

Investment of Kuwait's Natural Resources – An Integrated Management Approach to Kuwait's Environmental Problems

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<p>Abstract: Kuwait, which is a mono product economy, has been on a path of rapid economic growth through production and marketing of oil. Though the standard of living has improved in monetary terms, this growth has resulted in environmental degradation. Earth, Air, Water and Noise pollution as a result of the oil sector expansion without consideration to environmental issues is resulting in Kuwait slipping in the world rankings with respect to environmental indicators denoting the quality of life. This research paper analyzes the various environmental related problems, in particular pollution, affecting the life of the average citizen. The research also aims to find out whether Kuwait, in its pursuit of a luxurious standard of living, has wantonly or otherwise, damaged the environment through improper investment of its natural resources and the attitude of the Managers and key decision makers towards environmental problems.</p>	<p>ملخص: استثمار موارد الكويت الطبيعية اتجاه إدارى وتنموى إلى مشاكل الكويت البيئية إن الكويت، والتي تعتبر أحادية الإنتاج الاقتصادي، تسير بسرعة على طريق النمو الاقتصادي من خلال إنتاج وتسويق النفط. وعلى الرغم من التحسن في مستوى الدخل بالمعايير المالية، إلا أن هذا النمو قد تسبب في إهمال وإهانة البيئة. إن تلوث الأرض، الهواء، الماء والضوضاء والتي سببها التوسع في قطاع النفط بدون اعتبار لقوانين البيئة يتسبب في انخفاض متزلة الكويت وفق المعايير الدولية لقياس صلاحية الحياة. يجلل هذا البحث المشاكل البيئية المتنوعة وبالأخص التلوث، والذي يؤثر على حياة المواطن العادى. كما يهدف البحث إلى اكتشاف ما إذا كانت الكويت تسعى فقط إلى تحقيق مستوى رفاهية مرتفع وإن كان تحقيقه من خلال الاستثمار غير المناسب لمواردها الطبيعية، واتجاه المسؤولين وأصحاب القرار ناحية مشاكل البيئة.</p>
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Introduction

The objective of Economic Development is to increase the Gross Domestic Product and the Per Capita Income of a Country. The development has to be a continuous process and the economy should have sustained growth. National resources are to be utilized synergistically to achieve the Economic Development objectives for society's welfare.

The beginning of the last century, which coincided with the Industrial revolution, saw the predominance of traditional economic theory that emphasised realising maximum profits for the stakeholders. The focus was on continued increase in production to achieve economies of scale. The increase in production was to be achieved through investing all the natural and human resources, irrespective of the negative impact this policy had on the resources. This was exemplified in the maximising of the production from the agricultural land through use of artificial means, crop rotation, irrigation and modern technology. Industrialised nations exploited the raw material reserves in order to enhance their productivity. In the words of the American Economist Milton Friedman, "*The only social responsibility of the establishment is to exploit the economic resources for the sake of increasing profits.*" This supports the traditional theory and is an indicator of the philosophy prevalent at the time. The society may also focus on combating unemployment, equitable distribution of income and achieving equilibrium in the balance of payments. (*Friedman, M 1962*)

The Great Depression and the Second World War led to changes in the thinking. Profit maximization ceased to be the sole aim as policy makers started realizing the impact of the existing policies on Environment, especially air and water pollution. Social problems were also on the rise due to increase in population, urbanization and subsequent pressure on utilities.

It is vivid that there is a correlation between the environment and economic development. It can be safely deduced that

environment has an impact on development. The corollary is also true, that the nature of development will affect the environment. It is hence imperative that there should be effective co-ordination between the two. The environmental implications have to be considered while undertaking planning for development.

Man's activities had limited impact on the environment in the past. Ever growing population and economic activities has put considerable pressure on the natural resources of many countries. Exploitation of natural resources without giving a thought to the long term consequences in order to maximize returns, has led to the contamination and depletion of ecosystem. Most of the technological developments, till late into 20th century, were hostile to the environment resulting in an overall degradation of the environment to the detriment of all. Man's lack of understanding of the environment and his resulting behaviour represents "*comprehensive humanistic suicide*" (Al Karmi 1978).

