NEWSLETTER

THE ISLAMIC ACADEMY OF SCIENCES

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IAS - AL AL-BAIT FOUNDATION JOINT SEMINAR ON THE WAY

The Organizing Committee of the joint IAS - Al Al-Bait seminar on "Coordination and Cooperation Among Institutes of Research and Studies and their Applications within the Framework of Islamic Thought" chaired by H.E. Dr. Nassir El-Din El Assad, President of the Royal Academy for Islamic Civilization Research (Al Al-Bait Foundation), has finalized arrangements for convening a three day seminar during the first half of February 1989. The seminar shall be held at the Jordan University of Science and Technology, Irbid, which agreed to host this activity.

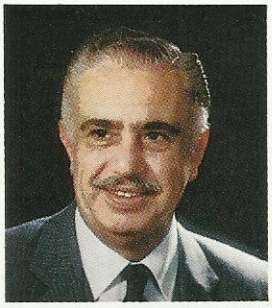
The Seminar represents an important step on the course of initiating a joint effort in the field of research and studies so that available resources are directed towards the study of contemporary problems facing the muslims all over the world.

In addition to the organizers (IAS and Al Al-Bait Foundation), many other institutes have been invited to take part in this joint seminar. Among those invited are:

- Islamic Foundation for Science, Technology and Development (IFSTAD).
- Islamic Jurisprudence (Fiqh) Academy.
- The Research Centre for Islamic History, Art and Culture.
- Islamic Research Academy, Egypt.
- International Institute of Islamic Thought.
- Institute of Islamic Studies.
- King Faisal Centre for Research and Islamic Studies.
- S.A. Kamel Islamic Economic Studies and Research Centre.
- Islamic Research Academy, Pakistan.
- Arab Thought Forum.

Individual muslim scholars will also be invited to participate in the seminar to enrich its output.

Invited institutes were requested to submit a paper presenting their views on the issue of coordination and cooperation. They were also called upon to present in details specific projects relevant to the theme of the seminar.



H.E. PROF. DR. N. EL-ASSAD, PRESIDENT OF AL AL-BAIT FOUNDATION

H.E. PROF. DR. M. A. KAZI, PRESIDENT OF IAS.

The papers submitted to the Organizing Committee will be given to a muslim scholar to be summarized in one paper comprising the main ideas and views.

The organization of this activity was initiated during the sixth annual conference of The Royal Academy for Islamic Civilization Research (Al Al-Bait Foundation) which was held in Amman in 1987. During that conference a full working session was assigned to discuss the pre-requisites for the provision of the Ummah with competent Ulama, both jurists (Faqeeh) and scientists and the possible means of bringing them closer together. Coordination between individuals as well as institutes concerned with the various aspects of Islamic Civilization and thought was also discussed.

Among the various recommendations of Al Al-Bait sixth annual conference, was the following recom-

mendation regarding coordination among Islamic Institutes and Research Centres: "The conference recommends the formation of a joint committee comprising Al Al-Bait Foundation, The Islamic Academy of Sciences, Islamic Jurisprudence (Fiqh) Academy, Islamic Research Academy and other institutes to organize a meeting for opening dialogue on coordination. The meeting is recommended to take place in the soonest possible time so that results are presented to the seventh general conference of Al Al-Bait Foundation".

Upon the directives of HRH Crown Prince Al Hassan bin Talal and in view of the prementioned recommendation of the sixth annual conference of Al Al-Bait Foundation, a joint committee of Al Al-Bait and IAS was formed. The committee was instructed by H.E. Prof. Dr. Al Assad, President of Al Al-Bait Foundation and H.E. Prof. Dr. Kazi, President of IAS, to start its task and to propose a framework for the joint activity. The committee held several meetings the first of which was during Muharram 1407 A.H, September 1987 A.D. at IAS headquarters.

The committee discussed the framework and theme of the proposed coordination and cooperation between Islamic institutes. Suggestions were presented and discussed and finally the committee agreed on the following title:

"Coordination and Cooperation Among Institutes of Research and Studies and Their Applications Within The Framework of Islamic Thought".

