

Fifty Years of Pakistan Journal of Scientific and Industrial Research - An Overview With Reference to PCSIR Laboratories

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Introduction

Pakistan Journal of Scientific and Industrial Research (PJSIR) completed its fifty years of uninterrupted publication in the year 2007; it started its publication in 1958 as a quarterly. Before going further into the subject matter under review, it seems appropriate to reproduce here 'The Foreword' that appeared in the first issue of the Journal. This Foreword was written by Prof. Dr. Salimuzzaman Siddiqui, the founder Chairman of the Pakistan Council of Scientific and Industrial Research (PCSIR); it describes not only the importance of scientific research in the industrial development of the country but also provides a broad scenario that prevailed in the country at that time and how steps were taken to build up the infrastructure that is necessary for scientific and industrial research. The need for bringing out the Journal of Scientific and Industrial Research is described in the said 'Foreword' alongwith the desire to develop this Journal into a monthly publication 'as early as possible'.

Foreword

"Recognizing the importance of scientific research in the industrial development and prosperity of a country, the Government of Pakistan took early steps to build up an organization for industrial research in the country and the creation of the Department of Scientific and Industrial Research in 1949 under the Ministry of Industries was the first step in this direction. As a result of the activities of this Department, the constitution of Pakistan Council of Scientific and Industrial Research was drawn up with due reference to the structure of the organization in the pre-independence period, and to the special needs and requirements of the greatly changed situation in Pakistan and the Council was established as an autonomous body in April, 1953.

The functions of the Council cover a wide range of activities generally directed towards the promotion and fostering of scientific research having a bearing on the industrial development of the country and utilization of its natural resources to the best economic advantage. While the scope of the activities of the Council has been kept broad and comprehensive, due priority is given to problems, which are of importance to the immediate needs of the country. In the pursuit of such a programme, however, it is generally recognized that, if science is to get a chance of effectively promoting the industrial development of the country, laboratory investigations in both pure and applied fields, followed by research development work on a pilot plant scale, will all have to come under the purview of the Council's activities.

By far the most important among the aims and objects of the Council was the establishment of National Laboratories in the two wings of the country^{**}. On the recommendations of a Planning Committee constituted by the Council, a plan was accordingly worked out for the establishment of four such Laboratories, namely, the Central Laboratories at Karachi, and three Regional Laboratories at Dacca^{**}, Lahore and Peshawar, to take care of industrial problems specific to these areas. These Laboratories comprised 21 functional Research Divisions, allocated among them according to the requirements of the various regions. While the planning and construction of these Laboratories are still proceeding, arrangements were made early for setting up the nuclei of the Laboratories in temporary buildings.

This was considered a matter of importance, because it is only work done and results achieved that can lend meaning and reality to organizational activities and, moreover, the progress of the nucleus phase directed towards the solution of urgent industrial problems of the country would ensure a sound, organic growth of the research organization and its Laboratories. As an indication of the rapid pace at which the activities of the Council have

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***Editor's note*: At that time, there were two provinces of the country, called East Pakistan (now Bangladesh) and West Pakistan; Dacca is now included in Bangladesh.

progressed, it may be stated that, starting with complement of only four research workers in 1953, the staff of the Central Laboratories, which are housed in temporary buildings covering about 50,000 sq. ft. of floor area, has grown to over 280 members including scientific personnel of various cadres and other technical and accessory services. The progress of the three Regional Laboratories, which started about two years later, is following the same steeply ascending curve.

One of the aims of the Council relates to the collection and dissemination of scientific and industrial information. To cope adequately with this sector of its activities, a scientific and technical documentation centre (PANSDOC)* has been recently set up under the Council with the assistance of UNESCO and the association of three UNESCO expert advisers. With the phenomenal increase in the volume of scientific research, keeping pace with scientific literature even in a narrow, specialized field has become a major problem in the advancement of scientific knowledge, and a virtual despair of individual research worker. The establishment of PANSDOC will, it is hoped, considerably relieve the situation by supplying the needed publications to institutions and individual workers in the form of microfilms and photocopies, and also translations of research papers from other languages into English.

