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**PROSPECTIVE OF SCIENCE AND TECHNOLOGY IN  
KUWAIT**

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# Prospective of Science and Technology in Kuwait

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تلعب العلوم والتكنولوجيا دورا حيويا في حياة وتقدم الشعوب، ولذلك تسعى كافة الدول الى تسخير إمكانياتها ومواردها للاستفادة من التقدم التكنولوجي والعلمي خصوصا فيما يتعلق بتقنيات المعلومات الحديثة. ولكن لا تتم الاستفادة من العلوم والتكنولوجيا إلا عبر نظام وطني أساسه خطة استراتيجية وطنية للعلوم والتكنولوجيا تنفذ سياسات علمية تكنولوجية. تستعرض هذه الورقة بعض الأمور الهامة لبناء الخطة الاستراتيجية الوطنية مثل الغايات والأهداف بالإضافة الى تقديم تصور حول ما يجب أن تتعرض إليه السياسة العلمية والتكنولوجية في الكويت، كما تنوه الى جهود معهد الكويت للأبحاث العلمية لبلورة السياسة العلمية والتكنولوجية لدولة الكويت.

## Introduction

**S** &T is an important tool for the advancement of the country, especially in the present scenario of changing technology, globalization of economics and society, and fiercely increasing competition in the global market. These forces are putting pressure on every country to develop business economics which require knowledge of science and technology, with new products and technologies as the targeted outcome.

Kuwait a young, developing country, gained its dependence in 1961. At that time, the country had essentially a rural society and was dependent on skilled human and natural resources inputs from outside

sources. Kuwait national leaders sought to have the development of nation be given a scientific base. Soon after independence many scientific entities were established such as Kuwait University in 1966, Kuwait Institute for Scientific Research in 1967, and Kuwait Foundation for the advancement of Science.

Kuwait scientific activities is distributed among several units, but mainly between Kuwait University for academic research and Kuwait Institute for Scientific Research for applied research. Other research units perform diagnostic and service type research. Despite the short period of engagement in scientific activities, Kuwait achievements can be placed in four areas; development of scientific

## **Science and Technology policy**

Article 14 of Kuwait constitution states “ The state shall promote science, art and encourage scientific research”. A more clear and direct policy statements need to developed to tackle the following issues in these areas :

### ***1. S&T infrastructure***

- Human resources development
- Upgrading of educational programs and teaching methods
- Provision of incentives
- Establishing and strengthening R&D networks internally and with the outside
- Supporting R&D institutions and developing centers of excellence
- Establishing science and technology parks
- Establishing mechanisms for dissemination of information
- Promoting science and technology awareness programs

### ***2. Enhancing R&D activities***

- Establishing areas of priorities
- Emphasizing development and utilization of local materials for industrial use
- Establish expertise knowledge in future promising areas

- Establishment of codes and standards
- Carrying out programs to stimulate the private sector for active participation in S&T programs.

### ***3. Development of the production and service sectors***

- Adaptation and customization of technologies for higher odd values
- Supporting commercialization of R&D output
- Promoting knowledge for proper technology screening and selection schemes
- Supporting linkage schemes with outside world
- Development of databases about production and serve sectors
- Development of systems for monitoring environmental hazards and impact assessment of technologies introduced

## **Overview of National S&T Strategy**

For science, technology and innovation systems to reach their potential, so as to contribute effectively in the prosperity of Kuwait, by

educational systems and human resources development. Emphasis will be towards greater utilization of information technology as a tool for greater understanding of S&T issues, skill development, and knowledge capacity building.

***Goal Two: Promoting and Investing in Science and Technology Institutions***

No one can doubt the contributions of science and technology towards enhancing the quality of life and other benefits. Now in order for science and technology institutions to realize their full potential, a sustained investment by the government has to be made in these scientific institutions. The investment can take several forms, direct in the form of supporting operating expenses for those scientific entities or indirect in the form of financing research projects.

***Goal Three: Building up the Systems of Knowledge Generations and Putting it to work Towards Solving our Economic Sectorial Problems***

Science and technology institutions are ware-houses of knowledge. They contain important databases about various problem pertaining to various developmental sectors as well as skills and research

facilities. The government should invest in sustaining adequate science infrastructure both in terms of human resources development and research facilities. Kuwait faces problems in food, environment, industrial, economic, and energy sectors. Various projects can be initiated towards analyzing and solving development problems, increasing productivity, gaining more knowledge and forecasting or catering for the future. The government should also encourage the private sector participation in S&T affairs by providing incentives and joint programs.

## **Global Trends**

- Great advances in biotechnology products and their impact in various sectors, and the ethical and social values they carry.
- Great advance in information and communication technologies and their impact in the performance of various sectors.
- Great intellectual property rights.
- Emergence of trade and environmental protection laws.
- Due to information technologies, technological skill can travel across

implementation mechanism, despite existence of long term plans.

