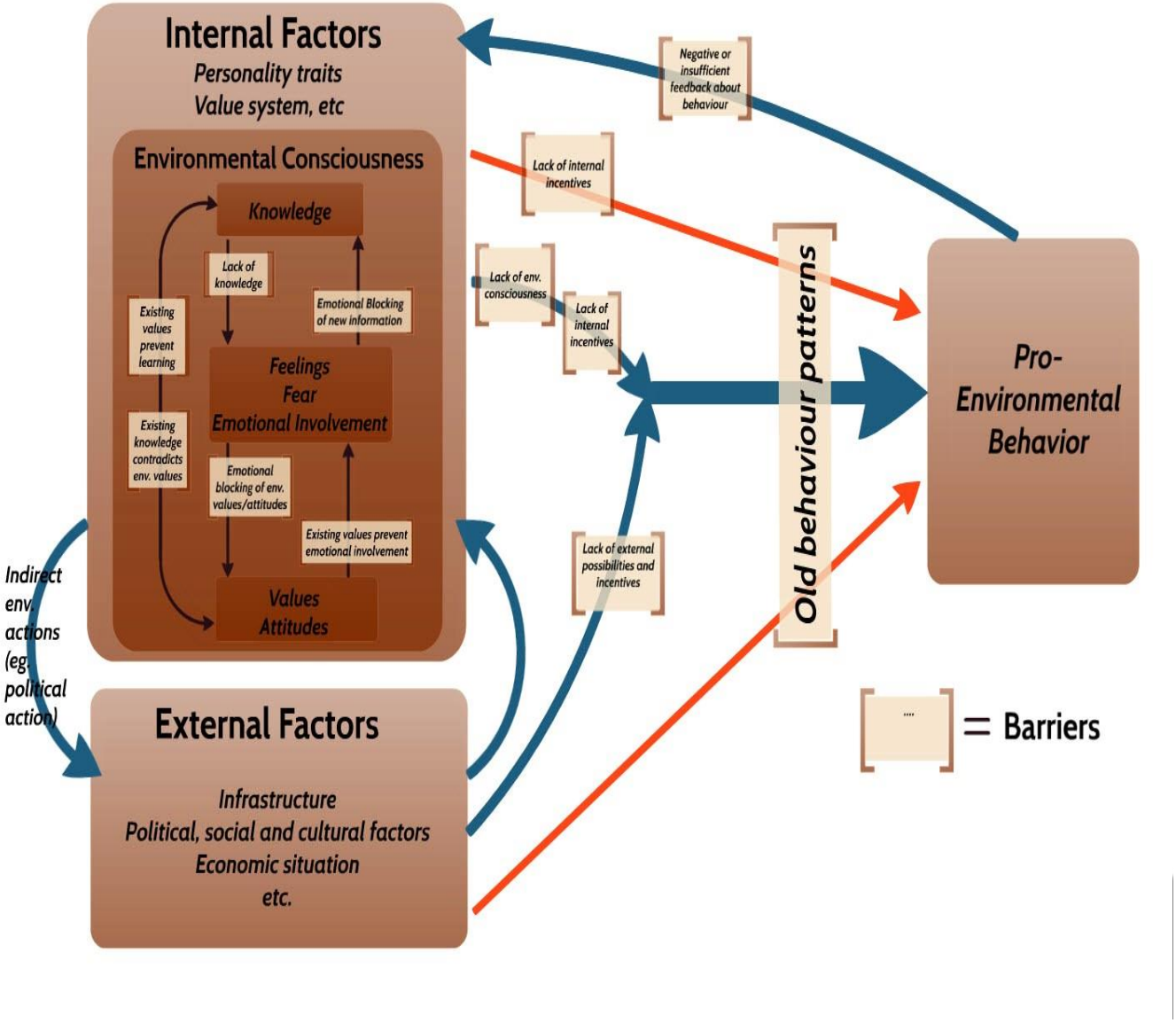



**Figure 20: Kollmuss & Agyeman (2002) Multidimensional Pro-Environmental Behaviour Model (from http://prezi.com/xnjho9ggvvha/kollmuss-agyemans-model-of-pro-environmental-behaviour).**

The arrow signs in figure 20 specify how the un-like elements can influence each other and, eventually, pro-environmental behaviour. The two thinner red arrows from internal and external factors straight to pro-environmental behaviour indicate environmental actions that are taken for other than environmental motives. The main positive impression on pro-environmental behaviour, shown by the larger arrow, is attained when internal and external factors have

synchronized interaction.

The light boxes specify likely barriers to the positive outcome and pro-environmental behaviour. In the model, the leading one is old behaviour patterns as authors considered that that old habit form a very strong barrier that is often overlooked in the literature on pro-environmental behaviour.

## 2.12 4E Model of Behaviour Change

This 4E model in figure 21 reflects that research and activity to influence behaviours should focus on the key change drivers of finance, information, legislation/regulation, education and leadership. One needs to use elements in a joined way to influence behavioural change. For example, communication and engagement need to be part of a joined up approach in which i) the public sector leads by its own actions and delivers the right mix of incentives and regulation; ii) education, training and skills enable people to make sustainable choices; and iii) barriers to sustainable choices should be removed. Though established for pro-environmental behaviours, the 4Es model has been applied more broadly, often being customized, (see e.g. French & Stevens, 2005; Lewis, 2007). Designed in accordance with social marketing principles, the model goes in line with the consumer behaviour, as is apparent in the non- coercive tone of the 'Es themselves: Enable, Encourage, Engage and Exemplify. Each of the 4Es is mapped contrary to intervention types, thus Enable relates to core infrastructure, Encourage to economic, legislative and regulatory measures, Engage to communications, and Exemplify to government signifying that is commitment to the behaviour in question (Defra, 2008).

Together the 4Es form a "package of measures", the question explicitly asked at the centre of the model is the platform "strong enough to catalyse the behaviour change?". The purpose of the behaviour change intervention is thus not presented as forcing the public to comply, but supplying a little extra energy sufficient to kick-start the process of change. However, within this non-coercive package there is still the potential for forcing behaviour change, as Encourage does include regulatory instruments, which could provide compulsory levers. Lewis (2007) proposes that instead of Encourage, it should appears as 'Encourage and Enforce', thus in a way emphasizing government need to compel behaviour change in some circumstances. The 4Es model provides a valuable framework for policy makers developing environmental interventions, thus functioning as a visual checklist to help ensure balanced policies as a result. However, being a tool for policy development rather than a behavioural model, it does not help to predict, how individuals will react in response to the policy that is designed. The 4Es models rely on many

other factors, including societal influences on behaviour and the impact of other government policies. Most obviously, social psychological factors are also omitted in this model; it would be necessary to use the 4Es model alongside relevant behavioural models to determine which policy instruments were most likely to achieve an adequate balance to target the behaviour change.

Defra (2008) proposed a framework for pro-environmental behaviours, in which it is advised that different combination of these variables should be applied to different population sections that vary with respect to environmental awareness and obligation.

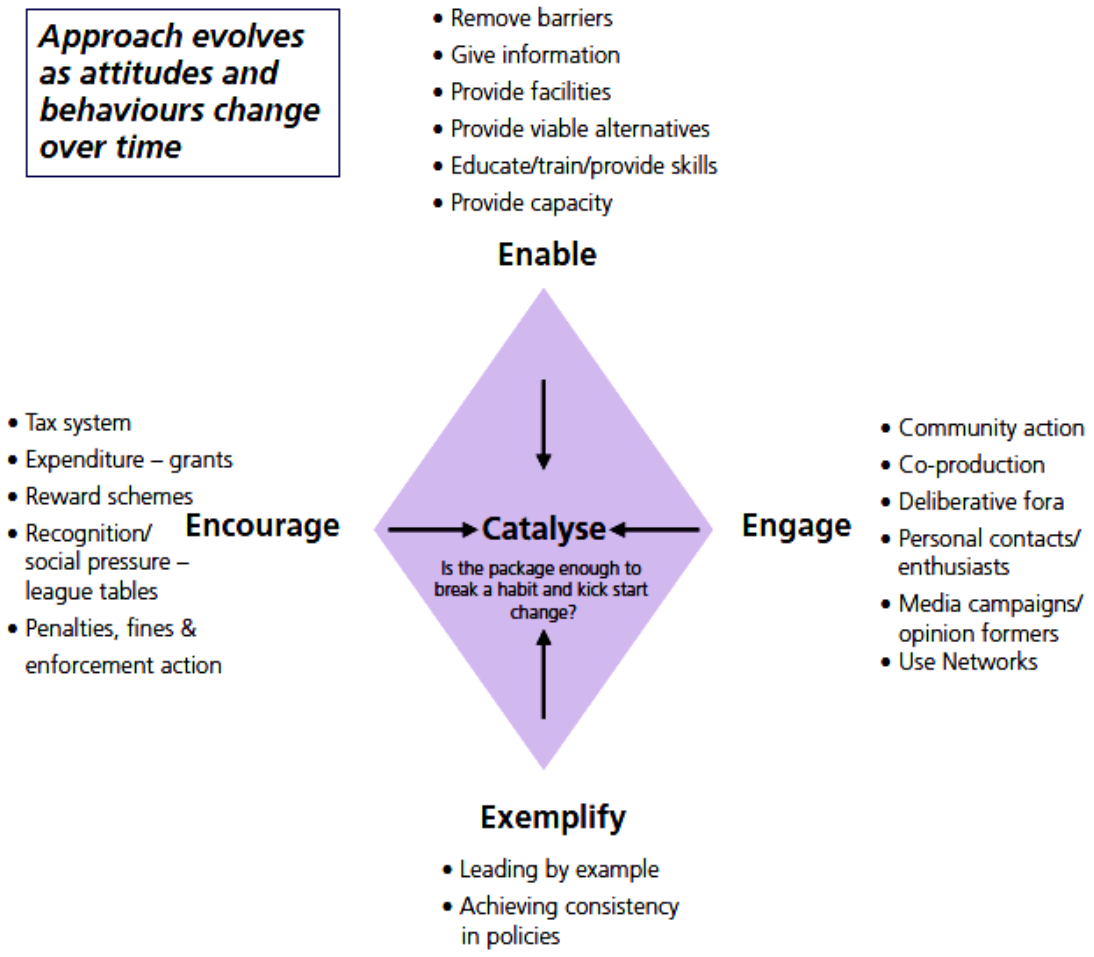



**Figure 21: Changing behaviour through policymaking (Defra, 2005).**

# 2.13 Factors Promoting Pro-Environmental Behaviour

In today's global environmental challenges, environmental psychologists have a vital part in combating the environmental challenges by encouraging behavioural modifications. By definition "Pro-environmental or green behaviour is a kind of conduct that curtails damage to the environment as much as potentially possible, or even benefits to environment". Very simple examples of pro-environmental behaviour are reduction in energy use, and minimizing waste etc. More simply, it has been defined as 'doing good and avoiding bad for environment'. Behavioural interventions are normally more efficient in terms of factual outcome when they are systematically planned, implemented and evaluated (Cushman-Roisin, 2012).

Before applying any environmental intervention technique five vital concerns need to be addressed are:

(1) Carefully recognition of the behaviour in question which needs to be changed, like

o *Pick behaviours that have considerable undesirable environmental impression.*

*o Evaluate the likelihood of behaviour alterations.*

*o Evaluate reference levels of focus behaviour's.*

*o Identity people fraction which needs to be trained.*

(2) Investigation of the key elements fundamental to subject behaviour like some of them listed below

*o Costs and paybacks.*

*o Ethical and normative interest's.*

*o Social Influence.*

*o Background factors.*

*o Habits.*

(3) Use of best available intervention techniques to alter the behaviours and their causes

o *Informational plans (information, encouragement, social boost and role models, public participation and contribution).*

*o Operational strategies (obtainability of products and amenities, legal guidelines, financial plans.*

(4) Programmes intended at altering environmental behaviour should include, among other things, school/college/university curricula that communicate students about the environmental challenges and how to deal with it. Appropriate public communication aimed at influencing

environmental values, boosting public participation in seminars, conferences about environment, etc.

(5) Assessment of intervention outcome on the behaviour in question, its vital elements, effect on the environment, alteration in quality of life (humans, animals, plants).

Pro-environmental behaviour is the mutual responsibility of citizens, community establishments and industrial sector. Strategy that can provide a structure for better harmony of business and people with probable outcomes that prove less harmful to the environment. When we talk about the application of environmental behaviour theories within a strategy framework, it is useful to incorporate them into a more realistic policy frame work. Mostly these environmental policy frameworks have been established on the national level and within specific policy divisions such as transport or energy.

Gifford and Nilsson (2014) propose that awareness of pro-environmental behaviour is more complicated than the simplicity of numerous well-known frameworks proposes. They place the factors which we have impact on pro-environmental behaviour into 17 categories: childhood experience, level of knowledge and education, personality, sense of control, values, political and world views, felt responsibility, place attachment, norms, age, gender, social class, chosen activities, religion, urban-rural differences, closeness to tough environmental sites, and cultural and traditional differences.

## 2.14 Barriers Towards Pro-Environmental Behaviour

Brand (1997) stated that environmentally friendly behaviour can be attributed to a variety of underlying factors: ecological commitment, financial considerations (for example when energy saving clearly shown in bills for utilities), infrastructural contexts (for example good or bad access to public transport), cultural habits (for example thriftiness) or simple poverty (for example people cannot afford a car or long-distance holidays).

Blake (1999) classifies three barriers toward pro-environmental behaviour, i.e. individuality, responsibility, and practicality (see Figure 22). Individual barriers are obstacles lying inside the individual, having to do something with attitude, nature and temperament. Blake claims that these barriers are especially dominant in people that do not have a strong environmental

apprehension. Environmental interest is, therefore, over shadowed by other contrary behaviours (Kollmuss & Agyeman, 2002). As an example, even a strong environmental commitment sometimes can be overcome by stronger requests and needs. We need to travel to long distances to meet our families each year prevails, our feelings of obligation about retaining our air travel to a minimum level to curtail global warming. In spite of environmental awareness people with children prefer to use most of time car as transport instead of public transport. The second set of barriers, which Blake (1999) outlines as responsibility, is very near to the psychologist's perception of 'locus of control'. Individual who does not perform in a pro-environmentally feel that they have no impact on the environmental conditions and consequently not willingness to take an obligation for it. As an example, lack of faith in a particular organization's often prevents individuals from behaving as pro-environmentally—since people are dubious of local and national government, and consequently they are not eager to respect the recommended activities. The third barrier, which Blake defines as practicality, the social and institutional limitations that inhibit people from acting pro-environmentally ir-respective of their opinions or positive intentions. Such constraints could be lack of time, financial constraints, and the absence of relevant information. Blake model of pro-environmental barriers is very beneficial in a sense that it links external and internal variables and defines both. However, Blake did not explain e.g. social variables such as familial stresses and cultural norms neither he investigate in more depth the fundamental psychological factors (e.g. what are the main factors of 'not having time to act pro-environmentally?).

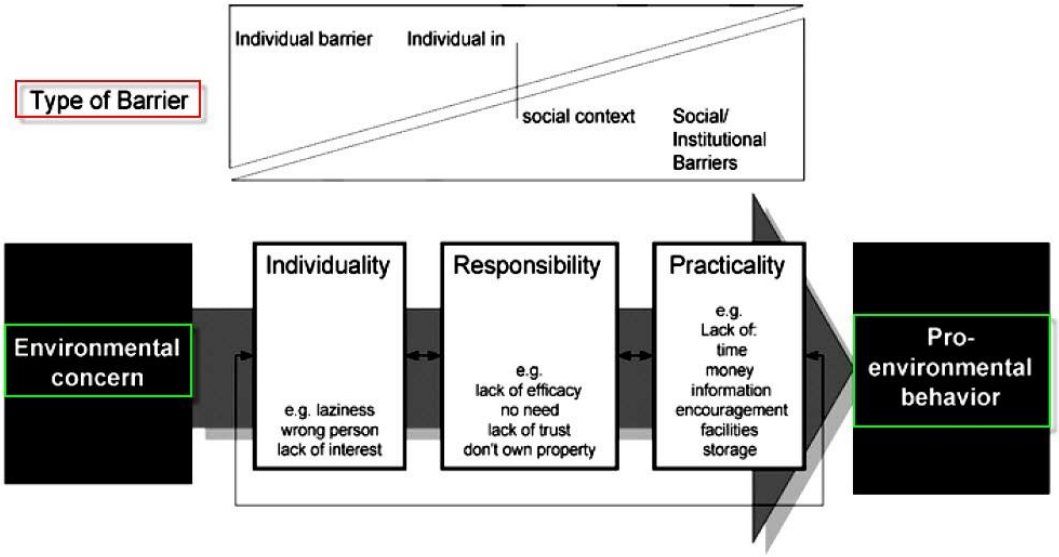



**Figure 22: Barriers between environmental concern and actions (Kollmuss & Agyeman, 2002).**

# Section 3

# Behaviour of Pakistani People Toward Environment and Interventions

In Pakistan understanding of the environmental influences from everyday activities is very low. At the same time, there is negligible concern, at the individual level, of the environmental problems that Pakistan is facing today, and the anticipated challenges that might evolve in the future (Jilani, 2009; Seyal, 1996). Pakistan national environmental policy admits the importance of increase in public awareness about the environmental problem but there is very little action. The human aspect of environmental challenges did not get justified consideration of the environmentalist and social worker in Pakistan in spite of the magnitude of the problem country is facing today. Lately, this has happened to change and studies focusing on green consumerism by Pakistani scholars have begun to appear in international journals in last few years (Rassol, 2013). Subhani, Hasan, Osman, and Rudhani (2012) established that social inspirations, environmental awareness, and by identifying the importance of the issue effect brand selection of consumers. Subhani et.al. also investigated that by environmental awareness and social inspiration females tends to select items that have been marketed as green. Males are influenced by information about the environmental concern of the brand. It is the need of time that investigations on all forms of environmental behaviour and also green consumerism need to grow substantially in Pakistan.

Due to the difference in life style, demographic factors, social norms, cultural and habitual factors it is not possible that one could make direct comparison of these above mentioned factors with the developed countries. The nature of environmental issues is totally at different level and magnitude in Pakistan as compared to developed and environmentally conscious countries like Norway. In this section I will focus and analyse the life style and behaviour of Pakistan people by giving different examples from urban and rural areas, and its effect on environment. How different environmental intervention techniques that probably help to change people behaviour could be applied for the protection of seriously degraded environment in the Pakistan will also discussed in this section.

