REVIEW OF SCIENCE AND TECHNOLOGY STATUS IN IRAN

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Abstract - The experiences by different societies reveal that consistent social and economic development results from the development of science and technology, and that the latter takes place only in a process that includes: comprehensive policy making; precise planning; determining relevant strategies and finally the effective implementation of plans in different areas. Providing a clear picture of science and technology status is an essential requirement of this process. For this reason, this paper seeks to discuss, as far as possible, different aspects of S&T in Iran based on a rather comprehensive set of indicators i.e. Human Resources indicators, Financial indicators, Performance indicators and finally Productivity indicators. The objective is to review, based on the information available, the changes occurred during the years 1996, 1998 and 2000. Also, statistics of S&T in Iran is compared with those of other countries.

Keywords - Science & Technology, Assessment, Indicators, R&D, Iran.

INTRODUCTION

The ever-increasing importance of science and technology, as the basis of social and economic development, has assigned a special status to topics related to S&T, i.e. the philosophy of S&T; the forecasting of S&T and finally the management of S&T.

Amongst the above items, the assessment of science and technology has special features which make it distinct from the other items. Such an assessment aims at providing a clear and factual picture of the status of S&T in each country and analyzing the factors involved using scientific methods.

The assessment program is more than a mere illustration of facts. It, in fact, also provides a kind of evaluation and judgment as it tries to shed lights onto the future using experiences received from the past. Therefore, this kind of assessment is an introduction to the research status of Iran in the future as it is an inseparable part of policy making and devising procedures and programs concerning S&T. Thus, such an assessment might well be labeled as an applied branch of science with a lot of advantages and uses. In fact, these advantages have made assessment an important process in any kind of development, and this well justifies why different countries, international organizations and private institutions

are using it so often and are benefited its results.

The history of the assessment of S&T goes back to four decades ago. Such assessments are, nowadays, made consistently in industrial countries by private and governmental sectors. In recent years, some developing countries have also started such endeavors. Some international institutions issue such reports consistently. Nevertheless, such endeavors are at their early stages in Iran. Apart from the useful reports dealing with cultural, educational and research activities, in Iran, the approval of the indicators related to the assessment of S&T by the High Council for Cultural Revolution, was a turning point in the identification of Iran as a country that pays a lot of attention to such assessment programs [11].

Using the statistics issued by Iran's Census Bureau about research and development centers in 1997, 1999 and the year 2001 [12,13,14], and the Government's Performance Report, the Law and the Budget Report, etc., statistics related to Macro indicators of science and technology were extracted and analyzed, which ultimately gave way to the compilation of the paper.

HUMAN RESOURCES INDICATORS

Trained human resources are generally regarded as the essential force behind development in societies. Researchers and their supporting work force engaged in the advancement of S&T, play an even more significant part in the process of development. Consequently, a precise and comprehensive assessment of the employed human resources, engaged in research is most essential. Research personnel can be divided into four categories: researchers, research assistants, technicians, office employees and support groups.

Table 1: Human resources indicators data.

Column	Human Resources indicators		1996		1998		2000	
1	Total researchers per million population		258		245		390	
	Total researchers, including students of higher education writing their M. A. and Ph. D. theses, per million population		678		663		842	
2	Total research personnel per million population		669		755		766	
3	Total researchers as a percentage of total research personnel		38.5		32.4		51	
4	Total research assistants as a percentage of total research personnel		17		15		11	
5	Total research assistants as a percentage of total research personnel		13.7		18		10	
6	The number and percentage of researchers in each discipline (Full-Time researchers)	Chemistry and Biology	261	3.7%	493	4.1%	872	5.8%
		Engineering and Technology	2578	36.2%	4558	36.7%	6285	42%
		Agricultural Sciences	2003	28.2%	3728	30%	3433	23.1%
		Medical Sciences and Pharmacology	572	8.1%	1492	12.1%	1403	9.5%
		Other Natural Sciences	300	4.2%	572	4.4%	450	3%
		Sociology and Psychology	346	2.1%	226	1.6%	292	2%
		Economics	76	1%	94	0.8%	186	1.2%
		Law	20	0.3%	46	0.3%	101	0.7%
		Linguistics and Languages	153	2.2%	148	1.2%	282	1.9%
		Other areas of Humanities and Social Sciences	761	10.6%	931	0.8%	1400	9.4%
7	The growth rate of researchers (%)		-		-1.8%		64%	

Source: Statistics presented by Iran's Census Center for: 1997, 1999 and the year 2001.

