SCIENCE AND TECHNOLOGY POLICY IN UNESCO: A HISTORICAL OVERVIEW

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Summary

Since its creation in 1945 UNESCO dealt with the development of scientific knowledge. At that time a strong belief existed that through application of scientific knowledge and technology transfer from the industrialized to the developing countries it is possible quickly rise welfare of society and spur economic transformation of the newly independent countries in need. Development of science and technology potential and devising strong policy became the important priorities of each government. Since early 1950's experts have been sent to the UNESCO's Member states to assist in establishing science and technology infrastructure, improve research performance and planning in the developing countries. The full fledged programme on Science and Technology Policy was adopted in 1964. The programme existed nearly 30 years and contributed in paving the ways for the science's orientation towards national socially oriented objectives. The article analyses the UNESCO's acievements in this field till the termination of the STP programme in 1994.

1. Genesis of science and technology policy in UNESCO.

When the founding fathers of the United Nations Educational, Scientific and Cultural Organizations met in 1945 in London, the old world laid in ruins, with many of its educational, scientific, economic and political institutions shattered or in disarray. The founding fathers who met in London had a vision of the dawn: they believed that conflicts could be prevented through the educational efforts, spread of knowledge and through international co-operation.

"Since wars begin in the mind of men", they wrote in the UNESCO constitution, "it is in the minds of men that the defenses of peace must be constructed". The Organization had been set up, they went on to say, "for the purpose of advancing, through the educational and scientific and cultural relations of the people of the world, the objectives of international peace and common welfare of mankind".

It is a historical fact that the acronym UNESCO narrowly missed not having the "S" for science. The new Organization supposed to deal exclusively with education and culture. The letter "S" was added in November 1945 by the preparatory commission under the pressure from scientists' groups. Joseph Needham, who became the first head of the Natural Science Section of the newly created organization, must be praised for this addition of "S" in the name of UNESCO. The appointment of Sir Julian Huxley, who was himself a distinguished scientist and accomplished popularizer of science, as the first Director General, assured that activities in the field of science would play an important role in UNESCO.

Sir Huxley recognized the potential of science and technology for development in his first publication about UNESCO in 1946. "The application of scientific knowledge", he wrote, "provides our chief means for raising the level of human welfare". These words remain even more valid in our times.

The task of promotion literacy, in general, and science and technology literacy, in particular, has challenged UNESCO since its inception. At the third session in 1948 UNESCO General Conference instructed the Director General of UNESCO to complete the preparation of reports on the popularization of science(which is one of important components of science and technology policy), disseminate them to Member States and to draw the attention of governments to the methods of popularizing science. Said one of the earliest UNESCO publications: "It is impossible to become an effective protagonist in the microelectronic age with large segments of populations remaining illiterate and excluded from political and cultural life". In pursuing this task a famous scientific review Impact of Science on Society, which discussed the problems of contemporary sciences and their impact on life of ordinary people, and understandable to a layman manner was launched in 1950. It was published in eight languages and contributed to raising level of scientific literacy over the world. After more than forty years of its existence it was replaced by a review "The World of Science", the first issue of which appeared in 1994, and became a good educational and informative instrument for policy-makers and researchers. The prestigious UNESCO award for scientific popularization, the Kalinga Prize, named after old Indian emperor, was initiated in 1952. The first Kalinga prize-winner was the Nobel Laureate Louis de Broglie. Among the Kalinga prize-winners were such prominent figures as Julian Huxley, Bertrand Russel, Arthur C. Clarke, Pierre Augier, Alexander Oparin, Sergei Kapitza, Abdullah Al Muti Sharafuddin and many others.

"It is of great importance", wrote Albert Einstein, "to give the great public the opportunity to experience, consciously and intelligently, the efforts and results of scientific research. It is not enough that each result is obtained, prepared and applied by a few specialists. Restricting knowledge to a small group diminishes the philosophical spirit of the people and furthers their spiritual poverty". To me, these words of a genial

scientist and philosopher provide a key to UNESCO efforts in the field of informal science popularization. To raise scientific literacy of society means not only to increase the level of human welfare, but also to boost spiritual level of society and its members, to improve their ability to make multivarious political, environmental and ethical choices with which scientific discoveries and its consequences are confronting, to resist antidemocratic attempts to impose on them wrong decisions, and to promote, through this, the spread of peace and democracy through society.