At the end of its deliberations, the committee approved the following:

- Holding a seminar to discuss the issue of coordination and cooperation among concerned institutes.

The seminar shall be held in 1989 for three days at the **Jordan University of Science and Technology-IRBID, JORDAN.** The exact date of the seminar shall be agreed upon by H.E. President of Al Al-Bait Foundation, Secretary General of IAS, and President of the Jordan University of Science and Technology.

- The Seminar will be organized by Al Al-Bait Foundation in cooperation with IAS.
- A rationale paper shall be jointly prepared by IAS and Al Al-Bait Foundation as a general framework for the envisaged coordination and cooperation.

The rationale paper was prepared and distributed to relevant parties. The paper comprises (5) sections titled background, objectives, options of actions, mechanisms of implementation and conclusions. The section on background is a review of the minutes of meetings of IAS-Al Al-Bait Joint Committee.

As for the objectives, the paper envisages that coordination and cooperation among Islamic institutes will hopefully achieve the following objectives:

- Enhancing interaction among institutes, muslim scientists and leaders of thought, towards creating a better environment for dialogue and exchange of views.
- Enriching the input and the outcome of the various activities by facilitating the participation of learned institutes of different disciplines.
- Helping muslim societies in getting acquainted with the potential of each other and thus, initiating mechanics of Inter-Islamic transfer and application of science, technology and knowledge at large.
- Saving of effort and time by avoiding duplication in projects and activities.
- Saving of funds by avoiding duplication in programmes.

Regarding options of action, the rationale paper suggests the following modes of action leaving the door open for other options.

Cooperation; This will have to take the form of bilateral or collective collaboration between concerned institutes on certain issues, projects and activities to yield the desired results.

Coordination; In addition to its role in saving funds, time and effort, more important will be the coordination to ensure better scheduling of activities and thus, expanding the base of participation both qualitatively and quantitatively. Because of lack of information and improper channelling, many activities carried out by Islamic organizations were not incisive and to some extent were unyielding. It is hoped, that Islamic institutes, will identify proper means for information dissemination and exchange of relevant literature to accomplish a meaningful coordination.

Complementary Action; In order to achieve multi-disciplinary and comprehensive programmes, Islamic institutes should embark on complementary actions in implementing their policies. Ambitious projects can be feasible if appropriately assigned to relevant institutes according to their major field of interest. This idea, can be best demonstrated in projects requiring knowledge of both modern sciences and Islamic Shariah.

The section on mechanisms of implementation reflects the hope of the organizers that the seminar will help initiating dialogue on the issue of coordination, cooperation and integration and will also give the con-

cerned parties the opportunity to present working papers on their views regarding this issue. In addition, the paper envisages that the seminar will provide a forum for concerned parties to present specific projects for coordination and/or cooperation.

Depending on the outcome of the seminar, the paper urges the participants to adopt the necessary means to pursue the agreed upon objectives. Among the various means, the paper suggests the following:

- Workshops; Where specialists can meet and discuss details of projects of common interest and set up procedures of implementation.
- Conferences; Concerned parties may wish to organize periodical conferences to review accomplishments and discuss future plans for the following years.
- Funds; Participating institutes, may find it necessary to establish a "Joint Fund" to sponsor their common activities and induce continuity to the process.

The paper concludes with emphasizing that the field of common interest to the Islamic World is vast and that the soil for coordination and cooperation between Islamic organizations is fertile. It also warns that fulfilling the aspiration of the Ummah is a task beyond the reach of any single institute or organization which calls for a coollective, persistent effort.

IAS COUNCIL MEETS IN SEPTEMBER

The 4th IAS Council Meeting shall be held during the period 10-11th September 1988 at IAS Headquarters in Amman. Invitation letters have already been forwarded to IAS Council members as per the instructions of H.E. Prof. Kazi, President of IAS Council.