Alongside of these activities and the rapid progress made with them, the need for bringing out a Journal of Scientific and Industrial Research under the Council has been increasingly felt. At the same time, however, it was realized that it would be wiser to defer such an undertaking till research contributions from the various Laboratories of the Council and through research schemes financed by it at the Universities and other research institutions of the country had become available in sufficient volume to run the Journal successfully without adversely affecting the publication of the existing Scientific Journals of the country. Happily, as a result of research work carried out under the Council during the last four years over a wide range of problems relating to the development of the natural resources of the country, a considerable volume of publishable material has accumulated, and it was felt that the publication of the Journal could not brook any further delay. It will be initially published as a quarterly, but every effort will be made to develop it into a monthly Journal as early as possible. Such as it is, we are fully conscious

**Editor's note:* Now Pakistan Scientific and Technological Information Centre (PASTIC), a separate organization under the Ministry of Science and Technology.

of the shortcomings of this first issue of the Journal. It is nonetheless hoped that it will be fulfilling an urgent need for the dissemination of scientific and technological information on the one hand, and liaison with industry on the other. The extent to which it may be able to fulfil these dual functions, and further serve as an effective medium for the publication of results of original researches in both pure and applied fields, will be the true measure of its success". (S.S)

Frequency changes and categorised publication. The *Pakistan Journal of Scientific and Industrial Research* (PJSIR) started its publication as a quarterly in the year 1958, then was converted to a bimonthly in the year 1971, which provided greater coverage and also relieved pressure on the Journal as it continue to receive ever-increasing number of research papers. The Publication Branch of PCSIR, established in 1956 at the PCSIR Head Office, launched the quarterly Journal in 1958. The Branch, in 1984, was given the status of Division and, in 1989, after reorganization was upgraded to the present Scientific Information Centre, at par with other independent Centres of the Council. The Centre handles all the matters relating to the Journal, from receipt of manuscripts submitted for publication to the Journal, to their processing, to publishing/printing and distribution of the Journal. Among strict scrutiny on receipt, the papers undergo peer-review which is a sophisticated tool for sifting the original work through review by the experts outside the in-house editorial staff. The process exerts quality control over the researches.

Since 1970, the Journal is being published regularly at bimonthly intervals and has been accommodating papers in diverse disciplines of science and research. A study of the Journal's frequency reveals that since inception, it accepted papers in all disciplines of science. However, since 1970 (vol. 13) the Journal did start assigning publications to the following broad categories:

- i) Physical Sciences
- ii) Biological Sciences
- iii) Technology

This practice is continued currently as well. The major part of the published material in the earlier years was received from the Regional Laboratories of the Pakistan Council of Scientific and Industrial Research (PCSIR). The reason for this was that the country then had only a few Universities, which were not properly staffed and equipped to undertake research activities. Also during that period there were virtually no other S&T and R&D Establishments and hence the work of PCSIR scientists formed the bulk of contribution. With the passage of time, this

scenario slowly changed and currently the Journal receives research work from not only the R&D and S&T Organizations and Universities (over 70) of the country but also from similar establishments abroad.

All the PCSIR Laboratories were sub-divided into various Scientific Divisions in order to pursue activities related to the assigned functions of these Divisions and to avoid duplication at the Laboratory level. As a policy the PCSIR re-organized itself during the decade of eighty and changed all its major Divisions to Centres with a view to achieving better efficiency and facilitating a smooth administration of the expanded Laboratories. Presently three major multi-functional Laboratories of PCSIR are functioning at Lahore, Karachi and Peshawar. Recently, another such Laboratory has been established at Quetta, whereas, the scope of former Solar Energy Research Centre at Hyderabad has been expanded to include other disciplines.

