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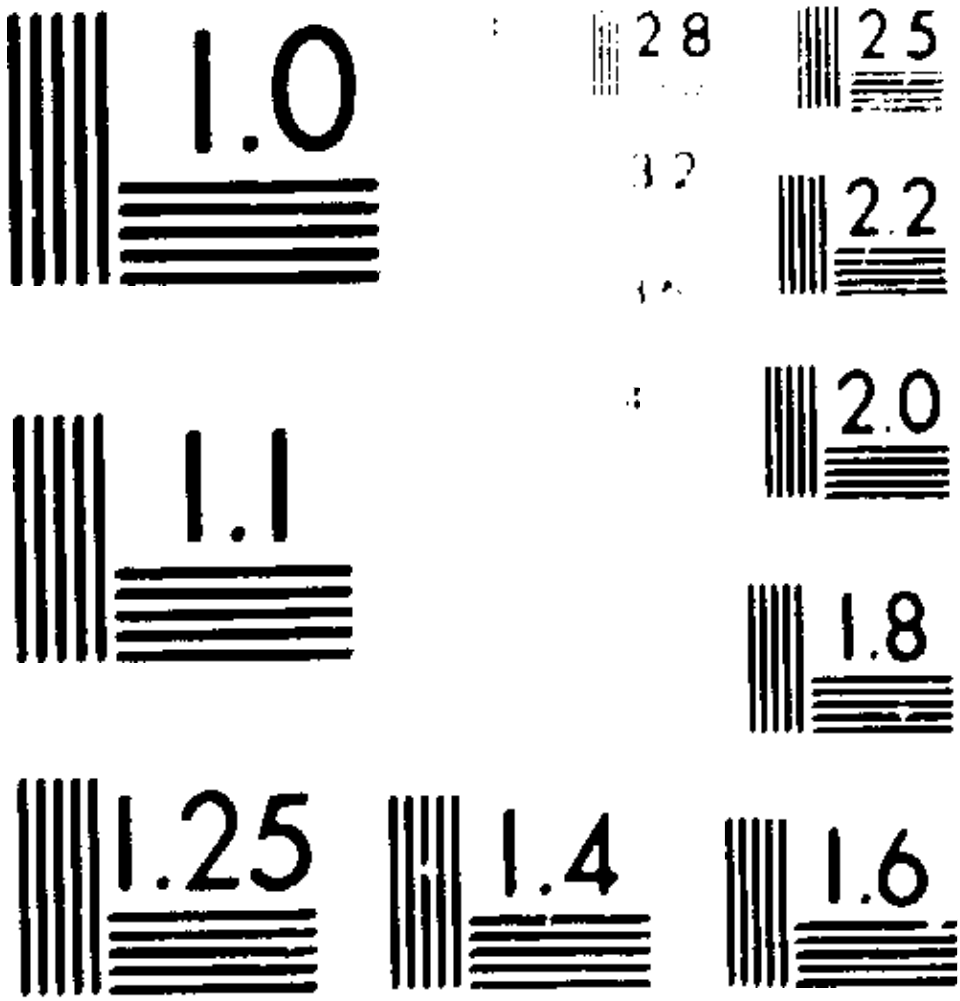
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Kuwait. Report.

NATIONAL WORKSHOP ON THE POTENTIAL OF GENETIC ENGINEERING AND BIO-TECHNOLOGY FOR ENVIRONMENTAL HEALTH AND THE PETROCHEMICAL INDUSTRY

Kuwait, 11 January 1982

R E P O R T *

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I. INTRODUCTION

On 11 January 1982 a UNIDO mission composed of expert scientists in the field of bio-technology together with development specialists, met with top level policy makers and scientists of Kuwait. The objectives of these meetings were:

1. To draw attention to concepts and recent developments in genetic engineering that have a potential application on environmental health and petrochemical industries.
2. To establish contacts with leading scientists of Kuwait and evaluate their research needs and goals in bio-technology against the perspective of existing resources.
3. To present to policy-makers developments related to UNIDO's initiative of establishing an International Centre for Genetic Engineering and Bio-technology (ICGEB).

