

Detailed

Curriculum Vitae

Professor Adnan Badran

Biographical Data:

Business Address:

University of Petra

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Educational Record:

- Ph.D. 1963 Michigan State University, East Lansing, Michigan, USA.
- M.Sc. 1960 Michigan State University, East Lansing, Michigan, USA.
- B.Sc. 1959 Oklahoma State University, Stillwater, Okla., USA.
- Hon. Ph.D. 1981 Sungkyunkwan University, Seoul, Republic of Korea.
- Hon. Doctorate in Science 2007 Michigan State University, East Lansing, Mich. USA.
- West Watkins distinguished Lectureship Award 2009, Oklahoma State University USA.
- Honorary Professorship 2012, L.N.Gumilev Eurasian National University Astana-Kazakhstan.
- Hon. Doctorate in Business, 2014 Yarmouk University, Jordan.

Languages:

English, French, Arabic, some understanding of Spanish.

Voluntary:

- Member of the Board of Trustees of the baccalaureate - Amman, Jordan (1983 -)
- Member, Executive Committee of the Noor Al Hussein Foundation - Amman, Jordan (1985 -)
- Member, Board of Trustees of the King Hussein Foundation - Amman, Jordan (1999 -)
- Chairman of the Jubilee Institute - Amman, Jordan (2000 -) President of Arab Academy of Sciences. Beirut, (2003 -)
- Member, Board of Trustees of Masdar Institute of Technology, Abu Dhabi (2007 -).
- Chairman of Board of Trustees of the Arab Forum for Environment and Development (AFED), Beirut (2008 -).
- Member of UNESCO Good-Will committee on Discrimination in Education (2011-).
- Member, Board of Trustees of Arab Thought Forum, Amman (2012 -)
- Vice President, The Higher Council for Science & Technology (H.C.S.T), Amman (201)
- Chairman of Board of Trustees of Jordan University, Amman (2014 -).

Employment History:

2007 -	Professor of Biotechnology, University of Petra, Amman.
2007-2014	President, University of Petra, Amman
2009-2012	Chairman of the Administrative Board of Arab Thought Forum, Amman
2006-2010	Senator and chairman of the senate Committee on education science, culture & media
2005	Prime Minister of Jordan & Minister of Defence
1998-2005	President of Philadelphia University
1994-1998	Deputy Director General (DDG), UNESCO, Paris.
1990-1994	Assistant Director General for Science (ADG/SC), UNESCO. Paris.
1989	Minister of Agriculture, Jordan Minister of Education. Jordan
1986-1987	Secretary General of the Higher Council for Science and Technology, Jordan.
1976-1986	Founding President of Yarmouk University, Jordan & Founder of the Science & Technology University Campus (JUST University), Jordan.
1976-1986	Professor at Yarmouk University and at Jordan University for Science, Technology, and University of Jordan.
1971-1976	Dean of the Faculty of Science at the University of Jordan.
1966-1971	Assistant, Associate, Professor, Faculty of Science University of Jordan.
1963-1966	Senior Research Plant Physiologist and Biochemist at the United Fruit Research Laboratories, U.S. and Central America, and member of the Board of Management.
1960-1963	Research Assistant at Michigan State University. USA.

Courses Taught at the University:

- General Biology (Science Majors)
- Molecular Biology
- Cellular Physiology
- Plant Physiology
- Biochemistry

Professional Memberships:

- Member of the Board of Trustees of the Jordanian Renewable Energy Society - Amman, Jordan (2012-).
- President, Board of National Center of Human Rights (2008-2011).
- President of the Asia-Pacific Forum on human rights (APF) Sidney (2009-2011).
- Member of Int'l coordinating committee of human rights, Geneva (2010 -).
- Advisory Board Member, Arab Thought Foundation, Beirut (2009 - 2014).
- Vice President of the Third World Academy of Sciences (TWAS) 1999-2004.
- Member and Secretary-General of the Third World Academy of Sciences (TWAS) 1991-1998
- Member in Islamic World Academy of Sciences (IAS).
- American Institute for Biological Sciences 1963.
- American Plant Physiologists 1963.
- Member of the Board of Trustees of Mutah University 1978-1985.
- Member of the Board of Trustees of the University of Jordan 1976-1985.
- Member of the Royal Commission of Yarmouk University 1976-1985.

- Member of the Executive Board of the International Union of Biological Sciences - IUBS 1985 - 1988
- Member of the Executive Board COSTED - ICSU 1984-1990
- Member of the Executive Board of the International Association of Universities (IAU) 1985-1987
- Chairman, Middle East International Association of Universities Presidents (IAUP) 1978-1986
- Member of the American Association for the Advancement of Science (AAAS)
- Member of the Board of Trustees of Philadelphia University 1992-1995
- Member of the Board of Trustees of the University of Jordan for Women 1992.
- Former member of the American Association for Horticultural Sciences
- President of IAUP, Chapter of Middle East
- ICSU- CBE, CTS, COSTED-Bioscience networks-UNESCO.
- Member of the ‘Comité des hautes institutions’ of the European Academy of Arts, Sciences and Humanities - since June 1997

Activities:

- Development of the biology curriculum for the secondary education cycle in Jordan (1967)
- Development of biology curriculum for the secondary education in the Arab States through the Arab League for Educational, Cultural and Scientific Organization (ALECSO), Cairo, Egypt (1970)
- Chairman, Technical Committee on the establishment of Al-Faisal Vocational College in Jordan (1972)
- Chairman, Technical Committee on the establishment of the Faculty of Engineering & Technology at the University of Jordan-Amman (1972-1976)
- Chairman, Pre-medicine and pre-nursing curriculum committee at the University of Jordan, Amman (1972-1976)
- Chairman, Faculty of Engineering Temp. Council, University of Jordan, Amman (1973-1976)
- Member of the higher committee on the Development of School Curriculum of the Sultanate of Oman (1976-1984)
- Chairman, Technical Committee on re-evaluation of Secondary Education in Jordan (1971)
- Vice-Chairman, Commission of Biological Education of the International Union of Biological Sciences (IUBS), 1975-1980
- Editor, Biological Education Newsletter of IUBS supported by UNESCO (1973-1982)
- Member, The Committee on the Teaching of Science (CTE) of the International Council of Scientific Unions (1980)
- Member, the Science and Technology Policy Committee in Jordan, 1980
- Chairman, The Five-year Development Plan of the Social Sector in Jordan (1981-1985)
- Consultant, the Academic and Space Planning of Sciences and Engineering Departments at the newly established King Abdul Aziz University, Jeddah, Saudi Arabia (1970)
- Consultant for assessment the design of King Faisal University, Saudi Arabia (1976)
- Chairman, Technical and Educational Specifications of Yarmouk University comprising faculties of Arts and Sciences, Medical Sciences, Engineering Agriculture and Veterinary Sciences, Social Spine and General Facilities
- Chairman, Technical Committee prequalification’s of Master Plan Consultants of Yarmouk University Campus (2000 acres and 1,000,000 m² of construction space) 1976
- Chairman, Technical Committee of prequalifications of Detailed Design and Tender Documents preparation of Yarmouk University Campus, first stage of 500,000 m² construction space (1977-1980)

