



Research and Research Capabilities in Lebanon

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- Lebanon has a small but diverse and dispersed S&T community
- 41 universities and higher education institutions (12 of them with science and/or technology faculties) and 6 rather small research centres
- All indicators (publication output, research budget, number of active researchers ...etc) show that most of the research is carried out in UL, USJ and AUB

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Lebanon's 20 universities by chronological order of creation

University	Year of Foundation	S&T Faculties	Total Faculties
American University of Beirut (AUB)	1866	5	7
Saint Joseph University (USJ)	1875	4	12
La Sagesse University	1875	-	13
Lebanese American University (LAU)	1924	2	4
Saint Esprit de Kaslik University (USEK)	1949	3	13
Lebanese University (UL)	1953	8	15
Haigazian University	1955	-	3
Beirut Arab University (BAU)	1960	4	9
Notre Dame de Louaizeh University (NDU)	1986	2	6
Balamand University (BU)	1988	4	6
Al-Manar University (MUT)	1990	1	3
Islamic University of Beirut	1996	-	1
Islamic University of Lebanon	1996	1	5
Antonine University (UPA)	1996	1	4
Global University	1999	-	3
Al-Jinan University	1999	-	4
Makassed University	2000	-	3
Arab Open University	2000	-	-
Middle East University	2001	-	3
Lebanese International University (LIU)	2001	4	6

Why is Research important

In General, advancement in research would lead to:

- Effective decision making
- Improvement of health services and medical care
- Raising the levels of educational standards
- Fostering creativity in industry through technological invention
- Economic growth through driving local businesses

Why is Research important... continue

Specifically, advancement in research would lead to:

- Better coordination, planning and implementing important programs
- Better focus on identified priorities and emerging important issues
- Dissemination of knowledge, including new technologies, for the public good
- Improving universities, students and faculty members reputation and provide capacity-building wherever needed

Who plays part?

- Universities and/or teaching hospitals
- Local funding agencies
- Regional and International funding agencies
- Local and regional entrepreneurs/industry
- Pharmaceutical companies
- - Scientists
 - Students
 - Engineers
 - Educators
 - RA/GRA
 - Patients
 - Professors
 - Physicians
 - Statisticians
 - Technicians
 - Administrators
 - Computer Specialists etc...

Research Capabilities in Lebanon

- Most scientific research in Lebanon is concentrated in very small number of higher education institutions
- Dynamic individuals, building on their earlier achievements abroad, usually champion the most productive research, often with little institutional incentive
- In many Lebanese universities, the absence of a reward and punishment system inhibits dynamic research
- The absence of any meaningful collaboration between researchers or between groups working on related or similar topics, whether from the same or different institutions, makes the problem worse
- The increase in the number of universities may not have a positive effect on the country's research and development, as many of these universities cannot or do not want to undertake serious research and link it to their teaching activities

Available Human Resources

- There is a high percentage of educated individuals
- Numerous higher education institutions, some using research output as a criterion for faculty promotion
- Relatively young population with tremendous eagerness and understanding of the value of higher education
- Important highly educated Lebanese Diaspora
- Pioneering role for graduates from the Lebanese universities in regional development

With approximately 150,000 students for some 4 million inhabitants, Lebanon has a comparatively high enrolment ratio.

University	Total Faculties	Total number of students	% of students
Lebanese University	13	70,627	48.1
Beirut Arab University	9	13,653	9.3
Saint Joseph University	12	9,718	6.6
American University of Beirut	7	6,933	4.7
Saint Esprit de Kaslik Univ.	13	5,949	4.0
Notre Dame University	6	4,677	3.2
Lebanese International Univ.	6	4,722	3.2
Lebanese American Univ.	4	4,529	3.1
Balamand University	6	2,813	1.9
32 additional universities and institutes	-	23,346	15.9
Total	-	146,967	100.0

Challenges

- Automatic transmission of “second hand” knowledge in most universities
- Absence of significant Ph.D. programs
- General disinterest in scientific research within few universities
- Low national budget for research
- Weak research output with few quality publications
- Limited capitalization on potential patents from important discoveries
- Limited clinical research/trials
- Lack of collaboration between different researchers or groups working on related topic
- Support for basic and clinical research from industry is negligible
- Serious challenge from emerging regional players

This background stresses the importance of developing programmes and mechanisms to encourage isolated researchers with the best qualifications to engage in research projects, establish research groups and participate in research networks, in order not to lose their competitive edge and fall behind advances of modern science.