II. VISIT TO THE DEPUTY CHAIRMAN OF THE KUWAIT PETROLEUM CORPORATION, H.E. MR. ABDULRAZZAK HUSSEIN

In welcoming the visitors, His Excellency expressed his interest in being kept informed on developments in modern bio-technology and the ways in which the Kuwait Petroleum Corporation could benefit from its potential. He also stated that the report on an ICGEB will be examined carefully. In particular, his interest was centred around issues such as the required infrastructure for setting up the ICGEB and its relations with other interested countries.

1. Technical Briefing

UNIDO's experts summarized the potential of modern bio-technology for the petrochemical industry, particularly with respect to environmental health (pollution control) and to developing technologies for the tertiary recovery of oil (recovery of about 70 per cent of oil in the well, which is left behind after extraction by conventional methods). The organisms that can be used to digest oil in spills share many characteristics with organisms that may be useful for the tertiary recovery of oil, although these must combine additional properties such as the ability to reduce the pH and the production of surface active agents.

2. UNIDO's Role in the Promotion of Genetic Engineering and Bio-technology

UNIDO representatives expressed to H.E. Mr. Abdulrazzak Hussein that UNIDO was addressing Kuwait not only as a country with financial resources but as a country that is a leader in the developing world. In so doing, UNIDO wanted to create an awareness of the potential of Genetic Engineering and Bio-technology for Kuwait and present all of these ideas for the consideration of the Kuwait Government. If Kuwait would take the initiative in these fields, immense benefits could come both for Kuwait and for other developing countries as well. At present UNIDO is actively seeking to identify major common problems of developing countries and to stimulate co-operation in areas that may be important both for Kuwait and for others. National level action is considered by UNIDO as a matter of priority.

3. The International Picture and the Need for an ICGEB

The rapid development of genetic technologies with a wide range of applications has prompted a dramatic privatization of the field. Thus, the main breakthroughs in genetic engineering are being made in small research companies in the USA. Large chemical and petrochemical companies have pledged huge amounts of money to centres of excellence where the best genetic engineering research is taking place. The trade-off is that sponsoring corporations will have rights for the commercial exploitation of any significant development that may come out of these joint-ventures. Similarily, almost every developed country has worked out national plans to stimulate goal-oriented research in bio-technology and, in several cases, national corporations have been established.[1/]

Within this overall picture, UNIDO has taken the initiative to organize an ICGEB.[2/] UNIDO feels that now is the right time to act in this direction and for this purpose has associated a group of eminent experts that co-operate in the definition of the ICGEB. This centre is intended to be used as a tool to implement research and development programmes of national interest for developing countries and to facilitate the training and specialization of their scientists. A set of interim actions, pending the setting up of the ICGEB, are also being considered by UNIDO.

1/ "Elements of Some National Policies for Bio-technology. A note by the secretariat of UNIDO.

2/ "The Establishment of an International Centre for Genetic Engineering and Bio-technology (ICGEB)", a report of a group of experts.

4. Recommendations made to H.E. Mr. Abdulrazzak Hussein

(a) Requirements for Manpower

The opinion was expressed that the development of genetic engineering and bio-technology requires a comparatively low investment. The main factor requiring a financial effort is the training of manpower of the highest quality. Any programme in bio-technology could be implemented with a group of researchers that has a critical mass of about 12-15 individuals.

(b) Development of Indigenous Technologies

Since the field of bio-technology has emerged very recently, it offers potential not only for technology transfer but also for the development of technologies with national significance for developing countries.

(c) Opportunity for Co-operation Among Different Departments

Modern bio-technology is developing a variety of techniques that are applicable in several sectors of a country's economy (health, chemicals and petrochemicals, food and agriculture); the same technology can be used to produce organisms useful for all these industrial activities. For this reason, any action taken to promote bio-technology in Kuwait should be executed in a highly co-ordinated way, with emphasis in the establishment of efficient communication mechanisms among all participating institutions. Thus, genetic engineering offers opportunities for the implementation of national programmes in which different sectors of the administration may establish co-operative relationships.

III. VISIT TO KUWAIT'S MINISTER OF PUBLIC WORKS, H.E. Mr. Abdullah D. Al-Rushaid

The Minister of Public Works was briefed by UNIDO's experts about the potential of genetic engineering and bio-technology for activities being carried out by his department.