As shown in Table 1 and based on the reports, there were 258, 245 and 390 researchers per million population for the years 1996, 1998 and 2000 respectively. This number increased substantially for the year 2000 due to the policies exercised by the government to boost research in the country. Some of these are as follows: The *Ministry of Mines and Industries'* endeavor to increase the number of research and development centers in industrial institutes; appropriation of budget for implementing high-priority research oriented projects – the so called, *National Projects;* making research centers more brisk; absorbing researchers to these centers and changing the number of personnel, with different

specialties, working in such centers.

A glance at the statistics related to the years 1992-4 (these statistics also appeared in *the National Research Report*) indicates a 130% increase in the year 2000 in the number of researchers compared to 1992.

In some international reports, by UNESCO for example, students of higher education who are writing their theses and dissertations are also included among researchers [7]. The same procedure was adopted by the present paper to guarantee the feasibility of comparisons between statistics related to Iran and those related to the international society. The number of such students increased significantly between 1992 and 1995, but underwent a slight change between 1996 and 2000.

The number of Iranian researchers, including students of higher education, increased significantly between 1992 and 1996. The rate of this growth fell slightly in 1998, but picked up again in the year 2000. In 1996, 1998 and 2000, there were 669, 755 and 766 individuals involved in research per million population. As reported in the National Research Reports, there were 520, 571 and 629 research personnel in Iran between 1992 and 1994. Finding out the percentage of researchers and comparing it with those related to research assistants and technicians reveals that these percentages have not remained unchanged during the past years. In the year 2000, there was a decrease in the number of technicians and research assistants, but an increase in the number of researchers. The increase found could be due to the employment of new research personnel and their acquiring of higher academic degrees. On the contrary, the decrease found could be due to scarcity of good job opportunities for research assistants, with B.A./B.S. degrees, or technicians with A.A. degrees especially in the areas of engineering and technical fields.

The fields of Engineering and Technology, Agricultural Sciences, Social Sciences and the Medical Sciences have the highest number of researchers, respectively. In the field of Engineering and Technology, the number of researchers remained rather unchanged between 1996 and 1998, but this number increased significantly in the year 2000. Within the field of Agriculture, a remarkable decrease was found in the number of researchers for the year 2000.

In general, in the fields of Engineering and Technology, Chemistry and Biology an increase in the total number of researchers was observed for the year 2000. However, in other areas, for the same period, either no change or a decreasing trend was noticed.

One of the most important human resources indicators regarding the country's Macro Assessment of Science and Technology has been the number of researchers per million population. In Iran this number was 678, including students of higher education writing their theses, for 1996. This number is very low compared to statistics related to the world indicator for 1996-7. For example, there are 4909 researchers per million population in Japan [2]. The number is 3801 in Russia, and 2476 and 3698 in EU and US, respectively.

On the contrary, there have been 537 and 946 researchers in Asian countries and the world during the same period.

A comparison of statistics related to Iran with these numbers reveals that, on the average, there are more researchers, in Iran, than in Asian countries, though this number is less than that related to the world at large. Statistics also show that newly industrialized Asian countries, such as China and India, fall behind Iran in this regard.

A comparison of Iran with other countries reveals that the growth rate observed in Iran has been more than other countries and that this was achieved because of the attention paid to the training of experts in the fields of S&T.