- Member of Jordan Guidance Council, Ministry of Information 1980
- Chairman, Arab Center of Higher Educational Research ALECSO, Tunis-Damascus (1981-1983)
- Member of Executive Committee on Strategy of Science & Technology in the Arab World (1984-1987)
- Member of BOSTID/National Academy of Science Committee on Research Grants for Developing Countries Institution, Washington D.C. (1980-1983)
- Member of the Arab Thought Forum (1978-present)
- Member of the World Affairs Council (1980-present)
- Member of IOC - UNESCO Executive Committee (1984)
- President, National Parks Committee (1981-1989)
- Member, Jordan Higher Board for Science and Technology (1987)
- President, Higher Council for Agricultural Policy in Jordan (1989)
- Director of Agriculture and Biotechnology Sector, Higher Council for Science and Technology (1988)
- Coordinator of AraBN-Bioscience network of the Arab World (1986-1989)
- Rapporteur of the Arab Conference of Ministers of Higher Education in the Arab World (1985-1989)

Awards:

- Renaissance, Al-Nahda Medal;
- Yarmouk Khalid Bin Walid Medal;
- Alfonso the tenth Medal, Spain;
- Hall of Fame Alumni Award, Oklahoma State University, USA;
- Independence National Medal, Estiklal, 1995.
- Nahda National medal 2005.
- Arab Thought Foundation Award for best Arab Scientist in higher education research 2005.
- TWAS Regional Prize for "Building Scientific Institutions", Durban, South Africa, Oct. 2009.
- World Education Asia award for Outstanding Contribution to education 2011.
- Shoman award for Peer review of young Arab scientists.

Affiliations and Honours:

- Member of the Board of Trustees of the Jordanian Renewable Energy Society - Amman, Jordan (2012 -).
- President, Board of National Center of Human Rights (2008-2011),
- President of the Asia-Pacific Forum on human rights (APF) Sidney (2009-2011),
- Member of Int'l coordinating committee of human rights, Geneva.
- Advisory Board Member, Arab Thought Foundation, Beirut (2009 – 2014).
- Past Vice president and Treasurer of The World Academy of Sciences (TWAS),
- Executive Board member of: International Union of Biological Sciences (IUBS),
- Member of International council of Scientific Union (ICSU), and International,
- Association of Universities (IAU) and Universities presidents (IAUP),
- Member of UNESCO bio-Science network. Royal Society of Conservation of Nature (RSCN), etc.
- Royal Conservation Society,

- Presidential Fellow of Aspen,
- World Affairs Council,
- Honorary President of the Renewable Energy Network (REN),
- Member of AAAS award for International Scientific Cooperation, Washington D. C.,

Books Published:

1. Badran A.M., Kanawati, 1968. *Laboratory Manual-General Biology, Science*, University of Jordan.
2. Badran A.M, Lutfi, Nazer, 1973. *General Biology for the 1st Secondary Education* (text book), Ministry of Education, Jordan.
3. Badran A.M, Lutfi, Awad, 1974. *General Biology for the 2nd Secondary Education* (text book), Ministry of Education, Jordan,
4. Badran A.M, Alawi, 1975. *General Biology for the 3rd Secondary Education* (text book), Ministry of Education, Jordan.
5. Editor, Badran A.M. 1975. *General Biology for the Secondary Class* (text book) - ALECSO Cairo.
6. Badran A.M, Buchari, Awad, 1976. *General Biology for the Agricultural Secondary Education* (text book), Ministry of Education, Jordan.
7. Badran A.M et al. 1976 *General Biology for the 2nd Secondary Class* (text book), ALECSO Cairo.
8. Badran A.M. *Energy* chapter in a book on environment, ALECSO, Cairo.
9. Badran A.M., Alawi, 1976. *Manual of Biology Laboratory* (text book), Yarmouk University.
10. Badran A.M. et al. 1977. *General Biology for the third Secondary Class* (textbook), ALECSO, Cairo.
11. Badran A. M. & Baydoun E, 1981. *General Biology 1st Secondary Class* (textbook), Oman.
12. Badran A. M. & Baydoun E, 1981. *General Biology 2nd Secondary Class* (textbook), Oman.
13. Badran A. M. & Baydoun E, 1983. *General Biology 3rd Secondary Class* (textbook), Oman.
14. Badran A. M. & Baydoun E, 1984. *Teacher's Guide for Biology books of the Secondary Cycle*, Oman.
15. Badran A. M. & Baydoun E, 1985. *The Cell*, a textbook for Teacher's Training College, Oman.
16. Badran A. M. & Baydoun E, 1985. *Biology of the Living Organisms*, a textbook for Teacher's Training College, Oman.
17. Badran A. M. 1985. *The University - a creating process*. Louvain Centre of Middle Eastern Journal, Louvain, Belgium.
18. Badran A. M. 1987. *Education in the Middle East: Transition from traditional to modern society*, Paragon Book in press (edited).
19. Edited by Khader & Badran A. M. 1987. *The Economic Development of Jordan*, Croom Helm, London.

20. Badran A. M. et. al, 1989. *Strategy of Science and Technology for development in the Arab Region*, ALESCO-UNESCO, and publication centre of Arab Studies, Beirut, Lebanon.
21. Badran A. M. (Editor) 1989. *At the Crossroads: Education in the Middle East*, PWPA Book, Paragon House, N.Y.
22. Badran A. M. 2014 Introduction chapter pages 13-35. *Sills to the Future: biography and process*. Dar Yafa Publishing house.
23. Badran, A. M. (Chief Editor), Baydoun E, Dagher N, Murad S (Co-Editors) 2015. *The Triangle: Water-Energy-Food Nexus in the Arab Middle East*. In preparation, Springer Publishing house.
24. Badran A. M. 2016. Opening Doors; Chapter in a book: “*A voice for Science in the South*”, edited by Daniel Schaffer, World Scientific Publishing.