A few universities have also started to do so during the last 15 years. Institutional initiatives have been introduced recently in the three leading research universities (AUB, USJ and UL).

What is needed to promote research

- Adequate infrastructure to carry out scientific research in the basic sciences
- Sufficiently well equipped laboratories in most areas
- Permanent research teams
- Clear institutional rules and mechanisms that promote the management, funding, evaluation, and dissemination of research activities as well as research policies
- PhD programs (creation of a interdisciplinary doctoral program in Sciences, Technology and Health)
- Professionalisation of higher education staff
- Development and/or strengthening of research centres in cutting edge areas of research
- Institutional mechanism at the university and faculty level to manage research funding (with a well-defined research budget), evaluations, publications, etc

Types of Funds/Grants available

- Grants tied to specific research or development projects, which are time limited and with specific budgets
- Institutional grants for specific program areas (new curriculum , capacity building, etc)
- Service contracts
- Development grants
- For industry-related: new technologies

Industry as a Potential Funder

- Partner (MOU, LOU) with industry for development and/or R &D of new technologies
- Encourage innovation at the University level
- Build income (not profit) from enterprises, start-ups/spin offs, royalties, licensing fees, etc..
- Recover cost of research and/or development programs
- Help capacity building in business management and experience

Reasons for Funding Organizations To Approve Awards

- Proposal fits priority of organization
- Good proposal
- Reasonable detailed budget that fits the proposal;
- Good reputation of institution
- Good academic reputation of faculty member
- Institution doing good work: honest, responsible, transparent, history, track record etc.....

Recommendations to Increase Research in Lebanon

Encourage scientific research and innovation

- Increase national funding to reach a level of research competitiveness that is appropriate to attract further funding
- Establish policies which stresses upgrading human capital through promoting access to a range of skills
- Assist innovation through technology transfer, sign PCT treaty to facilitate patent filing
- Facilitate research at the governmental level: expedite paper work, reduce red-tape, custom and governmental restrictions (tax-exemption!!!)

Improve the quality and cost-effectiveness of medical and health care through the development of scientific research in the medical and health fields

- Encourage and provide incentives for the creation and development of multidisciplinary research teams that integrate basic health and medical sciences with social sciences and clinical medicine
- Encourage and provide incentives for research in the fields of health promotion, prevention, rehabilitation, and towards identification of alternatives to hospitalization
- Develop research-involved health and medical centers of excellence which can attract national and regional attention and interest

Create academic/industrial/community bridges for their mutual benefits through technology transfer and development

- Encourage industry to support research through establishing and funding new research programs in genomics, proteomics, drug discovery, IT, ICT, engineering etc. where investment is likely to be profitable in both short and long terms; also taxes incentives
- Involve interested community and industry representatives in research boards / steering committees and in research related decision making
- Prioritize research programs / activities (and provide adequate funding) towards development of products that could be of value to involved / targeted industry
- Sponsor advanced training (doctoral and postdoctoral) in fields that would facilitate value-added “product” oriented research

Lebanon Research Status

Current output of research is around 0.15% of global total.

Current expenditure on research in Lebanon is around 0.2% of GDP (comparable to Egypt but less than Jordan).