As observed in tables related to human resources indicators, we witnessed an acceptable growth rate in 2000. This achievement could have been due to the attention paid to research and technology in the country's *Third Development Program*. Basically, paying attention to the development of science, technology and research has been one of the major characteristics of *the Third Cultural, Social and Economic Development Program* compared to the previous programs. This claim could be supported if we take into consideration Articles 99-103 in *the Third Development Program.*

Having observed such findings, we can conclude that regardless of the problems encountered, Iran will witness an acceptable growth rate in the areas of S&T if it moves with the same speed into the future.

FINANCIAL INDICATORS

Investing in the areas of *Information Production and Application* is one of the most effective ways of achieving better technologies. On the one hand, this kind of investment is a function of variables like economic growth, production, etc. On the other, economic growth and production have close relations with investments in the area of the sciences. In Iran, research is mainly dependent on budgets appropriated by the government. There are no reports on private sector investment in research.

The total research budgets for the years 1996 and 1998 were 693345348 and 968979600 thousand rials and that for the year 2000 was 1800173723 thousand rials [1]. As shown in Table 2, we observe an increase in the research budgets related to the above years. The growth rate, though minuscule, is satisfactory in comparison with the international statistics.

Table 2: Financial indicators data.

column	Financial indicators		1996	1998	2000
1	Total governmental research budget (Thousand rials)		693345348	968979600	1800173723
2	Governmental research budget growth (%)		the base year	40	160
3	Governmental research budget as a percentage of total GDP		0.31	0.3	0.29
4	Governmental research budget as a percentage of total government's budget		1.13	1.1	1.4
5	The different research sectors' budgets as a percentage of total research budget	Society	4.13	3.83	5.96
		Culture and education	1.43	2.05	3.62
		Rural and urban housing and development	1.43	1.03	1.14
		Universities	28.11	27.93	35.20
		Agriculture and natural resources	39.5	38.2	30.2
		Energy	15.13	17.2	2.5
		Industry	4.8	3.9	12.60
		Transportation and communication	1.2	1.95	0.38
		Trade and economic services	0.6	0.5	4.82
		Army and defense	2.9	2.64	1.98
		Information and informatics	00	0.2	0.1
		Provincial budgets	0.9	0.8	2

Source: The 1995-2000 budget laws, the Plan and Management Organization and the Government's Performance Report.

All the budgets mentioned above have been categorized, in the budget law, under the term, *'research'*. In practice, budgets extracted from other sections are also appropriated for research. Thus, the total amount of budget appropriated is actually higher than that indicated in Table 2.

The amount of budget spent on research in 1998 was 40% more than that related to the year 1996. Similarly, the research budget related to the year 2000 was 160% more than that for 1996. At first glance, this rate of increase might seem acceptable. However,

considering the rate of inflation in the country, it could only be claimed that we have just had a 42% increase for the year 2000, compared to 1990.

In 1996, the whole research budget comprised only 0.31% of the total GDP. This number fell to 0.30% and 0.29% in 1998 and 2000 respectively. Looking at the research budget and its decreasing percentage points within the GDP will clearly reveal that the growth, which occurred in the research budget, is lower than that of the GDP.

A glance at budgets of different sectors (within the total GDP) in 2000 indicates that the sector on *Services* devoted the highest proportion of the budget to itself (48.1%). Other sectors such as *Oil*, 22.4%, *Mines and Industry*, 17.8%, and *Agriculture*, 12.9%, ranked second to fourth. These findings show that the *Production* sector was able to allocate a small part of the GDP to itself. The situation is even worse in the *Research* sector, with just a 0.3% involvement in the GDP. These numbers indicate that research endeavors in Iran have not contributed effectively in the GDP.

It goes without saying that production rather than services must be focused within the GDP if we are to obtain a sustainable economy. Furthermore, it will not be possible to boost production unless we pay serious attention to research. Therefore, the portion allocated to research within the GDP must be substantially increased. Even if the goal set in *the Third Development Program* is achieved, that is 1% of the GDP, there will still be a significant margin between Iran and the developed and developing countries of the world.