## 3.1 Population, Environment and Poverty in Pakistan

Population and environment are closely intertwined in a complex and dynamic relationship as shown in figure 23.

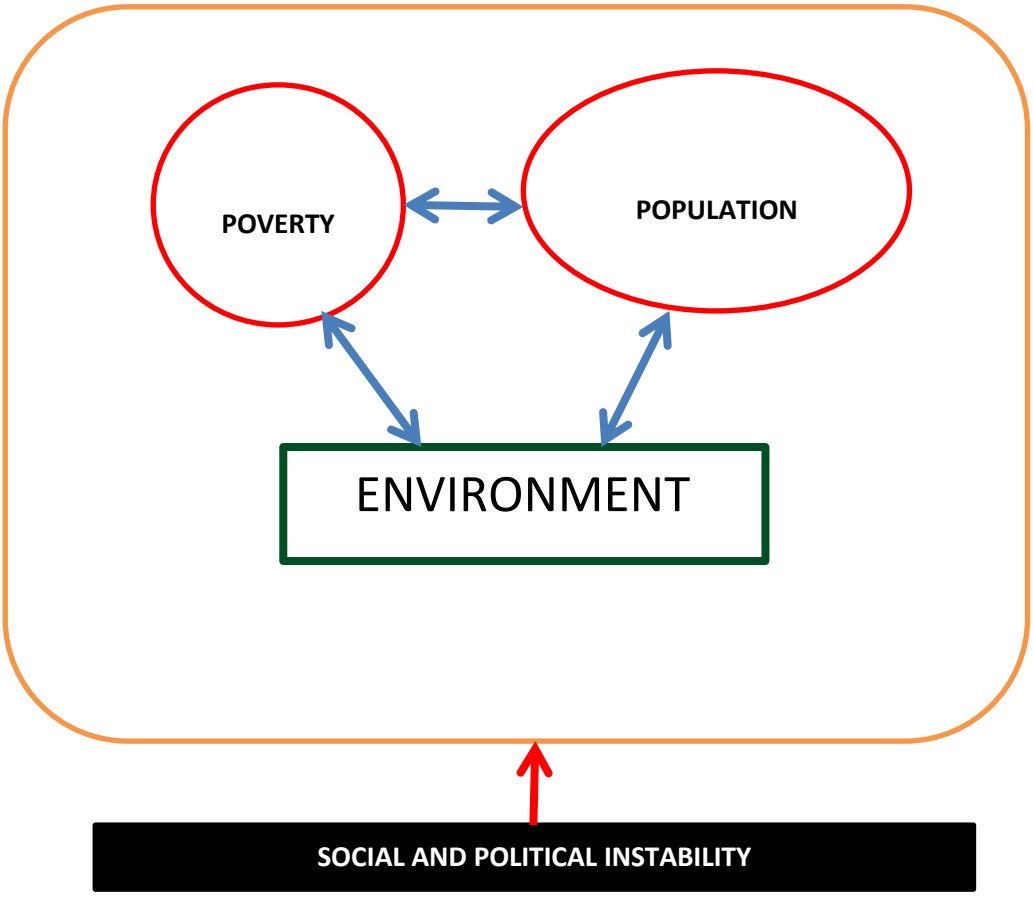



**Figure 23: Population-Poverty-Population Spiral (Khan, Inamullah, & Shams, 2009).**

The positive interpretation of this relationship is that growth in one of the connected segments is likely to make an influence on the others. As an example, efforts to curtail population growth, diminish poverty, to accomplish economic development, to intensify environmental protection, and to decrease un-maintainable consumption of resources are mutually strengthening each other (Khan et al., 2009). Likewise, decline of poverty will add to slow down population growth and attaining population stability. It is natural that sustained economic growth is vital to the reduction in poverty; likewise, rapid population growth is also a hurdle to sustained economic growth.

Population and environment are connected to each other by a number of socio-economic, cultural, political, and developmental factors, and relative significance of these factors varies significantly. In Pakistan solutions of many environmental issues are not available and if available it is not very straight forward due to lack of technical know-how, finances and administrative management on how to deal with the environmental issues.

Pakistan population at the time of its independence in 1947 was 32.5 million, and it is estimated around 207 million now. In three generations, Pakistan's population has increased by 170 million or approximately an average rate of 3 % per annum (Khan et al., 2009). Due to this Pakistan have more people to nourish, more families to shelter, more people to educate, and more individual looking for employment. Lack of education and awareness towards family planning in Pakistan is the main reason for increase in the population. It is very common to have 5-10 children for a married couples living in villages. This situation becomes worst also due to the fact, as Pakistan is male dominant society and people like to have more boys in the family due to financial reason, as they do jobs when grow up. These kinds of norms put tremendous pressure on already diminishing resources in Pakistan.

The distribution of Pakistan population by age is shown in figure 24.

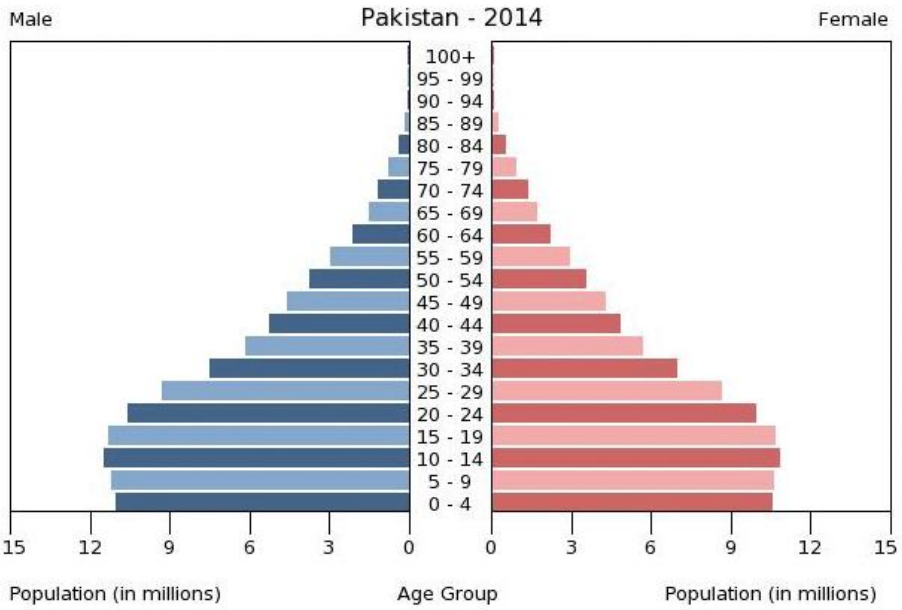



**Figure 24: Pakistani population Pyramid. (http://www.indexmundi.com/pakistan/age_structure.html).**

As shown in figure 25, only 40 million people are classified as those who has assessed to the basic facilities, while rest is categorized are poor. Historically poverty in rural areas is being

higher than the urban cities in Pakistan. In terms of the number of poor, about 130 million out of the total of 170 million people estimated to fall below the poverty line.

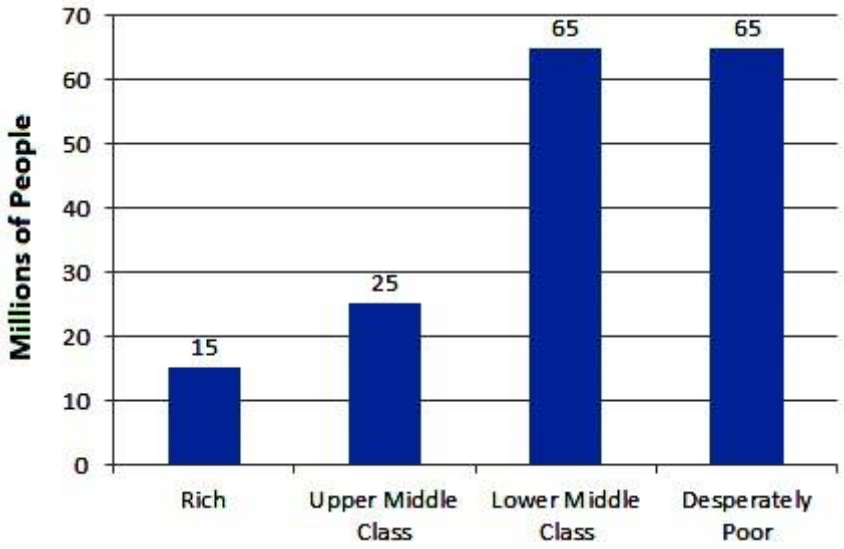



**Figure 25: Division of Pakistan population on basis of income levels (data not beyond 2000). (http://en.wikipedia.org/wiki/Poverty_in_Pakistan).**

The poor masses in Pakistan are also categorized by their susceptibility to environmental degradation. Worsening of the natural resource base has a shocking influence on the poor, given by the fact that they are strongly dependent on the use of such resources for their survival. As population increase and the quantity and quality of natural resources decreases and in this situation powerful element of society modify the circulation of resources in their favour.

## 3.2 Behaviour of the People of Pakistan toward Environmental Challenges

In this section I will discuss some the environmental challenges in Pakistan that could be reduced to a substantial level even if not completely eliminated by just alternation in people behaviour alone. Environmental psychology may contribute to solve some of environmental problems in Pakistan which are integral to this discipline by employing techniques such as surveys, scales and measurements of environmental behaviour and awareness, and intervention techniques for behaviour change. With the help of intervention techniques for behaviour change, environmental problems could be reduced without any expensive technology. Behaviour change programmes for environmental protection are very rare in Pakistan which means that up till now the problem-solving potential of environmental psychology is not yet explored. This section also gives a

reader some idea how much people are unaware regarding environmental issue and its impact on the quality of their life in Pakistan. With respect to prediction of behaviour and behaviour change in Pakistan four topics are important: Waste control behaviour, Air pollution, Water usage, and Use of energy.

## 3.3 Solid Waste Management (SWM)

Solid Waste Management (SWM) has long been a neglected sector due to lack of commitment of governments in Pakistan. Major cities of Pakistan face acute problems in managing solid waste generated in thousands of tons due to rapid growth of population. Resultantly heaps of waste and polluted environment are becoming a permanent features in big cities. Much of this un-collected waste poses a serious risk to health through clogging drains, formation of stagnant ponds and it becomes a source for providing breeding ground for mosquitoes and flies with consequent risk of malaria and cholera (Mahar, 2013). In figure 26 details of solid waste (ton/day) generated in big cities of Pakistan are given. Around 50 % of this waste is landfilled or burned in open grounds often very close to residential areas. There is no trend in Pakistan for composting or recycling of solid waste. Government of Pakistan recently launched two solid waste disposal companies in Lahore and Karachi and their opening flyer are shown in Appendix-1.

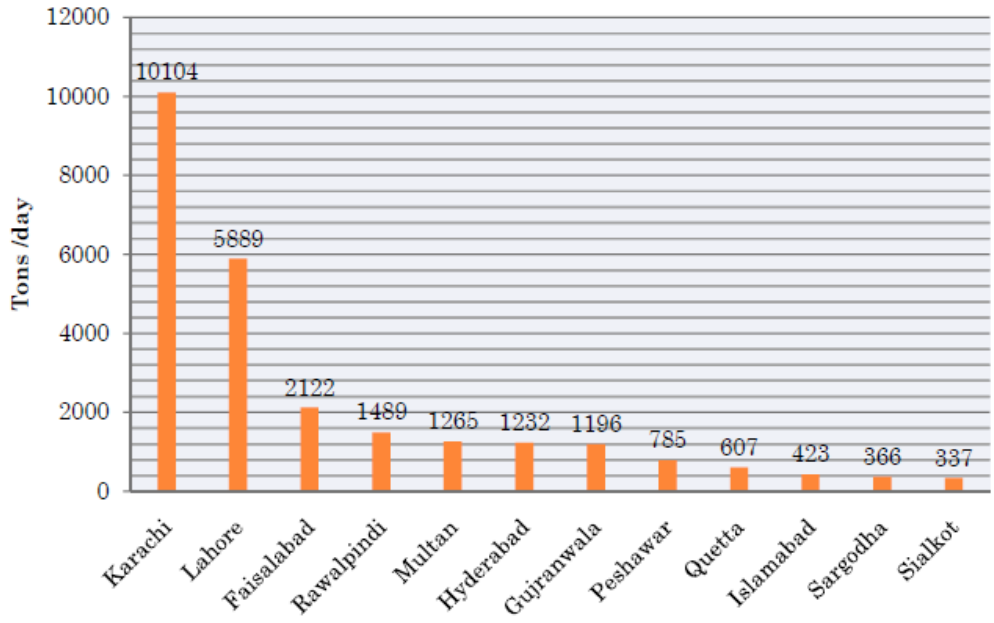



**Figure 26: Waste generated tons per/day in big Pakistani cities (Mahar, 2011).**

How the waste is usually dumped is evident in figure 27. One can see such kind of situations with waste lying all around is very common in big cities of Pakistan.


**Figure 27 (a-d): Normal Waste disposal outside residential areas in big cities (Mahar, 2011).**

People throw their waste in a very un-controlled manner, and there is no awareness among the people to sort and separate the organic waste. The general behaviour of the Pakistani people is that, they keep their household tidy, but they are not concerned about their outside environment (Seyal, 1996). In Pakistan, the cultural is that most people still live in a joint family system and they live with their parents that are being treated as family heads. In such a system, male do not participate in any household activities as they are the main reason of income in the home and also they feel ashamed if they work in the presence of the females. So it is only the females who have to manage all the activities, including preparation of breakfast, leaving the kids to school, making three times meal and in addition they have to clean the home and dispose waste (Arshad, 2008). After doing such an exhausting activities they do not have any energy left to take care of rubbish generated in the home in a proper way. The females also do not go far outsides the home due to the cultural reasons in Pakistan. The only and easy solution is dumping in areas close to home even in presence of garbage bins, and end result is that there is no control of waste and it is being thrown in an un-controlled manner. In few families where the couples lives separately and not jointly with parents and other family members, behaviour of male members is different, and

help each other and there is not so much pressure on the female to do everything alone. So it is kind of social norm, burden and trends/customs that are being set and become like an old habit that only women have to do all home activity without any support from male members.

When it comes to collection of waste, office cleaning, and all types of other dirty jobs are being done by 2 % (about 1.2 million) Christian minority in Pakistan. At least 75 % of the staff in waste management belonged to the Christian faith. Muslims employed as sweepers typically did not work as such but helped instead as family helpers in the houses of senior officers.

In Pakistan garbage men and sewerage workers, perform their duties in an extremely unclean surroundings as it is shown in figure 28. The usually pick the waste, and smut from the ground manually. The extremely unhygienic conditions, caused tuberculosis, hepatitis B, hepatitis C and skin diseases to these workers. In addition, these labour work for 10 to 12 hours a day without having any leave or relief. Only handful of them has permanent jobs even as sweepers; the rest are employed on a contract of 90 days and they are called daily wagers. "The only reward they get in Pakistan is either the Muslims call them 'kafir' (infidel) and burn their homes, or call us a 'chuhra' (dirty) when they clean their rubbish. The word "chuhra" is the most offensive one used for the sweepers in Pakistan. The term "bhangi" ("sweeper") and "jamadar" are another example of very bad titles given to these workers in Pakistan. Education is the only key to bringing the socio-economic relief in the lives of poor Christian in Pakistan. It is also important that missionary educational institutions should also play its role in bringing this socio-economic change. It is necessary that awareness should be given to Muslim majority in Pakistan to consider Christian cleaning workers as human and help and respect them as these are the people who are doing all kind dirtiest of jobs for them. They should be provided with all kinds of safety items (like gloves, masks, proper equipment for collection of waste), and only this way they do their job more effectively and with some degree of respect.

**Figure 28: Christian sweeper cleaning streets of Karachi in unhygienic conditions (https://www.worldwatchmonitor.org/2013/07/2622104/).**

One of the most serious challenges which Pakistan is facing today is the disposal of electronic waste. In Pakistan people used computers and other electronic apparatus, which are imported from different developed countries. They have short life span and after then it has to be disposed of which is adding in e-waste. Unauthorized recycling of precious metals from e-waste is done by the poor people without any skill under extremely vulnerable conditions.

A Ph.D. student from KTH, Shakila Umair (Umair, 2013) exposed the awful state of the e-waste recycling industry in Pakistan. Her research identified that children are forced to inhale in toxic fumes as people burn computer circuit boards and other waste products nearby and in houses. She quoted that, "They are not aware of the toxins they are inhaling, and most of them are illiterate. They are unable to relate their sickness to the work they do. I spoke to people who said they felt uncomfortable physically that they had troubled breathing. But they said they have no choice as there live hood vanishes if they cannot do this work.". Severity of the situation and the way vulnerable people in Pakistan are treating e-waste is depicted in figure 29 and 30.

**Figure 29: A boy burns computer circuit board to recover metal that is used to make soldering wire in Karachi (Umair, 2013).**

**Figure 30: E-waste recycling personnel's burn wires in an open yard in a Pakistani village (Umair, 2013).**

In Pakistan, there exists no policy and regulatory framework to handle this kind of waste. Icing on the cake that there is no technical know-how and understanding to treat the e-waste in the environmental friendly way. There is an urgent need of Policy and regulatory framework on this devastating issue which will become more and more worst in the future.

There is another dilemma in Pakistan that very young and elderly people are least bothered about the state of the environment they are living. According to figure 24, they comprise around 30 % of the Pakistan total population. In last three decades, through increasing use of cable TV and internet, the young generation in Pakistan is addicted to Bollywood (Indian film industry) and

Hollywood movies. These young people copies the film stars and start live in a hypothetical and imaginary world, by assuming themselves as hero or heroines and do not take part in any of activity that could improve the environment.

## Intervention Techniques to Change Behaviour for SWM

In Pakistan compositing and recycling of household waste is unknown and mostly non-existent thing, but people rated this positive when I talk and explain to them. Use of public awareness programmes through media could improve waste control and prompts public commitment.