### **Tactical plans**

The overview of the national strategy outlined before addressed important issues such as vision, global trends affecting science and technology as well as strength, weakness. Tactical plans will need to be developed that turn the stated vision into reality. More precisely, we need to translate the goals into specific objectives. We need to make science and technology system work most effectively. Below are some of the issues that affect and should be incorporated in the tactical plans.

### **Objectives**

For the science and technology system to work most efficiently, we need to turn its output toward attaining five general objectives: -

- Maintenance and continuous investment in scientific institution so as to turn them into knowledge warehouses and centers of excellence
- Ensure excellent linkages between scientific entities and the different benefiting sectors by maintaining or establishing mechanism for

communicating needs and alligning resources. This linkage will ensure active and real participation by the science and technology units and good return on investment

- Sustainment and support of R&D projects geared towards, developing and preservation of natural resources, technologies for resources sustainment and protection and development of environment monitoring systems
- Improve appreciation of S&T values in our society and encourage studies geared towards exposing benefits, and implication of technology on our society
- Maintain strong linkage with industrial world, through exercising many schemes such as linking to proprietary databases, scholar exchange programs, joint projects...etc.

### **Performance Indicators**

It is important to specify targets on quantifiable terms. And as such performance inductors will have to be developed to assess level of achievements of goals and objectives. In S&T developing such performance inductors is not easy, however it is

In the preparation process ESCWA carried out the following :

- Presentation on S&T policy and its relation to economic growth
- ESCWA mission to Kuwait included visits to various R&D and academic units.

It is anticipated that a full proposal by ESCWA will follow soon.

## **Conclusion**

An attempt was made here to give some prospective of Kuwait science and technology system. The system calls for the creation of a high office attached to the prime minister to administer and cater for science and technology activities in Kuwait. An overview of S&T strategy was outlined as well as issues related to defining S&T policy areas. And finally the Kuwait Institute for Scientific Research attempts to formulate S&T policy for Kuwait is reported.



possible to specify indicators that reflect directions and levels of changes. Performance indicators will aid in assessing success of S&T policies in specific areas and therefore they are important tools for the decision maker.

A number of performance indicators are reported in the literature that reflect level of scientific activities in the countries.

### **KISR's efforts towards formulating the national S&T policy for Kuwait**

Since its establishment in 1976, KISR has recognized the need for the formulation of a national S&T policy for Kuwait to guide the country's technological and scientific advancement in association with various aspects of national economic and human development. Initial attempts to accomplish this important and crucial task were commenced in May 1978 through the sponsoring and organization of a two-day "Symposium on Science and Technology for Development in Kuwait". In the years that followed this symposium, KISR carried out several activities and contacts relevant to the issue in coordination with various national

organizations concerned with the formulation of a national S&T policy in Kuwait.

Serious steps toward the formulation of an S&T policy in Kuwait have taken during the past two years. As a result, KISR have launched through the Ministry of Planning a joint effort with UN-ESCWA toward this objective. Accordingly, KISR and UN-ESCWA have agreed to prepare a proposal in and to execute associated activities/toward the formulation and implementation of a national S&T Kuwait. To expedite the accomplishment of this task, several meetings and visits between both sides have taken place. Based on these meetings/ visits and related discussions, UN-ESCWA prepared a preliminary proposal for the preparation, formulation and implementation of the S&T policy in Kuwait. This proposal highlighted the following three main stages/ tasks for the formulation and implementation of the project:

- **Policy Formulation**
- **Planning Strategy**
- **Implementation Process**



boundaries and thus not restricted to particular geographic locations.

- Increasingly the future does not hold for low-skilled labor.
- Great advances in the medical fields.

### **Strengths**

Kuwait over the past years have managed to attain good standing position among developing countries in the area of science and technologies, it has :-

- Established good telecommunication infrastructure
- Excellent educational systems and facilities
- Adequate resources were devoted to establishing and operating scientific entities
- Excellent international linkages.
- Establishment of national planning bodies responsible for state long term plans
- Rich in natural resource (oil, gas, marine)
- Excellent petroleum and petrochemical industry

### **Weakness**

A number of issues will no doubt undermine active engagement in

science and technologies matters such as :-

- Region unstability and its impact on sector development, attraction of forgein operators. The region have had two wars resulting in huge loss of resources
- Funding resources are limited despite emergence of new scientific entities
- Government funding of research institution is on the decline, and spending on research and development has not reached 1% of GDP, target reckoned to be the absolute minimum for any meaningful research and development activities.
- No indigenous industrial base and neraly all industrial project are given out on turnkey bases, thus forbidding effective technology transfer
- Globalization of scientific skills meant that countries with high salary payscale and good research facilities have higher degree of attraction
- Inadequate infrastructure for turning research output into products
- Difficulties in pursuing government objectives due to inadequate

enhancing quality of life, creating wealth and sustaining our environment, investment must occur within a context of comprehensive and coherent national S&T strategy. This context includes scientific strategies and tactical plans guided by clear and determined government policies.

