

# **OVERVIEW OF LOCAL STATE OF THE ENVIRONMENT**

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## **ABSTRACT**

An overview of local environmental problems is a description of state of the environment in the Kingdom of Saudi Arabia as per the author personal experience as a researcher in the Research Institute of King Fahd University of Petroleum and Minerals (RI/KFUPM). The experience as a senior expert in the Meteorology & environmental Protection Agency (MEPA) shows administrative side in addition to participation in international polar expedition and regional scientific cruises as a team leader contributes to the variation of the experience during peace and war times and showing actions at local, regional and global levels.

## **KEYWORDS**

Environment, pollution, air, marine, ground water, landfill, recycle, particulates.

## **INTRODUCTION**

The Kingdom of Saudi Arabia has had major development in industry, transportation, communications, housing projects, city expansion and coastal zone use and manipulation. The unprecedented development could have major environmental damage, if planning and implementation did not consider environmental issues especially in the major industrial projects of Jubail and Yanbu. The local cultures have survived the harsh desert environment for thousands of years.

The religion of Islam is environmentally conscientious. Whatever environmental damages that have occurred they are due to ignorance and lack of environmental awareness that was lacking even on the global level two decades ago. Any way the picture is not so gloomy. There are many government organizations that are environmental or concerned with environment or partially associated with environment. Private sector is moving quickly in the field of environment as contractor and investor. Universities and research institutes include environmental education and research. Individuals are participating on personal basis or through environmental societies local or international. The Kingdom is a major positive environmental contributor locally, regionally and globally.

## **GOVERNMENT ORGANIZATIONS**

Meteorology & Environmental Protection Administration (MEPA) is the official government organization that handles legislative roles in addition to implementation or supervises implementation and provides funds for limited research and studies on local

and global basis. MEPA is focal point for national and international organizations regarding environmental matters associated with the Kingdom. The organization is well known internationally i.e. within United Nation Environment Protection (UNEP), World Meteorology Organization (WMO), etc. MEPA is also active on regional level with the Regional Organization for the Protection of the Marine environment (ROPME) and has had established ROPME in addition to contribution in the establishment of the new organization, PERSGA, Regional Organization for Conservation of the Red Sea and Gulf of Aden Environment. MEPA has its rules and regulations that are implemented in the Kingdom of Saudi Arabia and has more to be approved by the Royal Cabinet for implementation. The sister organization of MEPA is the National Commission for Wild Conservation and Development (NCWCD) which is mainly concerned with sanctuaries, conservation and preservation of wild life. Other important government organizations are :

- The Commission of Jubail and Yanbu,
- The Ministry of Municipality and Rural Affairs,
- The Ministry of Health,
- The Ministry of Agriculture and Water,
- The Ministry of Interior,
- The Ministry of Foreign Affairs,
- The Ministry of Industry and Electricity

In addition to the above, the University of King Abdulaziz that has seven colleges associated with environmental issues and a College of Environment.

King Faisal University,

University of King Saud which has several colleges and departments that are contributing environmentally.

King Fahd University of Petroleum and Minerals has colleges and departments that are active in the environmental field in addition to the divisions of the Environmental and Water Resources in the Research Institute.

King Abdulaziz City for Science & Technology (KACST) fund and conduct environmental research through a specialized department within the city.

Finally public awareness is encouraged and propagated through print and electronic media means in Arabic and English.

### **PRIVATE SECTOR**

Saudi ARAMCO is a good model of local companies that are concerned with environment in planning and implementation. The company has specialized department and trained staff to plan, implement and follow-ups. Furthermore, the company funds research in the area of environment and conduct environmental impact assessment for all new projects and has clean up projects for areas contaminated previously.

There are other companies that are involved in the environment business such as Damath that has worked on hazardous water and has a study on medical waste. Gulf Environmental Services is conducting hazardous waste study for Jeddah Municipality funded by the Islamic Bank. SKAB Group has a specialized company in the field of environment called SADACA for Environment and has exclusive rights to municipal waste of the Kingdom except the eastern province. The waste will be recycled in huge plants across the country. The company had also run maintenance and operation for MEPA.

### **AIR POLLUTION**

Air pollution could be classified into natural, industrial and municipal. The dessert climate and the absence of plant cover make the dessert areas a good source of suspended particulates. The National Center for Atmospheric Research (NCAR) has found the

eastern province is a major global source of particulate during their studies on the Kuwaiti Oil Field Fire. The particulate mentioned above were related to sands and deserts.