There are some interventions techniques recommend and if implemented could help in reducing trash generated at homes. I feel embarrassed to see people's homes and shops from the outside in Pakistan. The mind-set is that; they consider the area outside the boundary wall is public property and not private. They do not feel humiliated welcoming customers, and guests into the homes and shops with all the trash placed around the door step.
It just takes ten extra minutes of the day to clean the area in front of the houses, offices and shops. After cleaning the area, accumulate the trash and dispose it correctly by giving it to the trash collector. One should **NOT** put dirty stuff it in front of neighbouring shop or house, or heave it into the nearby playground, park or vacant plot. If every citizen of Pakistan just takes 10 minutes out of their day for proper dispose of household waste, Pakistan will be much cleaner than it is today.

In Europe, it is not uncommon to gather organic trash in separate trash bags, and then use it as compost/fertilizer. In Pakistan, this could be very easily done. If a women put two separate trash boxes under the sink. For the sake of differentiation, use a green box for compost collection, and another trash box to collect everything else. In the green compost box, collect organic trash like vegetable and fruit skins, egg shells, tea and tea bags, coffee grounds, and other waste, leftover food from lunch and dinner plates and non-recyclable papers like used paper tissues, paper kitchen towels and toilet rolls, or torn paper waste. Paper that can be recycled, like old newspapers and books should still be given to the book collector called in local language (Raddiwala). One can also add waste from gardens, like dried leaves and any waste from carpentry, like sawdust. Even the general trash that is collected after cleaning the room, like fallen hair, lint, dust cottontails, etc. can be used in composting. The main things one should **NOT** put in this pile egg yolk, meat and bones, dairy, plastics, glass, oils, grease, pesticides and metals. These materials should be collected in main trash box and given to the trash collector.

This stuff could be composted easily in the garden, just dig a big pit, at least a foot deep. Put in all collected composting material and mix it with soil, to speed decomposition. Try to alternate layers of kitchen/home and garden waste. Then cover with at least eight inches of soil to close the pit. The last step is to stop pets from digging up the organic waste.
In Pakistan, It is shown that the average household could reduce trash by 30 % if they start to compost in this way as suggested above (Naqvi, 2013). If one can reduce the amount of trash that leaves homes, one can reduce the garbage dumps all over the cities in Pakistan. Using compost in gardening will also reduce the volume of water desired to keep lawn and plants healthy.

How can Pakistanis reduce the millions of plastic bags that we see floating around streets and filling up garbage dumps? They can start bringing a cloth bag with us every time they go shopping and refusing the plastic and paper bags that shopkeepers give them. Recently in Pakistan some famous supermarkets have done us a favour by making pay for plastic and paper bags (Naqvi, 2013). This has prompted most consumers to cut down on the paper and plastic bags they use. In Pakistan it is possible to explain the compositing and recycling behaviour by factors in TPB. Inside houses all these solid waste recycling behaviour will occur when people themselves have intention to do so, which is very strongly determined by the perceived behaviour control and to lesser extent by the variables like attitude toward compositing and the subjective norm for compositing. However when it comes outside homes the situation is quite different. People do not throw trash in the waste bins outside homes or in public places rather they like to place beside it. They throw the waste outside in an un-controlled manner from cars and public transport they use. It is not possible to explain such kind of behaviour with theories like NAT, VBN, TRA and TPB. However the more advanced models like CDAM or model proposed by Patchen (2006) which include variables like habits, emotions, and demographic factors could possibly explain such kind of behaviour. These are the old habits which people have developed over the decades and now it is the part of their life in Pakistan. This is quite complex situation as this could not be handled by just by giving people information about awareness of consequences. People know that what they are doing is bad and harmful for the environment but they still do that as it becomes it becomes as their habit by repeating it from generations. It is kind of mind-set which they have developed over a long period of time and it could possibly be solved or reduced if we involve some cultural/religious aspect into it.

Islam is the main religion in Pakistan (98 %) and people have quite strict Islamic view toward Quran and prophet Muhammad (PBUH) teachings. Prophet Muhammad (PBUH) has described the, Cleanliness is Half Religion. Almost every male family member goes to Friday prayers and listen the Islamic speeches in Mosques (Khalid, 2010). If Imams (Preachers like bishops in cathedrals) in mosques preach the people about cleanliness and environment as it is a fundamental concept of Islam, then it will quite helpful in changing the behaviour and mind-set of Pakistani people toward improvement of situation that is described above.

## 3.4 Event of Eid al-Adha and Resulting Waste

Eid al-Adha mean "Festival of the Sacrifice" also named the Feast of the Sacrifice is the second of two spiritual events rejoiced by Muslims worldwide each year. This event is rejoiced to the commitment made by prophet Abraham (Ibrahim) for scarification of his son, prophet Ishmael as an action of obedience to God's domination, before God then intruded to offer Abraham with a lamb to slaughter in its place (Ali, 2014).

The meat from the slaughtered animal is divided into three parts. The family keeps one-third of the portion; seconds third is given to relatives, friends and fellows, and the rest is given to the deprived and poor.

In Pakistan being a Muslim majority country, this event is celebrated with great enthusiasm. Before start of this event animals (varying from cows and goats to camels) were seen almost everywhere in all parts of Pakistan, mostly in empty grounds and people come and buy them (one of such animal market is shown in figure 31).

**Figure 31: Animal market in Pakistan at time of Eid al Adha (Ali, 2014).**

A week before the festival animals tied to the poles almost every step of the citizen's way. Due to this crowd of cattle, there is an un-pleasant odour take over the air. The cities began to look, and smell, like a cattle farm. And just like the cleanliness standards of a farm, there is not enough health procedures being taken to take care of animals and their release. Only in Karachi around one million animals were slaughtered in Karachi on Eid in 2013 (Ali, 2014). Due to the absence of free areas or grounds where animals can be kept safe from robbery, people usually tried to keep these animals as close as possible. That simply means, to keep them in their homes or outside their house streets. Due to this, many people are in direct contact with farm animals' days before the festival, which is un-healthful. People do not have awareness that being in close contact with animals enlarges odds of infecting by the Congo virus, which is extremely deadly. But this is not the end of story where things go bad. Things get from bad to worst once the slaughtering starts in Pakistan during Eid days (Jatoi, 2013). At the time of animal sacrifice there is pools of blood and slaughter waste, and it is awfully terrified (Figure 32).

**Figure 32: Scene in Pakistan at time of animal sacrifice at event of Eid al-Adha (Ali, 2014).**

In Lahore at time of Eid al-Adha in 2012, newly established Lahore Waste Management Company (LWMC) estimated that they collected 28,000 tons of animal waste, at four dumping places, during the three days of Eid al-Adha. Once the animal has been sacrificed, people usually throw away slaughter left-over near their houses or wherever convenient without giving a second thought (as an example sees Figure 33)

**Figure 33: People usually throw away slaughter waste near their homes without thinking about the associated health risks (Ali, 2014).**

Animals such as rats, cats and dogs nourish on this waste and make the disposal site an up-bringing ground for a multitude of illness. Some people usually just through the waste at the closet vacant ground or outside their homes, with hope that someday waste management company will take care of it. Though people know that their no waste management (expect Lahore) is going to take place, and they should need to take care of itself.

In United Arab Emirates (UAE) and other established Muslim states, the slaughtering process is done in a well-maintained and clean environment in the specially designed slaughter houses. People bring their animals (sometimes even that is taken care of) to the slaughter house and get them cut in a hygienic and clean environment. In Pakistan, such a thought is very un-familiar to the people (Ali, 2014).

## Intervention Techniques to Change Behaviour of people on Eid al-Adha

Waste that is being generated at the time of Eid al-Adha is a big environmental issue in Pakistan. People know what they do is wrong and it is not only harmful to environment but has serious implications on health. Still they do it as explained before, that they now develop this kind of practices as their habit. This kind of behaviour is explained by the complex models which have additional factors like Habits, Emotions etc. There are two ways to change this mind-set. First it should be done via religious teachings of Islam as main purpose of this event of Eid al-Adha is help the poor and needy peoples who do not have earnings to buy meat by their own means, and it is not for the making streets and cities a place for diseases to grow after this event. The 2$^{nd}$ way

is that government should take some steps to encourage pro-environmental behaviour as explained by Defra 4Es model. These steps might include fines and penalties to the houses for not deposing the waste in proper way.

These conditions could be improved and get healthier if every individual takes obligation on himself, being a citizen of Pakistan, and accepts to carry out the slaughtering procedure with a cultured and educated approach. People who wanted to do slaughtering of animals at their homes should remove the waste and leftovers in a controlled way. The Pakistani government must also do its share and execute waste management procedures, and people can bag the waste, which can then be gathered by waste wagons from outside of people's homes. Bloody roads, animal skin and undesirable tissues with flies flying around are not only a dirty sight but awfully unhygienic and germ-infested for people health. One simply do not understand why does one want to offer a disease to come intentionally when some simple processes could ensure a happy, clean and hygienic Eid for family to enjoy. Here some of behavioural change interventions are recommended to reduce the trash generated at time of Eid al-Adha.

**At Governmental Level**

It is possible that with media campaigns (aware of consequences) before Eid al-Adha to educate people that with very simple proactive procedures to keep each home clean, and that can add up to a clean street, clean locality, clean city and clean Pakistan. Individual and combined steps should be taken to safeguard the surroundings that are left un-hygienic after slaughtering the animal.

**In Street and Neighbourhood:**

Start having discussion with the neighbours before Eid festival how they could work together to retain the street cleanly. It is possible to generate awareness of public accountabilities and offer applicable plans to the inhabitants to collaborate with each other for keeping their street clean by printed flyers, social media groups or expression of mouth (such as Appendix-2). Emphasis should be done that protection of their environment is not possible without teamwork, and it is not the sole business of an individual.

**In the Home:**

If doing the slaughtering at home, do it inside house boundary walls, not outside gate, to confirm the blood do not spill cross the gate into the street. It is good to slaughter an animal in the lawn if one has that.

# 3.5 Air Pollution issues in Pakistan

In Pakistan major sources of air pollution are motor vehicles, industry, burning of municipal solid and medical waste. Travelling is a need in life whether it is going to job, to meet families/contacts, casual enjoyment or relaxation, this is something which all citizens of Pakistan has a right of doing. Due to situation and state of roads in Pakistan, it is turn to be un-wanted and often designated as a hassle and a symbol of annoyance. In Pakistan, there are traffic jams and traffic does not move quicker than 30 or 40 km/h on Pakistani roads. As shown in figure 34, these scenes are very common and often happen in Pakistani cities during rush hours (Raja, 2012).

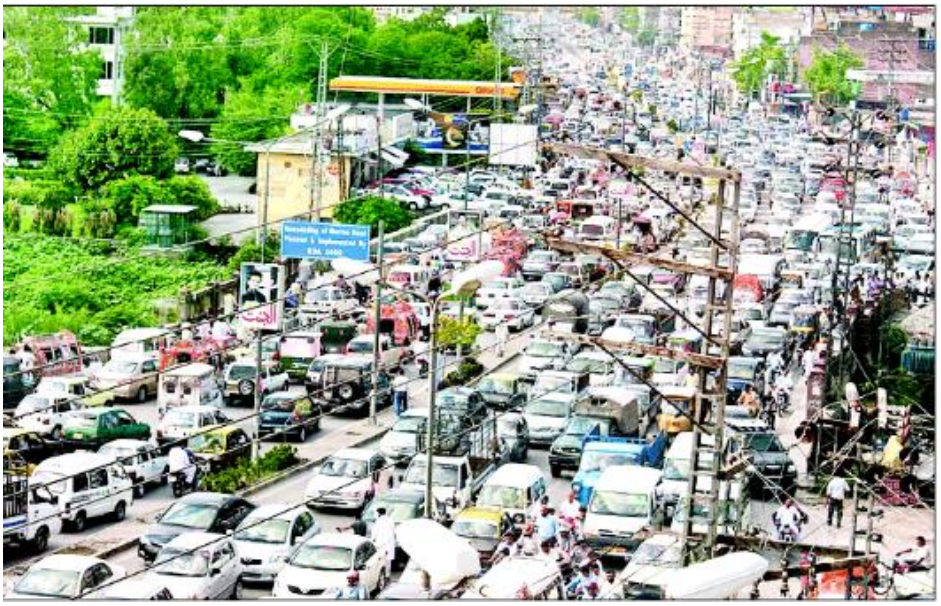


**Figure 34: Traffic jammed scene in Pakistan (Raja, 2012).**

On every road of Pakistan there are motorcyclists, rickshaws (3 wheels vehicles) and car owners breaking the rule of law and going in contradiction to the intended route of traffic to take a short cut to their end point of journey. For sake of saving few rupees of petrol, they jam traffic for the city and increase possibility of accidents as well air pollution.

The irony is that, they do not understand that there is no fuel saving by doing this. In reality, they increased their fuel consumption. Optimal mileage for a car is attained when driving in the range 50 and 80 km/h. By dropping the mean speed of the movement from 50 (km/h) to (30 km/h), people increase fuel usage by 25 %. So to save only a few rupees, people are ready to spend extra thousands every month.

People of Pakistan should be encouraged to left their vehicle at home and walk or use bicycle to cover small distance intervals. Elite and upper middle class people in Pakistan are a very much status conscious and if they have a car they must want to use for the sake of the show off. This mind-set needs to be changed. Secondly all the automotive on the road should be check in terms of their performance before they come into the road although such laws are non-existence in Pakistan. The type of vehicle shown in figure 35 should be banned come to the roads in Pakistan, as they are making environmental situation worst.

**Figure 35: Vehicles emitting heavy smoke (Raja, 2012).**

The capability of a people to move with comfort, predictability and proper speed to a large degree regulate the rate and value of economic progress. In Pakistan lack of flexibility of the people movement enhances to the woes of a poorly-ruled nation. It is the need of the time now to develop efficient public transport systems to help reduce dependence on private cars. There is a dismal state of public transport system in all the cities of Pakistan.

The transporters modify their carriages for setting extra arrays of seats, and thus restricting leg space. A study by The Express Tribune exposed that as many as 21 travellers are being towed into one small wagon that is initially constructed to seat no more than 14 (Raja, 2012). People are being obliged to travel in most weird conditions in public transport system of Pakistan. Typical vehicles used for public transport in most cities of the Pakistan are shown in figure 36. For female passengers, the pain is very severe. In the overloaded vehicle, with fewer space wagons, women travellers are only permitted to be sat next to the driver chair, where at most two ladies can be adjusted. Women are often harassed by the transporters and male commuters in addition to this put limit on travel options for women passengers.
In the absence of a suitable way of public transport, it becomes obligatory for people to obtain

their own vehicles (even on very worst conditions performance wise), which results in increasing traffic jams, air pollution and saddling the fragile road infrastructure in major cities of Pakistan (Raja, 2012). It is necessary that alternative transport system like, trams, metro lines, and big buses should be provided to the citizens of Pakistan.

**Figure 36: Typical vehicles used for public transport in Pakistan (Raja, 2012).**

For the citizens of Lahore, that is 2nd largest city in Pakistan with inhabitants over 10 million, the approach of December means the arrival of the notorious air pollution that covers the city each year in winter (Figure 37). For nearly two to three weeks, the city is suffocated by a thick cloud of haze and air pollution which results in breathing issues, traffic accidents, closes down the airport and cause travelling within the city a dreadful issue (Malik, 2013).

**Figure 37: Air pollution scene in Lahore during month of December (Malik, 2013).**

## Intervention Techniques to Change People Behaviour toward Public Transport

In Pakistan people are concerned about air pollution when I talk to them but had a lack of knowledge about the causes of air pollution and its effects on environment and health and therefore did not intend to engage in actions to reduce it. In general high-income people are more concerned about air pollution than poor and low educated inhabitants.

Keeping in view dismal condition of travel and air pollution in Lahore, the Lahore Metro bus Project in co-operation with Turkish government was initiated, and this is Pakistan first ever modern bus project, and it is being opened for common public in 2013. The unlimited happy and joy among the citizens of Lahore and celebrations can be clearly imagined from the figure 38 below.

**Figure 38: Scenes at inauguration scenes of Lahore Metro bus project (Saeed, 2013).** Lahore Metro bus consists of a 27-kilometres long route (where only these buses can run) includes 65 buses and 29 bus stations between (Figure 39 shows Lahore metro bus system). The route covers lots of residential and commercial areas along the city main artery. This public transport system is appreciated a lot due to its good standard and now even alongside with ordinary people many rich who used to travel by cars also use these metro buses in Lahore (Saeed, 2013).

**Figure 39: View of Lahore Metro bus service (Saeed, 2013). This is a typical model that the leaders should repeat in Rawalpindi and other big cities in Pakistan.**

The factors influencing the acceptability of public transport in Pakistan are improvement in service, office based transport service, economic measures considering lifestyles, travel attitudes. Behavioural theories in Section-2 could be used as a frame of reference in Pakistan for design of the questionnaire in evaluating the perceptions of specific segments of travel market. It is possible to use TPB and NAT with some additional variables for assessment of the behavioural intentions of policy measures. However, application may vary across different segments of travel market e.g. workers, low income, and less educated people. Social status-oriented and auto-oriented factors such as freedom and flexibility in traveling have significant influence on Pakistani people behaviour towards public transport, perceived behavioural control over public transport and social or subjective norms. These factors tend to reduce the usage of public transport in Pakistan. The personal norm, social norm, freedom and flexibility in traveling have the significant effect on people's intentions to protect environment from the negative impact of car use. The Perceived behaviour control and personal norms are significant determinants of behavioural intentions. The Personal norm have positive whereas Perceived behaviour control has a negative influence on behavioural intentions. In socio-economic characteristics, personal income, marital status, and existing travel mode are also significant in determining the behavioural intentions. In Pakistan high income and status-conscious people as well as who have high belief in freedom and flexibility of auto transport may reject the alternatives to car, and accept the double travel cost of car use. It is possible with the development of policy of doubling

the travel cost of car use might help in restricting the private transport and potential car users from owning and using the car. It simply means this kind of policy would assist in keeping the existing public transport users to continue, and to attract the potential users such as upper middle-income people even if it does not have significant impact on travel behaviour of elite and rich car users. With the policy of office based transport for employees has significant potential of reducing use of private vehicle in Pakistan. It is recommended that in order to make effective shift from private vehicle to public transport the service quality of improved public transport should be competent enough to car transport (example of metro buses in Lahore). However, integration among various measures is required for their successful implementation i.e. office transport, and public transport measures should be accompanied by economic measures. People's acceptance of public transport can be improved by highlighting the benefits associated with the implementation of each policy measure through social marketing and awareness programs. Moreover, some intervention and motivational packages need to design in order to activate the different norms, attitudes, self-focus and commitment, and encourage people (e.g. free or reduced travel cards in certain periods like winter) for use of alternative travel options instead of private car (Defras 4Es model).