CNRS role

Universities Role

National Council for Scientific Research (CNRS)

CNRS, a public agency with administrative and financial autonomy under the authority of the Prime Minister was established in 1962

CNRS has two major functions:

➤ Advisory function

➤ Implementation function

As part of this second function, the CNRS manages and runs four research centres: Centre for Geophysics, the Centre for Marine Sciences, the Centre for Remote Sensing, and the Lebanese Atomic Energy Commission

CNRS runs integrated action programmes addressed to the Lebanese scientific community as a whole:

- The Science, Technology and Innovation Policy Programme
- The Research Grant Programme
- The PhD Fellowship Programme
- The Science and Technology Culture Programme
- The CNRS Associated Research Units

CNRS initiated a new national policy for science, technology and innovation (STIP) that is fully integrated with overall economic and social policies. Each societal need was translated into carefully selected activities in research, education, training and research system reinforcement, including activities in the area of technology dissemination, transfer, and innovation.

STIP Plan objectives are:

- To increase and focus national efforts in science, technology and innovation
- To strengthen the position of Lebanon as a regional centre for high-quality education and research, economic development, trade, tourism and health care
- To strengthen partnerships between universities, the CNRS and research institutes on the one hand, and between those organisations and private enterprise, other private organisations, and public agencies on the other
- To strengthen Lebanon's participation in regional and wider international networks in science, technology and innovation, and to use those networks for the most effective and efficient implementation of the Plan

The Plan identifies a number of specific opportunities in three areas: 1) basic science, industry (including services) and engineering, 2) environment and agriculture, and 3) medicine and health care.

Universities Role(s)

Internal Funding

Incentives for Faculty

Promotion Criteria

Long Term Contracts

Students Research

Graduate studies

Proposal Writing

External Grants

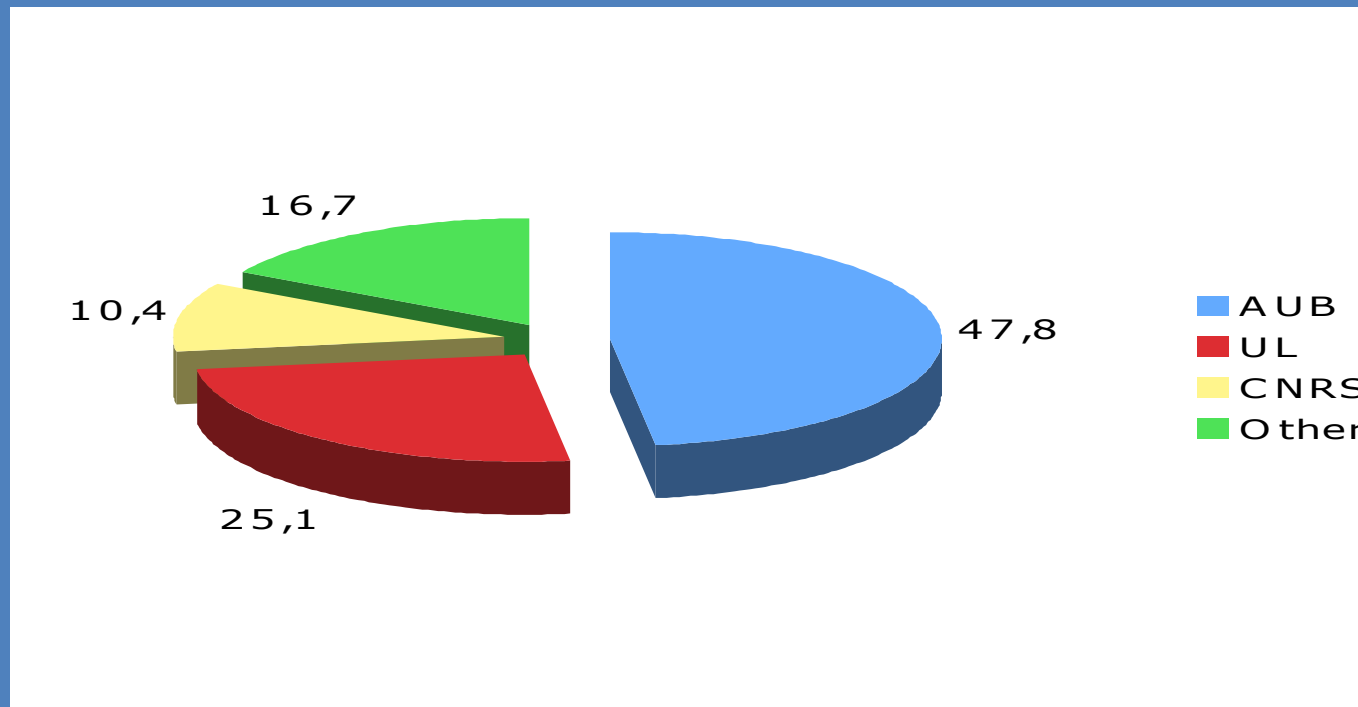
Collaborations (local, regional and international)