EDITORIAL LETTER

Despite its glorious past, the Islamic world is facing serious challenges in many areas. Its capability in the field of knowledge in general, and science and technology in particular, is far from being enviable. This has created a widespread consciousness of the need for a concerted, collective and persistent effort to initiate a joint Islamic action for building a strong base of knowledge in the framework of Islamic thought on the course of the revival of the Islamic Civilization. A clear and objective vision of the desired future of the Muslim Ummah, places the issue of building a sizable scientific and technological capability on top of its priorities.

The prevailing conditions in the Islamic World, necessitate solidarity at all levels. The pursuance of this objective should not be hindered as the differences among muslim societies are marginal and don't correlate to the foundations laid by the Islamic faith and the common goals of these societies. Realizing this fact, Islamic learned institutes carry a historical responsibility in taking the initiative to lay grounds for a joint Islamic effort and pursue it for the benefit of the Muslim Ummah.

*The joint action between IAS and The Royal Academy for Islamic Civilization Research (Al Al-Bait Foundations) to organize the seminar on "**Coordination and Cooperation Among Institutes of Research and Studies and their Applications within the Framework of Islamic Thought**" represents a committed step in this direction. The ideas and views expressed in the jointly prepared rationale paper dealing with this issue is an attempt to open wide the door for a fruitful dialogue on mechanics of coordination and cooperation among Islamic learned institutes.*

The objective of envisaged coordination and cooperation outlined in that paper are foreseen to achieve enhancing interaction among Islamic institutes, Muslim scientists and leaders of thought and enriching the input and the ouput of the various activities of learned institutes as well as spreading awareness of existing potential of Islamic countries and initiating mechanics for Inter-Islamic transfer of knowledge, science and technology. Needless to say that coordination and cooperation will also result in saving of effort, time and funds by avoiding duplication in projects, activities and programmes.

Before concluding, we highly commend Al Al-Bait Foundation for their sincere efforts and generous contribution towards bringing this activity to reality and we hope that this initiative will create the desired response and will be a beginning for a long lasting action for the progress of the Muslim Ummah.

The tentative agenda for the 4th meeting includes several important issues. Among these are:

- Headquarters Activities.
- Progress Report on IAS Journal.
- IAS Al Al-Bait joint seminar on coordination and cooperation among Islamic research and studies institutes.
- Financial matters.

The Council shall also finalize arrangements for IAS 1988 Conference on S&T policy for self-reliance in the muslim World which shall be hosted by the Government of the Islamic Republic of Pakistan in Islamabad next December.

SUCCESSFUL OPERATION FOR IAS PRESIDENT

H.E. Prof. Dr. Kazi returned home after a successful operation.

IAS President has been under treatment for some time in a London hospital. The editorial board grasps this oppurtunity to congratulate H.E. Prof. Kazi on his safe return and wish him a healthy life.

HIGHLIGHTS ON THE SCIENTIFIC AND TECHNOLOGICAL POTENTIAL OF TURKEY*

Turkey has established a rather extensive infrastructure in science and technology. However, the overall scientific activities must be promoted to reduce the wide gap with the industrial countries of the world. Political will, strong determination and continuous efforts based on long term goals are needed in science and technology.

- RESEARCH AND DEVELOPMENT STRUCTURE

Research and Development Structure in Turkey is composed of:

a) Universities, b) Public research organizations and c) Industrial research centres in the private and public sectors.

The Turkish system of higher education was restructured as recently as in 1982, when 27 universities were established in Turkey and all of them organically were brought under a centralized body, that of the Council of Higher Education. In universities, there are 183 faculties and 101 institutes. In higher education there are 1962 professors, 3322 dozents, 3396 assistant dozents and 10435 research assistants. The number of teaching personnel is therefore 8680. Two more universities have been established after 1982. In 1987-1988 there were 502888 students in higher education, 360456 students internal and 142432 students external under Open University.

The public research organizations in Turkey include:

a) The Scientific and Technical Research Council of Turkey (TUBITAK), with its Marmara Scientific and Industrial Research Institute, Building Research Institute and Ballistic Research Institute employing a staff of 920 with 420 of them being researchers.

b) The Turkish Atomic Energy Authority (TAEK), with its 2 nuclear research training centres and another in veterinary sciences employing a staff of 490, with 180 of them being qualified researchers.