Human activities definitely contribute to air pollution starting with breathing oxygen and exhaling carbon dioxide, bad habits and behavior, destructive activities such as wars and nuclear experiments and, of course, irresponsible industrial air pollution. The Kingdom has the best industrial complexes in Jubail and Yanbu that have been awarded International Environmental Prizes due to high standard of pollutant controls. Saudi Aramco implements MEPA rules and regulations, however, there is a definite need for enforcement of the regulations in small industrial areas. Municipal air pollution sources are cars, industrial areas and desalination plants on some coastal cities. Rock crushers near cities and cement plants are source of suspended particulates. A study conducted in the Research Institute (RI/KFUPM) showed that week-days have higher suspended particulate than weekends which relates the increase to construction activities. Landfills could be another source of air pollution whenever there is accidental fire or stagnant air layer dominates the area.

## **NOISE POLLUTION**

Municipality regulations prevent the establishment of all noise workshop within the city general plan. Furthermore, horn use is forbidden at schools and hospitals areas.

## **SOIL AND GROUND WATER POLLUTION**

Soil and ground could be contaminated at areas where industrial, agricultural, construction, medical, or municipal wastes are dumped. The only sanitary landfill is the Jubail Industrial City Landfill. Other areas have either primitive landfills or improved landfills in terms of operation and maintenance.

The source of soil and ground water contamination is sewage water. The deficiency of sewage network, treatment plants, operation and maintenance lead to ground water contamination. Irresponsible disposal of chemicals, oils, metals in the open areas is a source of ground water contamination. The problem of unidentified waste is another menace that may need supervised for identification, treatment and disposal.

## **WASTE MANAGEMENT**

Hazardous waste is managed properly by big companies and by contractors such as Be'Ah which has the best facility to handle, treat, store or dispose hazardous waster. Be'Ah should have their incinerator in operation to handle the abundant hazardous waste available.

Municipal waste is buried in landfills on daily basis and open fire is forbidden by law. Recycle contract with Sadaca Environment should minimize the build of municipal wastes and will help recycle and re-use of resources and minimize land waste.

Sewage water project in Jeddah where the network is absent is handled to investor to transport, treat, and sell water for agriculture and industrial purposes plus production and sale of composts.

Medical waste is going to follow the same line in Jeddah where private sector will be encouraged to invest in the establishment of treatment facility for nominal fees. Radioactive waste is handled by KACST.

## **MARINE POLLUTION**

Marine pollution is mainly due to oil industry and the worst was seen during the Iraq-Iran war and during Iraq's invasion on Kuwait. However, the dredging, metallic structure and

ship traffic, ballast work and land filling of coastal zones and sewage waters falling in the sea are sources of marine pollution.

Jubail Marine Sanctuary is a major step toward protecting the marine environment and better environment awareness and research. The Research Institute is conducting sustainable environmental projects funded by Saudi ARAMCO. Previous results were very useful during Gulf War. The College of Marine Science has conducted and is conducting research on the Red Sea eastern coast.

Saudi scientists have participated with international scientists locally and on scientific cruise such as Mt. Mitcheel and Umitaka Maru to study marine pollution. Actually the Kingdom had participated in Antarctica and Arctica to develop science to serve humanity and for the sake of international unity.

### **ENVIRONMENT CONFERENCES AND SYMPOSIUMS**

Many conferences and symposiums (workshops) were held in the Kingdom in the field of environment i.e. Sea to Sea Conference in Jeddah and the First National Conference of Pollution and Health. As a result an Environmental Society was established under the honorary presidency of HRH Prince Majid bin Abdulaziz, Governor of Makkah. The society will conduct research, publish magazine, sponsor local symposiums and conferences and award on distinguished research and scientific accomplishments.

### **CONCLUSIONS**

1. The religion of Islam emphasizes protection and conservation of the environment.
2. Survival in the dessert is sustained through a culture that respects nature and depends on sustainable resources.
3. MEPA is the official government organization and the focal point of environment in the Kingdom of Saudi Arabia. However, other government and non-government organizations are involved in the objectives and tasks with environment.
4. Private sector is active as contractor or investor.
5. Research and development of environmental nature are conducted in universities and research institutions.
6. Public awareness is ongoing through different media means.
7. The Gulf war environmental crisis has shown the positive effectiveness of local expertise.
8. Industrial cities are environmental friend.
9. Cities have problems with industrial areas.
10. Hazardous waste is a problem to be managed.
11. Sewage water management is a major problem in the cities.
12. Landfills are not well designed and may be threat to ground water.
13. Recycle is in its initial stages in Jeddah.
14. Environment Society is established in Jeddah.

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