Centres of the Lahore Laboratories Complex

- Applied Chemistry Research Centre.
- Food and Biotechnology Research Centre.
- Material Sciences Research Centre.
- Glass and Ceramics Research Centre.
- Applied Physics, Computers and Instrumentation Centre.
- Centre for Environmental Protection Studies.
- Centre for Development of Laboratory Equipment.
- Engineering Services Centre.

Centres of the Karachi Laboratories Complex

- Pharmaceutical Research Centre.
- Material Sciences Research Centre.
- Food and Marine Resources Research Centre.
- Applied Chemistry Research Centre.
- Centre for Environmental Studies.
- Centre for Development of Laboratory Equipment.
- Engineering Services Centre.

Centres of the Peshawar Laboratories Complex

- Medicinal Botanic Centre.
- Food Technology Centre.
- Material Sciences Centre.
- Engineering Services Centre.

Divisions of the Quetta Laboratories

- Food Technology Division
- Mineral Technology Division
- Chemical Engineering & Pilot Plant Division

Divisions of Hyderabad Laboratories

- Analytical and Consultancy Division.
- Food Preservation and Processes.

- Research Division.
- Rural Development Research Division.
- General Services Division.

Various mono-functional Centres are:-

- Scientific Information Centre, Karachi
- Environmental Analytical Laboratory, Islamabad.
- Leather Research Centre, Karachi.
- Fuel Research Centre, Karachi.
- National Physical and Standard Laboratory, Islamabad.
- Demonstration-Cum-Training Centre, Skardu.

Besides, a Training Centre, namely Pak-Swiss Training Centre was established at Karachi in 1965 to cater to the technical needs of the equipment used for research in the PCSIR Laboratories through training people in such diverse fields as maintenance, repairs and operation of machines. Similar Centres are also operating at Karachi, Lahore, Peshawar and Quetta in addition to a degree awarding Institute at Karachi.

The reorganization as well as the policy changes did not affect the tempo of the assigned responsibilities of the research scientists and technologists and consequently the Journal was regularly provided with the research papers for publication purposes. It is of interest to state here that during the earlier phase, the research staff for the Laboratories, was recruited, and trained both inside on the job and abroad in various Universities, because of this the contributions to the Journal from the Laboratories were largely dependent on the number of research workers available at any given time. In spite of this, however, all Laboratories of the PCSIR continued to feed the Journal for maintaining its regularity and continuity of appearance.

The data collected for the past fifty years of the Journal's publications, in fifty volumes (1958-2007), is presented in Table 1 and the number of publications from all the Laboratories (of the PCSIR) along with other contributing sources is tabulated in it. Similarly the data regarding publications in the earlier stated three categories i.e., Physical Sciences, Biological Sciences and Technology from 1970-2007, is provided in Table 2. It is to be mentioned that after establishment of Bangladesh (BD) in 1971, PCSIR Laboratories at Dacca and Chittagong were taken over by BD. It is evident from the data (Table 1 and 2) that the Laboratories of the Council have been contributing to the Journal not only regularly but also in all the three categories under which the Journal has been publishing the research papers since 1970 onwards.

The Journal published 4986 papers since 1958 to 2007, out of which 813 papers (16.3 %) were contributed by the Lahore, 988 (19.8%) by Karachi, 357 (7.2%) by Peshawar and 113

Table 1. Contributions from the PCSIR Laboratories and other sources to the *Pakistan Journal of Scientific & Industrial Research* (PJSIR)