The sector on *Agricultural and Natural Resources* (this includes the research budgets related to agriculture, water and natural resources) has appropriated a great part of the research budget to itself. Of course, budget restrictions in this sector for the year 2000 reduced its standing and ranked second among other sectors.

No doubt, the main bulk of research is carried out at the universities. In fact, universities are where the majority of researchers are at work. Nevertheless, in the year 2000 the sector of *University Research* appropriated about 35% of the whole research budget to itself. (This sector made use of the budgets related to universities, institutions of higher education, research centers related to the Ministry of Science, Research and Technology, Ministry of Health, Treatment and Medical Education and finally institutes affiliated to the Presidential Office.

The budget distribution pattern in 1996 and 1998 remained rather unchanged, but in the year 2000, it underwent drastic changes. In fact, for the year 2000, a substantial decrease was observed in the role played by *Agricultural, Natural Resources* and *Energy* within the total research budget. That was while the budgets related to the areas of *Industry, Economics and Trade Services* as well as *Industrial and University Research* increased significantly.

A comparison of Iran with smaller north European countries as well as the Common-Wealth countries reveals that in the year 1997 Iran spent a smaller percentage of its GDP

on R&D. Sweden appropriated the highest percentage of its total GDP for research in 1997. Japan (2.9%) and U.S.A. (2.6%) ranked second and third, respectively [4,15]. On the global scale, 1.6% of the total GDP is spent on R&D activities. This number is 1.1% and 0.6% for newly-industrialized Asian countries as well as developing countries, respectively. Among all the countries discussed, Arab countries ranked last, with no more than 0.2%. Similarly, Iran stood just above the Arab countries with 0.3%. This finding reveals that Iran has spent comparatively less budget on research than most countries.

In Iran, the per capita budget appropriated for each researcher, in 1996, was 7600 U.S. dollars. At that time each U.S. dollar was equal to 2200 rials. Of course, the actual amount of budget spent is a bit higher due to subsidies paid by the government on the purchase of equipment needed for carrying out research. This is while, the per capita budget for each researcher in United States is 203000 U. S. dollars, 26 times the number calculated for Iran. This number is 85000, 58000, 29000 and 24000 U.S. dollars for Asian countries, developing countries, Africa and the Arab world, respectively. A comparison of statistics pertaining to Iran and the world marks Iran as a country with severe research budget restraints.

Investing in the areas of *Information Production and Application* is one of the most effective ways of achieving better technologies. On the one hand, this kind of investment is a function of variables like economic growth, production, etc. On the other, economic growth and production have close relations with investments in the area of the sciences.

In Iran, research is mainly dependent on budgets appropriated by the government. There are no reports on private sector investment in research. The percentage of the research budget appropriated by the government, in the total GDP varied between 0.29 and 0.43 for the years 1996 – 2001. This indicates that during this period spending on research remained rather unchanged and the government did not pay enough attention, for one reason or another, to this area.

PERFORMANCE INDICATORS

The performance indicators in the Macro Assessment of Science and Technology provide us with information like: the role of the country in the production of science; its contribution in expanding the borders of knowledge, and the extent to which research expansion policies have led to successful and practical outcomes.

As shown in Table 3, there were 11420, 13757 and 19770 active research projects for the years 1996, 1998 and 2000. The above statistics indicate a substantial growth, 70%, in the total number of research projects for the year 2000, compared to 1996.

Table 3: Performance indicators data.

Column	Performance indicators		1996	1998	2000
1	The number of active research projects		11420	13757	19770
2	The number of completed research projects	Basic	1858	2181	2614
		Applied	7134	10775	9930
		Developmental	1474	3030	1863
3	The basic research projects as a percentage of total active research projects		14	20	17
4	The applied research projects as a percentage of total active research projects		74	63	72
5	The developmental research projects as a percentage of total active research projects		12	17	11
6	The published articles in Iran's scientific journals		5433	8207	9627
7	The published articles in international scientific journals		1515	2184	1988
8	Patents		205	262	663

Source: Census report on R&D endeavors, Iran's Census Bureau, 1997, 1999 and 2001, Center for Registration of Documents and Real Estate.