Papers and Patents Published:

25. Badran A. M. 1963. Environmental Study on McIntosh Maturation, AIBS Symposium, University of Massachusetts, Amherst, USA, ASHS No. 320, 24.
26. Badran A. M. 1965. Polyethylene Glycols - Tannins Interactions in Extracting Enzymes. *Nature* 206: 622-624.
27. Badran A. M. 1965. Mechanism of Core Browning in Bananas, Physiology and Storage Section, AIBS Symposium, University of Illinois, Urbana, ASHA No. 104 21.
28. Badran A. M. 1965. Preparation of Enzymes from Plant Tissues Containing High Molecular-weight Polyphenols. Phenolics, Auxins and Oxidases Section. *Plant Physiology Suppl.* Vo. 10, AIBS University of Illinois, Urbana.
29. Badran A. M. April 22, 1969. Method of Preparing Enzymes from Plant Tissues Containing Phenols. Patent, Ser. U.S. 3,440,143.
30. Badran A. M. June 14, 1969. Controlled Atmosphere Storage of Green Bananas, Ser. U.S. No. 3,450,542 Patent Office, and Washington D.C.
31. Badran A. M. 1967. Polyphenoloxidase Preparations and the Interaction of Polyethylene Glycols with Tannins. 8th Science Symposium, University of Damascus, pps 1-20.
32. Badran A. M. June 17, 1969. Method of Packing Ripening Plant Foods with climacteric rise of respiration to Prolong Storage, Patent, Ser. U.S. 3450,543,, Washington D.C. Pat. Office.
33. Badran A. M. June 17, 1969. Method of Packing Ripening Perishable Plant Foods to Prolong Storage, Patent, Ser. U.S. 3450,544, Washington D.C. Pat. Office.
34. Badran A. M. 1972. Endogenous Activation and Inhibition of Polyphenoloxidase in Plant Tissues Containing Phenols. Publ. The Lebanese Society for Advancement of Science, Beirut.
35. Badran A. M. 1972. Biochemical Study on Changes of Phenolic Compounds in Banana Fruit during Ontogeny, Chilling and respiration Climateric. *Disarat* vol. 2 (no. 2).
36. Badran A. M. 1986. *Biology and Health Education: Innovative Techniques*. UNESCO Book on New Trends in Education, Paris.
37. Badran A. M. 1988. Orientation of Education and Training Policy toward Science and Technology Self-reliance, IAS Journal, Islamabad, Pakistan.
38. Badran A. M. 1988. *Science & Technology and Human Resources*, ISESCO, Dakar, Senegal.

39. Badran A. M. 1988. New Trends in Computer Education, IUBS-CTS, Sydney, Australia.
40. Badran A. M. 1988. Higher Education in the Arab world, International Association of Universities (IAU) Publication, Rio, Brazil.
41. Badran A. M. 1989. Access to Higher Education in the Arab World, IAU, Higher Education Policy, Vol.2 , No. 1.
42. Badran A. M. 1989. Meeting the demand for Higher Education, Chapter 20: 243-252, PWPA Book, Paragan House, New York,
43. Badran A. M. 1990. Protected Cultivation in the Middle East: A promising future, Chapter 19, pps. 289-301. Agriculture in the Middle East, Paragan House, New York.
44. Badran A. M. January 1991. Integration of Traditional and Frontier Technologies. New Technologies: Reaching the Unreached. I. Biotechnology, Swaminathan Research Foundation, Madras, India.
45. Badran A. M. November 1991. Global Change and the Human Prospect: UNESCO's Scientific Contribution, pps. 245-257, Sigma Xi: The Scientific Research Society; Washington D.C.
46. Badran A. M. 1992. The Role of UNESCO in science and technology manpower development in developing countries, IAS Journal: Royal Scientific Society Press, Amman.
47. Badran A. M. August 1993. Sustainable Development and the changing ecosystems, IAS Journal: 81-123, Kuala Lumpur, Malaysia.
48. Badran A. M. August 1993. The Role of Education in the protection of the environment, IAS Journal: 433-462, Malaysia.
49. Badran A. M. 1995. Transboundary Waters: Prospects for Peace or Conflict, IAS Journal: 225-252, Varan Printing House, Ankara, Turkey.
50. Badran A. M. 1995. The Role of Education in Health, Nutrition & Development: Experience of UNESCO, IAS Journal: 161-172, Varan Printing House, Ankara, Turkey, 1995.
51. Badran A. M. 1995. Global Overview: State of Health Education in the World: Towards Partnership; Health Care Delivery and Medical Education: A blueprint for change. World Federation for Medical Education. Medical Education Journal, Vol. 29, supp. 1, pps. 16-23, Blackwell Science.
52. Badran A. M. 1995. Promoting Clean Technology Through the Use of Multimedia Learning Material in Environmental Engineering, European Journal of Engineering Education, Vol. 20, No. 2, pps. 183-185.
53. Badran A. M. 1995. UNESCO Policy on Data Exchange: Grave disparities in scientific data access (Data and knowledge in a changing world), CODATA-ICSU, Paris.
54. Badran A. M. June 1996. Solar Energy for Environment and Sustainable Development. World Renewable Energy Congress IV, Denver, Colorado.
55. Badran A. M. 1996. Globalization and Higher Engineering Education. Australian Journal of Engineering Education, Vol. 7, No. 2.
56. Badran A. M., May 24th 1998. Human Capital and Quality Management: Strategies for an Era of Globalization. Journal of ECSSR - 4th Annual Conference. Abu-Dhabi.
57. Badran A. M., May 17th 1998. Human Resources and Economic Development. Discussant IMF World Bank Arab Fund paper. Journal of Arab Monetary Fund - Abu Dhabi.

58. Badran A. M., 2000. Human Capital, Management and Quality: Globalization and Education Strategies 3rd. Millennium Challenges, the Emirate Centre for Strategic Studies and Research, (PP 129-164), Abu Dhabi, UAE.
59. Badran A. M., May 2000. What a higher education needed for 21st Century, Shoman Forum, pps 235-251, Amman.
60. Badran A. M., 2000. Science and Technology: Arab World Perspective of Science and Technology in the Arab World: Reality and Ambition, Abdul Hameed Shoman Foundation Publications, PP 107-123, Amman, Jordan.
61. Badran A. M., 2001. University Learning and Contemporary Requirements: Future Overview, Abdul Hameed Shoman Foundation Publications, PP 277-288, Amman, Jordan.
62. Badran A. M., April 2002 (co-author). Biotechnology and Developing world. Electronic Journal of Biotechnology, Vol.5 No.1, Issue of April 2002.
63. Badran A. M., 2004. Status of Science & Technology in the Arab Region. UNESCO Science Report.
64. Badran A. M., 2004. Jordanian Universities and Scientific Research vs. International and Arab Universities Scientific Research, Scientific Research Friends Magazine.
65. Badran A. M., 2006. Higher Education: Reality and vision. Shoman Foundation, pps 31-41, Amman.
66. Badran A. M., 2009. One-Way Ticket to Science, Abstract, P 14, TWAS 11th General Conference, Durban, South Africa.
67. Badran A. M., 2009. What is What in S&T and Higher Education in the Arab Region for 2006, Ankara/Turkey, IAS Journal pps 67-75.
68. Badran A. M. & Zou'bi, 2010. UNESCO World science Report 2010, Arab Status on Science & Technology, pps. 251 – 277, Paris.
69. Badran A. M., 2011. Scientific research in Jordan and the Arab world, Diresat, No. 34, pps 211-214, Emirates.