Resource Mobilization

Administrative and Management Support

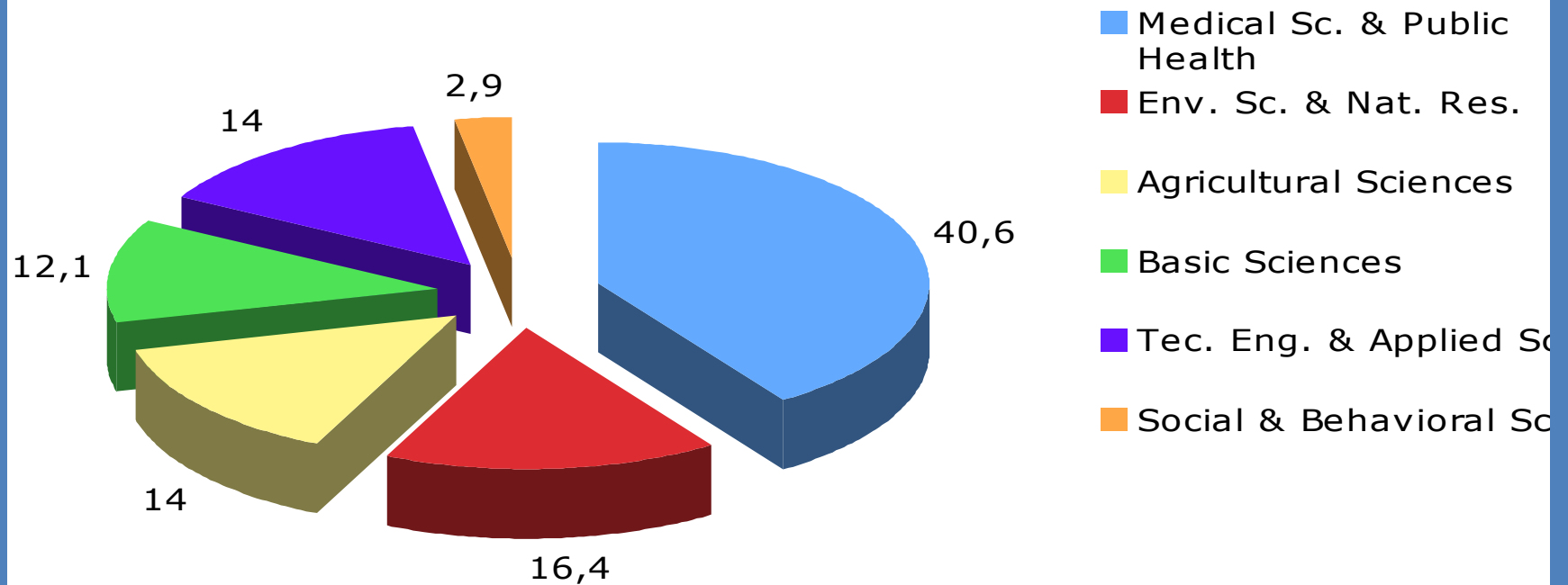
Interdisciplinary Programs

The Grant Research Programme (GRP) is a CNRS tool for sponsoring research projects implemented in public and private universities, and in national or private research institutions including the CNRS affiliated research centres.