Both TUBITAK and TAEK are attached to the Prime Minister.

c) Mineral Exploration and Research Institute MTA, attached to the Ministry of Energy and National Resources has more than 1800 scientists and engineers.

d) The Ministry of Agriculture, Forestry and Rural Affairs has

IAS FELLOW PROF. DR. NIMET OZDAS

around 100 research centres with 1524 researchers.

Other public institutions in Turkey which are also involved in research activities are: The State Hydraulic Works, Turkish Highways, The Sugar Company, The Petro-chemical (PETKIM) Industry, and several ministries have research centres.

In the private sector, companies that have established research centres are: The Turkish Bottle and Glass Industry, Cement Research and Development Centres, Koc Holding Research Unit, (Aselsan) Military Electronic Industry Research Centre, TELETAS Electronic Research Centre and a few others with sizeable activities.

- TECHNOLOGY STRUCTURE AND LEVEL

The technology level of a country depends on Industrial Research and Development. The industrial structure of Turkey is characterized by a large number of small and medium sized enterprises. There were some 9334 private sector establishments, 433 public sector establishments (10 or more persons were engaged), and 177034 firms employing 1-9 persons. 44.6% of the manufacturing industries were involved in the production of consumer goods, 43.3% in the intermediate goods and 12.1% in the investment goods. The R and D

survey of 1983 indicated that only 8% of the manufacturing firms are large establishments.

The public sector has been dominant in steel, paper, paper products, tobacco, petro-chemical, engineering products and aluminium. The private sector is involved in consumer goods, textile and clothing, engineering industries, automotive industries, furniture, mineral and electronic industries.

The large holdings import their technologies through patents, licenses, know-how and engineering agreements or have established joint ventures with multinational firms.

Medium sized firms resort to other methods of technology transfer such as the importation of new machinery and equipment, doing reverse engineering and also in house-research or contract research. Marmara Research Institute which is adequately equipped play an important role in developing new technologies specially for the public sector.

1000 licensing agreements were made and 83 joint ventures established until 1981. As some of the engineering industries are of recent years or established after mid-seventies, they are equipped with modern machinery and equipments.

The immediate concern for the Turkish economy is the introduction of software techniques, such as computer aided design and computer aided manufacturing, numerically controlled machine, tool system... etc. into engineering design activities and into manufacturing. This process lies within the technological capabilities of Turkish manpower.

The development of domestic technological capabilities in Engineering and Construction Sectors has reached a high technological level and Turkish companies are competing favourably under any specification with world leaders in their field. In fact, the successful experience of Turkish Engineering Companies in the Middle East markets has increased their acceptability worldwide. Recently Turkish companies have started the construction of large hospitals, hotels, and buildings even in USSR.

In Turkey, Ataturk Dam and related irrigation system which are the key to the large scale and ambitious South Eastern Anatolian Project (SAP) is under construction by a Turkish company.

"The Turkish Science Policy 1983-2003" document was prepared in 1983, after three years work, with the participation of more than 300 scientists, engineers, administrators and with collaboration of the State Planning Organization. However, this policy doucment has not been implemented, nor any other rational policy has been pursued for promoting science and technology.

The absence of a systematic government science and technology policy seems to be largely responsible for low productivity in the research system, and consequently the existing potential is not fully reflected in current levels of technological capabilities.

- HUMAN RESOURCES

According to the R and D survey of 1983, there were about 29000 persons engaged in R and D activities in Turkey. 16955 of them were researchers, 8736 were technical support personnel and 4217 were other supporting personnel.

In terms of the distribution of research personnel with respect to various disciplines, we observe that in the universities, Medical Sciences enjoy a special concentration of manpower followed by Engineering, Basic Sciences, Social Sciences, Humanities and lastly Agriculture. In the government research establishments however, the emphasis is primarily on agriculture. The number of research workers per 10000 of labour force is 4.2. This is a very low figure, less than 10% of the figure for advanced countries.

Publications resulting from research activities and the contributions of each country to the world scientific literature quantively provide another output indicator. The indicator presented here is based on a set of over 2100 highly cited journals.