Papers Presented:

70. Badran A, Baydoun E, 1982. Pollution in the Gulf of Aqaba. Proceedings of the 21st General Assembly of the International Union of Biological Sciences
71. Badran A, Baydoun E, 1985. Development of manpower in Jordan. Proceedings of the Scientific Cooperation Prospects Seminar for the Development of the Red Sea Northern Arab Region
72. Badran A, Baydoun E, Subbarini M, 1985. A frame syllabus for agriculture education for elementary school pupils in Jordan. Proceedings of the International Conference on Science and Technology Education and Future Human Needs
73. Badran A. M. 1988. Higher Education and Community Development, American Universities Alumni, Amman, Jordan.
74. Badran A. M. 1988. Address, Regional Conference on Progress in science and technology for development in West Asia region, UNCSTD, ESCWA, Amman, Jordan.
75. Badran A. M. 1988. Address, Regional Conference on Pharmaceutical industry development in the Arab World, Amman, Jordan.
76. Badran A. M. 1989. Role of International Cooperation in the Development of Software Computer Technology, Saqre Conference, Amman, Jordan.

77. Badran A. M. 1989. *New Approaches in Science and Technology*, UNCSTD, DES, Feldafing, Germany.
78. Badran A. M. 1989. *Science and technology in economic and social development*, KIAS, Kuwait.
79. Badran A. M. 1991. UNESCO, *Science, and technology for development*. Paper presented at UN meeting of Intergovernmental Committee on Science and Technology, New York.
80. Badran A. M. 1991. *New Trends in Higher Education in the Middle East*, Paper presented at Harvard Middle-East Centre.
81. Badran A. M. 1992. *Toward a sustainable use of energy*, UNESCO, Paris.
82. Badran A. M. 1993. *Higher Education and S & T Policies in the South*, UNESCO, Paris.
83. Badran A. M. October 1994. *Science and technology for sustainable development: Commission on S & T for sustainable Development in the South (COMSATS)* Islamabad.
84. Badran A. M. July 1994. *Contemporary science for 2000+: Challenges and vision*, ASTA Congress, Amman.
85. Badran A. M. May 1994. *Fundamental sciences for the 21th century: prospects and challenges*, International Conference on Romania and Romanians in Contemporary Science, Bucharest.
86. Badran A. M. September 18th, 1995. *Opening address: Capacity building in science: prospects for development*, Third World Academy of Sciences Congress (TWAS), Abuja, Nigeria.
87. Badran A. M. 1995. *The Academic Exchange: Prospects for mutual understanding between Europe and the Middle East*, UNESCO, Paris.
88. Badran A. M. 1995. *Israeli and Arab Waters: Key issues for peace*, UNESCO, Paris.
89. Badran A. M. 1995. *Basic and applied sciences in the world: past strategies and present status - Role of UNESCO*, Paris.
90. Badran A. M. September 1996. *Opening address: 3rd East-West Congress on Engineering Education*, Gdynia, Poland, *Australian Journal of Engineering Education*, Vol. 7.
91. Badran A. M. June 1996. *Symposium International: From partial insecurity to global security*, UNESCO, Paris.
92. Badran A. M. 1996. *Reforms in higher education for the Palestinian self-rule*, Najah University, Nablus.
93. Badran A. M. April 15 1996. *Presentation of the status of science in the World - UNESCO World-Science Report, 1996*. The Royal Society, London.
94. Badran A. M. September 24 1996. *Globalization: the challenge to science - International Conference on Molecular & Cellular Aspects of Plants Cell Differentiation*, Beirut, 24 September 1996.
95. Badran A. M. June 1 1997. *The United Nations: Challenges facing UNESCO in a world of transition. The Opening Session of the International Leadership Conference (UNU)*, Amman.
96. Badran A. M. September 2001. *Arab Science Profile: Comparative Analysis*. Arab Academy of Sciences Conference, Damascus.

97. Badran A. M. October 2001. Science and Technology: Arab World Reality Perspective, Princess Summayah University of Technology (PSUT), Amman, Jordan.
98. Badran A. M. 2001. Science Arab Prospects in the 21st Century, Arab Research Society, Amman, Jordan.
99. DaSilva E, Baydoun E, Badran A. M. April 15th 2002, vol.5, no.1. Biotechnology and the Developing World. EJB Electronic Journal of Biotechnology [online]. Available from: <http://ejb.ucv.cl/content/vol5/issue1/full/1/index.html> ISSN 07173458
100. Badran A. M. March 2003. Arab R & D Profile: Comparative Analysis & Capacity Building, the Third Academy of Sciences TWAS, Trieste-Italy, March 2003.
101. Badran A. M. June 2003. "Human & Economic Development in the Arab region", Arab R & D profile: Comparative analysis & Capacity Building, MIT Arab Alumni 4th annual Conference Dubai.
102. Badran A. M. 2003. Higher Education in the Arab World ... where to? UNESCO-ALESCO Conference, (The Global Forum for Human Resources Development), Damascus.
103. Badran A. M. October 2003. Capacity Building in Science and Technology in the Arab Region. IAS 13th Science Conference. Sarawak – Malaysia.
104. Badran A. M. October 2003. Strengthening Research and Development Capacity for Industrial Development in the Arab Region. OIC Science Conference, Kuala Lumpur-Malaysia.
105. Badran A. M. October 2003. Pure and Applied Sciences in Jordanian Universities, Science 1st Conference, Amman.
106. Badran A. M. January 2004. Science Profile of the Arab Region: Building Potentials, IUBS. Cairo-Egypt.
107. Badran A. M. April 2004. Modernity and Arab Modernism: towards a learning educational system in a changing world, Launch of Arab Institute for Intellectual Modernization Conference, Beirut, Lebanon.
108. Badran A. M. June 2004. Role of Education in Social, Economic and Political Development: Mechanisms of Implementing Sustainable development Strategies, Irbid, Jordan.
109. Badran A. M. June 2004. Tertiary Education, Research, Science & Technology Development, Workshop in Higher Education Reform/World Bank, Beirut.
110. Badran A. M. 2004. Higher Education Policy, Abdul Hameed Shoman Foundation, Amman, Jordan.
111. Badran A. M. 2005. Conducting a Comparative Study on Existing Management Structures at Tertiary Education Institutions (TEIs) with the Aim of Improving Their Governance & Management, UNDP, Pal.
112. Badran A. M. 2006. Cultural Heritage Law, Abu Dhabi.
113. Badran A. M. 2006. Where are we in S&T & Higher Education in the – Arab Region", Kuwait Ministerial Conference ISESCO, Kuwait.
114. Badran A. M. 2007. Higher & Democracy in Building Security & Stability in the Region, Parliamentarian Conference, Dead Sea.
115. Badran A. M. 2007. Education & Democracy in Building Security & Stability in the Region, A. Badran, Parliamentarian Conference, Dead Sea.