Technological advancement has led to the degradation of the environment and depletion of resources. The damages are non reclaimable. The developed countries, which saw their environment being altered to the detriment of their society, are now in the process of transferring these technologies to less developed countries indiscriminately, with callous disregard of the consequences. If pollution is the major problem in developed countries, malnutrition, unhygienic conditions, lack of housing and poor civic infrastructure form the core of the problems in the developing countries. The environmental problems hence are universal in nature.

There is a strong felt need to protect the environment. The onus is on the Government, national and international agencies and the individuals. There has to be a cohesive plan aimed at protecting the environment so as to ensure sustainable growth.

The state of Kuwait though blessed with considerable petroleum reserves, faces problems in the areas of water scarcity, population

growth, non availability of arable land apart from air and water pollution. With the natural resources, other than oil, at a premium, the only recourse for the country is to concentrate on developing other areas like industry, transport, communication, social and political. It is regrettable that in the past, the petroleum, industry and infrastructure sectors, the major contributors to the economy, have paid little heed to the issues pertaining to the environment. Though the above sectors have contributed greatly to the development of Kuwait's economy, they have also created numerous environmental problems.

The high temperatures in the summer, humidity, harsh sun, widespread sand storms, scanty rainfall and scarce fresh water resources are factors which are unique to Kuwait. They along with pollution caused by industrial and other activities adversely affect the health of the population of Kuwait, hinder cultivation and food production.

Kuwait, which has a long coastline, always had a vibrant marine life. The focus on developing the industries based on petroleum products, led to the establishment of numerous industrial projects along the coastal areas. The industrial waste pumped to the sea, Oil spillage and leakage while loading oil tankers has polluted the Kuwait sea waters leading to death of marine life.

Kuwait's total dependency on petroleum products and the fact that they contribute to the major portion of the National Income has led to lopsided development. The petroleum resources are being depleted without replacement and this will have long term implications for the society at large. Uncontrolled exploitation of oil reserves constitutes a major environment problem which can put the society itself in peril in the long run.

Research Objective

This research has the following objectives,

1. To find out whether Kuwait, in its pursuit of a luxurious standard of living, has wantonly or otherwise, damaged the environment through improper investment of its natural resources

2. To identify the attitude of the Managers and key decision makers towards environmental problems

Research Methodology

Data collection was done using Primary and Secondary Data.

Secondary data was collected through literature on the topic, articles and governmental records.

Primary Data was collected by administering a detailed questionnaire which was constructed using a 5 point Likert Scale. The questionnaire was administered to 30 experts associated with the field of environment and economic development. The questionnaire was generally designed to probe their views and opinions regarding the issue of environmental management and economy in order to find out an overall environmental framework where the economic and administrative aspects will be taken into account. The data collected was tabulated and factor analysis was applied to arrive at inter relationships. Conclusions were drawn from the findings of both secondary and primary data.

Environment – Basic Concepts

The environment comprises of not only the natural elements such as water, air, soil, minerals and energy resources but also the social resources. The natural environment represents the resources God provided for the man so that he could live on earth, while the social environment is the infrastructure which man has established to subjugate the natural environment to serve him. (*Al Sharnooby 1981*)

The critical feature of the environment is that it is a "System". It is a group of parts, units or operations connected with each other and work together to achieve a common goal. This system, which

is dynamic, is composed of the living or inanimate connected units or mere concrete parts of some dynamic phenomena such as the economic and political systems or groups of living metaphysical units. (*Tawfiq 1990, Al-Qassas 1991*)

Today's man interacts with three environmental systems,

1. Biosphere
2. Techno sphere
3. Social System

The biosphere comprises of the natural environment which man lives in and cultivates to produce his daily food. This system is responsible for the basic resources of social and economic development and has sustainability as long as their constituents are balanced.

The techno sphere represents all the structures which man has made such as building, dams, roads, factories and other constructions. He has done this to get more leverage out of the biosphere and is instrumental in changing the natural food serial. This techno sphere is responsible for the basic operations of modern development.