Volume	Year	Total Publications	Laboratory-wise Publications from				Others (c)	Foreign
			Lahore	Karachi (a)	Peshawar	Dacca (b)		
1	1958	63	2	40	1	15	5	-
2	1959	37	-	17	-	10	8	2
3	1960	57	4	24	4	12	12	1
4	1961	55	2	15	5	7	11	15
5	1962	67	6	18	9	20	10	4
6	1963	77	5	29	21	9	8	5
7	1964	76	9	33	12	6	12	4
8	1965	64	15	24	11	4	10	0
9	1966	104	20	37	20	9	17	1
10	1967	82	17	30	10	2	13	10
11	1968	115	19	41	18	-	30	7
12	1969	115	18	37	18	1	33	8
13	1970	105	17	31	12	6	29	10
14	1971	148	15	44	15	7	48	19
15	1972	127	15	30	13	5	46	18
16	1973	84	12	25	6	-	27	14
17	1974	71	15	12	5	-	28	11
18	1975	68	12	9	9	-	30	8
19	1976	78	12	5	8	-	30	23
20	1977	99	30	7	5	-	32	25
21	1978	65	9	5	3	-	28	20
22	1979	94	31	6	3	-	35	19
23	1980	70	17	8	3	-	24	18
24	1981	54	13	3	4	-	24	10
25	1982	63	10	11	2	-	31	9
26	1983	96	21	11	6	-	38	20
27	1984	97	20	11	7	-	37	24
28	1985	109	22	16	2	-	46	23
29	1986	122	38	27	5	-	38	14
30	1987	240	56	34	7	-	101	42
31	1988	225	41	24	9	-	95	56
32	1989	238	45	52	12	-	90	39
33	1990	157	24	22	11	-	60	40
34	1991	143	25	24	6	-	52	36
35	1992	146	27	12	8	-	52	47
36	1993	151	21	20	6	-	65	39
37	1994	145	20	17	6	-	47	55
38	1995	115	12	18	4	-	40	41
39	1996	52	9	5	3	-	18	17
40*	1997	30	4	4	3	-	8	11
41	1998	70	7	14	5	-	18	26
42	1999	91	14	13	4	-	25	35
43	2000	82	7	27	3	-	21	24
44	2001	88	4	23	4	-	32	25
45	2002	99	11	16	2	-	34	36
46	2003	101	10	13	5	-	30	43
47	2004	96	10	14	9	-	27	36
48	2005	89	10	8	1	-	17	53
49	2006	85	20	11	7	-	14	33
50	2007	81	10	11	3	113	20	37
Total		4986	813	988	357	113	1602	1113

(a) = inclusive of contribution from Head Office, Fuel Research Centre (FRC), Karachi; Leather Research Centre (LRC), Karachi; National Physical and Standard Laboratory (NPSL), Islamabad and PCSIR Laboratories at Quetta and Skardu. (b) = inclusive of contributions from other PCSIR Laboratories facilities in East Pakistan. (c) = contributions from Organizations (S&T and R&D), Universities and Faculties in Pakistan other than PCSIR Laboratories. * = only two issues Jan-April and May-Dec.

Table 2. Categorized publications from the Lahore, Karachi and Peshawar Laboratories of the PCSIR to the *Pakistan Journal of Scientific & Industrial Research (PJSIR)*.