116. Badran A. M. 2007. E-Learning: A Global Revolution, MIT LINC Conference: Dubai Executive Session, Dubai, UAE.
117. Badran A. M. 2007. The STI Landscape in the Arab World, Third World Science Forum, STI in Achieving MDGS, UNESCO – TWAS, Budapest.
118. Badran A. M. 2007. Role of Education in Combating Terrorism, International Conference on Terrorism: Impacts, risks and remedy, ISESCO, Tunisia.
119. Badran A. M. 2007. Higher Education Accreditation and Quality Assurance, 6th. Quality Assurance Conference, Jordan, Health Care and Education Quality Assurance, Dead Sea, Jordan.
120. Badran A. M. 2007. Annapolis Peace Process: where to, Lions Club, Jordan.
121. Badran A. M. 2007. Science Parks, Arab Academy of Science (AAS), La meridian Hotel, Amman, Jordan.
122. Badran A. M. 2007. Role of Education in Eradicating Poverty, Irbid Chamber of Commerce, Jordan.
123. Badran A. M. 2008. UNESCO Mission and to its impact on Society, Isra University, Amman.
124. Badran A. M. 2008. University Youngsters and Generation Gap, 2nd. Cultural Conference (University Youngsters and The challenges of modernity and tradition, Princes Summayah University of Technology (PSUT). Amman, Jordan.
125. Badran A. M. 2008. Mobilization, Consensus, and Rationality, Morocco, ATF, Rabat.
126. Badran A. M. 2008. Palestine and Annapolis: Reds and Greens in the Peace Process, Salt Charity Society Orthodox Club, Amman, Jordan.
127. Badran A. M. 2008. Biotechnology: New Horizon, Science Day, College of Science, University of Jordan, Amman, Jordan.
128. Badran A. M. 2008. Middle East Political Landscape; Present and Future, Lions Club, Amman, Jordan.
129. Badran A. M. 2008. Peace & Beyond, Nobel Laureates Conference, Petra, Jordan.
130. Badran A. M. November 2008. Biotechnology and Society: Prospects and Challenges, the 2nd Jordanian – Egyptian Biotechnology Conference, Yarmouk University, Irbid-Jordan.
131. Badran A. M. 2008. Science, Technology and Innovations for Sustainable Development in the Islamic World: Policies and Politics Rapprochement, IAS, Kazan.
132. Badran A. M. 2008. Political Parties and Parliaments in the Arab World, Inter parliament Conference, Dead Sea, Jordan.
133. Badran A. M. October 2008. Knowledge creation in the Arab region: Arabization or Alienation: 1st Conference on Arabization of Medical Sciences, Amman.
134. Badran A. M. 2009. Rights to Water & Water Rights, 5th World Water Forum, Parliamentarian Conference, Istanbul.
135. Badran A. M. October 2009. Science Indicators in the Arab region: Progress or Regress, Young Arab Scientist Award, Shoman.
136. Badran A. M. December 2009. Science & Technology Landscape of the OIC: The Arab countries in focus, 17 Conference of the Islamic World Academy of Sciences/Shah Alam, Selangor, Malaysia.

137. Badran A. M. December 21 – 22, 2009. The state of science in the Arab region: Progress or Regress, TWAS-ARO 5th Annual Meeting of Academy of Sciences, Alexandria, Egypt.
138. Badran A. M. February 24, 2010. Reforms Higher Education (Change & Continuity), the National Library, Amman, Jordan.
139. Badran A. M. March 3-4, 2010. The state of STI in the Arab region, Roundtable Meeting for the Revival of the STI System in Sudan, Khartoum, Sudan.
140. Badran A. M. May 17, 2010. The international system and regional human rights, National Defense College, Royal Jordanian, Amman.
141. Badran A. M. May 19-20, 2010. Access to Higher Education, World International Conference on Education WICE 2010, Royal Cultural Center, Amman – Jordan.
142. Badran A. M. September 18 2010. Science & Technology in the Arab Regain 2010, Young Arab Scientist Award, Abdul Hameed Shoman Foundation.
143. Badran A. M. September 29, 2010. Human Rights and Fundamental Freedoms in Jordan, UNU.
144. Badran A. M. October 1, 2010. Elections: Reluctance and Distrust in Jordan, Reflections on the Social Reality of the Jordanian Elections, Al Hussain Cultural Center, Amman, Jordan.
145. Badran A. M. November 25-26, 2010. Review of Alternative & Renewable Sources of Energy Conference, International Conference on Alternative & Renewable Sources of Energy, Beirut/Lebanon.
146. Badran A. M. Dec 5, 2010. Opening Address: Festival in the dignity of the Human Rights Film, Royal Cultural Center, and Amman/Jordan.
147. Badran A. M. Dec 8, 2010. Opening Address: on the Occasion of the Visit by Her Excellency, Navanethem Pillay, the United Nations High Commissioner for Human Rights to Jordan, National Centre for Human Rights, Amman/Jordan.
148. Badran A. M. Dec 12, 2010. Non-violence in schools and universities, University of Petra, Amman/Jordan.
149. Badran A. M. Dec 12, 2010. Human rights in the balance, Muntada Al-Dustour, Amman/Jordan.
150. Badran A. M. January 30, 2011. Science and technology in the Arab world in 2010: reference to Libya, National Authority for Scientific Research, Tripoli – Libya.
151. Badran A. M. Feb. 27, 2011. Scientific Research, Talents, Workforce, Innovation; National Medical Biotechnology Seminar, Landmark Hotel/Amman.
152. Badran A. M. June 21, 2011. Financing Higher Education: The Search for an effective way; Conference of the educational process in the light of developments in the age, Al-Hussein Bin Talal University.
153. Badran A. M. October 22-24, 2011. The Science and Technology and Human Rights Nexus in the Arab World, IAS, Doha.
154. Badran A. M. November 16-19, 2011. The Changing Landscape of Higher Education, Science & Technology: Arab Countries in Focus, Hungarian Academy of Sciences World Science Forum, Budapest.
155. Badran A. M. November 16-19, 2011. New Trends in Graduate programs in K-economies, Corvinus University of Budapest, Conference 2011 PI-NET International “The alternatives of the doctoral students' future”, Budapest.