The Social system can be categorized as political, economic, social and cultural. It controls the other two systems so as to secure the materials needed for development. (*Abdullah 1983*)

The social system subjugates the technology which exploits the natural resources. As such, the social system dominates the other two systems.

The ecological system maintains a dynamic equilibrium, is pluralistic in nature, the various elements co-exist. There is a quid pro quo. Another main feature of the ecosystem is its complexity. This acts as a safety valve and limits the effects caused by the environmental changes that threaten to disrupt the balance of the eco system.

Other feature of the ecosystem, its stability, ensures that the system balances itself when faced with a change. This does not mean that the ecosystems power to regain its stability is infinite. Indiscriminate exploitation of the environment is causing permanent damage to the environment at large and threatens the very equilibrium of the eco system.

Another critical feature of the ecosystem is its ability to recycle its waste. But the ecosystems ability to recycle the man made waste is limited. This leads to accumulation of non recyclable waste which threatens the core of the ecosystem.

It is imperative that we treat environment as a 'resource' which should be used as an 'investment' by the man judiciously to enhance the returns without causing irreversible damages to the system and to get a perpetual return.

Economic Development and the Environment - Relationship

The relationship between economic development and the environment should not be dealt without taking the ecological angle into account. Development can be understood only through the understanding of environmental finance, mainly natural resources such as minerals, oil, agricultural and human. The environment is the backbone of development and they share a dynamic relationship.

A distinction has to be made between economic growth and economic development. Various theories have been floated in this regard. The researcher adopts the stand that growth is the increase in the real GNP that depends on the simultaneous development of the elements of production or technical progress or the accumulation of the capital without changing the productive skeleton. Development, however, is the intended development that takes place as a result of skeletal changes in the society that lead to the increase of the average per capita income in the short run. It is oriented towards developing political and social relationship that guarantee the connection between remuneration, energy and

productivity. Development includes change and evolution. (Jhingan 1978, Paran 1962)

Development can be achieved when there is improvement in the standard of living, enhancement of self esteem and freedom from need, ignorance and political corruption. The above views development from an economic perspective. However the United Nations Environmental Program (UNEP) stresses the conception of environmental development as an alternative strategy for overall development. This will help to preserve the environment and natural resources which are the basis of production. Environmental development is built upon natural wealth, human wealth and financial wealth. Development and environment are intricately linked to one another, and cannot be understood separately. (GFBE 1979)

Sustainable Development

It is argued that focus on environment hinders economic development. The aim is not to halt progress but to harness the resources in such a way that there is *sustainable development* (OUP 1987). Sustainable development can be defined as the development that fulfills the basic needs of both the present and future generations without exhausting the resources.

- This concept argues that both the present and future generations have a right to the natural resources and hence they should be preserved.
- Development should not concentrate on the quantity of the economic growth but rather on the quality as well as on the distribution of return on investment of natural resources
- This also calls for the reconsideration of the patterns of present investment so as to meet stricter environmental conditions.
- Development should also examine the cost and benefit. The social cost of the natural resources, rather than the market cost should be taken into account while evaluating development projects. While assessing the social cost, the outlook has to be as

wide as possible so that even the cost to the future generation should be taken into account.

- Since an individual may not have a social outlook, but rather would like to maximize his returns, the matter of environment development should not be left to him or the free market, but rather the government should play an active part and have a comprehensive plan to ensure that there is Sustainable Development. The natural resources belong to the nation, and as such any investment made using them as capital should be the responsibility of the government.

Secondary Data Analysis

The Contemporary Environment Problems and Their Economic Impact

The last century has seen rapid economic growth at the expense of the environment. Indiscriminate exploitation of natural capital, population explosion and usage of non eco friendly technology has lead to a dramatic deterioration of the environment. (*Sowell 1990*)

The environment problems we face today are accumulated from the previous years. The major problems can be classified as those relating to earth, water, noise and atmosphere contamination. Environment pollution is one of the most critical problems facing the man. Pollution which is the result of the modern technology is placing serious stresses on the environment, breaking vital links in the web of biological and physical processes that sustain the ecological system. Mans biological capital is being systematically destroyed, putting his and his fellow creatures lives in peril. (*Hardinik 1994*)

Some of the major kinds of pollution are

- Earth pollution
- Water contamination
- Air pollution and Noise contamination.