Categorized Publications From Lahore, Karachi and Peshawar Laboratories										
Volume	Year	Lahore Labs.			Karachi Labs.			Peshawar Labs.		
		Phy. Sci.	Biol. Sci.	Tech.	Phy. Sci.	Biol. Sci.	Tech.	Phy. Sci.	Biol. Sci.	Tech.
13	1970	11	5	4	17	21	0	4	1	7
14	1971	5	8	2	20	30	1	10	2	3
15	1972	2	2	10	14	11	3	1	8	5
16	1973	4	3	6	7	10	5	2	1	4
17	1974	7	1	7	5	2	6	0	0	4
18	1975	2	2	10	7	2	0	2	1	5
19	1976	5	0	8	3	0	2	2	2	5
20	1977	2	0	29	1	2	4	1	1	3
21	1978	1	1	7	2	0	3	1	0	2
22	1979	0	0	30	0	2	4	0	0	2
23	1980	2	1	14	4	4	0	0	0	3
24	1981	4	0	9	2	2	0	0	0	3
25	1982	5	0	5	4	4	1	1	0	1
26	1983	6	4	12	2	3	5	4	0	2
27	1984	3	9	8	4	3	1	2	2	3
28	1985	4	8	8	5	7	3	1	1	1
29	1986	13	14	11	12	6	7	2	1	2
30	1987	20	19	18	8	14	9	3	4	0
31	1988	11	13	19	5	11	4	4	1	4
32	1989	4	18	20	10	24	11	4	2	7
33	1990	12	1	8	7	10	7	6	3	3
34	1991	5	12	8	9	6	6	3	1	2
35	1992	7	7	12	2	8	1	2	3	3
36	1993	4	5	11	4	11	1	2	2	2
37	1994	7	9	6	8	5	2	4	0	1
38	1995	1	6	5	5	4	5	1	1	2
39	1996	3	4	1	0	5	0	3	0	1
40	1997	2	0	1	2	2	0	2	0	1
41	1998	3	2	3	7	4	1	2	1	2
42	1999	1	11	2	9	3	0	1	0	3
43	2000	4	2	1	10	8	3	1	0	2
44	2001	4	6	2	4	6	2	1	1	0
45	2002	2	2	0	7	8	3	1	2	1
46	2003	4	7	0	9	3	1	3	2	2
47	2004	5	5	1	6	8	0	6	1	1
48	2005	7	1	2	3	1	1	0	1	0
49	2006	14	2	4	5	3	2	3	3	1
50	2007	6	-	4	5	4	1	1	-	1
Total		202	182	208	232	155	105	86	48	94

Table 3. Editorial Boards.

Volumes	Name
1-10 (1958-1967)	Salimuzzaman Siddiqui (Chairman) M.S.H. Siddiqui (Chairman) M.K. Afridi Ali Ahmad Nazeer Ahmed Taskhir Ahmad M. Innas Ali M.O. Ghani M.H.Khundkar A.M. Chaudhury M.A. Kazi N.A. Khan M.I.R. Khan Kamaluddin Ahmed Khawaja Solahuddin Mazhar-ul-Haque S.Hedayatullah Q.M.Hussain Karimullah M. Qudrat-i- Khuda M. Raziuddin Siddiqi M.M. Qurashi (Editor, Secretary) Aftab Hassan (Co-Editor) M.A. Haleem (Associate Editor) M.Aslam (Associate Editor) Kamal Mohammad Habib (Associate Co-Editor)
11-20 (1968-1977)	M.S.H. Siddiqui (Chairman) Abdul Ghani (Chairman) Salimuzzaman Siddiqui A.F. Abbasi Muzaffer Ahmed M. Zain-ul-Abedin M. Raziuddin Siddiqi M.H. Hashmi M.O. Ghani M. Aslam Valentine G. DeSa S.Z. Haider M.H. Khundkar A. Hameed Khan A.M. Chaudhury M. Afzal Mazhar-ul-Haque Kiam-ud-Din Yousuf Ahmed M.A. Kazi M.K.Bhatty A.H. Chotani N.A. Khan H.A. Kazmi S.M. Qurashi M.I.R. Khan Kamaluddin Ahmed Khawaja Salahuddin S. Riaz Ali Shah
21-30 (1978-1987)	Abdul Ghani (Chairman) M. Aslam (Chairman) Naeem Ahmad Khan (Chairman, Chief Editor) Mirza Arshad Ali Beg Muzaffer Ahmad Yusaf Ahmad Mirza Mansoor Beg Heshamul Haque M.K. Bhatti N.M. Butt S. Fazal Hussain M. Ikram H.A. Kazmi M.M. Qurashi S.A. Qureshi Riazuddin Siddiqui M. Ataur Rehman M. Shafi Ahmad S. Riaz Ali Shah M.A. Shaukat M. Zafarullah M. Zain-ul-Abedin R.A. Khan Tahirkheli A.R. Azmi S.H. Mujtaba Naqvi M.H. Qazi M. Ata-ur-Rehman Mahmood Iqbal Sheikh Nasima M. Tirmizi A.H. Chotani A.T. Khan F.A. Farooqi S.A. Qureshi S.M. Qureshi Mohammad Nazir Romani M. A. Haleem (Chief Editor) A.H. Khan (Editor) Azmat Ali Khan (Executive Editor)
31-40 (1988-1997)	Naeem Ahmad Khan (Chairman, Chief Editor) Qamar Iqbal (Chairman) A.Q. Ansari (Chairman, Chief Editor) Syed Naeem Mahmood (Executive Editor) Anwar-ul-Haq Atta-ur-Rehman Khalid Farooq Yasmin Badar