From among 11420 research projects in 1996, 1562 were basic and 8471 and 1387 research projects were applied and developmental. In 1998, the number of active research projects reached 13757 from which 2745 were basic and 8707 and 2305 were applied and developmental. Similarly, in the year 2000, there were 19770 active research projects – 3346 basic, 14246 applied and 2178 developmental. The above data reveals that about 70% of all research projects were applied and that basic and developmental research projects ranked second and third, respectively.

Table 3 indicates that basic research projects constituted 14%, 20% and 17% of the total number of active research projects for the years 1996, 1998 and 2000, respectively. This finding shows that the percentage of such projects increased consistently during the period under study (1995-2000). With respect to the active developmental research projects, studies show that there were varying numbers of such projects for the years 1995, 1997 and 2000. As indicated in Table 3, in 1996, all active research projects were developmental. This percentage rose to 17% in 1998, but fell again to 11% in 2000.

The area of Agriculture devoted the highest number of active research projects to itself in 1996 (with 4493 cases, 39.3%), 1998 (with 5842 cases, 42.5%) and 2000 (with 8108 cases, 41%). The findings concerning the subject area of Engineering and Technology were as follows: the year 1996 (28%), the year 1998 (24%) and the year 2000 (26.4%). This area ranked second after Agriculture. Studies carried out on active research projects

revealed that the two areas of Agriculture and Engineering & Technology embodied the largest number of active research projects. This was exactly the case with completed research projects (Table 4).

Table 4: The active research projects in terms of different disciplines (%).

Discipline	1996	1998	2000
Physics	3.2	0.76	0.8
Chemistry and Biology	4.5	3.8	4
Engineering and Technology	28	24	26.4
Agricultural Sciences	39.3	42.5	41
Medical Sciences and Pharmacology	11.1	12.7	12
Other natural sciences	3.5	1.9	2.3
Sociology and Psychology	2	2.8	1.4
Economy	0.9	0.98	1.2
Law	0.32	0.42	1.08
Linguistics and Languages	0.8	1.4	1.25
Other areas in Social Sciences and Humanities	6.3	9	8.5
Total	100	100	100

In 1996, 6948 articles were written and published by Iranian researchers, from which 1515 articles were printed in international scientific journals and the rest in Iranian scientific journals. Similarly, in 1998, a total of 10391 articles were published – 2184 articles in international scientific journals and 8207 articles in Iranian journals. Finally, in 2000, 11615 articles were written – 1988 articles appeared in foreign scientific journals and the rest in Iranian journals of the ranks mentioned above. In general, it can be concluded that the number of published articles is on the increase as the years pass by.

Two factors that play an important role in increasing the number of articles have been the emergence of new majors at higher education levels as well as the support and encouragement given to those who publish articles. Of course, two types of expansion occurred in higher education programs: (1) in terms of the number of M.A. and Ph.D. students and (2) in terms of the number of new majors added. Therefore, any improvement made in this area will improve the number of articles published in Iranian and international journals. Furthermore, adopting, motivating and encouraging policies will remarkably increase the number of articles published by Iranian researchers in foreign journals.

As indicated in Table 5, the two areas of Engineering and Technology as well as Agriculture, ranked first and second with respect to the number of articles published in foreign journals. (i.e., in the year 2000, researchers of these two groups published 550

(27%) and 320 (16%) articles in international journals, respectively.

Table 5: The articles published in international journals in each discipline (%).