All the above has serious health consequences, the cost of resolving them being high.

Another major hazard is the depletion of natural resources like,

1. The depletion and destruction of the agricultural soil
2. Deforestation
3. Extinction of wild life
4. Depletion of mineral and oil resources (*Al-Najjar 1983*)

Man's scant disregard for the environment and the consequent raise in the pollution level has affected the critical balance of the environment. Globally, the deterioration of the environment has had the following consequences:

1. Desertisation
2. Reduction in forest cover
3. Acid rains
4. Extinction of plants and animals
5. Contamination of water sources
6. Radioactive contamination
7. Ozone hole and the greenhouse effect

Numerous bodies all over the world have independently and collectively tried to generate awareness amongst the world community regarding the need for environmental protection and balanced development

Resources

The resources available for equitable development can be classified as

- Natural resources
- Human resources
- Capital resources

These 3 are interlinked. A nations development is based on how well each of the above 3 resources are employed for enhancing the productivity. Economists consider investment as the most important factor in the process of development. It is discovered that if investment is increased by 1%, the GDP increases three times.

The sources of financing the investment are, Savings, taxes, financing development (deficit financing), foreign private loans,

foreign private investment and foreign subsidies. One should also take into account the natural capital and treat them as investment, with the same rules that is applicable to the monetary capital.

State of Kuwait – National Resources

With the above as basis, we shall undertake a study of the natural, human and material resources which constitute the National Resources in the State of Kuwait.

Oil, a natural resource, forms a major chunk of the Kuwait's natural resource. Oil search and exploration was started in 1935 and the production has steadily increased. Oil production reached about 2 million barrels per day I 1995 and its reserve for the same year was 26.5 billion barrels. There are 3 major refineries in Kuwait with a refining capacity of 790 thousand barrels per day. Oil is the major contributor to the development of Kuwait's economy while at the same time affecting the economic, educational, social and political fields. (*Al Khateib 1998*)

The human resource of Kuwait comprises of the Kuwaitis and the expatriates. The population in 1996 being, 2093.9 thousand, with the Kuwaitis forming 35% of the population. Kuwait has seen a steady increase in the population since 1960's, mainly due to the influx of the expatriate population who are lured by the petro dollar. This increase in the Kuwaiti as well as immigrant population has put considerable pressure on the meager natural resources. With the land availability remaining same, last 4 decades have seen an increase in the density of population. With the increase in the percentage of Kuwaiti citizens in the government sector, there has been considerable pressure on the state budget as ever increasing wage bill eats up most of the oil revenues. In 1995, this stood at 52.3%. This has an adverse impact on the developmental activities.

Kuwait has abundant financial resources mainly due to oil revenue. The total fixed capital which stood at KD 126.6 M in 1971 rose to KD 1525 M by 1983. The economy was under a boom from

1974-80 due to the appreciation of global oil prices. The recession in the later part of the 1980's due to the Iran – Iraq war, stabilization of oil prices and the collapse of the stock exchange market led to an erosion of fixed capital to KD 733.3 M by 1989. This affected the manufacturing sector as the investment in it dropped drastically. The figure increased to KD 980.3 in 1995. Considerable disparity was seen in the distribution of fixed capital amongst public and private sectors, with the public sector having 87.2% of the share in 1994. The services sector is expected to grow investment wise in the years to come. Due to the immense oil revenues, Kuwait never faced a problem regarding financing its different investments. The national savings are more than the domestic investment efforts. The size of capital is affected by the oil price fluctuations. The oil sector and the manufacturing industry sector contributed 50.4% to the GDP in 1995.(MP-ASG 1996)

From studying the natural conditions, human activities and capital deployment, it is considered as a necessity that we study how the above factors affected the environment and the ecosystem.