Mohammad Yusaf
 Shamshad Mehdi Naqvi
 Zafar Saied Saify
 Ismail Khan
 S. Sadiq Ali Rizvi
 Mirza Arshad Ali Beg
 M.K. Bhatti
 N.M. Butt
 S. Fazal Hussain
 Shafi Ahmad Khan
 Atta-ur-Rehman
 S.S.H. Rizvi
 Ehsan Ali
 S. Shahid Husain
 A. Q. Alvi
 M. Ikram-ul-Haq Dar
 A.H.K. Yousufzai
 Khushnood A. Siddiqui
 Saeed Iqbal Zafar
 R. B. Qadri
 Ghulam Abbas Miana
 M. Aslam Butt
 Abdul Rehman Khan
 Mohammad Anwar Waqar
 Sabir Ali
 F.H. Shah
 Mahmood Iqbal Sheikh
 Jamil Ahmad Khan
 Naseer Sheikh
 Ikram-ul-Haq Dar
 M.A. Qazi
 M.M. Qureshi
 M. Shafi Ahmad
 R.A. Khan Tahirkheli
 A.R. Azmi
 S.H. Mujtaba Naqvi
 M.H. Qazi
 M. Ata-ur-Rehman
 Mahmood Iqbal Sheikh
 Nasima M. Tirmizi
 A.H. Chotani
 A.T. Khan
 F.A. Farooqi
 S.A. Qureshi
 S.M. Qureshi
 Mohammad Nazir Romani
 S.M. Abdul Hai (Editor)
 Azmat Ali Khan (Executive Editor)
 J. N. Usmani (Executive Editor)
 Abdul Gaffar (Assistant Editor)

41-50
 (1998-2007) A.Q. Ansari (Chairman, Chief Editor)
 Khalid Mahmood Khan (Chairman, Chief Editor)
 Misbahul Ain Khan (Chairman)
 Anwar-ul-Haq (Chairman, Chief Editor)
 Javed Arshad Mirza, (Chairman, Editor-in-Chief)
 Saeed Iqbal Zafar (Editor-in-Chief)
 Syed Na'eem Mahmood (Executive Editor)
 A. Rasheed Khan (Executive Editor)

Rabia Zuberi (Chief Editor)
 Khurshid Zaman (Executive Editor)
 Kaniz Fizza Azhar (Executive Editor)
 Atta-ur-Rehman
 Khalid Farooq
 M. Yasmin Badar
 Mohammad Yusaf
 Shamshad Mehdi Naqvi
 Zafar Saied Saify
 Ismail Khan
 S.Sadiq Ali Rizvi
 H. Akhtar
 G. Bouet
 W. Linert
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 F.M. Slater
 M. A. Waqar
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 M.A. Khan
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 H. Khan
 M.W. Akhtar