Discipline	1996	1998	2000
Physics	12.3	7	8.7
Chemistry & Biology	13.5	8	18.5
Engineering and Technology	32.2	42	27
Agricultural Sciences	13.5	14	16
Medical Sciences and Pharmacology	7.7	14	13.5
Other natural sciences	6.7	8	9.4
Sociology and Psychology	0.5	0.3	0.7

An analysis of the articles published in Iranian scientific journals in 2000, Table 6, shows that the two groups of Agricultural Sciences as well as Engineering and Technology rank first and second with 2208 articles (22.9%) and 2176 articles (22.6%), respectively.

Table 6: The articles published in Iranian scientific journals in each discipline (%).

Discipline	1996	1998	2000
Physics	3.5	1.1	1.7
Chemistry and Biology	5.3	5.6	6.5
Engineering and Technology	26.8	26.3	22.6
Agricultural Sciences	23.8	15.2	22.9
Medical Sciences and Pharmacology	12	18.3	15.5
Other natural sciences	4.6	3.5	5
Sociology and Psychology	2.7	2.5	2.4
Economy	1.2	1.4	1.5
Law	1.3	1	1.6
Linguistics and Languages	3.2	3.9	3.9
Other areas in Humanities and the Social Sciences	15.7	21.1	16.5
Total	100	100	100

The world's total scientific productions indexed in ISI were 1164627, 1408 cases of which were related to Iran, for the year 2000. In 1993, the total number of Iran's scientific productions, indexed in ISI, was 323. This number rose to 1041 in 1998 – a three-fold increase within five years. The statistics collected recently reveal that this contribution has increased to 2266 during 2002 [5].

Considering the scientific productions of different countries, while keeping an eye on their varying populations, reveals that Iran's contribution to scientific production in the world was 0.12 for the year 2000 – Iran embodies about 1% of the world's total population.

Among the fifty-two OIC member countries, Turkey and Egypt, with 0.54 and 0.21, ranked first and second in this respect. An overview of statistics related to the year 2000 shows that the sum total contribution of the seven major Islamic countries (Iran, Turkey, Saudi Arabia, Egypt, Kuwait, Iraq and Pakistan) was 11713 (1.26%), which is lower than the contribution of a country like South Korea (14814, 1.3%). [8,9,10]

The largest contribution in ISI was related to Basic Science with 718 cases, (about 52%) more than 50% of which were related to Chemistry. This is while the area of Agriculture received the largest amount of investment. After Basic Sciences, the areas of Medical Sciences and Engineering jointly ranked second with 279 (20%) scientific productions. And finally Humanities ranked last with 22 scientific productions [3]. One point of great importance is that although researchers, in the area of Humanities have published a large number of articles in domestic journals, for a number of reasons just few of their articles have been indexed in ISI.

In the year 2000, the largest number of citations was made to articles related to the area of Basic Sciences (1385 citations, 73% of all citations, were related to this area). The two groups of Medical Sciences (288 citations) and Engineering (145 citations) ranked second and third. Of course, more citations were made to articles in the area of Medical Sciences, although the total number of articles published in each area was the same. Finally, the two groups of Agriculture & Veterinary Medicine as well as Humanities ranked fourth and fifth with 65 and 15 references.

The number of Iranian patents between 1996 and 2001 reveals that there were 205 patents in 1996. In 1997, no remarkable increase was observed, but in 2000 and 2001 a 300% increase was acquired compared to the year 1996. When compared with global statistics, this improvement is found to be really small. For example, in 1999, there were 30049 patents in France but just 310 cases in Iran.

PRODUCTIVITY INDICATORS

With regard to the indicator, *"the number of articles per one hundred researchers"*, a decrease was observed for the year 2000 compared to the year 1998. One reason for this decrease was, as mentioned earlier, an increase in the number of researchers. Based on this indicator, during 2000, 47 articles were published in domestic and foreign journals - 39 articles in Iranian scientific journals and 8 articles in foreign scientific journals. Statistics related to the year 2000 indicates a 27% decrease in the number of articles published in domestic journals. Similarly, the number of articles published in foreign journals fell from 14, in 1998, to 8 in 2000.