156. Badran A. M. November 29, 2011. The Importance of a strong renewable energy solar system in the MENA region, Arab Middle East Renewable Energy Conference, Amman.
157. Badran A. M. Dec 2-3, 2011. New trends in renewable energy, Water and Energy in Sustainable Food Security Conference, Beirut.
158. Badran A. M. May 22-23, 2012. Science, Technology & Human Development, IAS Symposium on Outlook for Science and Technology in Kazakhstan and the Islamic World, Astana-Kazakhstan.
159. Badran A. M. May 27, 2012. R&D, Innovations, Entrepreneurship & IP Rights, Masdar, Abu Dhabi Higher Education Forum “Sustainable Alignment” University R&D A Catalyst for economic Development, Abu Dhabi.
160. Badran A. M. November 16, 2012. The Higher Education Sector in Jordan, Turkish-Jordanian Joint Business Council Meeting, Istanbul.
161. Badran A. M. November 18, 2012. The role of the public and private sectors in the development of work-related skills, Economic Policy Development Forum, Amman.
162. Badran A. M. Dec. 2, 2012. The Changing Landscape of Higher Education, Science & Technology in the Arab World: Jordan in Focus, 1st Greco-Jordanian Workshop on Technical Collaboration “Green and Smart Technologies”, Amman.
163. Badran A. M. Dec. 7, 2012. Renewables: Where to!, Conference on Energy and Water Sustainability, Arab Academy of Science, Beirut.
164. Badran A. M. Jan. 17, 2013. Building a Robust R&D infrastructure, World Future Energy Summit 2013, Abu Dhabi.
165. Badran A. M. Feb. 12, 2013. Conference sponsor: The role of citizenship in rooting out corruption, Enhancing Citizenship in Combating Corruption in the Arab World Conference, Amman.
166. Badran A. M. May 6, 2013. Excellence in Higher Education for building S&T proficiency: a Global perspective, 19th conference IAS, Dhaka, Bangladesh.
167. Badran A. M. May 20, 2013. Creativity and entrepreneurship in development, the United Nations Former Staff, Amman.
168. Badran A. M. June 9, 2013. Higher Education for Innovation: a Global Perspective, Transforming Higher Education in the Arab World. QS in Conversation, JUST, Jordan.
169. Badran A. M. Dec 11, 2013. Renewable energy in the Arab region as compared with the world, Federation Building of Arab Businessmen, Arab Fund for Economic and Social Development, Kuwait.
170. Badran A. M. Jan 28, 2014. The future of energy in Jordan, Economic platform of Businessmen Association, Amman.
171. Badran A. M. Feb. 24, 2014. Challenges Facing Higher Education in the Arab Region, Future University, Sudan.
172. Badran A. M. April 1, 2014. Prospects and Challenges of Higher Education in the Arab World, The Fourth International Arab Conference on Quality Assurance in Higher Education, Zarqa University, Zarqa/Jordan.
173. Badran A. M. June 24, 2014. Empowerment: New Strategy for Higher Education, Graduation Commencement at the Palestine Technical University/Kadoorie, Palestine.
174. Badran A. M. September 6, 2014. Higher Education and Social Responsibility, Social Responsibility of the Private Sector, Association of Jordanian Academics, Landmark Hotel, Amman.

175. Badran A. M. September 17, 2014. Challenges Facing Education In Private Universities In Jordan, Association of Arab Private Institutions for Higher Education, Le Vendome, Amman.
176. Badran A. M. Oct. 6, 2014. On Abdus Salam Legacy, Conference on the fiftieth anniversary celebration of the Center for International Research/World Academy of Sciences/UNESCO, Trieste.
177. Badran A. M. Oct. 26-27, 2014. New Trends in Higher Education in Jordan 2014, Education, Economic and Development 4th Arab-Turkish Congress of Social Sciences, University of Petra.
178. Badran A. M. Dec. 3, 2014. Cultural Diversity under Attack, UNESCO Paris table on Heritage and Cultural Diversity at Risk, UNESCO, Paris.
179. Badran A. M. Dec. 15, 2014. Counteracting Extremism by Youth through Education, Yarmouk University, Jordan.
180. Badran A. M. March 10, 2015. Welcome and opening remarks in: Engaging with host countries to increase humanitarian outreach, Syria: Engaging with local actors to increase humanitarian outreach; Amman.
181. Badran A. M. March 31, 2015. Reforms in higher education, Jordan Academic Society and World Affairs Council, Amman.
182. Badran A. M. April 21, 2015. Welcome Address: “media and extremism”, Marginalization Conference, University of Jordan, Amman.
183. Badran A. M. May 28, 2015. Priorities of scientific research at UOP, University of Petra, Amman.
184. Badran A. M. May 31, 2015. Charting the Political Map of Middle East, Poland/V4 and the EU – Jordan and the Middle East”, Marriot Amman.
185. Badran A. M. June 11, 2015. Graduation speech, The National Institute for Diabetes Endocrinology and Genetics, Amman.
186. Badran A. M. August 15, 2015. Priorities of scientific research, Phi Science Club, Amman.
187. Badran A. M. Sept. 8-10, 2015. Role of science, Technology and Innovation in Pharmaceutical Industry in the Developing Countries, plenary lecturer at The 1st International Conference on Natural Products & Drug Discovery, University of Jordan, Amman.
188. Badran A. M. Sept. 19-20, 2015. Political partnership in the Arab world: a comparison between Arab experiences, Middle East Studies Center, Amman.
189. Badran A. M. Nov. 4-7, 2015. Science Education & Science Investment in the Arab Region, World Science Forum 2015, Budapest, Hungary.
190. Badran A. M. Dec. 1-2, 2015. Role of science academies toward transformative & inclusive partnership for a sustainable future, Regional Forum on Science & Technology Diplomacy, Amman.
191. Badran A. M. Dec. 5-6, 2015. Climate Change & Water Science Policy in Management, Climate Change and Water-Energy-Food Nexus in the Arab Middle East, Le Méridien Hotel, Amman.
192. Badran A. M. April. 15, 2016. *University Governance*, First Forum of the Jordanian Society for Educational Sciences, Dead Sea, Jordan.