Start carpooling. It was much more common few years back but appears to have become non-existent now in Pakistan. By carpooling, not only one could cut petrol bills by 50 % or more, but it can help reduce the traffic, pollution and disorder on the roads in Pakistan.

With the development of internet infrastructure, telecommuting has become a feasible option. As a business of some specific areas like computer programmers, developers, one could think to let staff work from their home for some hours in a week. In this way, one could lower overheads significantly and have more employee contentment. All employees who commute 50 % of the time get the extra four weeks of their life back per year as they avoid the hassle of travelling to work if they use two hours daily for travel.

# 3.6 Water shortage and Behaviour of Pakistani People

Pakistan is a water-stressed country, and it has less than 1000 $m^3$ of water reserves per capita per year. The problem partly is, of course, very high population growth. The other aspect of it is that nearly 80 % of Pakistan renewable water originates through borders mainly comes from India. What Pakistanis should do to ease the water scarcity in cities, and across country? According to UN assessments (UNEP, 2002), an individual needs 50 litters of water every day for cooking, drinking and own hygiene. In Germany, each person daily uses around of 122 litters of water. Africans on other, however, get no more than 20 litters on average. How much water Pakistanis use? In urban zones, about 200 litters of water are spent by an individual on a daily basis. The question is what Pakistanis are doing with this amount of water?

## Intervention Technique to Change Behaviour Toward Water Shortages

With regard to the water usage in Pakistan one has to consider two aspects of it. In addition to water shortage and bad water supply many people suffer from regular supply breaks. As a consequence poor parts of the cities people are aware that water is scare which might positively influence their behaviour to conserve water and reduce actual water usage. While people living in posh areas of cities with un-limited water supplies have little or no motivation to conserve water. It is interesting to test the personal normative belief of TPB to measure the water conservation behaviour of Pakistani people living in cities.

Some intervention techniques are being discussed for water conservation in Pakistan in following paragraphs.

For people residing in houses, 50 % use of water is for watering the garden and washing the driveway. It is better to use water in lawns in a well-organized and efficient way. People should water gardens early in the morning, between 6 and 9 am. In Pakistan the climate varies very hot too mild throughout the year and watering the garden when it is hot outside will cause more

evaporation, which simply means one will require watering the lawn more often. One could have pistol grip nozzles for watering instead of regular pipes for better direction and control of water. These types of nozzles will allow stop the flow of water when needed to stop watering, and this could reduce wasted water. Plants should be water with a watering can, in place of a pipe, to significantly reduce water usage.

Pakistanis wash drive ways in the house every day and it should be restricted to one time a week, and just sweep it on the rest of days. In fact, it should be a mob just like one mop the rest of the house. This is not necessary that one have to wash it down with a pipe or buckets of water. There is often enough doubt about the quality of water delivered to the households and this situation is worst in rural areas. This kind of bad quality water should be processed one way or other before it could be safely used, e.g. by boiling, chlorination or filtration. Solar water disinfection is proven to good treatment method for drinking water. By simply filling microbiologically contaminated water into a cleaned plastic bottle and placing in sun for six hours, drinking water is produced without spending any extra cost. Information campaigns in form of leaflets (like in Appendix-2) should be quite helpful for increasing the awareness of people about the health issues that they could possibly have from drinking bad quality water.

In Pakistan, water corporations are heavily subsidized by public bodies. That means Pakistanis are paying nothing for the water that is being sent to them. The water services charge people based on the size of the house that they live in. So one could use as much water, but the water bill will stay constant each month. Normally this works out to a price between 0.06-0.09 US$/$m^3$ of water used. Compare this to the worldwide average price of 2 US$/$m^3$ of water, or the European charge of 7-9 US$ /$m^3$ (Rizvi, 2000). No surprise that most of Pakistanis do not bother about limiting water use, when it is almost free for them. It seems that it is vital that Pakistanis should be charged for the water they use according to Defra 4Es model. That is the only way that Pakistani people will take this issue seriously. Otherwise water shortages in Pakistani cities will hold on getting bad to worst with time. As tube well systems in Pakistan grow by over 6 % per year, causes water tables are swiftly dropping into the ground. In Lahore, the water table has declined 60 feet into the ground in last 20 years. For the Government, it is essential that they should to charge tax on every tube well connection, as well as start metering the water usage for monthly bills instead of constant bills.

In Pakistan, 96 % of the water spent in Pakistan is used for agriculture purposes. Authorities need to start pricing the farmers for the amount of water they use. That is the only way that the farmers could be motivated to reduce their water consumption by revamping irrigation systems, using superior fertilizers, and accepting other productivity enhancing procedures. In Europe, farmers use 591 $m^3$ of water per ton for wheat creation and Pakistani farmers use 2548 $m^3$/ton. In some areas in Pakistan, the practice is as high as 5000 $m^3$/ton (Rizvi, 2000). That is unforgivable, particularly in a water shortage country like Pakistan and there is need to fix this through behaviour change (Rizvi, 2000).

## 3.7 Energy Efficiency Behaviour of People of Pakistan

Energy efficiency is a big element of energy conservation worldwide. It permits us to have the same class of facility and comfort level for a less amount of energy as technology advances a lot with time. Conversely, in Pakistan, when people hear the expression "energy conservation", they only think of turn-off the lighting when exiting the room, or stop using their air conditioners. However, the biggest challenges in Pakistan are those people who say, "We do not use excess electricity at all." Pakistani people do not understand this is almost like a crime to excess of energy by using old or ineffective equipment in an energy inefficient way when country is not able to meet the energy demand (Nida, 2014).

Most cities in Pakistan experience breakdowns in energy supply every day lasting for several hours while rural areas of Pakistan do not even have even any power supply systems. There is more focus in Pakistan for improving access to energy rather than reducing energy consumption. Solar energy systems could possibly way for energy access to the rural areas of Pakistan.

It might take years for Pakistani government to build up the electricity capacity according to demand, but people could solve this challenge by cutting demand through energy effectiveness. The main awareness that one should provide to people of Pakistan, is that they do not need electricity or energy. They need the services like lighting, cooling, heating, food, entertainment, flexibility of movement etc. Electricity, gas or petrol is just different forms of energy that delivers power to the instruments to run for particular service. One can get that service in an energy efficient way as well.

In today world energy efficiency permits us to get the same level of service for a lower sum of electricity, gas or petrol due technological innovations. Energy saver bulbs save 80 % electricity compared to old luminous bulbs. An 11 W bulb gives the same amount of light as a 60 W bulb (Nida, 2014). People need to be aware that these energy-efficient bulbs might be costly, but that can benefit in terms of low electricity bills and higher lifetimes than conventional incandescent bulbs.

Likewise, a new energy-efficient fridge can reduce up to 75 % electricity than a 20-year-old fridge of the same trademark for cooling and freezing the same quantity of food. However, all brands are not produced equal. Some companies have used millions of dollars on research and development to manufacture energy efficient products while others do not. A new energy-efficient fridge can use 50 % or even 70 % less electricity than a common type new fridge. Correspondingly, new energy efficient ACs on the market spend 30 % less electricity than other new common AC to provide the same amount air cooling. People should be aware of what they buying and its impact on environment and energy consumption.

## Solar Energy

In Pakistan price of electricity was increased in August 2013 to 0.19 US$/kWh for an electric load up till 5 kW. The high electricity prices make solar electricity an attractive option now for household purposes at least. The prices of solar sections/panels are at an all-time low due to the global surplus. Utility-scale solar power is now very cheap like 1.5 dollars/W to investment cost with free fuel (the sun). This suggests that the solar power can now generate electricity below 0.10 US$/kWh in many places in the world. In comparison to the coal plants that cost approximately the same to install, but also need coal as fuel to run, accompanying many environmental challenges (Asad, 2013).

In offices and homes, small-scale solar power units will cost up to 2 US$/W to install. Nevertheless, the subsequent price of 0.10-0.15 US$/kWh is still notably inexpensive than the price of electricity, business owners are paying now. In addition, solar panels will eliminate the risk of power failures. People can then run their businesses in a well-organized way, instead of formatting their work day on basis of electricity availability. In Pakistan most of the businesses are functioned during daylight, the power made could be used immediately instead of being stored in batteries for later use. The size of batteries can also be considerably reduced, outcome in a lower cost solar solution. The reimbursement timeframe of the solar system will be between 5-10 years depending on savings electricity.

Solar energy can also be used to save on natural gas. Solar boilers are now frequently available and used all over Pakistan. In Pakistan, cooking activities uses only a very small segment of natural gas in the home. Up to 75 % of domestic natural gas use goes heating water for showers, washing utensils, etc. By accepting solar boilers, one can considerably shrink the usage of natural gas for ordinary domestic purposes; facilitate the shortage of gas all over the country. It can also help the environment as burning of natural gas discharges carbon $CO_2$, CO and other carbon compounds which are one of reason for the climate change. Leakage of natural gas can lead drastic outcomes as methane is even more toxic than carbon dioxide.

### Intervention Techniques to Change Behaviour of people Towards Energy

It is very important when talk about changing the behaviour of people toward reduction of energy consumption, that only those segments of societies that have access to these facilities (gas, electricity) should be addressed. The poor rural person in Pakistan who does not have privileges like electricity, gas, cannot be targeted for such campaigns.

For the people who have access to energy (electricity, gas) the main barrier in Pakistan is that people do not have much awareness about energy consumption, and also about alternative sources of energy like solar system etc. It is important to show people how much money actually they could by reducing energy consumption, or by buying products which are energy efficient utilities. Flyers from the campaigns that Pakistan government has started to educate its people towards energy preservation are shown in Appendix-3. The dissipation of information through flyers, media campaigns might be quite useful to changing behaviour of people toward energy consumption.

## 3.8 Major Environmental Issues in Rural Areas

People in remote and poorly accessible rural areas of Pakistan faced sever problems such as, lack of proper sanitation and other basic facilities of life and supplies. Improvement of the living conditions in such kind of areas may decrease the chances of migration of people to mega-cities. I presented here couple of environmental issues of people living in rural areas and how situation could be improved by doing simple things for changing people behaviour.

### 3.8.1 Rural Stoves in Pakistan

Amongst the many technologies presented in the area of effectual domestic heating and cooking means, still stoves are the most standard and prevalent in both urban and rural populations of Pakistan. In Pakistan stoves have a central place in the health, safety and environment, financial and public spheres of life. Simply by refining the performance of traditional wood burning stoves, the volume of toxic fumes generated can be minimized, and a health danger to the rural families in Pakistan is curtailed. Although the most operative way to control indoor air pollution formed by smoke would be to switch to cleaner gaseous and liquid fuels. However, it is more likely that for the masses of poor people in Pakistan, a better-quality biomass-fired cooking stove is the only option for several years to come.

In Pakistan ESCORTS Foundation, has designed and developed the new type of the kitchen stove, which has 50 % less fuel (wood) necessities and results in almost 70 % decrease of smoky releases. In general, open-fire stoves use roughly 10 kg of wood per home and day, which simply means 9.15 tons of wood annually (Energy Globe, 2004). Due to this much requirement for wood as fuel increases. The scale of stealing in Pakistan is 600 trees for every 760 trees rooted per acre every year, results in deforestation and environmental deprivation in Pakistan (Energy Globe, 2004).

The new stove in Pakistan called ‘Nada’ is cost effective and easy to make. It is potentially less of a health threat to women, time effective, initiates less darkening of heating utensils and kitchen walls. The stove uses firewood and cow manure cake for heating. The technology of the stoves looks like the old-styled open stoves used by the women in the rural areas before. Initially some projects failed in rural areas of Pakistan because of the fact they were more technologically advanced, not taking into account the demands and requirements of the local community.

## Intervention Technique to Change People Behaviour

The ESCORT foundation, Nada stove uses the same constituents as the traditional stove and is built for the deprived and needy families, by local women who are skilled as ‘Chulah Mechanics’ (Energy Globe, 2004). The figures (40-43) shown below indicates that how much difference one could create by doing simple things. It first helps the humanity that is in terrible condition for living and secondly improving severely destroying environment. In figure 42 and 43 it is important to note that as custom female do not show their faces to males which are not form their family makes the job for the social worker much harder.

**Figure 40: Traditional way of cooking in rural areas of Pakistan.**

**(From ://www.ashden.org/winners/escortsf)**

**Figure 41: New Nada stove developed by Escort foundation.**

**(From ://www.ashden.org/winners/escortsf)**

**Figure 42: Women busy in training session for construction of the stoves.**

**(From ://www.ashden.org/winners/escortsf)**

**Figure 43: Women express their feeling after having new stove.**

**(From ://www.ashden.org/winners/escortsf)**

The outcome of this project is a major change in the lives, particularly for the women in rural areas. Not only the health risks related with cooking on open fires are minimized (chimney pipe), but two meals can be cooked at same time and retained heated. After having these Nada stoves, women need less time for gathering and saving fuel-wood and cooking food. Therefore, they have more time to support the family in other income making activities. Women skilled as 'Chullah Mechanics' can also earn extra income by making the newly designed stoves. The simplicity of the stoves together with participation of the local public through training assemblies ensued in an approval fraction of over 70 % in the 54 towns where the stove has been introduced

from 1995-2004 (Energy Globe, 2004). Often for the people living in such conditions where survival is much bigger challenge than the comforts of life, environmental issues hold the secondary option. However, the above example also shows that people could except change in a positive way when it is compatible to existing habits and customs and also when implemented in a proper and legitimate way keeping in view local culture.

### 3.8.2 Lack of Sanitation/Toilet Facilities

Pakistan, regardless being a nuclear power, it is still unable to provide basic sanitation to around 50 million of its people. Basic latrine amenities continue limited in rural and un-regulated urban slums. Most poor people are thus required to use wild, river banks or agricultural arenas to defecate. World Health Organization (WHO, 2011) evaluate that the average person can produce up to 1.5 kg of fossil and urine per day. Pakistani residents, who defecate open, produce close to 7,500 tons of waste per day - all out in the open. In Pakistan 97,900 people die annually due to unsafe water quality and inadequate or no sanitation facilities (Swanson, 2012). Pakistan is facing the intimidating issue of providing toilets to millions of people who are doing open defecation today. Stomach and multiplicative health complications have been allied with the fact that women frequently delay doing defecation until dark prevails. They also need to walk long distances to find appropriate places to relax themselves. The need of privacy for women also brings with it the risk of sexual assault that is common in rural areas. In Pakistan access to toilets is necessary for women dignity and safety.

Moreover, open defecation on such a massive level is contaminating, water used for drinking and irrigation reasons and agricultural products consumed by people across the country. Despite commitments to address the situation, successive governments have not taken this problem seriously.

The current state of laziness is obvious from the fact that drinking water source lines and open sewage drains placing side by side remains common, despite the obvious health hazards posed by such blunders. It is the responsibility of the public sector to ensure that proper dirt systems are put in at the community level (Azizullah et al., 2011). Citizens should only be concentrating on capitalizing in hygienic latrines within their homes, which are then related to a larger sewage system.

Earlier struggles by fractions to construct latrines in different rural areas become unsuccessful, mainly because they did not involve native people in the building process, but also because they are unsuccessful to convince people the many health and financial prosperities latrines can bring to their life. As a result, residents could not keep the latrines running or simply did not understand their value. Many of the rural people in Pakistan are ignorant how big a problem it really is - or the health implications associated with it (Swanson, 2012).

But with the piles of filth in grounds and fields, the danger that germs could be carried back into the houses, via shoes, or through other sources, including animals or local springs from which residents drink, and it is possible that germs might find the way into the food.

They leaflets for awareness of people toward defecation provide quite useful information in a simple way and local language, and might be beneficial in changing mind-set. These colourful flyers which explain the problem with open defecation is shown in Appendix-2 ( translated in English). It is necessary to put the signs like shown in figure 44 is quite important as it is not easy to change people behaviours which they are doing repeatedly for years.


**Figure 44: The sign show in local language do not go to the bathroom in the open ( http://caseyconnor.org/pakistan/gallery4.html).**

## Intervention Techniques to Change Behaviour Toward Proper Sanitation

In India now a days the current ruling party, Bharthia Janata Party (BJP) launches a campaign that young women not to get married into families who do not have own toilets. They slogan this campaign as "no toilet, no bride." For the successes for this movement, they also give rewards to

the women (one of them is shown in Figure 45) who left their new houses after wedding because of non-availability of toilets in their homes. As proposed in the model of Patchen (2006), emotions are strongly linked with behaviour, so that kind of campaigns or slogans are quiet positively linked toward the emotions of a targeted individual. So before the marriage girls think that if the man she is going to marry, not able to make a toilet for her comfort, dignity and respect, what she could expect afterwards. Since the culture in India or Pakistan is more or less same, so these types of campaigns could also be very useful in Pakistan toward behavioural change of people toward hygienic sanitation.

Neighbours watch as recently-wed Priyanka Bharti, who left her marital home in protest due to the lack of toilets in the household, return to the residence of her in-laws at Vishnupur village in Maharaj Ganj. Three newly-wed brides who left their marital homes because of sanitation concerns were each rewarded with 200,000 rupees (3,500 USD) and the costruction of new toilets in their in-laws residences for taking a stand on sanitation in rural India.

**Figure 45: Newlywed brie in India, who returns to home after getting toilet facility (Silverstein, 2012).**

In one of the villages in north-western Pakistan a research team from Norway tried to develop a new ecological sanitation system in cooperation with local Muslim community (Nawab, Nyborg, Esser, & Jenssen, 2006). They showed in their results that all respondents were strongly opposed to the standard ecological urine-separating toilets, which they considered backwards and offensive for them. However, an adapted ecological system in which urine and fossils were discharged in wetlands was found to match the local preferences for privacy, dignity and

security. One may conclude that it is very significant to understand and incorporate cultural preferences for the successful design and implementation of environmental interventions that could meet local values of targeted people.