Environmental Problems in the State of Kuwait

Air Pollution

The problem of air pollution, which is normally associated with industrial advancements, has emerged in Kuwait after the discovery of oil and the construction of several factories. With rising standard of living, vehicles on the road have increased, compounding the problem. The major sources of air pollution in Kuwait are

- Pollution resulting from the industrial activities in Shuwaikh, Sabhan and Shuaiba industrial areas. The factories in these areas, emit poisonous gases, sulphur dioxide, hydrogen sulphide, carbon monoxide, nitrogen monoxide and other hydro carbon gases.
- The ever increasing vehicle population and the traffic congestion cause high level of air pollution.

- Another major air pollutant is dust, which is due to the particular phenomena that affect Kuwait especially in summer.
- Air pollution resulting from sanitary drainage system and swage system constitute another major factor for air pollution apart from the health hazard caused by poisonous chemicals in the air, there are direct economic affects due to corrosion, dust affecting traffic and industrial activities and adverse impact on agriculture. The quality of life and the productivity of the industry. (*Al Mossa 1991*)

Water Pollution

- Sea has always been critical to Kuwait's economy. Erstwhile an economy, which is dependent on fishing and pearl diving for its livelihood, Kuwait has changed over the past half a century. With the discovery of oil, sea became more of a facilitator for transporting oil from Kuwait. The establishment of various petrochemical and other industries along the Coastline and the sudden spurt in the industrial sector along the coast has been a recipe for marine pollution with catastrophic effects. Oil leakages into the sea, impact of the Iraqi invasion on the marine ecology, industrial waste emanating from Industrial installations and power stations and pollutions resulting from sanitary drainage which is released to the sea, river disposals and air pollutants which find their way to the water environment has caused irreparable damage to the hydro system. These pollutants destroy the precious and rare marine life. The closed nature of the Arabian Gulf, which is an extremely productive sea with regard to botanical world, also makes it the most vulnerable of the ecosystem to pollution. The Gulf has limited capacity to dispose pollutants, leading to a steady increase in the level of pollution. The result is the mass destruction of marine life, including the coral reefs.
- The Iraqi invasion and the subsequent pumping of a million barrel of oil from the oilfields into the Gulf caused the death of birds and other marine life. The invasion apart from causing an alarming rise in the level of pollution in the sea also caused non-oil

pollution caused as a result of destruction of the sewage purification stations by the Iraqi troops. (*Al Mezzani 1991*)

Pollution caused by Iraqi invasion of Kuwait

- The Iraqi invasion on August, 1990 of Kuwait affected the Kuwait ecosystem adversely. This is apart from the effect it had on the social, economic, cultural fields. The infrastructure, financial and otherwise, carefully built since 1960, was destroyed to a large extent (*UNR 1991*). Though nature has an infinite capacity to adapt, this was not the case as far as Kuwait was concerned. The environmental catastrophe cause due to the setting of the 732 oil wells was phenomenal. (*Al Kandari 1992*) Air was polluted as a result of the smoke emanating from the burnt oil wells. The concentration of various pollutants over the Kuwait environment was more than the permissible levels. Another major source of pollution was caused by the oil pools which in turn released poisonous fumes once exposed to sun rays. These led to various diseases being spread amongst the Kuwaiti population, and even causing permanent damages.
- War had a negative impact on the already fragile soil structure of Kuwait. Planting of mines and the deterioration of the land due to the pressure exerted by the troop movement and the burning of underground oil wells affected the flora and fauna adversely.

Impact of desertisation

- Desertisation, a fairly contemporary environmental phenomenon, threatens many dry and semi arid environments. These environments have fragile ecological and biological systems and poor environmental capacities. Though this phenomenon affects the Arabian Gulf in general, Kuwait in particular suffers from desertisation that has led to the increase in the salinity of the soil, advancement of sand to the agricultural and pastoral areas leading to disorder in the eco system.
- The most important manifestation of desertisation in Kuwait in Kuwait are the shrinkage of the grass cover and the

deterioration in the quality of the grass cover, increased salinity which affects agricultural productivity, advancement of sand to roads, urban areas and agricultural lands, soil erosion and increase in the quantity of dust released into the atmosphere. The country also has to depend more on import of foodstuff. (*Al Ajmi 1996*)

- Some of the reasons for the desertisation are man made. Enhanced use of fertilizers, over grazing, use of some plants as fuel, lack of rain and the windy conditions.