A comparison with global statistics reveals that Iran is weak in this area. For example, in 1999, the number of scientific articles indexed in ISI, by one hundred researchers was 2.6. The number was 5.5 for China.

In the year 2000, total research budget per research personnel at current prices showed a 77% increase compared to 1998. This growth rate, though satisfactory at the national level, is far behind the growth rate at the global scale. In 1998, the proportion of the total research budget per research personnel was 4155.5 U.S. $ in Iran. In South Korea, this indicator was 134497 U.S. $ in 1999. In other words, the average amount of budget appropriated for each researcher in South Korea was 30 times higher than that in Iran.

The number of research centers in Iran increased in the year 2000, and subsequently the total research budget per research center increased. This amount rose from 461,308,000 rials in 1996 to 659,646,000 rials for the year 2000, which is a 43% increase.

Table 7: Productivity indicators data.

Column	Productivity indicators	1996	1998	2000
1	Number of articles per one hundred researchers	45	68	47
2	Number of articles published in Iran's scientific journals per one hundred researchers	35	54	39
3	Number of articles published in foreign journals per one hundred researchers	10	14	8
4	The government's research budget per researcher. (thousand rials)	44848	63812	72180
5	The government's research budget per completed research project. (thousand rials)	66247	60614	124951
6	The government's research budget per research center. (thousand rials)	461308	448187	659646
7	Number of active research projects per one hundred researchers.	74	91	66

Source: Statistics related to Iran's R&D activities, Iran's Census Bureau, 1997, 1999, 2001; Iran's Budget Law, 1995-2001.

One of the most important indicators in the Macro Assessment of Science and Technology concerns the research budget per researcher. In 1998, the total research budget of Iran with 41106 researchers, including graduate students who were writing their theses, was about 302286570 U.S. $, i.e.7353 U.S. $ for each researcher. This is while in Japan the budget per researcher during 2000 was 143756.7 U.S. $. It should be noted that the budget appropriated by Japan for each researcher is twenty times that appropriated by Iran.

The research budget per research personnel is another important Productivity indicator. This proportion was 103056.7, 102298.6, 134497.4 and 62300.3 U.S. $ in Japan, Germany, Korea and Spain for the year 2000, respectively. In Iran, however, the number calculated was more than 4155.5 U.S. $ in 1998 [6].

An analysis of the average amount of budget appropriated for each completed research project, Table 7, reveals that the budget rose from 66247000 rials in 1996 to 124951000 rials for the year 2000. The average amount of budget appropriated by the government for each research center was 461308000 rials, in 1996. This amount fell to 448187000 rials in 1998 but rose to 659646000 rials, a 47% increase, in the year 2000. Taking into account the inflation rate, this increase cannot be regarded as satisfactory. In 1996, each research center had, on the average, 7.6 active research projects. No substantial change was observed in 1998 and 2000. There were 74 active research projects for each hundred researchers in 1996. This number rose to 91 in 1998 but fell to 66 during 2000.

CONCLUSIONS

Theoretically, science has acquired high status in the Islamic and Iranian culture. Iran's luminous scientific history proves that science has always been under Iranians' particular attention. The assessment of S&T indicates that Iran has the potential, as well as human resources and facilities to enhance the status of S&T. However, Iran falls still far behind the achievements of successful countries and even lower than the average global level. Iranian researchers still play a small role in the production of science in the world and face problems in publicizing their scientific productions, particularly in applied and non-natural sciences disciplines.

Nevertheless, very rapid improvements have been observed in some indicators of S&T in recent years: compared to the past years, Iran is performing much better at the moment. Despite the strong interest of Iranians to attain higher education levels, factors including lack of sustained motivations and stimuli have made Iran's long term scientific production rather unstable. Although some important improvements have been observed in the quality of scientific productions, it is the quantity that is still receiving more attention in the scientific development of Iran.

With regard to areas like technology, science applications, business aspects of science and their applicability, the situation is not satisfactory and, in fact, there is a large gap between Iran and industrialized societies of the world.

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