An analysis of the contributions of some 160 countries show that in 1983 the first 10 countries contributed 82.94% the second 10 countries contributed 9.57%, and the third 10 countries countributed 4.472% of the total scientific publications. The first 40 countries contribute approximately 99% and the remaining 120 countries about 1% to the world literature. In terms of the quality the picture is even worse. Turkey ranks 43rd in this list and has been at this position for the past ten years. It is believed that this is well below its capacity.

- R AND D EXPENDITURE

In accordance with an extensive survey of Turkey's capacity for scientific research and development carried out recently, the total R and D expenditure amounted to $110 million in 1983, making R and D expenditure per GNP ratio 0.24%. Of this sum $62.7 million (57%) was spent by the universities, $30.8 million (28%) by the government

sector and $16.5 million (15%) by industry. These percentages clearly indicate that R and D activities in Turkish industry are inadequate and at a very low level when compared with industrial countries where 2/3 of the R and D expenditures are made by the industry.

- INTERNATIONAL COMPARISON

International comparison in the field of R and D is necessary in order to determine the order of magnitude of the national effort with respect to science and technology.

Certain indicators are commonly used for this purpose:

a) National resources devoted to R and D, research expenditure, and the number of qualified scientists and engineers (Q.S.E).

b) The results of R and D investments, stock of knowledge produced through research and related publications or scientific literature, citations ratios,..., etc.

c) New inventions, patents, data, balance of trade, royalties and fees.

Indicators in (a) constitute the inputs of the research system; while the one's in (b) and (c) the outputs. In other words, the research system may be considered as a system with inputs and outputs. As is well known, the positive feedback is very strong in developed, weak in developing countries. Furthermore, experience shows that exponential inputs are required for (linearly varying) ramp output. In cases where the inputs are kept constant, the outputs fall. The following table gives the R and D expenditures, the ratio of R and D expenditures to G.N.P. and the number of researchers in O.E.C.D. and in a few other countries. The R and D expenditures of industrial countries are very high as can be seen from the table.

The ratio of R and D expenditures to gross national product (GNP) is used to make more meaningful comparisons of science and technology activities between countries of various sizes. R and D per G.N.P. ratio is also indicative of research intensity of a country. The supreme leaders in research have R and D expenditure ratios over 2.5% which was once considered the magic ratio (limiting ratio), in the USSR this ratio is over 3.6%; today the FRG with a ratio of over 2.8% comes second. In contradistinction the above ratio in the developing countries of the world is rather low and on the order of (0.1-0.2)%. The R and D expenditure per GNP for Turkey is 0.24%. This ratio indicates clearly that Turkey is not investing enough in the research system.

Obviously these indicators are not meant to be precised measurements, R and D expenditure, the number of research personnel data reflect only the magnitude of scientific activity and scientific publication counts provide information on just one type of scientific output. Furthermore the institutional structure in science, the efficieny of the information system, the intensity of international relations and the technological structure and level are other important indicators but difficult to quantify.

If the trends of indicators are considered together rather than separately their ability to describe adequately the state of science and technology in a country will be more meaningful.

** Article written by: IAS Fellow Prof. Dr. Nimet Ozdas,*

R & D Expenditures and Number of Researchers (O.E.C.D. 1983)

COUNTRIES	R & D EXPENDITURE $ MILLION	R & D EXPENDITURE G.N.P%	NUMBER OF RESEARCHERS
U.S.A	88976	2,72	722900
Japan	34371	2,56	435340
F.R. Germany	19472	2,54	133114
France	14252	2,15	92682
United Kingdom	13499	2,28	104445
Italy	6022	1,12	63021
Canada	4769	1,36	32780
Spain	1333	0,44	14376
Australia	1793	0,96	24210
Holland	3253	2,03	21550
Sweden	2965	2,48	14227
Belgium	1066	1,37	10943
Switzerland	2124	2,28	17044
Austria	1002	1,24	6712
Yugoslavia	522	0,76	24881
Denmark	672	1,14	7255
Norway	839	1,42	8283
Greece	109	0,21	2441
Turkey	110	0,24	7747

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