Environment Protection in the State of Kuwait

Kuwait has taken positive steps to combat the threat to the environment in the past few decades. The focus has been on promoting and maintaining the environment. In this respect it has signed several environment related international treaties and agreements and it has become a member of the territorial organizations which endeavor to protect the marine environment.

On the legislative front, Kuwait has promulgated many legislations pertaining to the environment, including the law that prevents polluting the navigable water with oil, the legislation of the Kuwait municipality, and legislation relating to the maintenance of the petroleum wealth. Numerous institutions and authorities were set up to protect the environment and their activities to restore the balance of the ecosystem, upset by the Iraqi invasion, are commendable.

Despite the efforts made by the governmental and private agency to safe guard the delicate Kuwait Environment, there are areas which are not attended to. The territorial agreements though it plays a major role in co-coordinating the environmental work amongst the Gulf States, are however limited in scope and hence cannot be an answer to the environmental problems facing Kuwait. Though the legal system of Kuwait has covered the pollution concerning the marine life, it lacks in tackling the air and land pollution adequately. These challenges require revision of the existing laws and promulgating new ones to keep pace with the

changing environment. Need of the hour is to have preventive measures to avoid environmental disasters in the future.

Treatment of the environmental problem is costly. It is estimated that the cost of environmental problems in the Arab World, including Kuwait, is more than US Dollar Ten Billion per year. This amount represents 3% of the GDP of the area and this cost is expected to go up in the future unless adequate steps are taken now. (*EBUNEP 1994*)

It is clear that the cost of environmental problem, which stands at 3% of the GDP, has an adverse effect on economic growth and development, especially in these times of recession. This is likely to affect the investment required for development and is expected to have a cascading effect on the performance of the economy.

Primary Data collection and Analysis

To understand the issue at hand in depth, a detailed questionnaire was administered to 30 experts in the area of environment and economic development. The experts were given a series of statements and asked to give their opinions about the validity of the statements on a 5 point Likert scale. The questionnaire was exhaustive in nature and covered an entire range of issues pertaining to environmental management and economy. The following steps were adhered to,

- Based on the secondary data, 30 professionals who are interested and are experts in the environment were identified. These 30 constitutes the entire 'population' of 'Experts' on the subject.
- Data was collected through the administration of an exhaustive questionnaire to the Experts.
- The questionnaire was essentially formulated using a 5 point Likert Scale, with the respondents asked to give their level of agreement on a series of statements. The respondents had to choose from a choice of five levels of agreement - ' *Strongly Agree*', ' *Agree*', ' *Undecided*', ' *Disagree*' or ' *Strongly Disagree*'.
- The questionnaire contained statements on degradation of environment, managers and public attitude toward environmental

issues, causes for the environmental degradation, adequacy of legislation to combat environmental problems, and recommendations for creating awareness amongst other statements. The questionnaire was generally designed to probe their views and opinions regarding the issue of environmental management and economy in order to find out an overall environmental framework where the economic and administrative aspects will be taken into account.

- Since the data was collected based on a census of the entire 'population' of 'Experts', testing of data for validity is not required. Also, the questionnaire was pre-tested, prior to administering.

- Factor analysis was applied to the data collected to arrive at inter relationships

The empirical results based on the Factor Analysis are given below,

The factor analysis process employed here consisted of the following steps:

- Correlation Matrix

- Testing the Assumptions:

A) Bartlett's Test.

B) Measures of Sampling Adequacy

- Driving Factor Loading

- Selecting the number of factors to represent the underlying structure in the data.

Primary Data Analysis

Factor Analysis for the main Issues of the Study

These are statements describing how the managers perceived and appreciate the environmental policies and the issues. The Correlation matrix was formed by calculating the simple correlation between pairs of variables. The resulting correlation matrix was used to underline relationship between variables and thus the factor pattern.