In order to enforce the people no open defecation the empowered communities should form sanitation committees who keep watch and continually discourage people from defecating in the open. The community may reward anyone who identifies an offender or contributes substantially in changing the collective or individual behaviour pattern. The reward could be a small amount of money or offers the reward of a sheep or a goat to the small hamlet of the village that achieves good results. Likewise, offenders should fine or penalized for their offence, as agreed by the local community.

## 3.9 Pakistani Leadership Behaviour toward Environmental Issues

A leader is "a person or individual who impacts a group of people to the realization of a goal". Another angle to explain this definition would be 3P's concept - Person, People and Purpose as shown in figure 46.

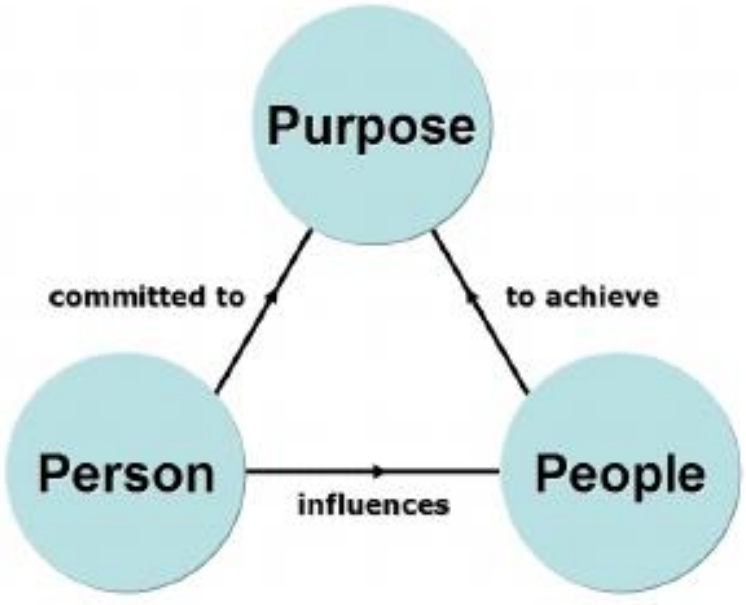



**Figure 46: Person-Leadership Relation Toward a Goal (from http://www.vtaide.com/gleanings/leader).**

In the western societies often leaders lead by example and with their people at times when nation need them or at times when they want to inspire nation by personal behaviour. In the time of any issue like disasters and campaigns they are first to be with their people. In figure 47 Prime Minister of UK, David Cameron is shown visiting the flood affected areas early last year.


**Figure 47: The UK prime minister is visiting flood-hit areas in early 2014 (http://www.bbc.com/news/uk-26131515).**

Normally in third world the leadership do not have any feelings for common people, and they did not want to mix up with ordinary public even in time of big crises or disasters. However, the current democratic elected Prime Minister, Narinder Modi of India started a campaign named **"SWACHH BHARAT ABHIYAN"** (Campaign Clean India) last year and it is getting very successful in India. One of the main reason behind this initiative was that PM himself is from very poor background and started his grown up life as tea seller. This campaign was very well backed by Bollywood actors, players, members of civil society and common public. This campaign becomes like a huge success in India as common people were motivated to take part in environmental movement when they see their leaders and stars doing dirty work (Defra 4E Model). This movement does not cost anything to India but just by changing behaviour through leading by example, results in much cleaner environment in many places. Some of the moments from the clean India campaign are shown in figure 48-50.

**Figure 48: India Prime Minster cleaning road during clean India movement in year 2014 (Mukane, 2014).**

**Figure 49: Salam Khan a big Indian Bollywood star doing work in PM Nirindar Modi Clean India Campaign (adapted from http://www.brandsynario.com/news/salman-khan-takes-up-broom-for-modis-swachh-bharat-clean-india-campaign).**

**Figure 50: Tennis star Sania Mirza collecting garbage in clean India campaign (from http://www.deccanchronicle.com/141016/sports-tennis/article/watch-sania-leaves-racket-aside-picks-broom-swachh-bharat).**

Time is come now that in 21st century Pakistani leadership should change their behaviour toward their people and led them by their personal examples. The cricket players are big stars in Pakistan like football players in the western world, and people follow their action and styles, so they should be involved in environmental campaigns to motivate people toward pro-environmental behaviour. According to Defra 4Es model leaders lead by the example and the people follow their behaviour. If Pakistani leaders and cricket players start such campaigns for environmental protection, it might have a very inspiring effect on motivating people toward pro-environmental behaviour.

# Section 4

# Modern theories on Environmental Behaviour and their Implementation in Pakistan

In current environmental situation in Pakistan, it looks like that all the efforts and struggles put by various departments and associations of the Pakistan Government, and national and foreign organizations and NGO, the national environment drive has failed severely to make the anticipated progress and outcomes towards a "Green Pakistan". At a personal level people think that they can do little to protect environment, so what will effect of that, why should they put effort? In fact, they are likely to add to the environmental problems by having this philosophy that their tiny bit of pollution is just a drop in the bucket. Community response to pollution differs immensely in Pakistan whether live in rural or urban areas. At one hand, there are people in Pakistan, who called themselves as environmentalists or nature-lovers, who criticize everything that causes a drop in the cleanliness of the environment. Nevertheless, there is another extreme, and these are those people who seem least concerned about the state of the environment, pollution and its influences particularly on them and on coming generations. Most of the people in Pakistan are split along the line between these two extreme ends. However, if we talk to people of Pakistan one could find that in reality, they do not like pollution. Almost everybody would like to see something done about it, but no one likes to take liability and ownership for it (Seyal, 1996).

## 4.1 A Multidimensional Approach to Pakistan Environmental Issues

Human being often reacts to problems and complications with their sentiments rather than with the logic (Seyal, 1996). In general policies recommend to control the environment, should reflect this human characteristic. Standard endorsements call for direct control of pollution by the state. This is only one of the workable ways of reducing pollution problems. Others possibilities include indirect control by state through a system of incentives that encourages pro-environmental behaviour. Examination of the award of private property rights to see if it can

provide the desired limitations on polluting activities.

The current environmental policy of Pakistan (PEPA, 2005), which only addresses the direct and indirect controls must be coupled with other proactive steps like extensive education and awareness program for each and every part of the society including government, business sector, household, students and for a common men (Living in rural and urban parts). Before suggesting any steps and measures to enhance the impact of current national environmental policy, I tried to draw a "Model of Change" based on VBN and Defra's 4E Model, and this offers a framework for Pakistan environmental policy.

## 4.2 Model of Change - The Policy Framework

Model of Change that I propose is based on the integration of Personal, Corporate and National Change. Change is defined as "a continuous living process by which individuals, institutions, businesses and societies strive to search for better ways to be, as they cope with their life and seek to realize their full potential in harmony with their environment" (Seyal, 1996). The model as shown in figure 51, suggests that we are all part of a global human system. Individuals, groups, societies, countries are sub-part of that global human system. The Model suggests, that for any change initiative (either at corporate, community or national level) to be successful, it has to be supported by a change at the smallest human systems (personal level).

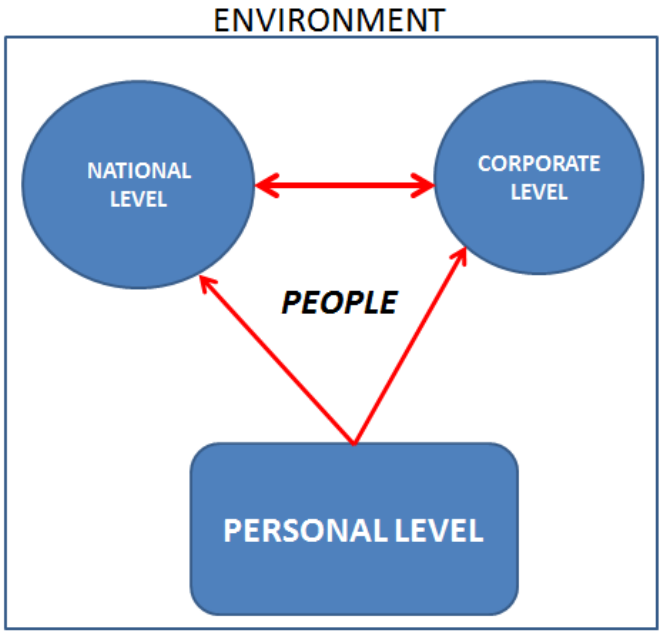



**Figure 51: Proposed Model of Change.**

The Model argues that businesses, households, institutions, communities, societies are all made of people. This resistance is due to the long-held beliefs of people about life and things around them. These beliefs constituted their attitudes, behaviours and ultimately became their habits. The choice of rejecting or choosing a particular behaviour is simply a matter of Pain and Pleasure. Environmental excellence in Pakistan should consists of a comprehensive, synergistic approach including environmentally sound policy and legislative framework with integrated control measures at the national and corporate level coupled with sound behavioural change and training measures at the personal level. In the following paragraphs, some of these measures are explored.

## 4.3 Recommended Behavioural and Training Measures at the Personal Level

It is very hard to accomplish success in environmental policy or for that matter in any change initiative unless one changes individual outlook and beliefs about it. Before one can expect Pakistani people to become Environmental friendly and support and contribute in the national environmental program, one must make them aware of the implication of each and every single action they take at the cost of the environment. More than 90 % people living in Pakistan are not even conscious of the consequences of their non-environment friendly behaviour on them as well as the next generations (Seyal, 1996). But on other hand people become very interested once they have been told about the consequences of their actions and also given the relevant What, How, and Why of the environment tailor-made to their real-life situations. The recommendations in the following discussion are based on environmental psychology point of view. It provides a framework to be coupled with the environmental policy measures discussed in the previous paragraphs. A Pakistani environmental policy must provide a clear statement of principles, control measures and must be coupled with a strong behavioural commitment which is not existed today. The current environmental policy of Pakistan is not being reviewed and revised since 2005.

### Social Responsibility

Social obligation is implemented when people express their values in their actions, acting individually or together. It cannot be exercised when people try to enforce their views on others. A socially responsible person questions to non-environment friendly behaviour and products and then decides to act based on developed opinion. One can even put an effort to encourage the

owners of businesses units to change their companies into environmental oriented organizations.

It is up to people to make their choices regarding job and personal life style. Within a business, of course, it not appropriate for employees to challenge business orders, than how it is possible that they can alter the business's objectives. Employees are legally and morally bound to regard their honour and commitments. It is, however, always a personal liability to choose what commitments he or she will agree, what guidelines one will endorse, what ambitions and associations one support. People are responsible for affiliating their activities with their moral principles. An employee who thinks that his employer is acting unlawfully or immorally, and who does not want to share accountability for those wrong acts, should stand to correct it.

The appropriate time to express moral views, however, is usually before making a formal commitment/contract. Changes of organizational character and individual minds may sometimes make later protests essential, however in countries like Pakistan by accepting a job ordinarily means agreeing to do that particular job without too much objections or standing against owner/boss. Probable job chances should, therefore, be scrutinized not only for their pay and benefits, but also for their ethical suitability and environmental concerns. The tactical expression of moral values in person own professional and other choices of life, social obligation can be a substantial force. On the other hand the products that businesses produce, influencing whether they are useful or good value for money. It can affect the conduct of business in producing them, influencing whether procedures are environmentally friendly, and if not refusing to buy it.

## 4.4 Changing People's Beliefs

Individuals value their beliefs that ultimately affect their behaviours which are predictable as shown in behaviour models presented in Section-2. Because these beliefs are learnt, it is possible to unlearn or change these beliefs. Although the change may be easy or painful, as every action individuals take has an associated belief with it. No one can deny the impact of personal actions on the environment. Whatever we are doing to the environment is due to a long-held belief which ultimately become our habit. Quite often, our beliefs are misinterpretations of the past experiences and events and are transferred generations to generations. Because of these long-held beliefs, people might resist new behaviours. This is especially the biggest scenario in Pakistani society today and it is a challenge for people how to get rid of old beliefs. It is not our experience or the happenings of lives, but the value that the individual attach to these happenings shape our lives. Beliefs are the controlling force of people actions and behaviours.

People mind has strong association either Pain or Pleasure to all experiences and actions. The test with all these beliefs is that they have become restrictions for future decision. One needs to recall that many of our beliefs are simplifications about our past, based on our versions of painful and enjoyable encounters. All personal advances begin with an alteration in beliefs. So how does one can change Pakistani people's beliefs about the environment? The most realistic way is to help people with massive problems due to the past belief and habits about environment. One must tell people that not only have this belief cost them pain in the past, but it costs them is the present and eventually going to bring a massive pain for the future generations. Then one must encourage other people in relating pleasure and comfort to the idea of accepting a new positive belief about the safe and greener Pakistan. One should remember to never forget that everything one do, we do either out of our necessity to avoid pain or our desire to gain pleasure, and if one associate enough pain to any behaviour that he or she want to change, one could change. Needless to say if one want to change the individuals' behaviour towards the environment, we will have to take steps in associating Pain with the current negative belief and the Pleasure with the new belief about the environmental issues and this is hypothesis that could possibly best workable in Pakistani scenario.

## 4.5 Addressing Human Needs

We certainly admit that inability to specify the relative importance of needs is a limitation to bring changes in people's behaviour. The success of any environmental program lies on its flexibility to be customized according to the needs of the people, it is meant to target. The most fundamental or proponent needs are physiological needs. This category of needs include the need to stay alive. On a higher level, the physiological needs include the individual's desires for food, sleep, relaxation, etc. In a country like Pakistan, where 80 % population is still fighting to meet their first level physiological needs, it is impossible to expect them to be receptive to other needs like a clean environment. The people's inability to respond positively towards environmental issues demonstrates that the basic reason for this lack of sensitivity is the lack of flexibility of government environmental campaign to take into account the various social classes and their respective needs. The only practical solution for the people striving to meet the first level needs is to find ways and means to educate them by demonstrating that being environment friendly does not cost them anything but in fact save them money to take care about their other needs. For the group, which is striving better Level (that is upper middle class and rich in Pakistan), the environmental policies should address it from the security and safety point of view as Pakistani

society from last four decades are the victim of terrorism from Islamic militants (Vaughn, Carter, Sheikh, & Jensen, 2010). The same way the policy should be flexible to satisfy the desires of all the social levels by integrating the environmental issue with the hierarchy of their needs.

## 4.6 Extensive Awareness, Education and Training for Behaviour Change

As shown in advanced models for behaviour change presented Section-2, like CDAM, and Patchen model, there are ovariables like old habits, emotions which strongly influence the behaviour change, but still awareness of environmental issues is one of the important element for influencing people behaviour. One of the overlooked factor in the environmental policy of Pakistan is Awareness, Education and Training about environmental issues at all levels. From politicians, to government functionaries, from businesses to students, form households to farmers. This is probably the most important, but, unfortunately, the neglected element for successful implementation of Pakistan national environmental program.

Effective awareness, education and training help everyone understand the purpose and benefits of the environmental program and must demonstrate how they can incorporate environmental improvements into their area of responsibility (Hungerford & Volk, 1990; Seyal, 1996).

An effective environmental awareness, education and training program increases awareness of environmental issues in general, encourage commitment to work toward appropriate solutions in workplace, explains the reasons and benefits for implementing pro-environmental behaviours and for taking action, and builds the commitment, self-accountability, enthusiasm and momentum (Knapp, 1998). It is also important that environmental campaign must be tailored according to the needs of people. It should not only provide answers in terms of "Why", "What" and "How" but also create a "Want to do". Following are few of the guidelines that must be incorporated in the National Environmental Campaign of Pakistan for increasing awareness toward clean environment in Pakistan.

1. Appointment of an Environmental Education Advisor as part of National Environmental Campaign.
2. Coordination with other ministries e.g. industries, defence, education, health, etc. for the effective development, design, delivery and evaluation of various educational programs on environmental awareness.

3. Incorporation of environmental education in the core curriculum for students at all levels (primary, secondary, intermediate, bachelors, masters, professional colleges and institutes) with the help of education ministry

4. Development of comprehensive customized awareness, education, and development programs for various sectors of the society in association with the respective bodies, including:

• *corporate bodies and institutions*

• *professional groups*

• *house-wives*

• *farmers association*

• *various trade and business associations*

5. Design and Development of a comprehensive Environmental Campaign on Radio and TV.

6. Organize national and regional seminars and conferences to create awareness.

7. On-going Monitoring and Evaluation to check the effectiveness of these programs and to acquire the feedback to make desired changes.

8. Involvement of various donor agencies and seeking the support of various national and regional NGOs.

9. Research and development of statistics to demonstrate the environmental costs and impact of ours daily decisions including, dietary, construction, use of public utilities, water, natural resources, etc.

## 4.7 Environmental Education at School/College/ University Level

In Pakistan, there is no subject regarding environmental awareness at school/college and even university level.

In a statement given by director of World Wide Fund for Nature-Pakistan (WWF, 2007) said that, "Environmental education should be an integral part of school syllabus in Pakistan. By instilling environmental awareness in young ones, only then you can shape an environmentally considerate population." It is very important that young people in Pakistan should be aware of the topics like Green handling, Reduce, Reuse and Recycle of waste, Green purchases, Benefits of Trees, Green areas, Health, Hygiene and Environment, Disaster Management, Water crisis Management, Un-authorized Hunting and Environment Management Systems etc.(Naqvi, 2014). In private schools some programs and activities has been started now which gives them

awareness about environmental problems, although these schools are only few and out of reach of the common people (see Figure 52 as an example where children showing there 3-D environmental model).

**Figure 52: Students showing there 3-D model about environmental preservation (Naqvi, 2013).**

WHO (2011) data issued in April 2011, expected life in Pakistan is: Man 62, Woman 64 and total life prospect is 63 years that provides Pakistan a World Life Expectancy ranking of 134. On the other hand when persons reach the age of 55 they start thinking that they are very old, and should stop any kind of physical activity. The retirement age in Pakistan is 60 years and after those people normally do not involve in any kind of activity and just do rest. In Pakistani culture parents and elders is the symbol of respect, so nobody could have a much influence of them. They think that soon they will die and why they should bother do much in hard activities when more comfortable in doing nothing (Soni, 2012). This leads to nothing, except that they are prone to many types of diseases. This kind of mind-set in old people is quite strong, and they are part of their old habits which is very difficult to change. However, some psychological effort is necessary to change this kind of behaviour and mind-set, so this group of population should involve in some kind of positive activities. It is in fact not only helpful for that particular individual health, but good for the whole environment.