Distribution (%) of GRP funds by institution (2000-2006)

GRP % allocation of funds by Discipline (2000-2006)



Research Output

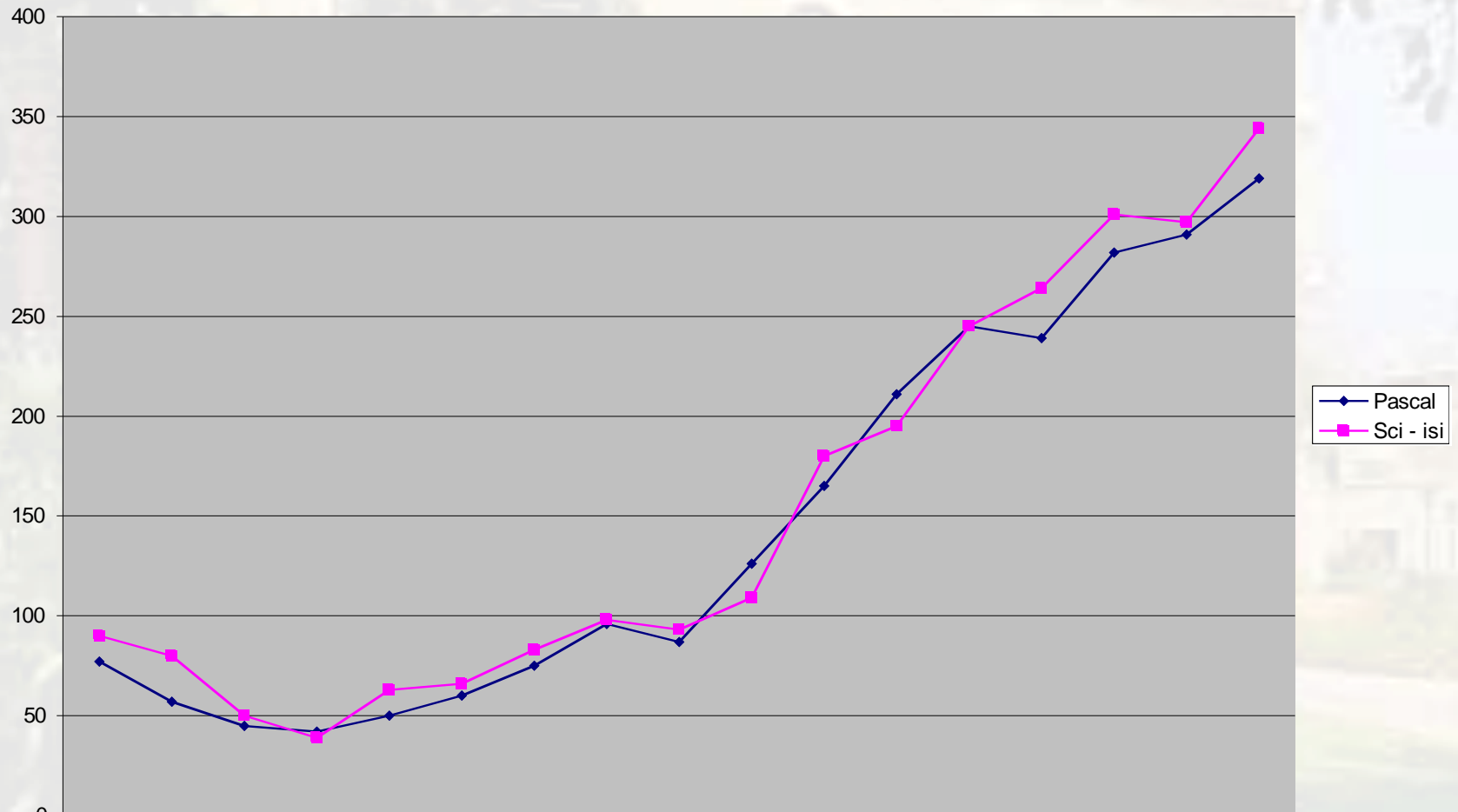
Measured mainly by the actual amount of funding spent on Research and by the number of publications published in peer reviewed journals.