All the variables included from the survey are metric and constitute a homogeneous set of perceptions appropriate for factor analysis. The sample size is adequate, e.g : there is a 14-to-1 ratio of observations to variables, which falls within the acceptable limits. Also the sample size provides an adequate base for calculation of the correlations between variables.

The factor analysis also assessed the factorability of the correlation matrix. The correlation matrix demonstrated that most of the correlations are significant of 0.01 level, which provided an adequate basis for proceeding to the “testing the assumptions.” The next step involves assessing the overall significance of the correlation matrix with the “Bartlett’s Test”. The Bartlett’s Test value thus obtained is highly significant at the 0.0001 level. The conclusion is that the correlation matrix has significant correlations among the variables.

Furthermore, the other important statistical test is the measure of sampling adequacy, which gave a low level of 0.419. In this case, all variables with lower correlations were omitted. The measure of sampling adequacy significantly improved to about 0.505 which is statistically acceptable. The variables were subjected to driving the factor values techniques as represented by the Eigenvalues and the factor loading. The results showed that there are four factors that have an Eigenvalue greater than 1. These two factors have explained about 95 percent of the total variations (total variance). The first factor as indicated by the factor loading is mostly concerned with economic and culture development and their impacts on the environment. Meanwhile, the second factor is mainly focused on the attitude towards the environment.

Factor Analysis for the Whole Variables of the Study

These are statements describing the environmental policy of the management in all the areas of concerns. Possible responses were Strongly Agree, Agree, To Some Extent, I Don’t Agree, I Don’t Agree at all.

As in the last section, all the variables included from the survey are metric and constitute a homogeneous set of perceptions appropriate for factor analysis. The sample size is adequate, e.g : there is a 14-to-1 ratio of observations to variables, which falls within the acceptable limits. Also the sample size provides an adequate base for calculation of the correlations between variables.

Correlation matrix was calculated initially. The visual examination of the correlation matrix indicated that most of the correlations are significant of 0.01 levels, which provided an adequate basis for proceeding to the next step. "Testing the Assumptions". The Bartlett's Test value is highly significant at the 0.0001 level. Thus, we can conclude that the correlation matrix has underlined significant correlations among the variables.

The measure of sampling adequacy, is acceptable at 0.692. The variables were used to drive the factor values as represented by the Eigenvalues and the factor loading. The results showed that there are two factors that have an Eigenvalue greater than 1, i.e., principal component. These three factors have explained about 99 percent of the total variations (total variance).

The first factor as indicated by their factor loading is concerned with the rate of economic development and their impact on the environment. The second factor is mostly concerned with the level of environmental problems and their severity. The third factor is focused on the general knowledge of society with the environmental problems.

Correlation analysis of study data:

Upon conducting correlation non-parametric analysis on the level of every different axes of that of study it has been found from the matrix of correlation that there are strong direct correlation between the questions of the study and each other at indication level of less than 0.05% (P.Value<5%) as follows:

1. There is a strong correlation (0.90%) at corporal level of indication amounting to 0.037% between the growth that has

accompanied economic development and its impact on the increased levels of international environmental problems.

2. There is strong direct correlation of (0.975) at the corporal level of indication amounting to 0.05 between economic and cultural development and their impact on the aggravation of the environmental problems.

3. A strong direct correlation of (0.975) at corporal level of indication amounting to (0.005) between the sea, land and atmosphere environment, jointly and severally and its impact on the aggravation of the environmental problems in the area post second gulf war is found to be present.

4. There is a strong direct correlation of (1) at complete corporal level of indication that the State of Kuwait has always been taken into consideration the environmental implications while doing developmental planning not only after the second Gulf War but early before that.

5. A direct correlation of (0.90) at corporal level of indication of (0.037) between the development of the economic and educational legislation and its impact on the environment was noticed.

6. The development of the human resources is linked with the environmental development and the care for the rights of the coming generations, which reflects that the concept of development and planning is involving these points. There is complete correlation of (1).