## 4.8 Scope and Implementation of Environmental Behaviour Research in Pakistan

The investigations on environmental behaviours and actions in Pakistan need to highlight the following key questions.

First it has to observe the nature of the connection between diverse social, psychological and demographic factors with environmental behaviours of people in Pakistan. Although researchers have acknowledged numerous factors that can potentially affect the analysis of social and psychological bases of environmental behaviours (Bamberg & Möser, 2007). Nevertheless, many of these investigations have been carried in Western developed countries. Therefore, environmental behaviour investigations in Pakistan has to reflect the applicability of scales established in Western countries to assess the factors such as environmental values, attitude, world opinions and knowledge in terms of Pakistani context. The scale-like, NEP scales (Dunlap, Van Liere, Mertig, & Jones, 2000), environmental concern scales (Schultz, Gouveia, Cameron, Tankha, Schmuck, & Franek, 2005), and environmental values scale (De Groot & Steg, 2008), are illustrations of few scales developed in Western countries. Since the exploration on environmental behaviour is just evolving in Pakistan, realistic and reasonable evidence backing or negating the consistency and legitimacy of measures needed for appropriate research for behaviour change is lacking. One way to tackle this problem can be to focus on behaviour research. In these investigations, researchers in Pakistan should develop their own scales, to assess behaviour change, cultural and social norms which they might feel are more sensitive with respect to the Pakistani people, and use also available western based methods in the literature (Rasool, 2013). By making comparison of the consistency of the newly developed measure according to segments of Pakistani society and of the measure taken from the literature, the question of relevancy and applicability of research measures used in West for Pakistani context is more likely to be answered.

Future investigation should also consider examining the role of Islam (main religion in Pakistan) in promoting, and motivating friendly environmental attitudes. Fazlun Khalid, a prominent Muslim environmental activist and writer on environmental problems, has tried to use Islamic lessons to inspire pro-environmental attitudes among Muslims in United Kingdom. The

possibility of making people understand the Islamic ethics about environmental sources in order to encourage environmentally friendly activities is mostly un-tested in Pakistan (Khalid, 2010).

In Pakistan there are four provinces, named Punjab, Sindh, KPK, Baluchistan and they are just like states within a state. Although, the national language is Urdu but people speak different languages in all of these provinces. The people living in these four provinces varies a great deal in their cultural and social norms, attitude, temperament, demographics, etc.

I presented a Comprehensive Model which is revised from (Stern, 2000; Klöckner, 2013; and Kollmuss & Agyeman, 2002) and try to present an inclusive view of the factors that play a key role in people's decisions to practice environmental behaviours in Pakistan (Figure 53). By examining both the personal factors, as well as factors beyond individual control gives complete perspective, and thus a more explanation could be obtained on Pakistani people behaviour toward environmental issues they are facing today.

I have separated these factors that influence environmental behaviour into two groupings:

***1*. External variables, which are those factors that on their person can do nothing about**
**2. Individual factors, which cover those things that persons can alter, and are linked only to the individual behaviour**

In the external factors, it is the culture that provides for the setting for the Pakistani society. If we look into the way Pakistani, society is built such as the degree and level of industrialization, level of prosperity, cultural norms, forms of social difference and integration, and political order, influence the ways of life of any individual and ways of experiencing reality of life. These broader conditions lead to diverse external factors at play for people as they experience different policies, political orientations and cultural limitations. The Pakistani society is also very much affected by its level of modernism. This has practical meanings in organizing power structures, and private enterprise in Pakistan. Within the culture, its framework of norms sets up by a system of social standards and expectations. For example in Pakistani society, it was a social and cultural norm that most of a women do not work outside but now women need to come out of home for jobs to overcome financial constraints. These norms did not help to shape the policies, for example, public transport was not designed that female could also sit alongside males. Now public transport for females also be a critical factor as more and more women are going to work.

The broader settings help to shape the infrastructure, which includes many practical things, such as public transport and utility systems, waste collection, recycling, and city layout and planning. Closely related to this is the availability of alternatives, and this relates to the possibilities that are available to change behaviour to act environmentally. For example people cannot give up their car to because there is no car sharing or good public transport system in Pakistan. The same goes to waste thrashing, if there is no company to collect the trash, how people get rid of them; off course they cannot keep all everyday waste into homes.

In investigating the individual factors, there are a wide variety of influences. The theories mentioned in Section-2 have focused on the role that individual attitudes or concern for the environment play in behaviour choices. However having only concern for the environment is not enough to change behaviour in complex society like Pakistan; one must also have awareness of what are the behaviours that cause environmental damage and how they can be changed to limit that damage. In Pakistani society habits especially old habits also put a substantial constraint preventing person from adopting pro-environmental behaviours who even has awareness and concern for the environment, as their established routines are very hard to break. Demographic data such as education, income, and gender have been shown to have varying levels of influence on pro-environmental behaviours. As noted earlier energy consumption is also used as a tool to reflect one's self-identity, thus this is important to include in individual factors affecting pro-environmental behaviour. The final factor in this group comprises the personal resources an individual has, such as time, competing interests, finances, and access to a car. One can expect that the different behaviours will be affected by different combinations of these factors, and this multi-faceted approach will be the most useful in identifying what are the strongest barriers to practice particular pro-environmental behaviour. In figure 53, I have attempted to provide a holistic framework but realized that this is still only an outline of factors that can influence people behaviour in Pakistan.

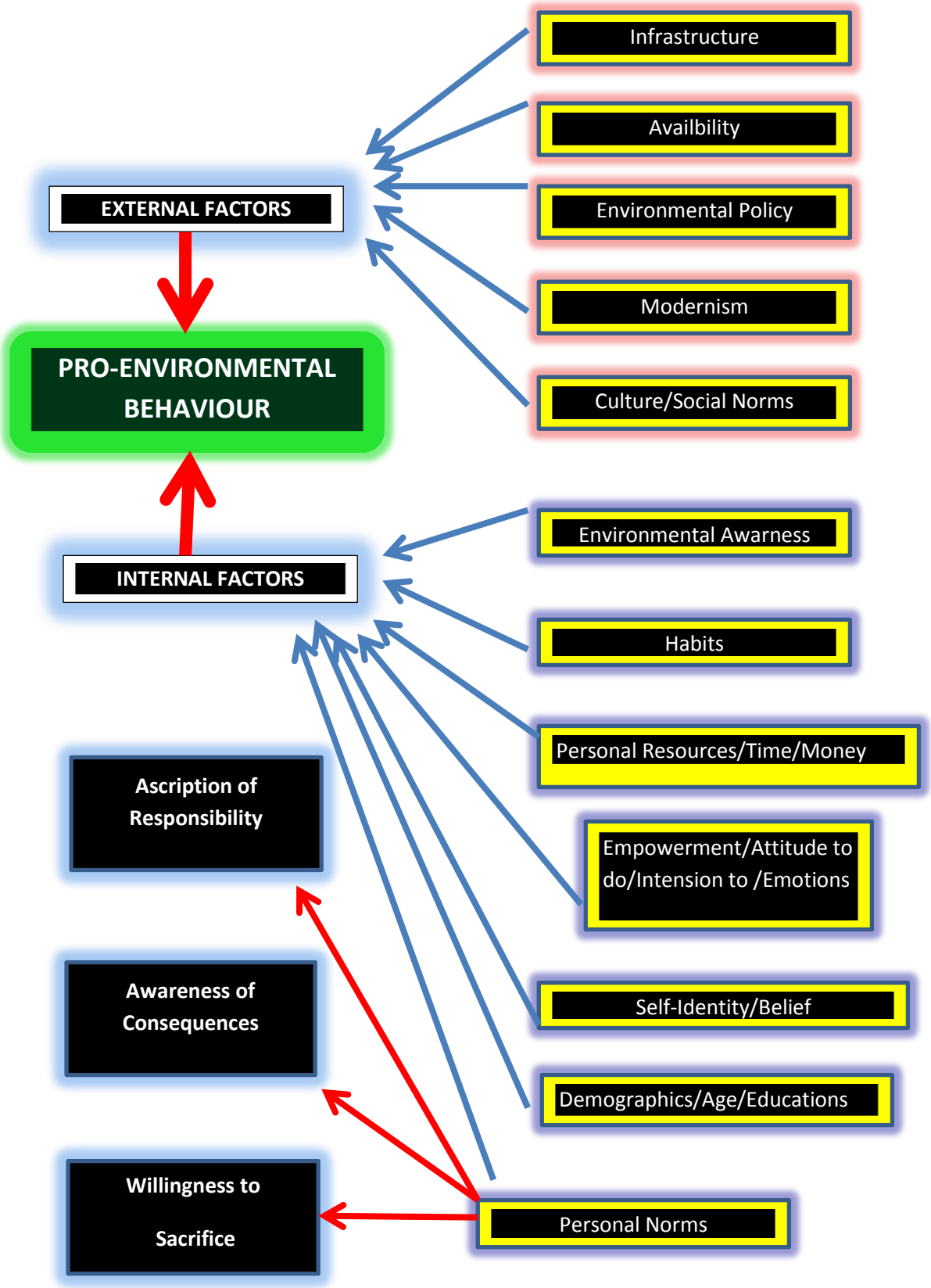



**Figure 53: Comprehensive model revised from (Stern, 2000; Klöckner, 2013; and Kollmuss & Agyeman, 2002).**

In Table 2 few questions that further investigations on environmental behaviour in Pakistan should consider and possible solution, how to response to these questions are proposed. These questions and proposals should not be interpreted as they do not require any changes in the future. As research on environmental behaviour in Pakistan and the resultant literature gives answer to some of these questions in other ways, and new questions may arise. Also, it is recommended that environmentalist should explore answers of the questions in table 2 as per their own choice of research methodology.

## Table 2

## Questions for further environmental behaviour investigations in Pakistan and possible solutions

| Question | Best Possible Solution |
|---|---|
| Do people in Pakistan see a link concerning their everyday behaviour and the environmental issues? | *Focus groups, in-depth interviews, followed by questionnaire based surveys.* |
| Which theoretical model is most suitable to explain environmental behaviours in Pakistan? | *Surveys using scales to measure hypotheses of models developed in west of locally (If any) and assessing their adeptness to forecast environmental behaviours in Pakistan.* |
| How one could develop dependable and effective scales to measure psychological forecasters, such as attitudes and values associated with environmental behaviours? | *Scale development giving due consideration to the local context and using an existing scale in the literature and comparing the reliability of both scales.* |
| What are the main social, psychological, and organizational barriers for people to commence environmentally friendly behaviours? | *Ethnographies focus groups and surveys, although it can be very expensive.* |
| How to design and plan activities and movements to increase positive environmental conducts in Pakistan? | *Persistent supervising the campaign in the evaluate the outcome of campaign, by initial stage so any required changes can be made in time.* |
| How to increase knowledge of Islamic environmental ethics in Pakistani Culture? | *Through Local Mosque Imams, Islamic scholars, media, and schools, colleges and universities.* |
| Practical overview of the relationship between environmental issues and human behaviour in rural and low income areas of Pakistan | *With the existing evidence and field research might give detailed picture of environmental issues and behaviour in rural and low income areas and the links between them.* |
| Lessons for supporting behaviour change in rural and low income areas in Pakistan. | *Identify factors that influence people's environmental behaviour in rural and low-income areas. Suggest potential lessons and starting points for those supporting environmental behaviour change e.g. (Flyers in Appendix-2 )* |

## 4.9 Social Science and National environmental policy of Pakistan

The aim and targets of national environmental policy of Pakistan (PEPA, 2005) are very difficult to be accomplished without the appropriate role of environmental psychologists. The main goal of the national policy is "to protect, conserve and restore Pakistan's environment in order to increase the quality of life of the Pakistani citizens through ecological development."

Objective 1 of the Pakistan national environmental policy (PEPA, 2005) states that "Conservation, restoration and efficient management of environmental resources." Objective 5 of the policy states that "Creation of a demand for environment through mass awareness and community mobilization."

Politicians and policymakers can use economic or social-psychological methods to promote pro-environmental behaviour in people of Pakistan. If people do not follow regulations, the environmental fines could be introduced. Homes, as an example, fine could be charged per kilogram of the waste they generate extra than allowable quota, by local waste collection authorities. Likewise subsidies should be given to people for pro-environmental actions, as an example reduced the bus ticket to half in the winter period (more comfortable season in Pakistan weather wise). In the social and psychological tactics social marketing and advertising (Like shown in Appendix-2 and 3) practices can be used to make people take environmentally friendly activities. Poverty is a foremost important issue of Pakistan, and usually people are not use to pay a lot for services like water and waste management, the social- psychological approach is likely to be more appropriate to convince the people toward pro-environmental behaviour. This situation further offers support to the argument that social scientists have a key vital role to play in discovering answers to Pakistan's environmental challenges by developing policies and methodologies to raise pro-environmental behaviours at the personal, family, institutional, community, national and cooperate level.

# 5. CONCLUSIONS

The pollution problem arises primarily from the use of the environment by manufacturers and customers as a clearance ground for their trashes and contaminants. In Pakistan, people mess the countryside with cans, paper, and the other remains of consumption and production. They dump the emissions and contaminated air from automobiles and factories in air. They throw sewage and residue from production directly and indirectly into streams, rivers, and lakes. They use natural resources to fulfil their needs, which are most of the times un-real.

In the past few years, some organizations and people in Pakistan have taken some good steps to control pollution and enhance the environmental awareness of people issues. Unfortunately with all the positive developments, the effect has not been as it should be at national level. The inability of the current environmental policy framework to take into account the People's social and cultural values, attitude, traditional insensitivity to national issues such as lack of education, lack of personal accountability and people's desires and needs seem to be major barriers toward people's pro-environmental behaviour in Pakistan.

I concluded that, there is a need to incorporate the behavioural science aspects for a long-term success of the national environmental program. These steps are in addition to the control measure required for the degrading environment. An extensive awareness, education and training for each and every segment of the society, in the context of environmental challenges have become the need of the time in Pakistan.

Another objective of this study was to assess the existing level of pro-environmental behaviour and to see whether or not current western theories of environmental behaviour are applicable in Pakistani society. The findings show that the level of environmental behaviour is relatively very low in Pakistan as compared to Western world. The psychological variables that I think to be significant predictors of environmental behaviour in Pakistan are 'Ascription of responsibility', 'Perceived behavioural control', and 'Willingness to sacrifice'. Furthermore, viewing the environment as spiritual but not created by GOD is positively related to environmental behaviour. In Pakistan there is a great lack of infrastructure supporting environmental behaviour (such as public transport, trash collection and recycling facilities). Therefore, the physical barriers to acting more environmentally friendly in many cases might be so large that the

psychological factors play a subordinate role. In Pakistan environmental behaviour is significantly dependent on age, education, social and cultural norms and income level. Other obstacles for acting pro-environmental behaviour were indicated as a lack of facilities, lack of incentive, difficult to change habits, lack of time, and proneness to luxury (for elite class).

From a policy perspective, a number of recommendations can be made from this study. Firstly, there is an immense need to improve the infrastructure that supports environmental behaviour in Pakistan. This includes providing and promoting the use of suitable and sustainable public transport, recycling facilities, energy saving electronic devices and water saving technologies. The findings indicate that providing such kind of infrastructure is one of the most important factors for improving environmental issues and people behaviour (Lahore Metro bus service as an example).

Secondly, there needs to be a deeper change in the attitudes and values of the society. Information campaigns, education programs, media campaigns and good exemplary leadership that aim at changing the behaviour of the population of Pakistan, focusing towards a more 'green' culture would be very beneficial for pro-environmental behaviour.

Environmental programs aimed at promoting environmental behaviour should be targeted towards specific demographic groups. There are a number of reasons for that as different cultural groups in Pakistan might respond differently to these programs. This would require that the content of the programs is tailored in such a way that it reaches to the desired groups. Secondly, various groups from different regions of Pakistan perform differently with regards to environmental behaviour. Possibly more weight should be put on the low performing groups such as young and old people, very low and very high income classes, and people from rural areas in all regions of Pakistan.