Profound geo-political changes have taken place in the world after the World War II when the decolonization process began and the emergence of newly independent states ensued. The course of the World War II, that was determined by use of scientific and technological achievements (radar, antibiotics, nuclear fission, operational research), demonstrated the possibilities which science and technology engendered in the reconstruction of society at the end of the war. Hence, an importance of science and technology was widely recognized as a crucial element of national development and a lack of science and technology capacities in the newly independent nations was considered as a major obstacle to the successful economic development. The theoretical works, in particular that of J.D. Bernal about social function of science, has crystallized opinions towards that end. Some economists call this period as a "science push" phase, the main objective of which was the establishment of scientific and technological infrastructure consisting of laboratories, research institutes, universities, and science and technology councils. Governments were ready to spend large expenditures for these purposes. The creation of a famous European Centre for Nuclear Research (CERN) that followed several meetings and an intergovernmental conference organized by UNESCO may serve as a good illustration to those early preoccupations of national governments and UNESCO. On 24 September 1954 CERN's Convention came into force, thus establishing the world's leading fundamental physics research institution. Such "science push" model triggered optimism among the governments of developing countries. They were of a view: once the infrastructure of research and development was created, scientific personnel trained and policy-making institutions put in place much of the development problems could be solved.

2. Science policy consultancy services

UNESCO as well as the whole newly created UN System (United Nations was officially chartered in 1945 at conference in San Francisco, CA, USA) has tried to respond to the pressing needs and demands of their member-countries. Since early 1950's experts have been sent to the UNESCO's Member states in order to submit recommendations for the improvement of science and technology infrastructure, research performance and planning in the developing countries.

A standard procedure for a mission was the following. A consultant proposed by UNESCO's Secretariat and approved by the corresponding government visited a country in question, worked in the country in close relationship with local authorities during a certain period (a medium stay for those consultancy missions was 22 days, as recorded in one evaluation report) and thereafter submitted a report with concrete recommendations. After being considered by a corresponding government and the UNESCO's secretariat a report was eventually approved. According to the existing

rules, the reports from such consultancy missions were not generally available to the public – only from the1960's have reports been available after they were agreed by concerned governments. The first UNESCO consultancy missions were mainly focused on the establishing of scientific and technological infrastructure in the newly independent developing countries.

The 1960's witnessed an emerging interest on the part of governments to science policy. It was the work of scholars (S. Dediger, K. Olszewski, J.D. Bernal, D.de Solla Price, H. Brooks) and of different research groups, which gave an academic and institutional legitimacy to science policy. As F. Sagasti correctly noted, the use of the term "science policy" did not prevent those researchers from undertaking also technology policy issues. Such trend was reflected in the UNESCO's working programmes. The evolution of UNESCO's approaches, operations and formal mandate in science policy can be traced by reference to the science policy resolutions adopted by UNESCO General Conferences. Thus, the twelfth session of the UNESCO General Conference held in Paris in November - December 1962 for the first time included "information on the science policy of Member States" among the priorities of its science programmes. Education and science sectors were established within the UNESCO secretariat. It should be noted that in 1962 the UNESCO memberships counted as much as 114 Member States in comparison with 37 founding Members in November 1945.

UNESCO actively participated in the preparation of the important international event in 1963 , the United Nations Conference on the Application of Science and Technology for the Benefit of the Less Developed Areas (UNCAST), organized by the UN secretariat in collaboration with UNESCO. This conference was regarded as an initial step in focusing the UN system on science and technology policy as an important instrument in attaining the development goals. According to Juma, it was based on the view that the developing countries could "leapfrog" across various development stages by adopting technologies developed in the industrialized countries. (more details about UNCAST can be seen in the article about STP within the UN system).

A very important milestone at the thirteenth session of UNESCO General Conference (12 October-20 November 1964) was a decision to accord the UNESCO's programmes on natural sciences and technology an importance similar to that given to education. Member States were invited to formulate and implement national science policies with a view to increasing their scientific and technological potential, to improve science teaching at all levels. So, to be able to give effect to new orientation for science programmes, the divisions dealing with science received increased budgetary allocations and their reorganization was embarked upon. The full fledged programme for science and technology policy was worked out, the corresponding Division was set up. Yvan de Hemptinne, a chemical engineer and a functionary from Belgium was appointed as the first Director of Science and Technology Policy Division (STP) of UNESCO.

Lack of political constituency for the representation of science and technology in government affairs of newly independent countries was the major reason why the emphasis of the UNESCO's science and technology policy programme in the sixties

and early seventies was mainly in the establishment or strengthening the governmental machineries for science and technology policy –making.

According to the UNESCO reports released early in 1980s, after 20 years of offering advisory services to more than 80 Member States , the situation in this field has changed and by the mid- seventies a majority of the developing countries was equipped with governmental structures for the formulation of their national science and technology policies. The examples are many: the « Consejo Nacional de Ivestigaciones cientificas y tecnologicas» (CONICIT) was established in Venezuela by the law of 26 June 1967, the Tanzania National Scientific Research Council was established by the Government Act in October 1968, the Nigeria Council for Science and Technology (Federal Military Government Decree of 3 February 1970) which has been replaced in 1977 by the National Science and Technology Development Agency (Federal Military Government Decree of 20 January 1977) and later transformed into a Ministry for Science and Technology (National Science and Technology Act, 1980), the National Council for Research (NCR) of Sudan was set up by the Governmental Bill of 15 April 1970, the "Centre National de Planification de la Recherch Scientifique et Technique" of Morocco (Dahir No 1-76-503 of 5 August 1976).