Keynote address:

193. Badran A. M. 1994. Keynote address to the World Summit on Medical Education: *World Federation for medical education proceeding*, University of Edinburgh, Medical Education Journal, Vol. 28, supp. I, pps. 15-16.
194. Badran A. M. Feb. 1-2, 1995. Keynote address: *Global civilization and cultural roots: Bridging the gap and the place of International University Cooperation*, International Association of Universities (IAU) Conference, New Delhi.
195. Badran A. M. December, 1995. Keynote address: *Health education for all: ministerial consultation*.
196. Badran A. M. October 1995. Keynote address: *From xenophobia to tolerance: Jews and Moslems*, Simon Wisenthal Center - Europe, Paris.
197. Badran A. M. July 1995. Keynote address: *Sharing knowledge for globalization and social development*, International Congress of Engineering Deans and Industry Leaders, Melbourne, Australia.
198. Badran A. M. 1995. Keynote address: *Narrowing the gap: developed and developing South-South cooperation and international development*. Special reference to Latin America, IBN-COSTED: ICSU, UNESCO, Mexico City.
199. Badran A. M. September 1995. Keynote address: *University, industry science partnership in Africa* (UNISPAR) Accra, Ghana.
200. Badran A. M. September 1995. Keynote address: Solar Energy: The World Solar Summit Process, ISES Congress: *In search of the Sun*, Harare, Zimbabwe.
201. Badran A. M. 1995. Keynote address: *Solar energy for rural Africa*, University of Readings, U.K
202. Badran A. M. 1995. Keynote address: *Re-orientation of engineering education to local environment and priorities of development*, World Federation of Engineering Congress.
203. Badran A. M. June 18, 1996. Keynote paper: *Science for sustainable food security*, M.S. Swaminathan Research Foundation, Science Academies Summit, Madras, India.
204. Badran A. M. June 1996. Keynote address: *Future challenges for development in an interdependent society*, the Graduation Ceremony of the European University, Paris.
205. Badran A. M. May 1996. Keynote paper: *Challenges to science in a globalized free market-economy*, Congress of the Encyclopaedia of Life Support Systems, Bahamas.
206. Badran A. M. October 8, 1996. Keynote paper: *Status of higher-education teaching personnel*, UNESCO, Paris.
207. Badran A. M. November 24, 1996. Keynote paper: *Science for sustainable development in the South: Challenges ahead*, TWAS, Trieste, Italy.
208. Badran A. M. March 6, 1997. Keynote address: *Science and Mathematics Education Investment in future generations for a new era of globalization*. Sao Paulo, Brazil.
209. Badran A. M. March 31, 1997. Keynote address: *Bio-informatics as a dynamic network for developing countries*. International Centre for Co-operation in Bio-informatics. The Weizmann Institute of Science, Rehovot, Israel.
210. Badran A. M. April 6, 1997. Keynote address: *The future of technological and vocational education - UNESCO's perspective*. The Higher Colleges of Technology (TEND 97) Abu Dhabi, United Arab Emirates.

211. Badran A. M. April 15, 1997. Keynote address: *Bioinformatics: Dynamic network for training and research in the developing countries*. Oxford International Biomedical Centre, Worcester College, Oxford.
212. Badran A. M. June 27, 1997. Keynote address: *Science, Technology and Mathematical Education in an era of economic globalization: Special reference to developing countries*. CASTME-RAST International Symposium, Headquarters of the Commonwealth, London.
213. Badran A. M. September 8, 1997. Keynote address: *Challenges Facing the Third World in an Era of Transition*. TWAS 6TH General Conference & 9th General Meeting, Rio de Janeiro, Brazil.
214. Badran A. M. October 4, 2010. Keynote address: *Promoting Science & addressing societal concerns through international scientific collaboration*, American Association for Advancement of Science (AAAS) in collaboration with Jordan University of Science & Technology (JUST), Amman/Jordan.
215. Badran A. M. Nov. 25-26, 2010. Keynote address: *Introduction to Alternative & Renewable Sources of Energy*, International Conference on Alternative & Renewable Sources of Energy, Beirut/Lebanon.
216. Badran A. M. Nov. 15, 2011. Keynote Speaker: *The Talent and Creativity, Conference: The Talent and Creativity - an important turning points in people's lives*, Arab Council for Gifted and Talented, Geneva Hotel, Amman.
217. Badran A. M. Feb. 12, 2013. Keynote Speaker: *The phenomenon of corruption in its political and social dimensions*, Enhancing Citizenship in Combating Corruption in the Arab World Conference, Amman.
218. Badran A. M. March 23, 2013. Keynote Speaker: *Leading Change in school: to meet the challenges of a new century*, leading Change Conference in school, Kempinski Hotel, Aqaba.
219. Badran A. M. March 24th- 25th, 2013. Keynote Speaker: *Bridging science & policy in water management*, University of California, Rosenberg International on Water Policy, Moevenpick hotel, Aqaba.
220. Badran A. M. April 10, 2013. Keynote Speaker: *"Encyclopedia of Amman old days"*, the Royal Cultural centralized, Amman.
221. Badran A. M. April 13, 2013. Keynote Address: *School as a tool for building creativity and entrepreneurship*, 1st Conference of Schools of the Islamic Educational College, Amman.
222. Badran A. M. April 22 -24, 2013. Keynote Speaker: *Landscape of Global Perspectives of Renewables*, International Conference on Renewable Energy and its Future in the Arab World 2013 (ICREFAW Conference), University of Petra, Amman.
223. Badran A. M. April 25, 2013. Keynote Address: *The dimensions of the use of social networking*, Science Day for the Department of Educational Sciences at University of Petra, Amman.
224. Badran A. M. May 29, 2013. Keynote Address, The 1st International Conference & Exhibition on the Applications of Information Technology in Developing Renewable Energy Processes and Systems (IT-DREPS 2013), Le Meridian Hotel, Amman.
225. Badran A. M. July 7, 2013. Keynote Address, Youth violence at Univ. Campuses: causes & remedies. Arab Association for Thought and Culture, University of Jordan, Amman.