At the end I just say that,

***Let's not stop dreaming about "A Green Pakistan". With persistence, a strong commitment and flexibility in our approach, we can make this dream come true.***

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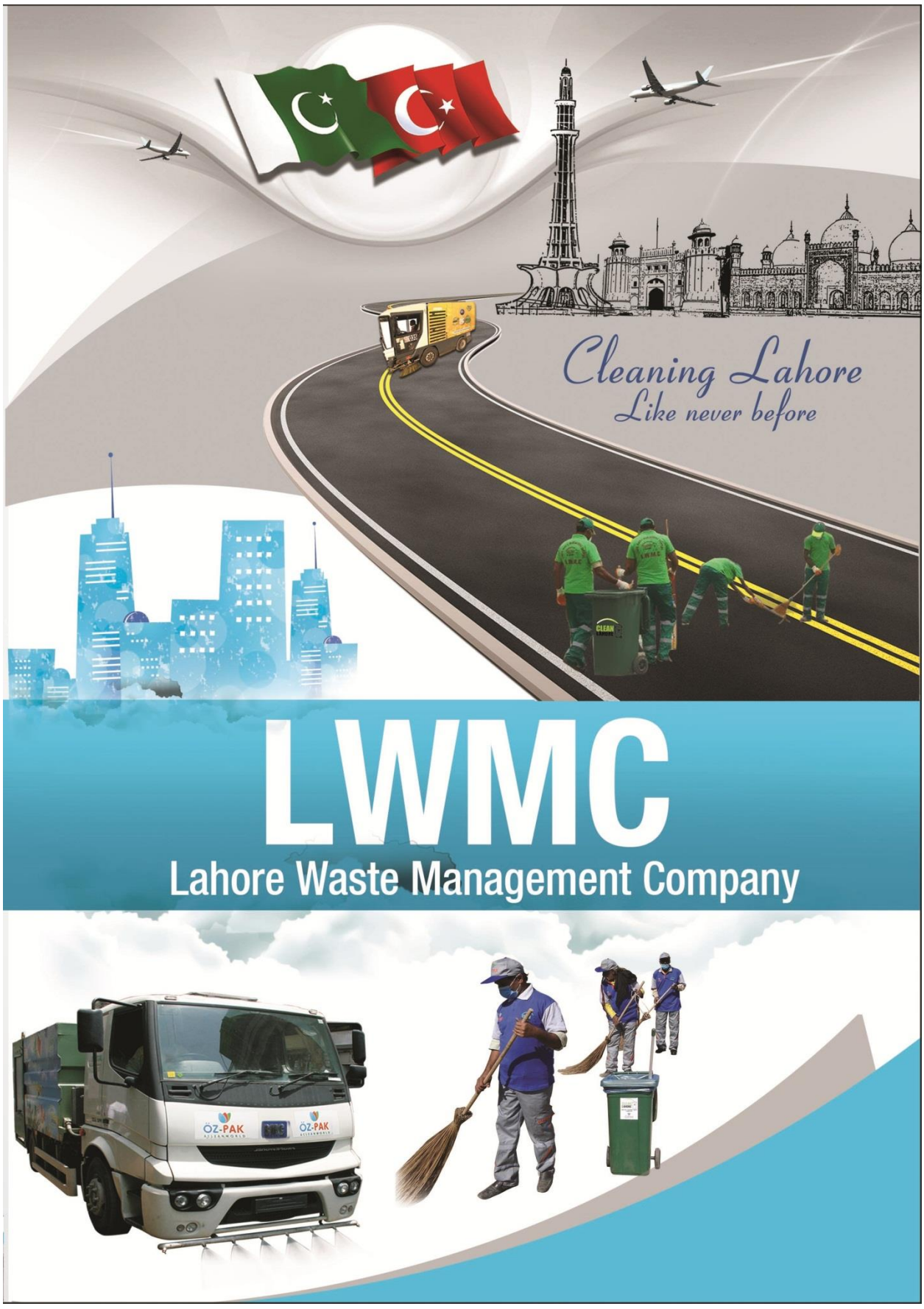
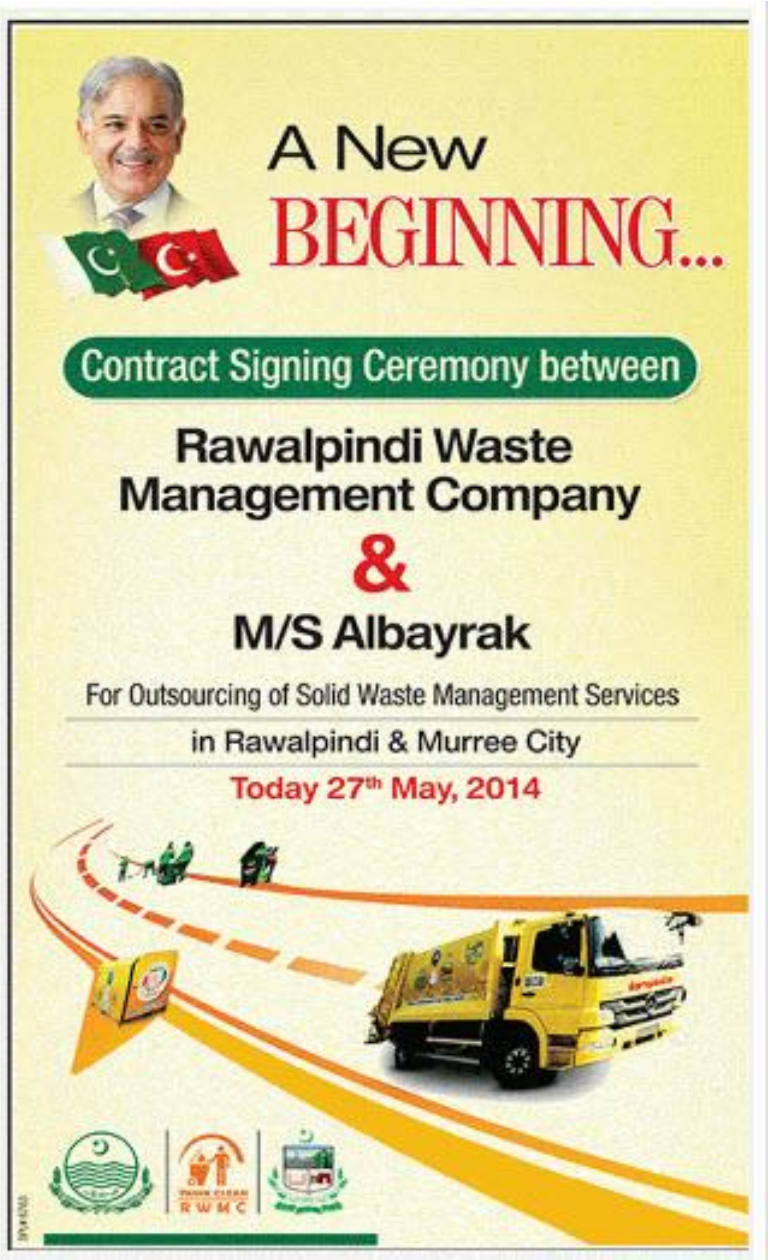
# APPENDIX-1

## FLYER OF LAHORE WASTE MANAGEMENT COMPANY AND LAUNCHING OF WASTE MANAGEMNENT SYSTEM IN RAWALPINDI CITY

PS: These are trial waste management system and established with the help and expertise from Turkish Government.


Cleaning Lahore
Like never before
LWMC
Lahore Waste Management Company
ÖZ-PAK
ÖZ-PAK


A New
BEGINNING...
Contract Signing Ceremony between
Rawalpindi Waste
Management Company
&
M/S Albayrak
For Outsourcing of Solid Waste Management Services
in Rawalpindi & Murree City
Today 27th May, 2014
RWMC

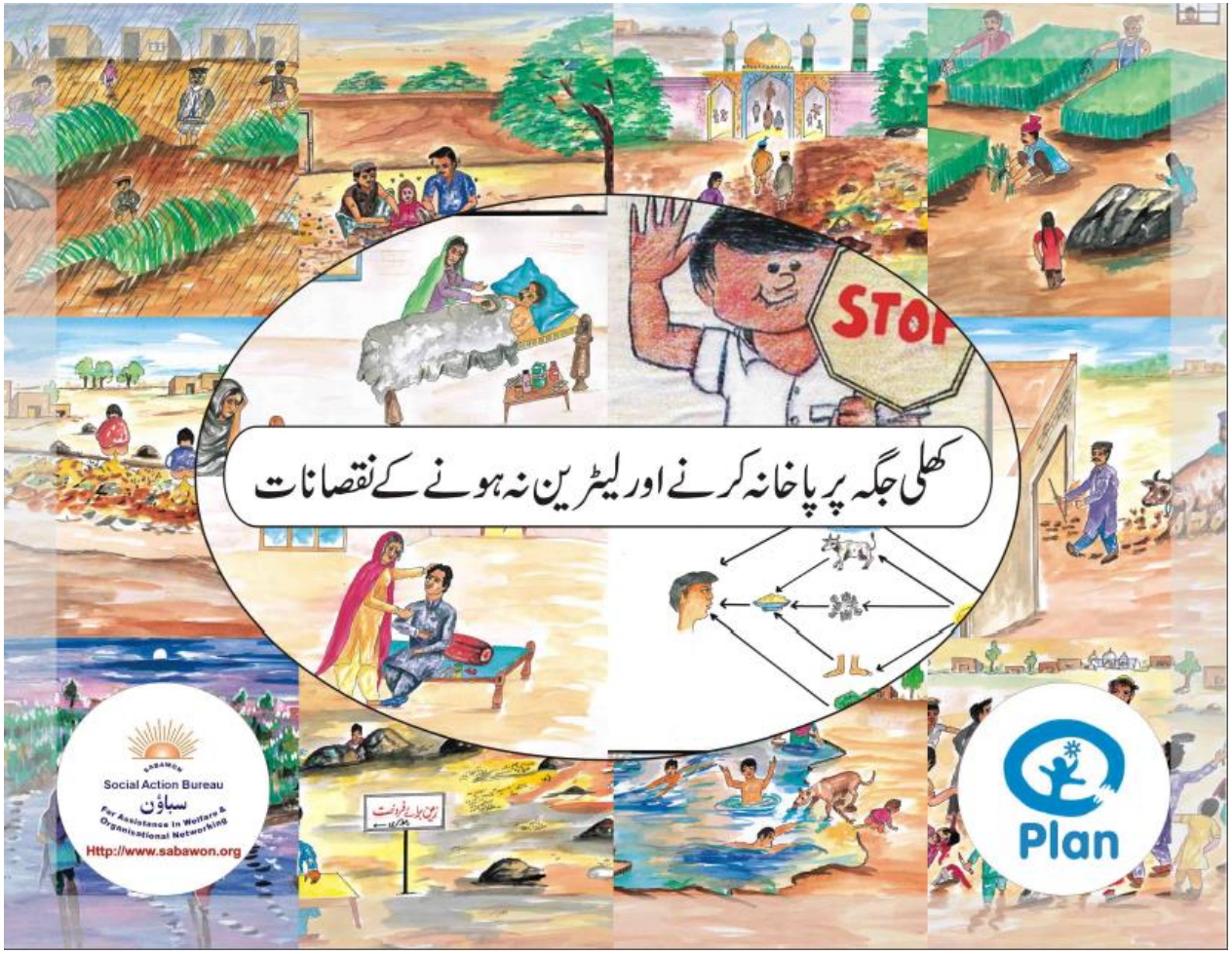
# APPENDIX-2

## BROUCHERS OF CAMPAGINS FOR ENVIRONMENTAL AWRANESS AMONG RURAL POPULATION TO USE TOILET FACILITIES INSTEAD OF OPEN DEFECATE

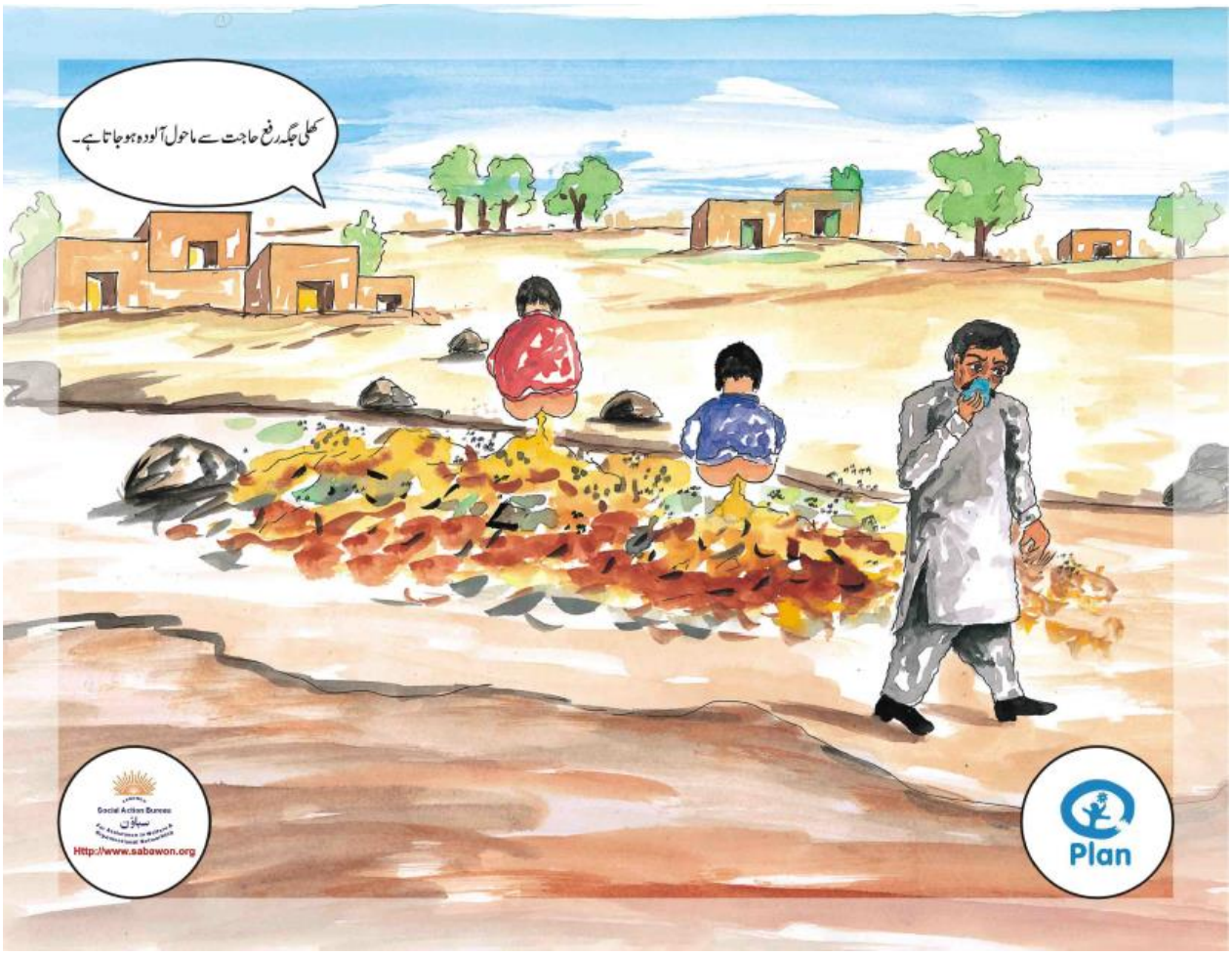
Made by LOCAL NGO (www.sabawon.org)

Note: All these flyers are based on Pakistani context and the text in local language is translated into English

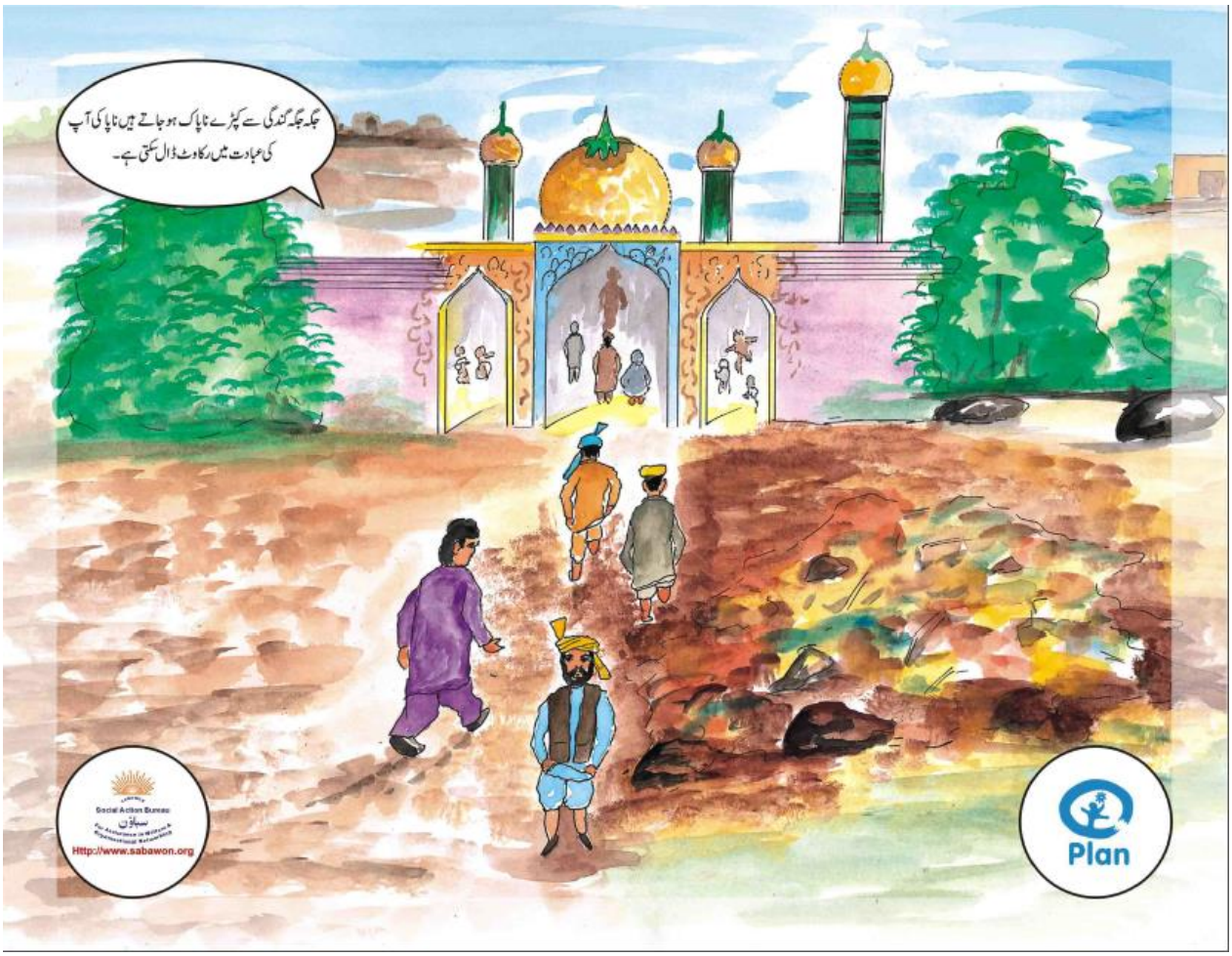
**Disadvantages of doing open defecate without toitlet facilitis**