Lebanon R&D Expenditure

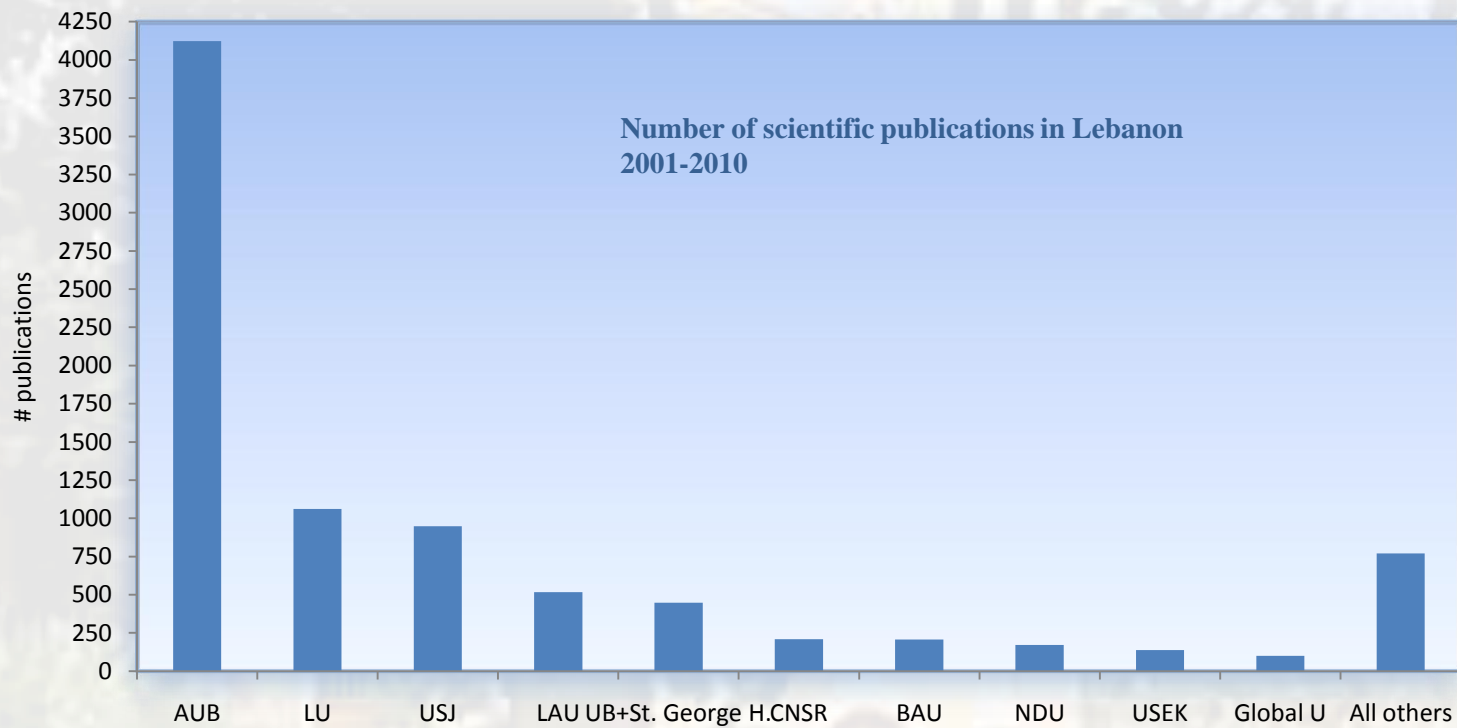
	Year	Budget (MLBP)	R&D budget (MUSD)
Public Research Institutes			
National Council for Scientific Research (CNRS)	2006	8,650	5.72
Lebanese Agricultural Research Institute (LARI)	2006	7,894	5.22
Industrial Research Institute (IRI)	2006	5,000	0.30
Higher Education Institutes			
Lebanese University (UL)	2005-06	17,100	11.40
Saint Joseph University (USJ)	2005-06	12,000	8.00
American University of Beirut (AUB)	2005-06	26,691	17.80
Other universities (7) less involved in research activities	2005-06	9,000	6.00
Total			54.44

the R&D budget as a percentage of GDP would be 0.22%. This percentage is comparable to Egypt and Kuwait, but below Jordan (0.34%) and far below Tunisia (1%). The official target for Lebanon is still 1%.