226. Badran A. M. Dec. 5, 2013. *Keynote Address, Science potential for sustainable water policy and management*, Arab Academy of Science (AAS), Beirut.
227. Badran A. M. Nov. 9, 2014. *Keynote Address, Overcoming barriers of Building Culture of Peace*, 25th anniversary of the Fall of Berlin Wall: A World without Walls, Berlin.
228. Badran A. M. Nov. 16, 2014. *Keynote Address, Climate Change: Fossil Fuels to be phased out by 2100 & replaced by renewable*, Energy Efficiency for MENA. Amman.
229. Badran A. M. Nov. 26– 27, 2014. *Keynote Address: Food Security and Climate Change*, Arab Forum for Environment and Development (AFED), Le Meridian Hotel.
230. Badran A. M. Dec. 12, 2014. *Keynote Address, Climate Change Fallout on Energy, Water & Food Security*, Sustainable Energy & Water Resource Management for Food Security in the Arab Region, Arab Academy of Science (AAS), Beirut.
231. Badran A. M. May 31, 2015. *Keynote Address: “Poland/V4 and the EU – Jordan and the Middle East”*, Marriot Amman.
232. Badran A. M. Sept. 6-9, 2015. Keynote speaker: “*Science, Technology and Innovation Indicators*”, NASIC Conference cum Workshop on “Herbal Drug Development for Socio-economic Uplift in Developing World”, University of Jordan, Amman.
233. Badran A. M. Nov. 16-17, 2015. *Keynote Address: Sustainable Consumption*, Arab Forum for Environment and Development (AFED), Phoenicia Intercontinental Hotel, Beirut.
234. Badran A. M. Feb. 11, 2016. *Keynote Address: Inauguration of Prof. Wolfgang laboratories*, International Centre for Chemical and Biological Sciences, University of Karachi, Pakistan.
235. Badran A. M. April 7, 2016. *Keynote Address: **The Changing Patterns of Universities in Middle East: Recognition, Internationalisation, Strategies and Challenges.** International Conference on Recognition, Qualification and Internationalisation of Higher education in the EURO-Mediterranean Region*, University of Petra, Amman.
236. Badran A. M. April 27, 2016. *Keynote Address: Higher Education in Middle East: Where to? Recognition, Internationalisation, Strategies and Challenges*, International Conference: 2nd Turkish-Arab Congress on Higher Education, TACHE 2016, Istanbul.

Major Contributions of Significant Application Impact:

1. In Research and Development (R&D) International:

- a) *After extensive research on banana metabolism and ethylene biogenesis, an environmental technique was developed to suppress respiration and ethylene evolution-extend the shelf life and delay the ripening process. Fruits were harvested at large caliber, without being at risk of turning ripe during shipping. This led to quality bananas branded Banavac (Chiquita), shipped all over the world from central America (1963-1966).*
- b) *After extensive biochemical and histological research on the mechanism of polyphenoloxidase and identifying substrate (L-dopamine) and inhibitors of high molecular weight (tannins) A technique was developed to control the core browning and the peel scars of bananas, elucidating the mechanism of core browning and chilling injury. The outcome has led to quality bananas brand "Chiquita", free of core browning and dark scars (1963-1966).*

2. In Institutional Building, (National):

- a) *Establishing and managing a university of two campuses:*
 - *The 1st campus for arts, sciences, humanities, social sciences, education, economics and administrative sciences, fine arts, physical education, mass communication, and continuing education and community services with general and physical facilities and students dormitories and staff housing. This campus houses 30000 students with faculty of 850 Ph.D. and 1200 of technical and administrative staff (110,000 m² construction space - 200 acres), 1976-1986.*
 - *The 2nd campus for science and technology, which houses faculties of medicine, dentistry, pharmacy, public health and allied health sciences, nursing, engineering, agriculture, and veterinary medicine. Staffing development of faculty and technical staff was undertaken, and a campus of 500,000 m² on 1200 hectares was constructed. The campus houses 20000 students. 1976-1986.*
- b) *Building up and managing a faculty of science for graduate and undergraduate students, teaching and research, University of Jordan, Amman, 1966-1976.*
- c) *Establishing the Higher Council for Science and Technology to manage research and development in Jordan, 1987-1988.*
- d) *Developing and expanding Philadelphia University as its president, from 3300 undergraduate students to a comprehensive university of 7500 students of diversified specializations.*
- e) *Developing and expanding University of Petra as its president to 7465 undergraduate & graduate students and improving quality and standards.*

3. In Building Science Curriculum & Textbooks:

- a) *Science curricula for Jordan and Arab region (ALECSO) and Oman were developed with complete textbooks in biology for secondary education were authored. In addition, curricula and textbooks for community colleges - higher education in Oman.*
- b) – *Co-chairman of UNESCO – EOLSS Joint Committee for the Development of "Encyclopedia of Life Support Systems" of 200 volumes written by 3000 scientists world- wide, published electronically. 2006. www.EOLSS.Net*
 – *President AAS who published "Encyclopedia of the Arab Region", 4 volumes. 2007.*

4. In Formulating Science and Technology Policies (National, Regional):

- a) *As a member of the executive committee for science and technology strategy in the Middle East, supported by ALECSO, a strategy was developed and published in 1988.*
- b) *Also, an institutional framework for National Science and Technology policies priorities of R&D for implementing programmes, at the national and regional levels.*

5. In Institutional Cooperation for Development:

- a) *As Assistant Director-General for Science (1990-1994) at UNESCO-Paris, responsible for the Science Sector programme at UNESCO: (1) Science and*

technology for development; (2) Environment and development. The Science Sector comprising 280 professionals and administrative staff at Headquarters, Paris and six regional field science offices in Asia, Africa, Eastern Europe, Latin America and biennial regular budget of \$55 million and \$60 million extrabudgetary. Science has achieved a high multiplying effect on concentrating on priority areas for developing human resources and national capacities on which science and technology depend; and increasingly is being harnessed for sustainable development

The mode of action is mobilization and facilitating partnerships with NGOs and international centers and fostering on cooperation research and enhancing intellectual cooperation. Interactive multimedia and information technology in frontier areas which have greater impact on development have yielded very positive results at the grass-roots level.

b) **As Deputy Director-General of UNESCP-Paris (1994-1998):**

- *UNESCO, an International Intergovernmental Organization (192 Member States), with a wide mandate on Education, Science, Culture and Communication and a regular staff of 2200--almost half of whom are at Headquarters, Paris, while the remainder are spread over 60 Field Offices covering all regions and subregions of the world. Operates with a biennial regular budget of \$518 million and extra budgetary of \$290 million.*
- *To be cost-effective, time-effective and relevant, and efficient in delivery to Member States, we have as DDG of UNESCO undergone a strong reform change and renewal in order to adapt to new realities of a rapidly changing and complex world.*
 - *Rationalization of permanent staff and development of high calibre rotating rosters of experts in every region of the world to carry out the programme.*
 - *Decentralization and mobilization of other resources.*
 - *Concentration and prioritization.*
 - *Seed-funding partnership (i.e. African Technology Fund, etc.) and increasing extra budgetary resources.*
 - *Fund raising, Delivery of high quality services.*
 - *Capacity building in education, science, culture, media & communication at the grass- roots levels.*