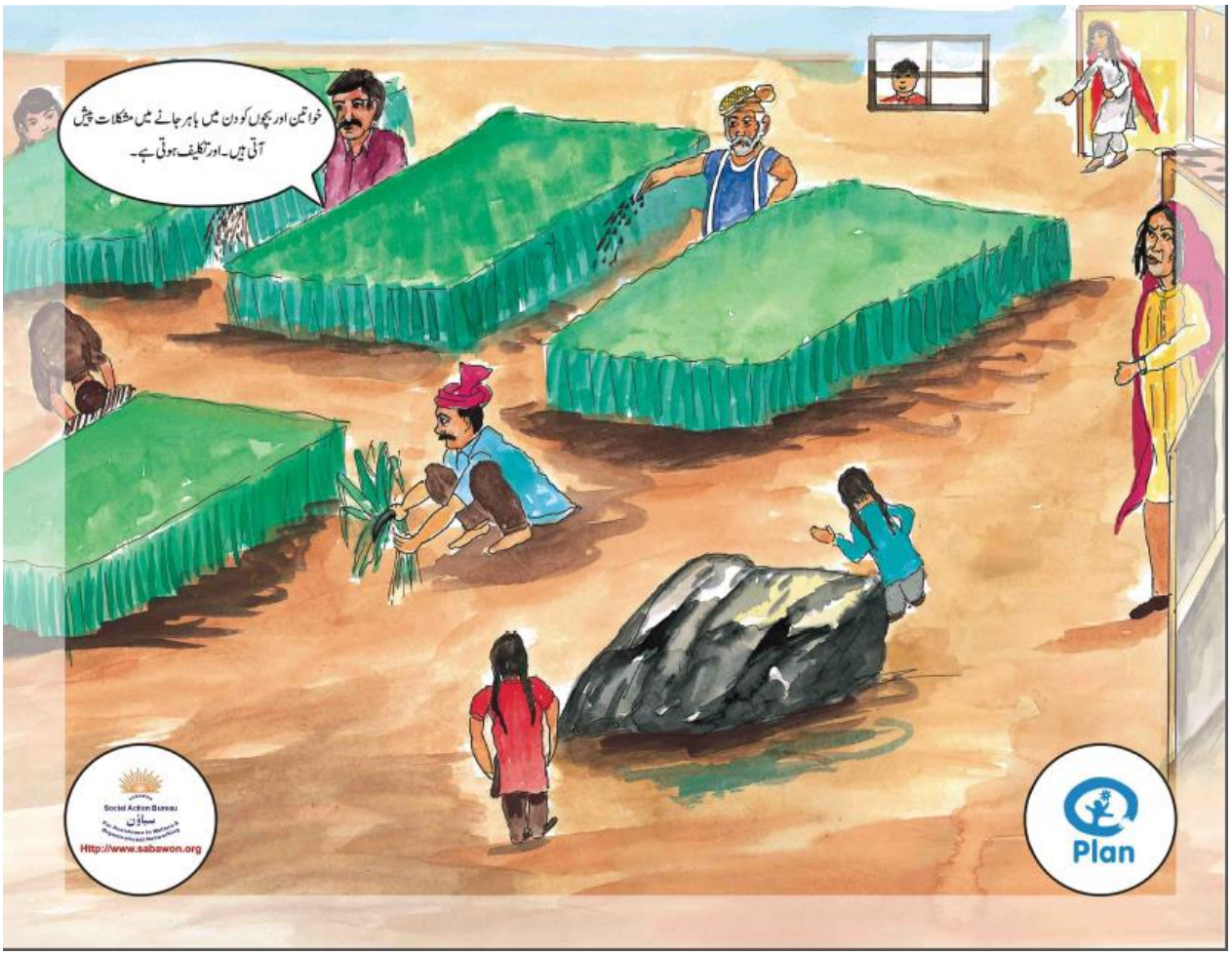
# Atmosphere get pollutted by doing open defecate



**By having Evacuation every where, clothes can get dirty and hinder in performing religious activities**



**It is very difficult for women and female childrens to go outside in day light to defecate**



**Please Stop, It is not allowed to defecate openly!!**

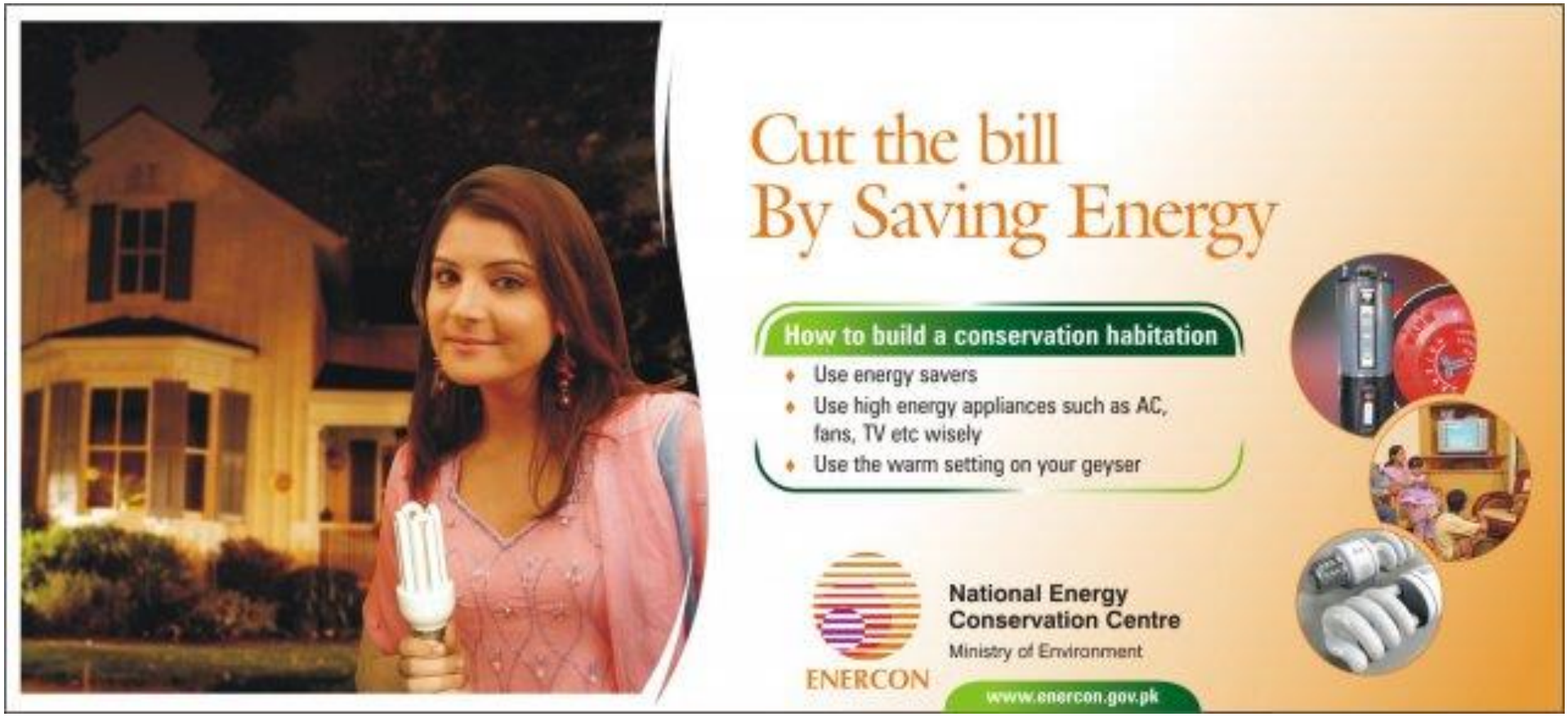
# APPENDIX-3

## BROUCHERS OF CAMPAGINS FOR AWRANESS FOR ENERGY CONVERSATION

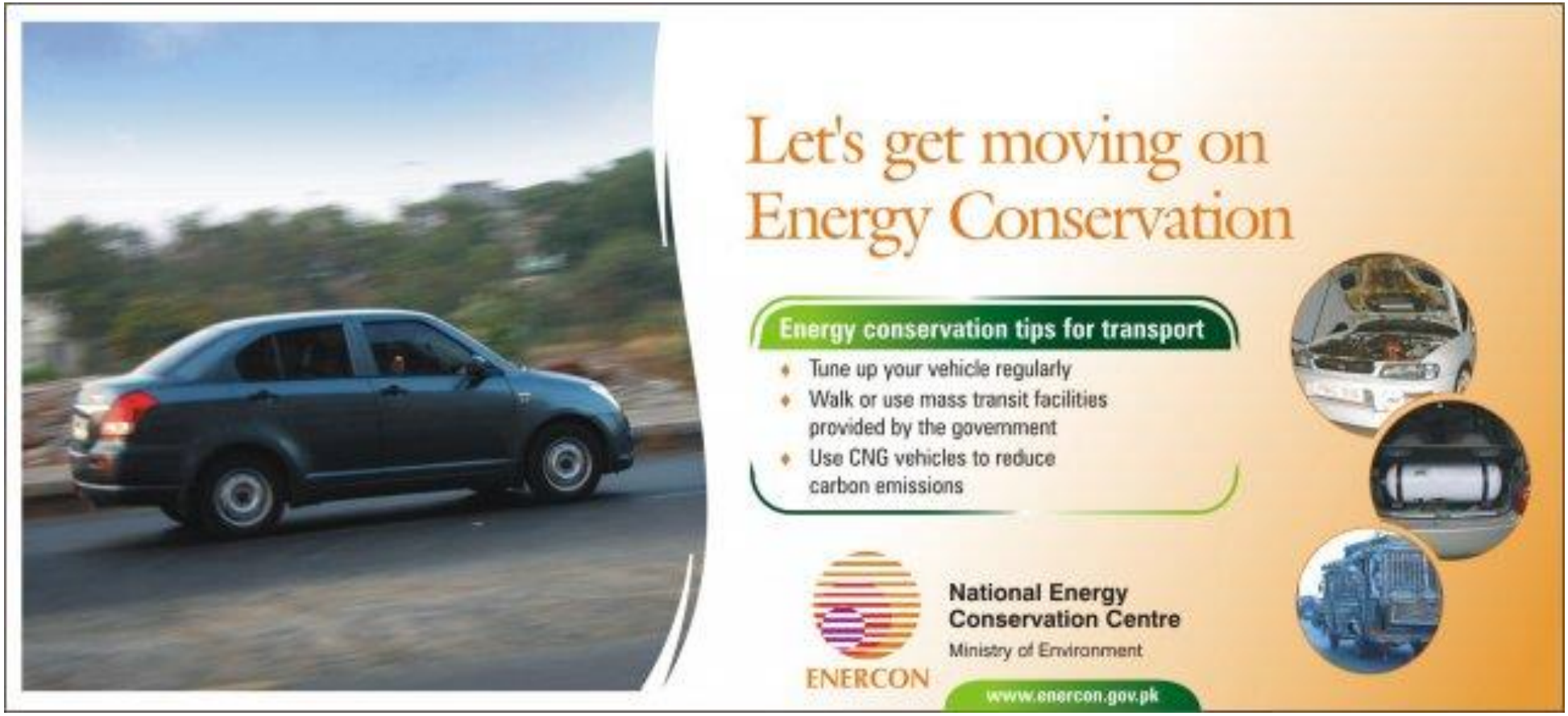
PAKISTAN CENTER FOR ENERGY CONSERVATION (www.enercon.gov.pk)

Note: All these flyers are based on Pakistani context/culture

**HOW PEOPLE COULD SAVE ELECTRICITY**



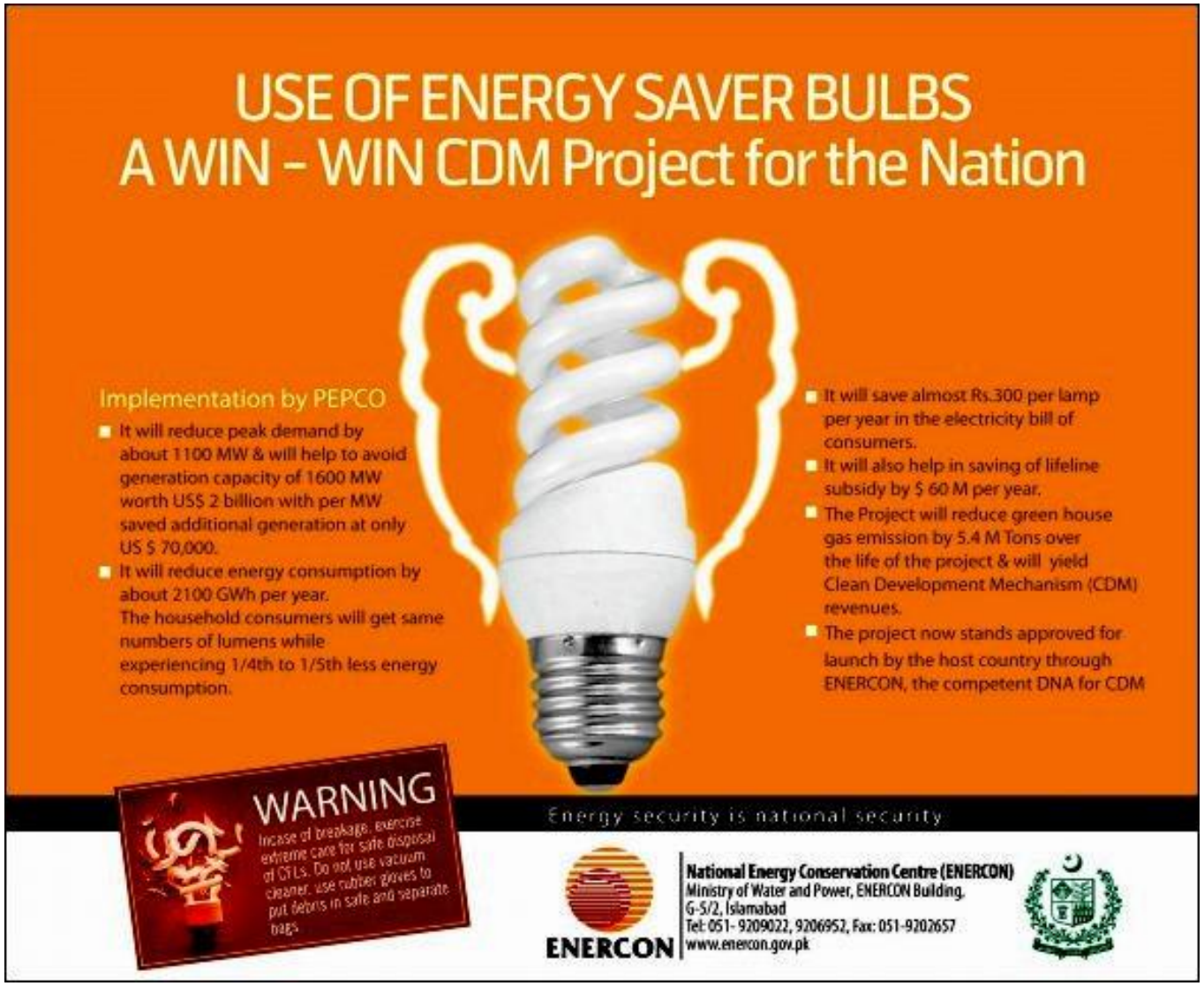
**ENERGY CONSERVATION BY PROPER VEHICLE MAINTENANCE**



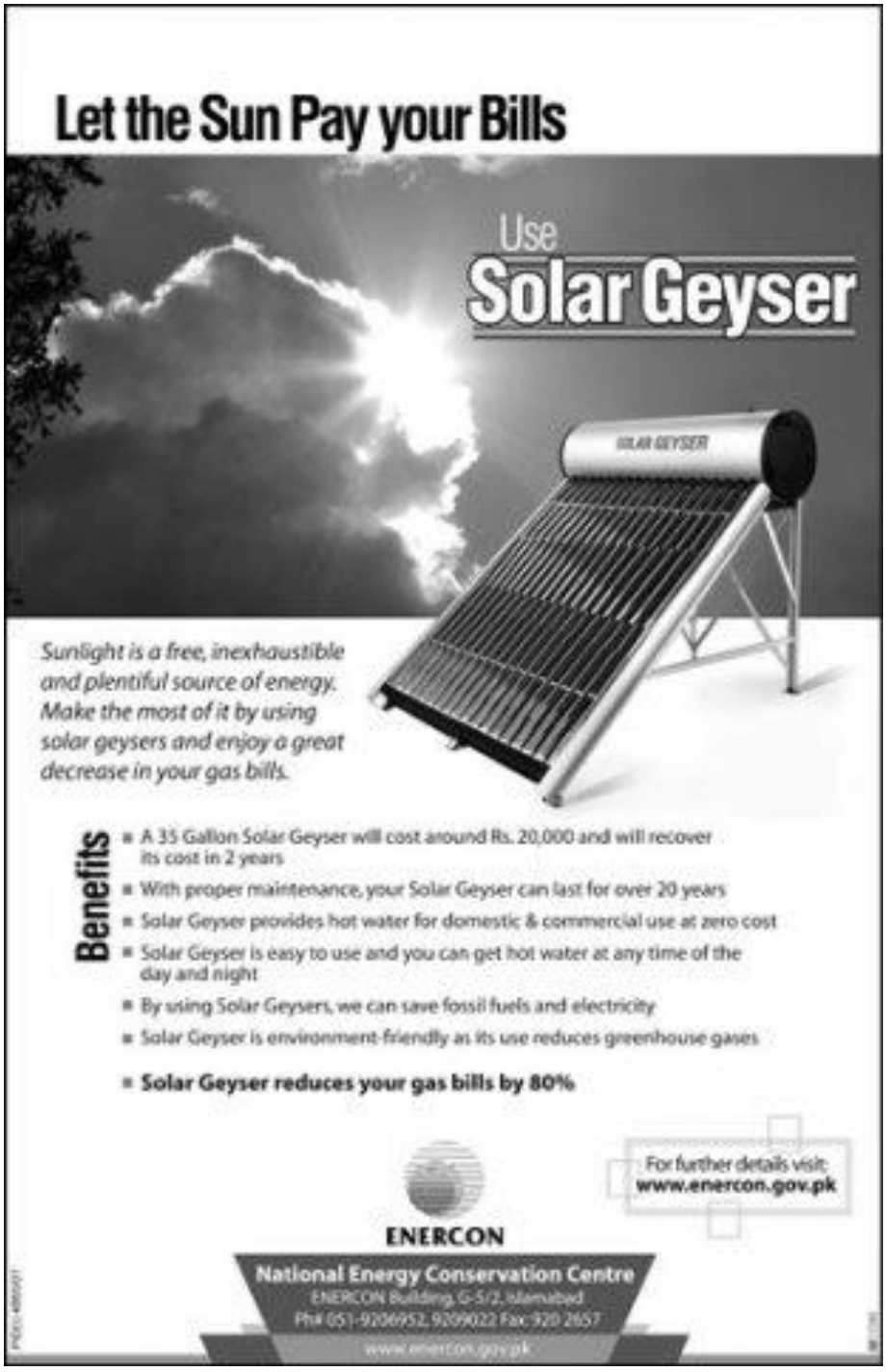
**ENERGY SAVING COMPAIGN FLYER**


They promote, 1) make use of day light 2) use warm clothes instead of heater 3) Use solar water heating systems at homes.

**FLYER TO INSTALL ENERGY SAVER BULBS**



**FLYER FOR SOLAR GEYSER ISTALLATION AT HOMES**



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