Strategies define visions for the future and goals that realize that vision. It also discusses the role of the main players, knowledge bases needed for decision making and performance parameters.

## **Vision**

Vision statements have to be thought of carefully and through dialog and discussion among several parties, but one can safely say that for Kuwait, we want to create a Kuwaiti society who is well conversant and will totally comprehend the values of science and technology, and the role they play towards assuring our future. We have to plan for the emergence of the information society. We want to base our economic sectors development on scientific bases in order to ensure sustained growth.

## **Goals**

Realizing this vision does not mean that we have to turn every Kuwaiti into a scientist or information technologist, it is merely meant that we only want to create an atmosphere where everyone can participate in realizing this vision. The role of individuals, private sectors, public societies and government is clearly very important. The role of the government is the most important as it is seen as the investor in science and technology areas and the owner of institutions. The government has a greater role also in making effective, working relationships between scientific institutions and the private sectors.

In order to achieve the stated vision, one needs to achieve the following goals:

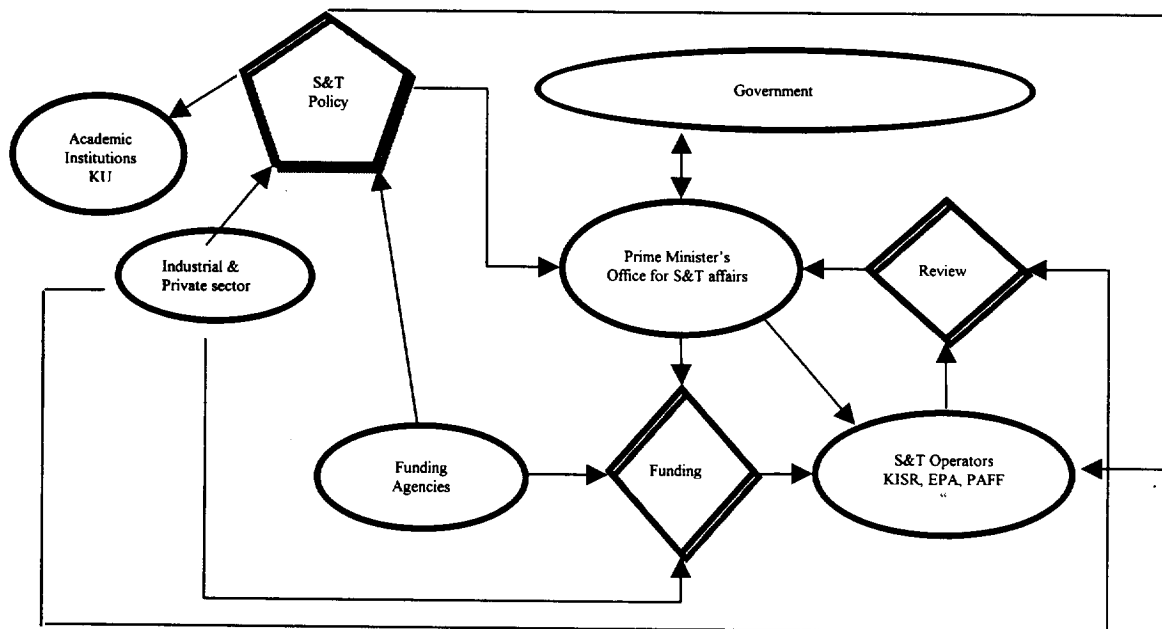
### ***Goal One: Making Science and Technology Part of our Social Values***

Efforts have to be made towards making science and technology as part of our social values, so that we can harmonize and link in the modern world. Programs have to be established that cater to this objective. Short-term programs include media promotions and scientific awareness programs. Long-term programs are

infrastructures, development of skilled human resources, many studies and research projects; and establishment of scientific databases. All these achievements manifests themselves in the form of : maintenance of sound scientific infrastructure, solution to many developmental problems, production of knowledge systems, attraction of notable scientists, active participation in conferences and committees and finally yearly publication exceeding 600 per year in various arenas. All this is not to say

that the problems does not exists, limiting optimal performance of scientific entities in Kuwait. Some of the problems lie in lack of coordination among several research units, competing for funds from single source and most importantly lack of central S&T policy. With this in mind one can see the following system for science and technology to be most effective. The system is essentially run by two component national scientific strategy and tactical plans boned by S&T policy for Kuwait.

***Overview of Kuwait's science and technology system***



As can be seen from the figure above some components of the S&T system for Kuwait already exists, other will need to be established such as the

Prime Ministers office for science and technology affairs. The role of each entity will be further defined.