These activities have been substantially increased after the 1979 UNCSTD. In 1985 UNESCO reported that the number of developing countries and intergovernmental organizations which benefited from UNESCO's advisory services in science and technology policy after UNCSTD were: in 1979 -1980- 26 Member States and five regional organizations, in 1981-1983 -51 Member States and four regional intergovernmental organizations and in 1984 - 20 Member States and two regional intergovernmental organizations. These services mainly related to the preparation of scientific and technological development plans and budgets consonant with the overall development plans of the countries concerned.

UNESCO secretariat has always emphasized that UNESCO did not apply a "blue-print" in its consultancy work. The needs and wishes of a government in question guided the work of an expert but not preconceived models. Among the UNESCO's consultants were the representatives of different school of thought and partisans of different economic models. Nevertheless, in spite of remarkable achievements in the efforts to strengthen national science and technology policy potential, some criticism about UNESCO's high reliance on the role of central planning bodies and perhaps a kind of simplistic, institutional planning philosophy could be heard. The critics said that the established national system had frequently become too bureaucratized and incapable in providing leadership in the field of science and technology policy.

UNESCO not only assisted in establishing national science policy-making machinery but also monitored changes that occurred in this field with a view to meet better the changing needs of developing world. One of the notable world trends in the mid 1960s and 1970s was the growing regionalization of scientific and technological co-operation including the setting up of regional instruments or mechanisms for the programming and financing of scientific and technological development. Regional groupings of Member States were increasingly formed in various parts of the world. This trend towards close association of countries belonging to the same (sub-) region raised the

problem of harmonization or even integration of their national policies in many fields which are normally the sovereign province of the partner governments. UNESCO assisted these associations of Member States, sometimes with the financial support of UNDP or other financial institutions, with a view to elaborating and implementing science and technology policies for such communities of States. The fruitful work was carried out with the West African Economic Community (CEAO), the Convenio Andres Bello (SECAB), and Association of South-East Asian Nations. The setting up of the Caribbean Council for Science and Technology (CCST) is a sound example of the UNESCO's efforts in the regions.

In 1979, a group of Caribbean countries approached UNESCO and UNDP for help in planning their scientific and technological developments. UNESCO arranged for a six-month work of a consultant whose advises were implemented by the countries. Furthermore, the UNESCO Secretariat proposed draft statutes for the Caribbean Council for Science and Technology (CCST), an independent intergovernmental organization. The CCST held its inaugural meeting in Barbados from 29 June to 3 July 1981. Its inauguration was a culmination of a number of UNESCO sponsored (sub-regional) consultations and advisory missions. At the time of inaugural meeting eight countries- Cuba, Dominica, Grenada, Guyana, Jamaica, St. Lucia, Suriname and Trinidad and Tobago- had accepted to membership. Currently the membership in the Caribbean Council for Science and Technology has grown to encompass 16 member countries of the wider Caribbean.

The overall objective of the CCST, as it stands now, the development of cooperation in the field of science and technology. Among key areas of activity of CCST are the promotion of science and technology programmes in member countries, science and technology popularization, renewable energy and others. CCST is unique among intergovernmental science and technology bodies. Its members are nominated by the governments. Each member country is entitled to designate two Council members, one of whom must be a scientist chosen by the respective government from amongst senior officials of national bodies responsible for science and technology policies, or of national science and technology research councils, or, where such bodies do not exist, from amongst leading scientists or engineers, the universities, appropriate professional associations or the productive sector**.** One member sits in his/her personal capacity while the second Council member may be a governmental representative. A small CCST Secretariat updates researchers, planners and policy and decision makers from the region on its activities and topical science and technology-related issues via its quarterly newsletter - the Caribbean Council for Science and Technology Newsletter.

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Biographical Sketch

Vladislav P. Kotchetkov is a consultant to the UNESCO. He graduated from the Moscow Higher Technological University in 1959 and worked on satellite and missile technology. In 1969 he was awarded by the USSR Laureate State Prize. He received a diploma *cum lauda* in international economics from the USSR Foreign Trade Academy in 1977 and worked as a Director of a Division of International Scientific and Technological Co-operation for the USSR State Committee for Science and Technology. He was involved in the preparation of the 1979 United Nations Conference on Science and Technology for Development (UNCSTD), was a Secretary of the USSR Preparatory Committee for UNCSTD, represented the country at the sessions of the UNCSTD Preparatory Committee, was elected as a Rapporteur at the European Regional Conference for UNCSTD in Bucharest in 1978 and participated in the Vienna Conference in 1979. From 1980 he has been working for the UNESCO Science and Technology Policy Division, was a Chief of the UNESCO Science, Technology and Society Programme

and a UNESCO representative at the UN inter–Agency Task Force on Science and Technology for Development. He also served as the Executive Secretary of the Moscow International Energy Club, of the UNESCO International Council for Scientific Communication, the UNESCO representative at the IUCN Commission on Education and Communication. He is a member of the UNESCO-EOLSS Joint Committee.