H.E. Mr. Abdullah D. Al-Rushaid showed keen interest in the topic and remarked that the Government of Kuwait would examine with interest the establishment of a highly qualified nucleus of bio-technologists that

could have an impact in the welfare of developing countries. He asked UNIDO to submit more concrete proposals for his consideration. UNIDO officials declared their intention to use the opportunity offered by the National Workshop for the identification of research and development problems of interest for Kuwait and the Middle East.

IV. TECHNICAL SEMINAR AT KISR

The seminar was chaired by H.E. Dr. Abdul-Rahman Al-Awadi, Minister of Public Health. UNIDO experts presented in detail the development in genetic engineering and explained possible applications in health and medicine, agriculture and the chemical and oil industries. There was a discussion of the risk/benefit ratio involved in the introduction of novel technologies. The overwhelming conclusion was that potential benefits are far larger than potential hazards and that genetic engineering can be managed for the welfare of mankind.

V. DISCUSSION OF FUTURE ACTIONS AND PROSPECT FOR COLLABORATIONS BETWEEN UNIDO AND THE KUWAIT GOVERNMENT

In a meeting chaired by H.E. Dr. Abdul-Rahman Al-Awadi and with the presence of H.E. Mr. Abdulrazzak Hussein and some members of KISR's Board of Trustees, the UNIDO team of experts had the opportunity to learn about the way in which the Kuwait Government would like to go ahead in the implementation of programmes for the development of bio-technology.

The following sections of this report summarizes opinions expressed by UNIDO and by the Kuwait Government.

1. The Four Levels of Actions Considered by UNIDO

The leader of UNIDO's mission described the operational strategy that the Organization will follow to promote genetic engineering and bio-technology in developing countries. UNIDO's plan is centred around four levels of action:

(a) Give urgent attention to the creation of core groups in a number of disciplines that should be identified at the national level.

(b) Intensify the dialogue between developed and developing countries and seek opportunities for the establishment of co-operative programmes.

(c) Develop an infrastructure to manage the flow of information, which is considered a key element for genetic engineering research.

(d) Create laboratories and implement research and development programmes that are significant for developing countries.

For the immediate future, UNIDO proposed to organize a mission aimed to identify priority problems in selected developing countries, gaining knowledge about their needs, resources, infrastructure and current activities. After this programme is implemented, a meeting could be held in Kuwait to decide what problems, appropriately modified for Kuwait's environment, would be important for further developments in that country.

UNIDO's experts recommended to create a research group at KISR to convey high level work in microbial genetics. This group could be established in co-operation with one of Kuwait's leading universities. The budget required for this purpose was estimated at about KD 1.2 million/year for ten Ph.Ds working at KISR. The need to obtain researchers of the highest quality was again emphasized.

2. Plan of Action Proposed by Kuwait's Government

H.E. Dr. Abdul-Rahman Al-Awadi expressed his concern about creating a Centre without having ready the proper manpower to work in it. He proposed to concentrate in national problems and to create core groups of scientists that would evolve into local centres of excellence. From these groups, cadres of experts could be selected to work in the laboratories of the future ICGEB. The immediate action needed, in his view, was to bring experts to Kuwait to identify national problems that may offer opportunities for research and development programmes. He also encouraged UNIDO to present concrete proposals for national level actions in Kuwait, and expressed his willingness to host a meeting in Kuwait, late in 1982, to discuss the progress achieved.

ANNEX I

AGENDA

of the National Workshop on bio-technology held in Kuwait, 11 January 1982

1. **Meeting to the Deputy Chairman of Kuwait Petroleum Corporation, H.E. Mr. Abdulrazzak Hussein**

2. **Visit to the Minister of Public Works, H.E. Mr. Abdullah D. Al-Rushaid**

3. **Visit to Kuwait's Institute of Scientific Research (KISR). Host: Dr. Adnan Shihab-Eldin, Director General of KISR**

4. Technical Seminar on the Potential of Genetic Engineering for Environmental Health and the Petrochemical Industry, Chairman: H.E. Dr. Abdul-Rahman Al-Awadi, Minister of Public Health

5. Discussion of future actions and prospects for collaborations between UNIDO and the Government of Kuwait

ANNEX II

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