Number of scientific publications in Lebanon (1996-2003)



	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
◆ Pascal	77	57	45	42	50	60	75	96	87	126	165	211	245	239	282	291	319
■ Sci - isi	90	80	50	39	63	66	83	98	93	109	180	195	245	264	301	297	344

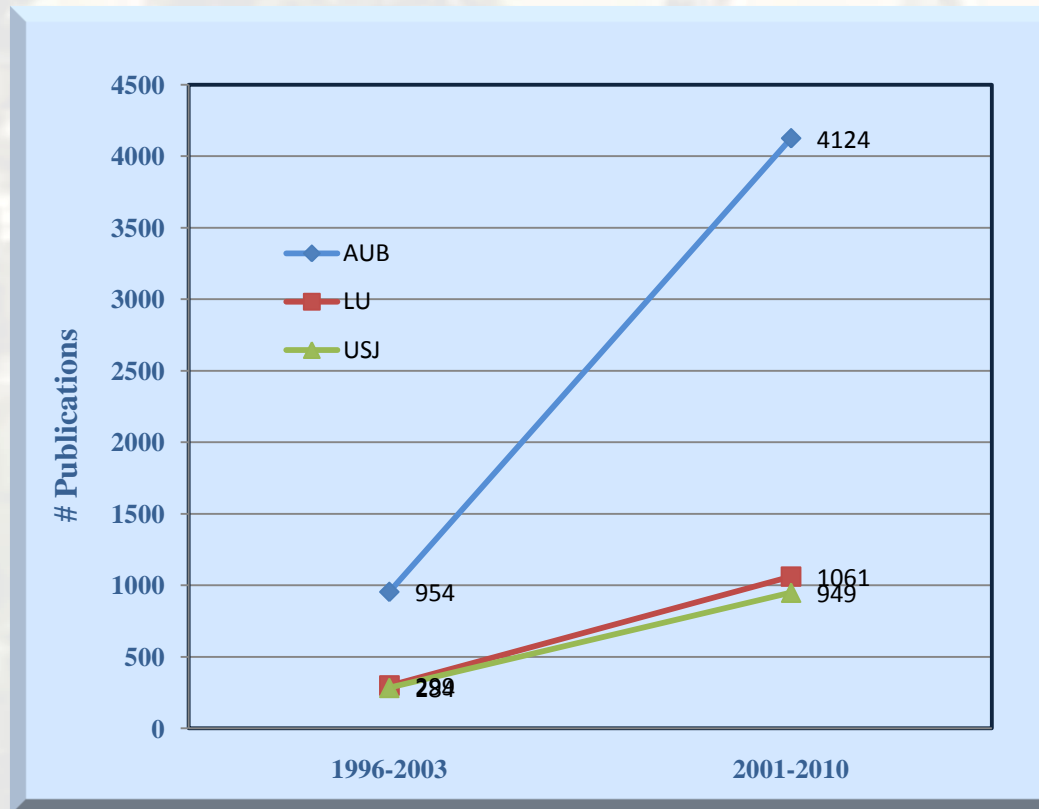


AFFILIATION	Count	Percentage
AUB	4124	53%
LU	1061	14%
USJ	949	12%
LAU	516	7%
UB + St George H	448	6%
CNSR	209	3%
BAU	207	3%
NDU	171	2%
USEK	138	2%
Global U	100	1%
All others	770	10%
TOTAL	7792	100%