7. A correlation of (0.975) at corporal level of indication of (0.005), is noticed suggesting that the responsibility of maintenance of environment is to be shouldered by the population, Government, family and entire international community.

8. With regard to the questions of the ninth axis relating to average contribution in the environmental development by the specialists in the environment. It has been found that there is complete correlation of (1) at complete corporal level of indication between the development of the human resources and execution of

the environmental policies at the level of planning, information and education.

9. With regard to the questions of the tenth axis relating to the average of commitment by the institutions to its role in the environment maintenance. It has been found that there is complete correlation of (1) at complete corporal indication level between commitment to environmental legislation and the finance of environmental protection and orientation process.

10. Regarding the major international environmental problems, it has been found that there is strong direct correlation of (0.975) at corporal indication level of (0.005) between radioactive, chemical and sea pollution as well as the pollution of rivers, desertification, and the pollution resulting from waste and manufacturing.

11. As to the most critical of the current environmental problems at the Arabian Gulf Region, it has been found that there is strong direct correlation of (0.975) at corporal indication level of (0.005) between the climate, oil pollution and the pollution resulting from industrial development, noisy, desertification and intensive urban growth.

12. Appropriateness of the current environmental plans keeping in mind the future needs - A strong direct correlation of (0.921) at corporal level of indication of (0.026) between the realistic nature of the plans and the possibility of following it up is indicated. This also depends on the availability of necessary tools for execution and the active participation of the institutions and individuals.

13. The research also showed a strong direct correlation of (0.949) at corporal level of indication of (0.014) between the increase of expenditure on environmental researches and the increase of the number of researchers in this field in collaboration with the economic institutions.

14. With regard to the questions of the relating to the availability of environmental information database in the State of Kuwait, it has been found that there is strong direct correlation of (0.975) at corporal level of indication of (0.005) between the availability of this database in order to measure pollution levels, to

control the trends of the environmental elements, to conduct environmental researches and the availability of the technicians who are able to deal with the environmental information.

Findings of the Study

The following conclusions were arrived at from the study,

1. Kuwait has in its pursuit of a luxurious standard of living damaged the environment through improper investment of its natural resources. It has, through its uncontrolled production and sale of oil, its major resource, created a situation which could lead to an environmental catastrophe in the future.
2. The environmental awareness with different section of the society reflects the degree of economic and cultural development of each society and the hazards of environmental problems to the existence of human beings were the prominent cause for linking environment with economical development operations.
3. Left to themselves Managers will pursue economic activities detrimental to the environment for profit maximization. The managers and key decision makers have to be made to comply with environmental regulations through proper legislation to ensure that there is no further degradation of the Kuwait's environment.
4. Environmental problems can be tackled only through a paradigm shift in the attitudes of the citizens, institutions and the government.
5. The rate of development of the production and consumption operations has been the main reason behind the emergence of the international environmental problems. It has a direct impact on the environment.
6. State of Kuwait's major environmental hazards are generally, represented in the contamination of water, pollution of air and the sea environments. The severity of the above environmental problems calls for immediate attention and concerted action.
7. There is a relative increase in the awareness of environmental problems among the citizens of Kuwait.

The findings clearly points out to the criticality of the environmental problems and the need for awareness. The need of the hour is to develop appropriate environmental plans and to strengthen the role of institutions so that we are on constant vigil against environmental degradation and catastrophes.

The research emphasises the urgent need for enforceable and stricter laws, creation of awareness regarding environment and opening dialogues to promote the concept of environmental planning in Kuwait. This can be achieved through creating a strategy for environmental administration, co-ordinating the efforts to ensure a hygienic environment and by ensuring that the available resources are utilized judiciously to optimize the returns. This will ensure that there is a positive cost - benefit ratio. The research also calls for treating the natural resources as an 'investment'.

Action based on the above findings will also ensure that the cost of the environmental problems, which are currently at 3% of the GDP, is minimized, thus stimulating the economic growth. Sustained economic growth, coupled with judicious investment of natural capital will ensure that the country will have a sustainable model for development.

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