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Report of Trip to Algeria (December 25-27, 1990)

The Ministry of Science & Technology, Government of Algeria expressed interest to develop an R & D base in microbial enhancement of oil recovery (MEOR) and bioremediation, and requested UNIDO's assistance to initiate the project. Dr. D. Subrahmanyam of UNIDO and I visited Algiers for this purpose.

On December 25, we visited The Centre for Development of Nuclear Technologies, an affiliate of IGGEB and discussed with the Director, Dr. Boussaha and two senior researchers, Dr. Oussadou and Dr. Touzi, in-charge of the Divisions of Biotechnology and Industrial Microbiology respectively on the ongoing biotechnology programmes at the Centre. Dr. Boussaha, while explaining the functions of the three Departments of the Institute, namely, Biotechnology, Nuclear Physics & Technology and Applied Radioisotopes, emphasized his efforts to strengthen the Biotechnology component of his Institute. In this context, he expressed his keen interest in promoting the application of the modern technologies in oil recovery and bioremediation and suggested that his Institute could act as a focal point to develop the project in collaboration with the other concerned institutions in Algeria. He also reminded on the two collaborative research proposals submitted by his staff for ICGEB funding and requested early approval. We also met Mr. Ramtani, Director, External Relations, who expressed the Government's desire to introduce MEOR and bioremediation technologies in Algeria and suggested that EEC could be approached as a possible source of funds for the project. We suggested that OPEC could be considered as another source.

On December 26th, we paid a visit to the Centre for Research and Development of SONATRACH, Boumerdes, which is involved in petroleum technologies. We made a scientific presentation and provided some literature to the Director Dr. Belhaouas and his staff on MEOR and bioremediation and their field applications. After detailed discussions, Dr. Belhaouas summarized that it is appropriate that such technologies should be introduced soon in Algeria and his Centre can provide petroleum engineering expertise and field testing facilities on the project. In the afternoon, we met Mr. Babaghayou, the Adjoint Director General of SONATRACH who also endorsed the views of Dr. Belhaouas.

On December 27th, Dr. Cherif, the Minister for Science and Technology, Government of Algeria, received us when we explained to him what the new technologies can offer in MEOR and bioremediation. Dr. Cherif informed us that colleagues in his ministry and also of the Petroleum ministry are very keen to establish such a project and would like UNIDO's assistance. He stated that his ministry will submit a project request to UNIDO for this purpose along with proposals on possible sources of funding. Meanwhile, Algeria will identify a senior scientist, well-trained in microbiology who could undergo intensive training for about 3 months in MEOR and bioremediation technologies in order to lead the project as its director.

Dr. Cherif further told us that his ministry has identified priority areas for Algeria in the field of biotechnology and requested UNIDO's assistance in developing a National Centre for Biotechnology in the country. We informed him that UNIDO can send an expert to Algeria on research and development centres of the country and formulate the modalities for developing such a Centre.

Dr. Cherif also inquired about UNIDO'S bioreagents project and renewed his interest to see Algeria as a focal distribution Centre for the region for bioreagents. He wanted a list of the bioreagents that are needed for biotechnology R & D.

#### Report of Trip to Venezuela (January 15-17, 1991)

The purpose of the trip was to raise the level of interest of the Petroleum companies of Venezuela to implement the UNIDO BIOROR project.

Meetings were arranged with the Centre of Technological Research and Development (Intevap, S.A.) which is the R & D Branch of the Venezuelan Holding Petroleum Company (Peneveza). The project was presented by Dr. George Tzotzos and myself over a 2 days meeting, while at the same time, representatives of Intevap analyzed the plans of their industry with respect to microbial enhanced oil recovery (MEOR) and bioremediation of petroleum wastes. A number of senior Intevap managers such as Carlos Espinoza and Luis Vierma participated in the discussion.

The Intevap executives as well as researchers such as Ando Anselmi and Maria Leon expressed their keen interest in the project and indicated that although their plans followed broadly the same lines as UNIDO's proposal, they were lacking concrete modalities on implementation procedures. In this respect, UNIDO's project was particularly useful to the scientific staff of Intevap in convincing their administrative and financial authorities to initiate a major facility for MEOR and bioremediation in Intevap's premises.

It was agreed that Intevap would submit to UNIDO within a few months a proposal indicating their precise personnel training requirements, as well as an indication of their financial commitment to the project. UNIDO would then modify the project in accordance and submit it to Intevap for final approval.