The Top Science Producers in Lebanon

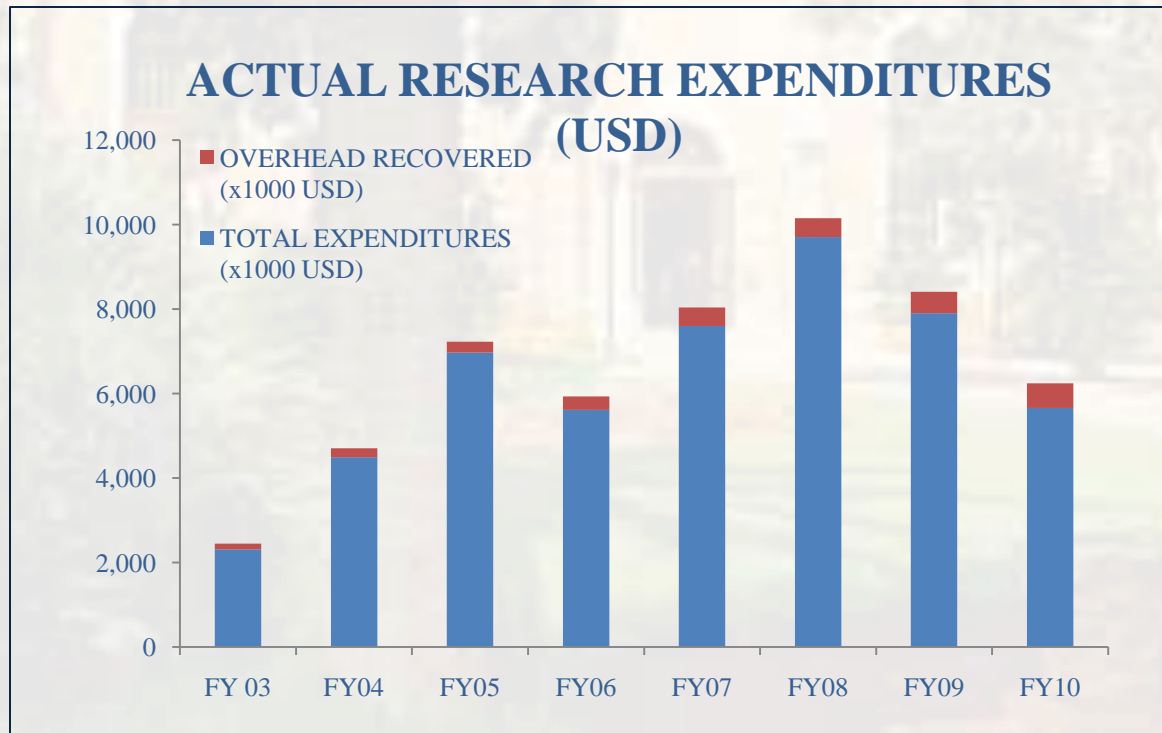
Institutions	1996-1999	2000-2003	Total
American University of Beirut (AUB)	347	607	954
Lebanese University (UL)	137	162	299
Saint Joseph University (USJ)	124	160	284
Beirut Hospitals	38	63	101
Lebanese American University (LAU)	21	42	63
CNRS Research Institutes (4)	12	15	27
Balamand University (BU)	3	22	25
Beirut Arab University (BAU)	6	15	21
Others	22	36	58
Total	710	1122	1832

Significant Increase in Number of Publications in the Last 10 Years



Actual AUB Research Expenditures (USD) 2003-2010 (not including internal funding)

	FY 03	FY04	FY05	FY06	FY07	FY08	FY09	FY10	TOTAL FY 03-10
TOTAL EXPENDITURES (x1000 USD)	2,312	4,496	6,971	5,618	7,604	9,710	7,905	5,662	50,279
Total overhead (x1000 USD)	139	208	258	317	437	441	507	581	2,888



Despite all sorts of constraints, in particular the civil war of the 1970s and 1980s and the most recent conflict that ended in August 2006, the development of S&T activities in Lebanon has been relatively dynamic over the last 20 years. Although still modest, Lebanon has significantly increased its publication output in the recent past, and the number of publications indexed in international databases registered over doubled since 2003.