(2.3%) by the Dacca Laboratories; other R&D and S&T institutions of the country contributed 1602 papers (32.1%), whereas, 1113 (22.3%) were contributed by the institutions of foreign countries. On an overall basis, the PCSIR's share of contribution thus stands on an average, at about 45.55 over the past 50 years. The data regarding the categorized contributions from the Lahore, the Karachi and the Peshawar Laboratories of the PCSIR is given in Table 2. The basic purpose of the statistics is to consolidate the data as well as to analyze and understand it with a view to knowing the significance of the contributions from all the Laboratories of the PCSIR. It is hoped this effort will provide authentic basis both for the policy planners and the working scientists/technologists to better assess the output. Consequently, the potential and S&T capabilities of various groups will be better judged and the disadvantages, if any, will be identified and removed for a better programme and efforts will be directed towards providing the needed facilities and opportunities to accomplish the assigned and planned tasks

for developmental purposes. The publications considered for the present report have been gathered, thus, from 1970 to 2007 (vol. 13-50) as they contain the publications under the above stated categories.

The data for the past 38 years (i.e., 1970 to 2007, both years included, vol. 13-50 of *Pakistan Journal of Scientific and Industrial Research*) is presented in Table 2. It can be seen that the three Laboratories at Lahore, Karachi and Peshawar contributed 202, 232 and 86 papers in the Physical Sciences, 182, 155 and 48 in Biological Sciences and 208, 105 and 94 in the Technology fields, respectively. Numerically speaking the contributions, in the three specified categories add up to 592 for the Lahore Laboratories, 492 for the Karachi Laboratories and 228 for the Peshawar Laboratories. Various Research Divisions/Centres of the three Laboratories, as already mentioned, carry out their research projects largely in relation to the scope of the assigned activities of the Division/Centre. However, there is no bar in the intra-Division/Centre or the intra-Laboratories collaboration and many a publications are also the result of such activities as it helps in using the expertise and facilities available to various research groups at different Laboratories for the completion of the undertaken projects.

A closer look at the data in Table 2 indicates that all the three research Laboratories undertake activities, in the specified fields, according to their planned programmes though in varying degrees. The contributions from the Lahore Laboratories are less in the Physical Sciences and more in the fields of Biological Sciences and Technology, when compared with the Karachi Laboratories. The reason for this variation is only due to the pre-planned programmes of each unit. On an overall basis, however, it can be said that all the three contributing units have adhered well to a healthy competitive attitude inspite of variations in the availability of research staff and facilities.

An improvement both in the quality and quantity of the contributions to the Journal from the parent organization (PCSIR) can be achieved if intra-Laboratory task forces can be created to undertake various technological projects which are time targeted and their component bits are assigned to groups identified on the basis of technical expertise.

Such an approach, it is hoped, will encourage cooperation and provide access to facilities, if they are available at one place and not available at another, and help in better monitoring the progress of the undertaken project and bring it to a useful conclusion. A similar approach can also be practiced both in the fields of Physical and Biological Sciences as these projects can also be divided and distributed to collaborating groups so that their assigned aspects are completed faster than

when the whole project is tackled at one place only. Thus, not only collaboration but the output as well will increase and the collaborating scientists/technologists will get more useful and wide exposure in their respective fields of expertise.

Editorial Boards

The Editorial Boards of the Journal have been changing with the appointments of the Chairmen of the Pakistan Council for Scientific and Industrial Research (PCSIR). However, the boards always comprised of prominent scientists available not only in the country but also from foreign lands. The major share of the board members has however, been occupied by the senior scientists from the Laboratories and various subject specialists from the Universities. A list of the members of the Editorial Boards during the period under review is presented in Table 3 for information only.

Conclusion

The *Pakistan Journal of Scientific and Industrial Research* (PJSIR), during the period under review (1958-2007), published 4986 research papers in various disciplines out of which 45.55% papers were contributed by the PCSIR Laboratories Complexes, at Lahore, Karachi and Peshawar only. It is thus seen that the Journal during the period has continuously and regularly brought out publications in all the disciplines in which its Laboratories were mandated to operate and accepted publications from other S&T and R&D organizations of Pakistan (32.10%) and from all over the world (22.30%).

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