In a debriefing meeting with the resident representative of UNDP, Mrs. S. Siegel, we explored the possibility of UNDP supporting a preparatory assistance phase for the project, should this be required. Mrs. Siegel indicated that her office would gladly support such a preparatory assistance phase but considered that the main project should be financed in its entirety by the Venezuelan Authorities.

Dr. Tzotzos and I also met with the Biotechnology Adviser and Executive President of CAF (Corporacion Andidina de Fomento) who also indicated their Organization's willingness to finance part of the project. We have asked both the Intevap and CAF representatives to be in contact, in order to establish the exact levels of financial contribution of their respective Organizations.

We met Mr. Camilo Daza of the UN University, who is the Co-ordinator of the biotechnology programme of the University for Latin America and the Carribean. Mr. Daza expressed a keen interest in the training activities of the ICGEB and suggested that he would like to know the possibilities of joint training activities between ICGEB and the UN University. We recommended that he should contact Professor J. Allende, who is the Senior Adviser of the Director of the ICGEB in Latin America. We also promised to send Mr. Daza, a detailed programme of ICGEB's training activities.

#### Report of Trip to Indonesia (February 3-6, 1991)

The UNIDO BIOROR project proposal on the building up of R & D capability in microbially enhanced oil recovery and bioremediation was sent to UNDP-Jakarta with the purpose of ascertaining the interest of the Indonesian Petroleum Companies to implement the project.

A number of meetings were arranged by UNIDO's office in Jakarta and the Bureau of Foreign Cooperation of the Department of Mines and Energy. The meetings involved officials of PERTAMINA, which is the Indonesian State Oil and Gas Enterprise and LEMIGAS, which is the R & D Centre for Oil and Gas technology. The names and contact addresses of the senior staff of PERTAMINA and LEMIGAS were given to Dr. George Tzotzos of UNIDO. Our major discussion were carried out at PERTAMINA with Mr. Marzuan, Secretary, Directorate General of Oil and Gas, Mr Max Maloringan, Head of Center for Environment Control and Dr. A.M. Naim, Head of E. & P. research & Development Division. At LEMIGAS, we talked with Dr. Rachman Subroto and his research associates.

The project was presented by Dr. Tzotzos and myself while at the same time our Indonesian counterparts provided us with information on their industry's capabilities and plans to either enhance secondary and tertiary extraction of oil or to bioremediate oil spills. During the deliberations it transpired that the level of awareness at PERTAMINA and LEMIGAS, with regard to the possibilities of using microorganisms for oil recovery and bioremediation, was quite low. Nevertheless, the senior management of the two organizations seemed to be impressed by the proposed project and promised to give it due consideration.

#### Report of Trip to Mexico (April 8-9, 1991)

Visit to Mexico during April 8 and 9, 1991 to discuss BIOROR program with management of PEMEX and Instituto Mexicano del Petroleo (IMP) was initiated after the initial effort to visit Mexico and Venezuela at the same time fell through. To discuss the UNIDO BIOROR program with various oil companies in Mexico, Dr. K. Venkataraman, UNIDO and I visited IMP and held considerable discussion with the management of both IMP and PEMEX. PEMEX, the major oil company in Mexico, has considerable interest in hydrocarbon microbiology and oil biotechnology, and would like to get into these areas. Dr. Susana Chow Pangtay, Scientific and Technical Coordinator at PEMEX, indicated to us that PEMEX would seriously evaluate the UNIDO program and would let us know the outcome after they have discussed this at the highest level of the management. Next day, Dr. Venkataraman and I visited IMP where we discussed the program with the Director-General of IMP as well as with Dr. Hector Nava Jaimes, Assistant Director-General for Applied Research, Dr. Julian Fernandez, Scientist in the same division, and Mr. Felipe Marquez Cortez, the Chief of the Product Recovery and Industrial Production Division. The Director-General of IMP and Dr. Hector Jaimes spent considerable amount of time with us, discussing the research needs of IMP in the area of biotechnology concerning oil recovery and oil pollution clean up, and expressed strong interest in the UNIDO BIOROR program. Neither PEMEX nor IMP has any active biotechnology program at present, even though they have been talking with a Houston firm regarding recovery of heavy oil through enzymatic means. Desulfurization of oil through a microbial process has also been discussed. In the light of the UNIDO program, which also deals with microbial dewaxing and desulfurization processes, the IMP management expressed considerable enthusiasm in taking this program into consideration and seek further clarifications in the near future.